ROBOCOAST STEM OUTREACH PROJECT

UNIVERSITY OF THE SUNSHINE COAST

USC

CONTENTS

A LETTER FROM THE VICE CHANCELLOR AND PRESIDENT

Delivering a project during a pandemic is no mean feat, but delivery to schools and school students is a real challenge. USC's RoboCoast STEM Outreach project rose to the challenge supported by our grant partner RoboCoast Sunshine Coast Robotics Association and Natalie McMaster from USC's School of Education and Tertiary Access, and Julie Hobbins from USC's Community Engagement. During December 2020 to April 2022 the project delivered 15 x Immersion Days and 8 x eDiscovery School Holiday Programs to 1389 students and 165 teachers from 154 schools in Southeast QLD North, Wide Bay Burnett, Darling Downs/Southwest QLD and Mackay, Isaac, and Whitsundays.

The $100,000 Maker Projects – Community STEM Engagement grant funding, enabled the project to widen the participation of underrepresented (girls, Aboriginal and Torres Strait Islanders, people with disabilities and people living in regional, rural and remote areas) aged 8 – 15 years, in STEM focused maker activities using robotics and technologies. This important work strengthens the university's efforts to encourage young people to consider careers in STEM and tertiary education as a realistic post-school option.

Professor Helen Bartlett
Vice-Chancellor and President

ACKNOWLEGEMENTS

PARTNERS

UNIVERSITY OF THE SUNSHINE COAST

The University of the Sunshine Coast (USC) is committed to being a driver of regional capacity building, delivering education initiatives that strengthen local capital, and build strong collaborations which apply and advance knowledge. This project aligned with USC's vision and the university contributed $42,720 in-kind to the project. This included access to auditorium and tutorial spaces at USC campus locations, equipment and technology to deliver the project. USC staff coordinated the delivery of the project, the eDiscovery days and USC student volunteers.

ROBOCOAST SUNSHINE COAST ROBOTICS ASSOCIATION

RoboCoast Sunshine Coast Robotics Association joined forces with USC, teachers and schools to establish the RoboCoast STEM Outreach Project and create a sustainable avenue for underrepresented students aged 8 – 15 years to access hands-on STEM focussed learning opportunities in their regions. RoboCoast worked with USC to allocate Board members and volunteers to project roles and responsibilities and coordinated the delivery of the Immersion Days in each region in consultation with teachers and schools. They also offered Immersion Days in the school holidays for students at attend.
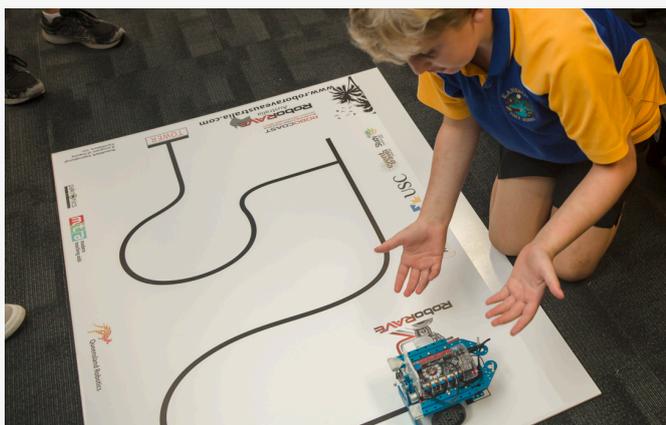
ROBOCOAST'S CONTRIBUTION
Website hosting and design
Access to intellectual property for the Immersion Days
6 x Promotional banners and 2 x table throws
Lego EV3 Kits
Total in-kind Contribution: **$20, 760**

03

INTRODUCTION

INSPIRING AUSTRALIA - SCIENCE ENGAGEMENT PROGRAMME: MAKER PROJECTS: COMMUNITY STEM ENGAGEMENT GRANTS 2020

The Maker Projects: Community STEM Engagement grants 2020 funded by the Department of Industry, Science, Energy and Resources, aimed to foster creativity and inquiry-based learning and support the development of STEM skills in students and youth under 18 years of age in design, engineering and programming, through hands-on learning. The objectives of the grant opportunity were to:

