

# Creating an R&D culture to solve real problems at Sunshine College



Melbourne West, Victoria

"In STEM classes I have learnt to be creative, to communicate with my friends and to talk to people I don't normally talk to."

*Sunshine College student*

## Key characteristics, challenges and goals

Sunshine College is a multi-campus school currently operating three campuses. These cater for approximately 1030 students comprising Years 7-10, a Year 11-12 VCE campus for senior students and the innovative Harvester Technical College catering for a Year 10-12 cohort, which focuses on trade training.

The Sunshine community is incredibly diverse, with over 50 different nationalities represented in the student cohort. The school's ICSEA index of 939<sup>1</sup> reflects social disadvantage where 86% of the school's families are represented nationally in the bottom two quartiles (64% and 22% respectively). The community has a strong sense of pride and identity and the school reflects this diversity with a wide range of programs aimed at fully addressing career aspirations and the learning needs of all students.

Sunshine College runs extensive programs to support "at risk students" including the operation of a deaf facility. The school is accredited to take international students, attracting students predominantly from Vietnam. It is a Registered Training Organization.

More recently the college has adopted a strong focus on developing a Research & Development Culture developing skills and capabilities that will support students to become lifelong learners who are flexible and adaptable to a changing world. Leadership felt it was their responsibility as educators to help create futures by increasing career opportunities and pathways for their students.

To do this they set out to build teachers' capacity to equip students with 21st century STEM skills, developing a whole-school approach to fostering a research and development community that would drive authentic, targeted professional learning. This meant that teachers worked in Action Research Teams, publishing findings in a yearly school journal.

## Achievements

The school has been mentioned in two Grattan Institute reports for its work in achieving outcomes for its community; is featured in the Victorian Auditor General's report for its pastoral care programs; and has won recognition and awards for its work in literacy and numeracy, including the Lindsay Thompson Award for Excellence in Education at the Victorian Educational Excellence Awards.

## Innovations introduced through involvement with The Connection

Sunshine College wanted to establish a culture of staff research and development, and for teachers to experience the power of collaborative, self-directed learning to envision how they can provide the same for their students. Providing staff with the space for self-directed learning enabled

<sup>1</sup> The Index of Community Socio Educational Advantage (ICSEA) is a scale developed by the Australian Curriculum, Assessment and Reporting Authority (ACARA). Relative disadvantage is defined as below the average ICSEA score of 1,000.

genuine learning experiences and has led to authentic development of their ability to utilise STEM capabilities. This has resulted in a shift in the school culture of learning.

Sunshine College identified that the landscape of work is ever-changing and current students needed to be better equipped to be job ready.

The college provided staff with the space and resources for collaborative, self-directed learning based on research and development principles, leading to the creation of rich teaching and learning opportunities for students aligned to core capabilities.

Students are now involved in more project-based learning. As these are capabilities-focused and delivered through team teaching, deeper learning is occurring, supported by a greater focus on inquiry, and aligned to a growth mindset. Emerging technologies are increasingly embedded as tools to improve student engagement and learning outcomes.

## **Innovative teaching strategies and practices**

### **The Future of Transportation – Flight Crew**

Sunshine and Harvester Technical College applied for and received funding from Samsung and Toyota to run two projects to teach students to use STEM skills and some technology to solve problems.

In the Future of Transportation unit Year 8 students examined the problem of increasing traffic and transportation issues in Melbourne. At the beginning of the unit, students used research and development skills to work together to identify different types of transportation being used to transport people and goods to Melbourne, then set examined order problems about what causes congestion and how to come up with solutions.

Students investigated the strengths and weaknesses of different kinds of travel and explored the use of flight and drones to address the congestion issues experienced at ground travel.



*Sunshine Secondary College students getting into flying the drone they programmed - controlled by a smartphone - Future of Transport STEM learning project.*

Students then had practical tasks to manually fly drones through a course and also to use a program to write a course in code for the drone to follow. They then evaluated the strengths and weaknesses of each to see which was more accurate and safer.

This gave student the opportunity to:

- Identify problems
- Work collaboratively with other to create a solution
- Test and record the results of their solution
- Make modifications and re-test
- Use technology to solve problems

"When they get the drones and find out that they can determine their own learning outcomes, they can set their own parameters about what is a success - they're instantly engaged, it's a powerful tool," says Teaching and Learning Manager at Harvester College, Janeden River.



*Sunshine Secondary College students program a smart phone to fly a drone - Future of Transport STEM learning project.*

"It's really not about the drones themselves, it's about thinking like an engineer, thinking about problem solving, not just following the normal rules but stepping outside to be creative to get outside a process."

Harvester has welcomed other schools to visit and get a 'taste' of this collaborative project-led approach to learning STEM. [Watch a short video about this project](#)

## Benefits for Students – Learning Outcomes

The school reports student growth in research and development skills involving Science, Technology, Engineering and Maths, with an increased knowledge of how the areas of STEM align to the real world.

The creation of a STEM Focus Group and the development of extensive STEM units of work aligned to the Victorian/National Curriculum; the integration of emerging technologies as tools to support engagement in learning; and an emerging whole-school R&D culture that supports inquiry by both staff and students.

- **24% more students are directly involved in STEM-related courses and electives than when the project began**
- **88% of eligible staff involved on average in Action Research Teams within the research and development communities over two years**
- **92-100% of STEM electives in Years 9 and 10 run at capacity**

They are now one of the top schools in the State getting great NAPLAN results in reading.

## Coping with Covid-19

A huge challenge for Sunshine and Harvester is not being able to continue many of their pioneering large group teaching with hands-on tools for children to learn STEM skills to solve problems in groups.

They have been able to give out nearly 200 laptops to students with no access to technology, and the dedicated teachers make up hard-copy packs and drive them around to homes with no internet access.

One of the new approaches Principal Tim picked up through his involvement in The Connection is a team-building idea to set up affinity 'Crews'.

Teachers have now set up 'Crews' to help stay connected and boost their own morale.

'We decided to take a well-being approach to remote learning with our middle years students,' says Principal Tim. "We don't expect them to follow a school time-table at home, and we don't expect parents to monitor their school work in a rigorous way."

'We have children of a very wide range of abilities, including many deaf students, who are struggling without access to Auslan interpreters and support teachers as they would have in a classroom setting.'

"We decided that we needed to focus on our students' wellbeing as well as their education – so we've asked students and parents to make sure students spend time each day on four equal priorities, within a daily planner:

- school work set by teachers
- do something that makes you happy – play, read, work on a hobby
- support your wellbeing – exercise, play outside
- help around the home – ask what chores need your support

**Sunshine's approach will be a case study in a paper by [Evidence for Learning](#) on different approaches to remote learning.**

The Connection is a Collaborative Leadership Development Network, created and facilitated by Social Ventures Australia, that has achieved educational improvements in 50 Australian schools, across NSW, SA and Victoria. This network has connected 2900 educators and benefited approximately 50,000 students over five years from 2014-2019.

Participating schools in areas experiencing disadvantage are connected to other primary and secondary schools in the network and learn from each other. They are supported to implement new and innovative teaching practices and approaches to improve learning outcomes for their students.

Read more about Sunshine College & Harvester Technical College involvement in The Connection [here](#)