Embedding career education in the Victorian Curriculum F–10

Design and Technologies – Engineering principles and systems, Levels 9 and 10

An existing learning activity linked to a particular learning area or capability in the Victorian Curriculum F–10 can be easily adapted to incorporate career education, enriching students’ career-related learning and skill development.

1. Identify an existing learning activity

**Curriculum area and levels:** Design and Technologies – Engineering principles and systems, Levels 9 and 10

**Relevant content description:** Critically analyse factors, including social, ethical and sustainability considerations, that impact on designed solutions for global preferred futures and the complex design and production processes involved [(VCDSTS054)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTS054)

**Existing activity:** Discussing the impacts of robots on our lives today.

**Summary of adaptation, change, addition:** Considering the types of careers that robots could replace and could not replace as well as careers in robotics and those that could be enhanced by using robots.

2. Adapt the learning activity to include a career education focus

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| Existing learning activity | Adaptations, changes or extensions that can be made |
| Students watch the videos in the ‘Additional resources’ and brainstorm ways robots are used in society today. | Teacher focuses the discussion on the jobs that robots currently do (i.e. manufacturing or parcel sorting) and jobs that have been improved as a result of using robots (i.e. complex surgeries, bomb deactivation). |
| Teacher leads a discussion on the things that robots are good at in these uses, and ‘human’ factors/traits/skills that are not evident in the uses identified (i.e. creativity, social intelligence, compassion). | Teacher extends the discussion to include the types of work that it would be difficult or impossible for a robot to do, such as childcare, teaching, or work in the arts, because of the ‘human’ traits inherent in those roles. |
| Students assess how these robots are enhancing and impacting our lives by individually completing a plus, minus and interesting (PMI) worksheet for each use identified. Students list the positives, negatives, and things they find interesting about the current uses of robots. | As an alternative to the existing activity, students dissect a role and determine what parts a robot could do and what parts would be difficult for a robot. For example, if the students consider the work of a chef, a robot could collect ingredients but find it difficult to determine taste and smell and/or express the art of cooking. |
| Students share their findings with the class, and then categorise the PMI findings about robots into social, ethical and sustainability considerations. For example, a ‘plus’ for the use of a robot to sort parcels could be that it prevents human workers from injuring themselves by doing repetitive manual labour. This could be classified as a ‘social’ and/or ‘ethical’ consideration. | Students extend their thinking to consider if there is tension between social, ethical and sustainability factors in a work context – for example, a robot that can sort parcels quickly may be cheaper to run, and get parcels to customers faster than a human in capable of, but might have a greater environmental impact than people would in the role, and take the jobs of a team of human workers. |
| Teacher asks students if there are particular factors that they were surprised with, or anything that changed their thinking about how robots are used today.  Students are asked to predict future uses of robots. | Teacher extends the discussion to explore career opportunities that relate to the design/creation/use of robots – for example, robotics engineer, computer programmers, mechanical engineers, aerospace engineering. Teacher can link in a career practitioner to explore pathways to these roles for interested students. |

Considerations when adapting the learning activity

* Robotics is a dynamic and ever-changing area. Teacher should keep abreast of changes and consider other resources that depict emerging uses of robots.

Additional resources to help when adapting the learning activity

* News.com.au, [Collaborative robots could save Australian manufacturing jobs and boost small business](https://www.news.com.au/technology/innovation/design/collaborative-robots-could-save-australian-manufacturing-jobs-and-boost-small-business/news-story/6eea5f2eed4e3fd211b7aa1190392f1a)
* 60 Minutes Australia, [Human vs robot](https://www.youtube.com/watch?v=XFFFYQpGdww)
* Nine News Australia, [New generation of robots on show in Sydney](https://www.youtube.com/watch?v=heYyrINbTAE)

Benefits for students

Know yourself – self-development:

* Recognising the way technology such as robots has impacted jobs and could affect jobs in the future encourages students to be adaptable.

Know your world – career exploration:

* As they identify factors that are/aren’t uniquely human, and how this connects to specific jobs, students enhance their understanding of work.
* Thinking about how technology will shape workplaces of the future and which career paths are involved in the design and creation of robots helps students know what is possible for their careers.

Manage your future – be proactive:

* Students use opportunities to learn and explore as they delve into the way robots are currently being used and the various ways this can impact on jobs.
* Considering the social, ethical and sustainability factors that influence the development of (or result from the creation of) designed solutions can help students make informed decisions, as they learn to think critically and creatively about their own choices.