- deliver maker projects where students and youth under 18 years of age can develop and apply their STEM knowledge through experimentation, tinkering and hands-on learning by engaging with a range of technologies

- encourage practical skills, creativity and entrepreneurial thinking through the delivery of hands-on STEM-related events and activities

- inspire students to pursue STEM disciplines in their study and work

- ensure that maker projects are accessible to as many young people as possible, including those in regional, rural and disadvantaged areas

- make a positive sustainable impact on youth under 18 years of age, particularly those from historically under-represented groups, including girls, Aboriginal and Torres Strait Islanders, and youth living in regional, rural and remote regions.

PROJECT OVERVIEW

THE ROBOCOAST STEM OUTREACH PROJECT

The RoboCoast STEM Outreach project aimed to widen the participation of underrepresented youth (girls, Aboriginal and Torres Strait Islanders, people with disabilities and people living in regional, rural and remote areas) aged 8 – 15 years, in STEM focused maker activities using robotics for direct exposure to science, technology, engineering and mathematics (STEM) activities and experiences. With a view to garnering interest in STEM subjects at school, future transition into tertiary studies and STEM occupations. The project achieved this via inquiry-based Immersion Days and eDiscovery School Holiday Programs presented in the Southeast QLD North, Wide Bay Burnett, Darling Downs/Southwest QLD and Mackay, Isaac, and Whitsundays regions, where previously these programs were only available to youth in the Sunshine Coast community.

The project used inquiry-based learning pedagogies in the Immersion Days and eDiscovery School Holiday Programs. During the Immersion Days, students worked in teams to propose a solution to a problem using robotics, gathering information to assist in their investigation and designing and programming a robot in response. Students were presented with coding challenges to solve, culminating in a Sumo robotics competition at the end of the day. At the eDiscovery School Holiday Programs, students engaged in a range of STEM focussed, hands-on, inquiry-based maker activities outside of school terms. The sessions were designed so that youth gained practical knowledge and skills from experts in design, technology, innovation and entrepreneurship.

1389 Students

165 Teachers

154 Schools

TO INCREASE PARTICIPATION OF UNDERREPRESENTED YOUTH AGED 8 – 15 YEARS IN STEM ACTIVITIES VIA INCREASED ACCESSIBILITY TO STEM FOCUSED MAKER ACTIVITIES USING ROBOTICS AND TECHNOLOGIES

EVENT LOCATIONS

ROBOCOAST IMMERSION DAYS 2020-2022

IMMERSION DAYS	LOCATIONS
Caloundra Immersion Day	Caloundra City Private School
Currimundi Immersion Day	Talara Primary College
Murrumba Downs Immersion Day	Undurba State School
Maleny Immersion Day	Maleny Primary School
Kingaroy Immersion Day	Taabinga State School
Noosa Immersion Day	Sunshine Beach State High School
Maryborough Immersion Day	Maryborough State High School
Beerwah Immersion Day	Beerwah State School
Gunalda Immersion Day	Gunalda State School
Sippy Downs Immersion Day	University of the Sunshine Coast – Sunshine Coast Campus
Bribie Island Immersion Day	Bribie Island State High School
Girls Only Immersion Day	University of the Sunshine Coast – Moreton Bay Campus
Bowen Immersion Day	Queens Beach State School
Moreton Bay Immersion Day	Undurba State School
Cooran Immersion Day	Cooran State School

