

Scotch Enterprise Project (Scotch College Melbourne)

Inspired by the ground-breaking research of Sugata Mitra on promoting curiosity, exploration and learning in autonomous student groups, a new elective subject, the Scotch Enterprise Project (SEP), was introduced in 2015 during Semester 2 at Year 9, and trialled again at Year 10 in 2016 and 2017.

Boys, typically working in groups of two or three, were asked to identify a real world problem and develop a solution in the form of a tangible product. Boys were assigned to a mentor teacher who, rather than 'teaching', was charged with the responsibility of keeping projects moving forward through a Socratic questioning technique, and ensuring that responsibility for progress and outcomes remained with each group. Boys' final assessment in the SEP involved presentations to members of the Scotch staff, including the Principal, along with industry representatives with expertise in fields related to SEP projects.

Projects emerging from the SEP groups in 2016 and 2017 are summarised below.

2016 SEP Projects

Group One

Developed the 'SMART' irrigation system that uses feedback from moisture sensors and weather satellite predictions to precisely control the water used on sports ovals, golf courses and other large areas of turf. They created a fully working system and were assessed by our Head of Grounds, Mr Michael Smith, who thought the idea had great commercial potential.

Group Two

Created a 'Survival Bracelet' that helps to prevent drownings in young children. This bracelet would be worn by young children and, if they were immersed in water, the bracelet would send out an audible and visible warning as well as sending a text message with GPS coordinates to the guardian. The boys demonstrated their 3D printed prototype that functioned as an alert when immersed in water but at this stage have not developed the functionality to send a text message. The group was assessed by the general manager of Kids Safe Victoria and a representative of Maritime Victoria.

Group Three

Looked at the wastage caused by failed 3D printed parts, a common problem with this emerging technology, and how these plastic parts could be recycled into reusable printer spool. The boys designed and manufactured a working prototype of a device that melted the parts and extruded them. They were assessed by a representative of the Imaginables 3D printing company who thought the idea would be a useful money saving device for schools and universities.

Group Four

Designed, and managed to create a basic model of, an autonomous water vehicle. The prototype boat used GPS coordinates and proximity sensors to successfully navigate its way down the Yarra River in an early trial. The group was assessed by a representative of Maritime Safety Victoria who thought it would be ideal as a tool for cleaning waterways and could see other commercial applications, including the retrieval of submerged golf balls.

Group Five

Focussed on the problem of litter, especially in schools and around sporting venues, and worked on a way to encourage people to use the litter bins provided. Their solution was to use 'gamification' and the psychology of reward to create basketball inspired bins that made celebratory sounds as the litter was 'slam dunked' into the bin. Their expert assessor was the Director of the 'Innovation Precinct' at Swinburne University who agreed that the design had merit, although issues regarding rodent access still needed to be addressed.

Group Six

This 'one-man team' worked out a way to help people communicate in Auslan sign language without prior training. He developed a prototype of a phone app that uses SIRI to create Auslan sign language via an animated avatar. The expert panellists assessing the app were a representative of Deaf Connect and a deaf man from Melbourne University, both of whom saw merit in the idea and were encouraging of further development work.

2017 SEP Projects

Group One

Two boys developed an elegant solution to reduce the problem of post-operative complications in cataract surgery (patients who move their heads too fast, or at too great an angle, risk complications, such as pain and even retinal detachment). The boys designed and prototyped a 'Smart' eye patch that senses changes in the angle and speed of head movement, and, when this becomes potentially injurious, a small vibration is activated, warning the wearer to desist from such movements. This product was reviewed by the Head of Medical Innovation at the Royal Melbourne hospital.

Group Two

Sports injuries are very common, especially 'corkers', bruises and sprains, and are usually treated with a disposable icepack followed by a heat pack in combination with a compression bandage. First aiders have to carry many ice packs, and these end up in landfill. Two boys developed a new electronic bandage that can compress as well as cool or heat an injury site, operated through a smart phone app, and using high tech electronic heat pumps. This product was reviewed by a representative of Optimus Health and a Professor of Engineering from Monash University.

Group Three

Two boys focussed on the problem of scuba divers who have been left, mistakenly, at the end of a dive and often perish as a result. Their solution was to create a wearable device that senses the location of the divers, on and off the boat, alerting the captain should he or she attempt to leave the area without a fully returned crew. The product was assessed by the owner of Scuba Academy Divers and a representative of Maritime Safety Victoria.

Group Four

Obesity is a growing problem throughout the First World, not just amongst people, but also their pets. Two boys created a system that allows dog owners to keep their pets at a healthy weight. Using an app, the dog's details are entered (breed, age, etc.), the app then syncs with a device on the collar which records the distance travelled and the calories burned by the dog. A further integrated device is the dog's feed bowl, which calculates how much food is required for that day and uses a simple green light system to indicate when the owner serves up the correct amount. This product was assessed by a Professor of Engineering from Monash University and Dr David Skelt, Scotch Biology teacher and former veterinarian.

Group Five

This group of three boys created a website which encourages people to swap ideas through a forum and allows them to discover people with similar passions and personality make-ups. As they enter the website, users undergo a standard Myers Briggs psychology test which then alters their profile within the interface. This website idea was assessed by a Scotch old boy who has started up his own software development company.

Group Six

Traffic accidents, domestic murders, and other traumatic incidents require emergency services to quickly 'screen off' any upsetting scenes from the general public. This was the design starting point for two boys who devised a lightweight, retractable screen that can be easily transported and erected by first responders. This product idea was assessed by a representative of the Victorian SES.

Group Seven

This 'one-man team' created a concept design for an aircraft trolley that can be called automatically to dispense food and drink throughout the flight. This design was assessed by a Professor of Engineering from Monash University.

Group Eight

Terrorism is now something that the Western World has to deal with on a regular basis. The recent spate of attacks involving trucks mowing down pedestrians was the starting point for the 'Anti-Terror' Bollard, a system for keeping pedestrian areas safe from motorised vehicles. Two boys created a design brief for a ram proof bollard that also incorporates seating, lighting, urban garden, artwork and data points. This product was assessed by an architect from Origami Architecture.