

Learning face-to-face with actual scientists, students can now plot their own career path in science

ABC Wimmera / By Alexander Darling

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Stawell secondary students learn dark matter theory during the 2021 pilot. (ABC News)

Abbey Johnson always had a natural interest in science, but she never considered it a possible career path.

But that all changed a few years ago when her school started hosting actual scientists and PhD students.

Now in her final year of VCE, 16-year-old Abbey of Stawell Secondary College is preparing to sit physics and chemistry exams.

"I would have studied physics anyway, but having people come in and tell us there are these local opportunities guided me more towards studying it further into the future than just school," she said.



Abbey Johnson is considering studying post-secondary science after her school hosted real scientists. *(Supplied: Stawell Secondary College)*

See it, be it

The pilot program that directly connected Abbey and her classmates with scientists is now a fully-fledged program across parts of western Victoria.

Melbourne University's Centre of Excellence for Particle Physics (CoEPP) rolled out the program of scientists teaching scientific theory directly to students in 2020, leveraging off the fact [Stawell is about to host a massive dark matter experiment](#) which could solve one of the universe's greatest remaining mysteries.

To explain dark matter — an invisible substance that makes up 85 per cent of the universe's mass — educators such as Jackie Bondell gave students lasers to point at gelatin blocks and conducted demonstrations on the school's basketball court with black sheets, silver balls, and coal.

"Learning they were going to set up a local dark matter lab was really interesting to me and I really wanted to learn more about that," Abbey said.

"I wasn't expecting male or female when they came in — I was happy with any scientists — but it did make me more comfortable to ask questions that there was a female scientist there."

Last year the federal Department of Education stated the number of school students studying STEM in later secondary — years 11 and 12 — "has flat-lined at around 10 per cent or less".

Abbey said a major hurdle to getting more young people studying STEM subjects is the perception that it was "hard to wrap your head around the concepts".

"As long as you really focus on making sure people in your classes understand what's going on I think it's not as hard as it's made out to be," she said.



Jackie Bondell has been spearheading the campaign to host real scientists in secondary schools. (*ABC News: Michael Barnett*)

"I'd heard of dark matter before, and that we knew nothing about it, and I thought 'well it's impossible to understand if they have no conception of what it looks like'.

"But when they came in and explained why there had to be something there I kind of felt like that was the missing piece that might explain a few things later on."

Roots of STEM growth

Ms Bondell, the education and public outreach coordinator for CoEPP, said it was too early to say whether her visits to Stawell had led to a general increase in VCE science enrolments.

"Most of the students I spoke to aren't at a point where they're choosing to take physics, when they're in year 10," she said.

"We're starting to get to that point, but the leadership and science team in Stawell has been very positive and accommodating too, working with us to provide this opportunity."

One of the enthusiastic teachers, then-principal Carlos Lopez, is now assistant principal of Warrnambool's Brauer College.

When he left Stawell the science pilot followed him south.

"Last year Jackie gave a series of workshops at Brauer about women in science, along with a marine biologist from Deakin University," he said.

"Two year 12 students are now doing a 4,000-word research project on dark matter as part of their VCE studies.

"[That] is quite an out-of-the-box area for students to take an interest in, and I think that was facilitated by Jackie and her talk."

Ms Bondell is also visiting Hamilton's Monivae College, and there are plans to add partner schools in Ararat and Ballarat.

Carlos Lopez has worked at two of the schools that hosts scientists in the classroom. *(ABC News: Michael Barnett)*

Universal appeal

It was logical to make Stawell the pilot site — a dark matter experiment nicknamed SABRE has been under construction in a town gold mine for years and is about to begin.

The building in which SABRE is housed, the Stawell Underground Physics Laboratory, is the first of its kind in the Southern Hemisphere.



The epic experiment at the bottom of a Stawell gold mine. *(ABC 7.30: Ben Knight)*

Ms Bondell is confident the uptake will be just as strong in the other towns that do not have a lab beneath their feet.

"Because it's the Southern Hemisphere's first dark matter experiment I think there is a sense of ownership and enthusiasm across Australia," she said.

Abbey's advice for the students at the schools joining the CoEPP program is to keep an open mind in case science turns out to be "the one thing they love to do".

"I think physics classes tend to be bigger if they have more opportunities to learn about things that are currently being invested in, not past things that have already been discovered," she said.

"When they come in and say 'we are actually still learning about dark matter and the universe' it gives people hope that if they go into these fields when they're older they will be able to help discover something truly inspirational."

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