EVENT LOCATIONS

EDISCOVERY DAYS 2020-2022

USC FRASER COAST

USC GYMPIE

USC SUNSHINE COAST

USC CABOOLTURE

USC MORETON BAY

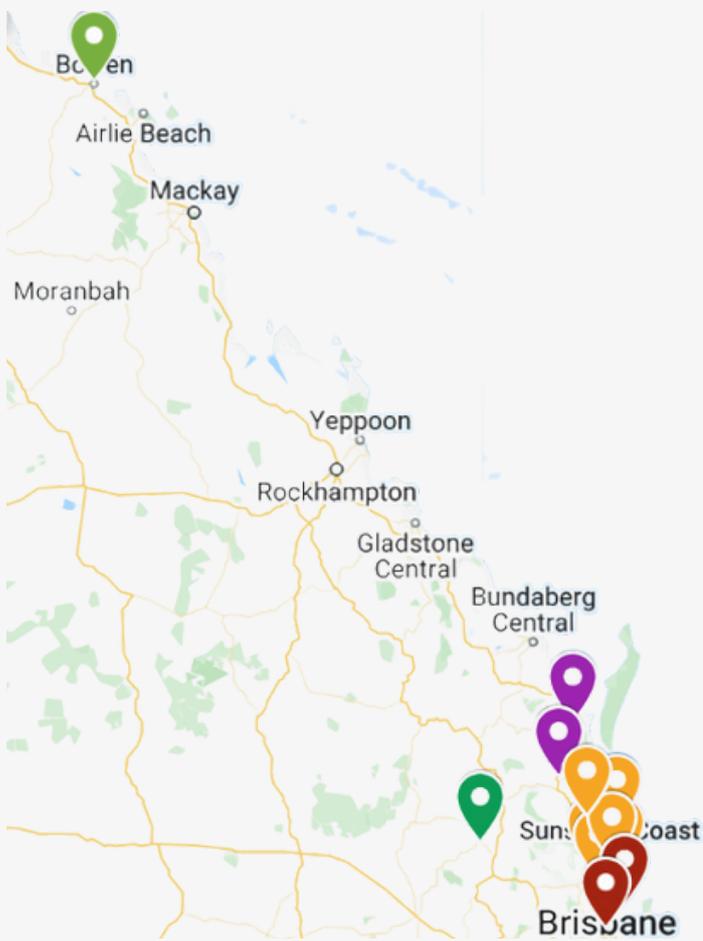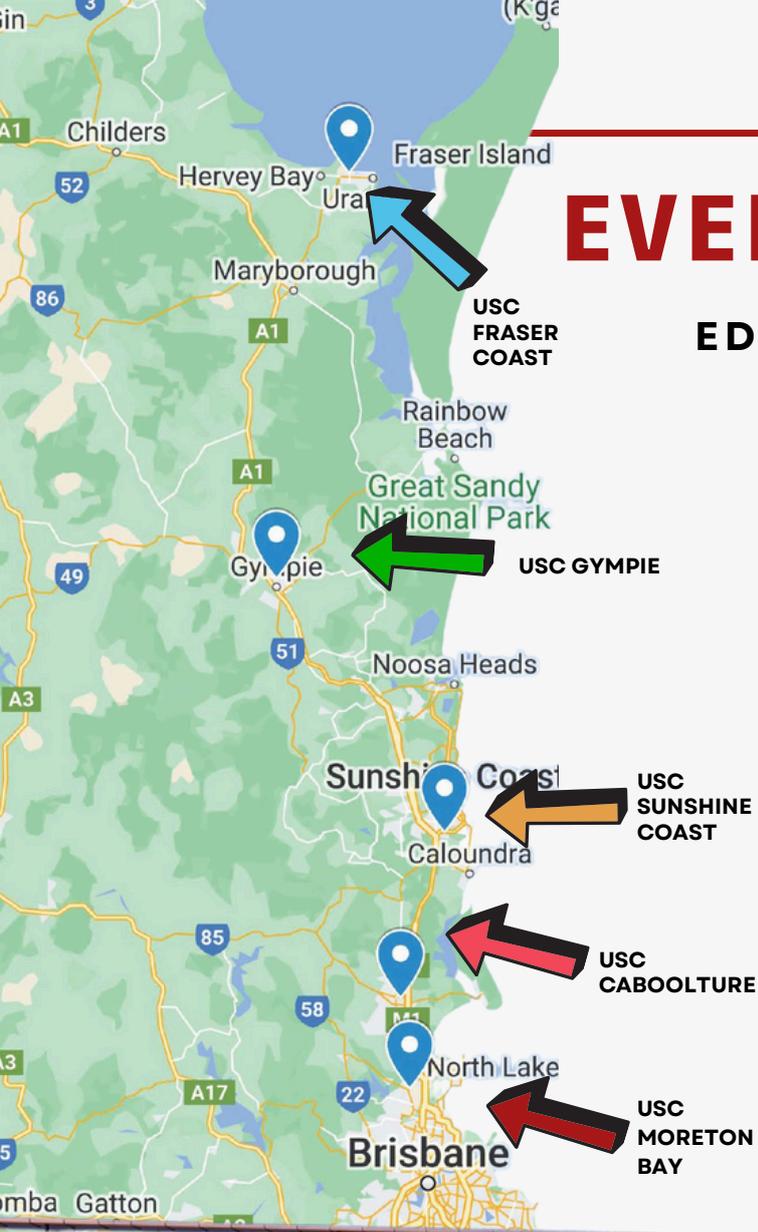| LOCATIONS |
| --- |
| University of the Sunshine Coast – Fraser Coast Campus |
| University of the Sunshine Coast – Gympie Campus |
| University of the Sunshine Coast – Sunshine Coast Campus |
| University of the Sunshine Coast – Caboolture Campus |
| University of the Sunshine Coast – Moreton Bay Campus |

