The Growing Tall Poppies in Science Program

Partnerships between schools and communities provide a connected learning experience for students.

by Dr Eroia Barone-Nugent

Partners with a purpose

'Growing Tall Poppies: An authentic science experience for secondary school students' (GTP) is a collaboration between Santa Maria College (SMC), Northcote, the Australian Research Council Centre of Excellence for Coherent X-ray Science (CXS) and Akorn Educational Services. The initial implementation of the program was supported by the Catholic Education Office Melbourne (CEOM). The program grew from a shared goal of providing positive and engaging experiences for students to enhance their learning of science, with the greater aim of increasing the number of students studying science. Working in partnership with the wider community in this way has been essential for realising this goal.

The program has been named *Growing Tall Poppies* to emphasise the potential, given the opportunity that we believe students have, to rise conspicuously above the norm in achievement. The purpose of the GTP program is to help young Australians, who have the potential, to become 'Tall Poppies' in science. It is genuinely about growing new Tall Poppies for Australia.

SMC is a Catholic girl's school in the inner north of Melbourne and its vision is to ensure that students are fully able to realise their potential in all areas of academic endeavour, so as to enrich their lives and the lives of the members of the community of which they are a part. CXS is a multi-university and interdisciplinary science research organisation that has its headquarters in the School of Physics at the University of Melbourne. It has an imperative to share its interdisciplinary research and to encourage students to pursue careers in the sciences. An important feature of the partnership formed between SMC and CXS is that students from many schools have also been able to participate in the program through an agent (Akorn) that connects educational programs and school communities.

In developing the GTP program we have focused on giving secondary school students, especially girls, an authentic experience of the physical sciences. Through this enquiry-based experience, students are given the opportunity to use their curiosity by being placed in a real scientific research environment. This gives them a genuine feel for how interesting and relevant the physical sciences are to their world and their future. It allows students to exercise not only their curiosity but also to create knowledge and to practise team-building and leadership skills.

When students have the capacity to experience science with real scientists grappling with real problems, they are more likely to view their classroom activities in context, and so feel more connected to their classroom learning experience. This enables teachers to engage students with the relevance of science to society and so make what would otherwise be an esoteric pursuit into a tangible one. Through the partnership developed between CXS and SMC we have been able to get students in Years 10 and 11 to engage

Student and mentor analysing data on a fossil ant they have just collected. Photo courtesy Santa Maria College, Northcote.

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with science in a unique way, and by increasing their engagement to improve their classroom wellbeing.

Students crave excitement in their learning environment and they search for life or career choices where they can make a contribution to the world. Young adults in our care deserve the opportunity to see how science is constructed in real time and how the advances that are being made right now can effect change that can cure disease, solve climate change and benefit society, the community and individuals in many other ways.

The Growing Tall Poppies program

The GTP program is a series of authentic science projects that connect students with the science community to explore science process and knowledge along with its formation and relevance. Students are mentored by professional scientists and do real experiments to obtain first-hand data that is, in some cases, the first of its kind collected in the world. Students are immersed in labs that are working at the forefront of science. They formulate questions and search for the solutions together with the scientist. GTP focuses student learning on the scientific process as a way of building knowledge that improves the quality of life and solves problems that confront society today. Students experience meaningful learning by linking the science content to the relevance of science to everyday human life. They are also able to expand their understanding of the technologies used in research in Australia, such as laser facilities and the Australian Synchrotron.

The GTP curriculum allows students to focus on the interconnectedness of science to other facets of life and society. This builds an understanding of the interdisciplinary nature of science, as well as society's dependence on scientific knowledge and understanding. Through experimental investigation and reflective discourse with experts, students learn the issues associated with science and they get the chance to synthesise individual opinions and critical thinking. The confidence students gain from working in this environment arms them with skills for future learning as well as developing them as global citizens for the challenges of the 21st century.

Program outcomes

Through partnership with the science community we are improving students' sense of self and of connectedness with the world they live in while they are learning science. Although students get to do practical experiments in the conventional science classroom, these are historical re-enactments, sometimes with an inquiry dimension. The partnership with scientists overcomes this classroom constraint and broadens students' experiences. Students have developed new, positive ways of viewing science and they have been engaging more actively in the classroom. Students have displayed an increased ability to ask questions about the class topics and are self-confident in seeking answers. They become proactive in posing

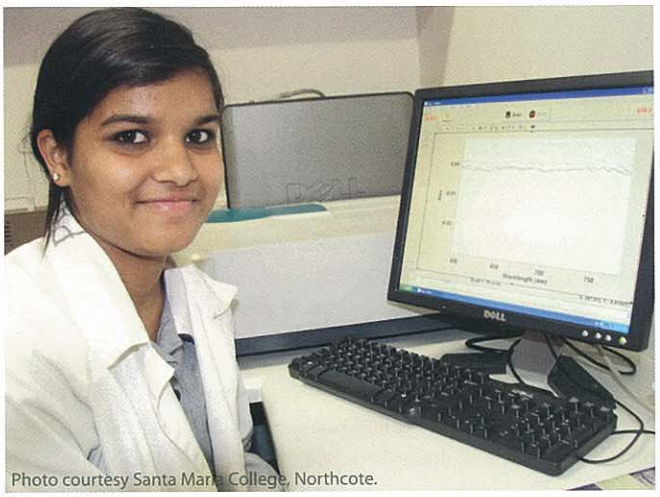

Photo courtesy Santa Maria College, Northcote.

new inquiry questions to investigate, and have published their work both on the web and in the Science Teachers' Association of Victoria (STAV) *Labtalk* magazine. Students are eager to participate in multiple GTP programs and to mentor not only other students but also teachers to participate with them.

The student outcomes of the project are aligned with the Victorian Essential Learning Standards (VELS), the National Curriculum and the International Baccalaureate Middle Years Program curriculum. The GTP curriculum outline and student projects can be viewed on the GTP website <www.coecxs.org/growingtallpoppies/>.

The Growing Tall Poppies program is also providing a unique opportunity for scientists to reflect on their role as advocates of science in the community. Furthermore, teachers have been inspired to experience this authentic science experience to stimulate and invigorate their classroom teaching practice. This GTP component of teacher professional learning, which places groups of teachers with scientists to investigate cutting-edge technology and the relevance of the scientific research, contributes to positive student outcomes.

Through a further partnership an online learning environment has been developed to utilise the modern mode in which students communicate. The Growing Tall Poppies On-Line Forum is the outcome of another partnership with VeRSI (Victorian e-Research Strategic Initiative). This can be viewed at <http://gtp.versi.edu.au/forum>. This new web-based environment enables students and scientists to work as partners on projects via the web and also to remotely link into scientific facilities, for example the Australian Synchrotron, to perform experiments. This is consistent with the way scientists are currently performing experiments.

The partnership established between Santa Maria College and CXS is a new and exciting mode of delivering a living science curriculum in secondary schools. Connecting with the professional science community, and ultimately with the wider community, creates positive outcomes for students and school communities.