Pictured: USC Moreton Bay Campus

PROJECT OUTCOMES

Increased participation of underrepresented youth aged 8 – 15 years in STEM activities via increased accessibility to STEM focused maker activities using robotics and technologies.

Students gained practical knowledge and skills in scientific experimentation, design, technology, innovation and entrepreneurship via participation in inquiry-based Immersion Days or eDiscovery School Holiday Programs offered in their region.

Raised awareness of, and aspirations for careers in STEM for youth across the Southeast QLD North, Wide Bay Burnett, Darling Downs/Southwest QLD and Mackay, Isaac, and Whitsundays regions.

Inspired and motivated underrepresented youth to have positive capability beliefs and attitudes to STEM.

BENEFITS

IMMERSION DAYS AND EDISCOVERY SCHOOL HOLIDAY PROGRAMS 2020-2022

A UNIQUE AND VALUABLE OPPORTUNITY TO PROMOTE STEM FOCUSED MAKER ACTIVITIES USING ROBOTICS AND TECHNOLOGIES

IMMERSION DAYS

All youth aged 8-11 years and their teachers were invited to participate in the Immersion Days, which aimed to close the gender gap in STEM engagement by engaging students in fun hands-on robotics experiences in teams, designed to increase student motivation to continue their STEM learning and empowering teachers with ideas about how to deliver STEM focused maker activities using robotics to meet Australian curriculum outcomes. The RoboCoast Immersion Days are sustainable and duplicable for regional communities as they were hosted at USC campus locations, primary schools and high schools where smaller feeder primary schools could bring their students. All schools who attended an Immersion Day were provided with competition boards to take back to their schools so that they could continue their robotics journey.

EDISCOVERY DAYS

eDiscovery is a STEM-related school holiday program, developed by USC to increase student interest and participation in tertiary education. eDiscovery sessions were delivered at USC's regional campus locations and focussed on hands-on, inquiry-based, student activities, which provided direct exposure to science, technology, engineering and mathematics (STEM) activities. USC preservice teachers, academic staff, ICT staff and external presenters shared their knowledge and expertise in fun 3-hour workshops, where students gained practical knowledge and skills in scientific experimentation, creative design, technology, innovation and entrepreneurship. The delivery of the program at USC campus locations enabled students in regional, rural and remote areas, access to STEM skills and resources which may be unobtainable in their school or community.

ENGAGEMENT

IMMERSION DAYS 2020-2022

At the Immersion Days students worked in pairs to propose solutions to problems using robotics. The challenges were to autonomously drive a square, follow a line and compete in a Sumo competition against another robot. To achieve these challenges, students were engaged in inquiry-based learning, gathering information to assist in their investigation and designing and programming a robot in response. The students identified that participation in the Immersion days increased their interest and confidence in coding and robotics, as well as inspiring them to choose STEM subjects at school.

1141 Students
165 Teachers
24 Volunteers
113 Schools
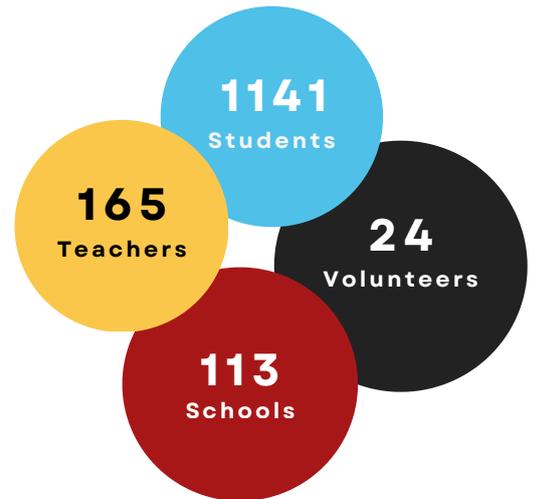
821
6-11 yrs

43% MALE	PREFER TO SELF-DESCRIBE 4%
53% FEMALE	IDENTIFIED AS ABORIGINAL OR TORRES STRAIT ISLANDER 6%

320
12-18 yrs

64% MALE	PREFER TO SELF-DESCRIBE 5%
31% FEMALE	IDENTIFIED AS ABORIGINAL OR TORRES STRAIT ISLANDER 11%

REACH

IMMERSION DAYS 2020-2022

Southeast QLD North
76

Albany Creek State High School
Aspley East State School
Banksia Beach State School
Baringa State Primary
Beachmere State School
Beerburrum State School
Beerwah State School
Bli Bli State School
Bounty Boulevard State School
Bray Park State High School
Bribie Island State High School
Bribie Island State School
Brightwater State School
Brisbane School of Distance Education
Buddina State School
Burpengary State School
Caloundra Christian College
Caloundra State Primary School
Cannon Hill Anglican college
Chancellor State College
Charmichael College
Chevallum State School
Conondale State School
Cooloola Christian College
Cooran State School
Dayboro State School
Eumundi State School
Glasshouse Christian College
Glenview State school
Good Samaritan Catholic College
Grace Lutheran College
Humpybong State School
Immanuel Lutheran college
Kallangur State School
Kandanga State School
Karalee State School
Kawana Waters State College
Kuluin State School
Kurwongbah State School
Lawnton State School
Maleny State School
Mary Valley State College
Mathew Flinders Anglican College
Mooloolaba State School
Mountain Creek State High School
Mountain Creek State School
Mueller College
Nambour Christian College
Narangba Valley State High School
Noosa District State High School
Pacific Lutheran College
Padua College
Palmwoods State School
Peregian Springs State School
Petrie State School
Pine Rivers State High School
Pomona State School
Pullenvale State School
Scarborough State School
Southern Cross Catholic College
St Andrews Anglican College
St Johns Anglican College
St Michael's Christian College
St Thomas More Primary School
Strathpine State School
Sunshine Beach High School
Sunshine Beach State School
Sunshine Coast Grammar
Talara Primary College
Undurba State School
Wamuran State School
Whites Hill State College
Yandina State School

Wide Bay - Burnett
19

Bauple State School
Gunalda State School
Gundiah State School
Gympie East State School
Hervey Bay State High School
Kawungan State School
Maryborough State High School
Parke State School
Rainbow Beach State School
Sandy Strait State School
St Helens State School
St Mary's College Maryborough
St Mary's Primary School
Sunbury State School
Theebine State School
Tinana State School
Urangan Point State School
Victory College
Wolvi State School

Darling Downs/South West QLD
11

Cecil Plains State School
Coolabunia State School
Cooyar State School
Crawford State School
Durong South State School
Kingaroy State High School
St Patrick's Primary School
Taabinga State School
Tanduringie State School
Tingoora State School
Wondai State School

Central QLD region
1

Glenella State School

Mackay, Isaac and Whitsunday region
6

Cannonvale State School
Merinda State School
Proserpine State School
Queens Beach State School
St Anthony's Catholic College
St Colman's School

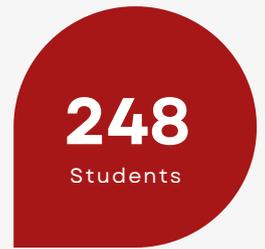> "These types of experiences can be life changing for the children, as many of them then joined our robotics club and some began their own journey on their pathway of STEM and science."
>
> **Victor Mijnarends**
> **Palmview State SchooL**

11

All schools which had students attend an Immersion Day
(some of the schools listed had students attend an Immersion Day in the school holidays)

ENGAGEMENT

EDISCOVERY DAYS 2020-2022

At eDiscovery, students aged from 8-16 years selected from a packed program of fun, low-cost holiday workshops at USC campuses at Sunshine Coast, Moreton Bay, Caboolture, Fraser Coast and Gympie. Students who participated in the eDiscovery School Holiday Program, gained practical knowledge and STEM skills in scientific experimentation, design, technology, innovation and entrepreneurship. Students engaged in inquiry-based learning which nurtured their interests in STEM activities, interest in jobs in STEM fields and aspirations for going to university to study in a STEM field. The students also identified that participation in the eDiscovery School Holiday Program had inspired them to take STEM subjects in high school.

8 eDiscovery Days

248 Students

5 USC Campus Locations

8-16 years

185 6-11 yrs

63% MALE

36% FEMALE

PREFER TO SELF-DESCRIBE 1%

IDENTIFIED AS ABORIGINAL OR TORRES STRAIT ISLANDER 6%

63 12-16 yrs

47% MALE

36% FEMALE

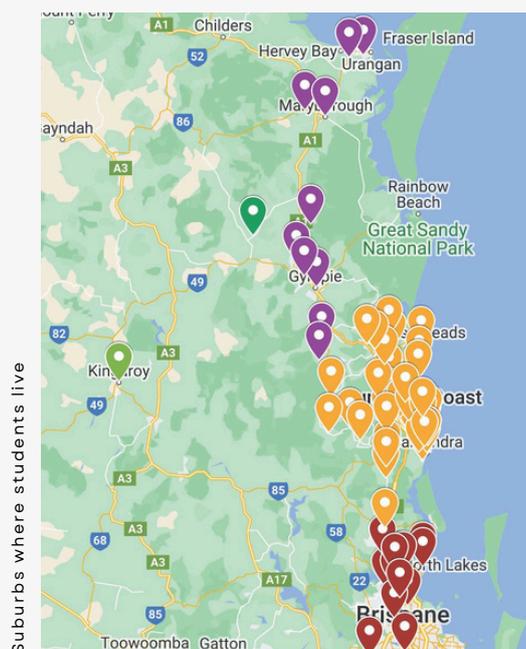PREFER TO SELF-DESCRIBE 10%

IDENTIFIED AS ABORIGINAL OR TORRES STRAIT ISLANDER 9%

REACH

EDISCOVERY DAYS 2020-2022

"Today was very fun because I learnt new strategies and I would like to do this again"

Suburbs where students live

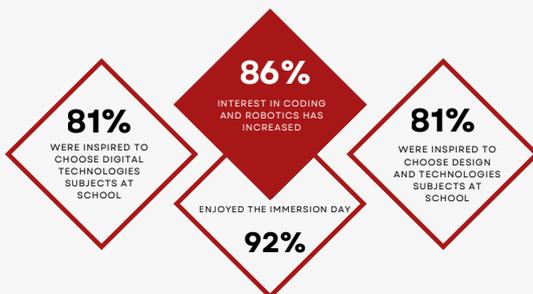|					
Aspley East State School	Caloundra State High School	Geebung State School	Kawana Waters State College	Nambour Christian College	Scarborough Primary School
Baringa State School	Carinity Education Glendyne	Glasshouse Christian College	Kingaroy State School	Nambour State College	St Aidens Anglican girls School
Beerwah State School	Chancellor State College	Glasshouse Mountains State School	Maleny State High School	Narangba State School	St Andrew's Anglican College
Bellmere State School	Charters Towers State High School	Glenwood State School	Maleny State School	Noosa Christian College	St Joseph State School
Bli Bli State School	Chevallam State School	Good Shepherd Lutheran College	Mango Hill State School	Noosa District High School	St Thomas More Primary School
Brightwater State School	Conondale State School	Gympie Central State School	Mary Valley State College	Noosa Flexible Learning Centre	Strathpine State School
Brisbane School of Distance Education	Cooloola Christian College	Gympie East State School	Mathew Flinders Anglican College	North Arm State School	Sunshine Beach State School
Buderim Mountain State School	Coolum Beach Christian College	Gympie South State School	Mawarra Indpendant School	One Mile State School	Talara Primary Collage
Burnside State High School	Cooroy State School	Immanuel Lutheran College	Meridian State College	Pacific Lutheran College	Toowong State School
Burnside State School	Currimundi State School	Indooroopilly State High School	Mooloolaba State School	Peregian Springs State School	Unity College
Calder State School UK	Enoggra State School	James Nash State High School	Morayfield State High School	Petrie State School	Victory College
Caloundra Christian College	Eumundi State School	Kallangur State School	Mountain Creek State High School	Pumicestone State School	Yandina State School
Students from 80 schools attended the eDiscovery days from 70 suburbs, 6 students were home schooled				Riverside Christian College	Yarrilee State School

STUDENT IMPACT

STEM AND STEM SKILLS

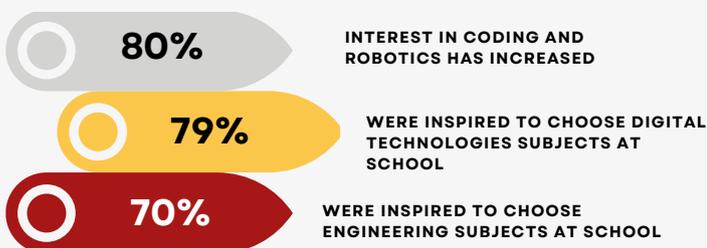*"I liked learning how to make a robot follow a series of instructions."*
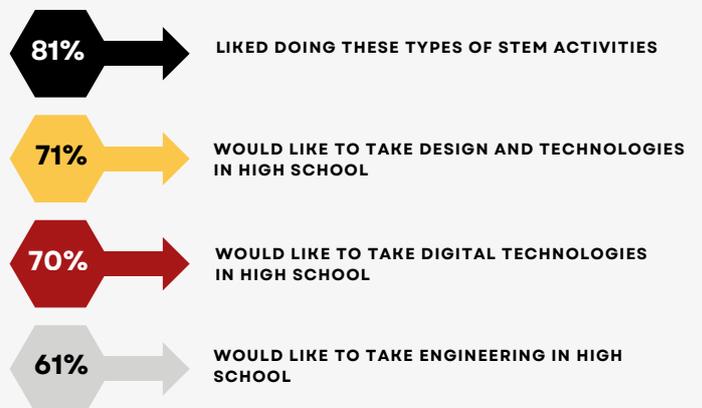

IMMERSION DAYS

Age 6 – 11 years

86% INTEREST IN CODING AND ROBOTICS HAS INCREASED

81% WERE INSPIRED TO CHOOSE DIGITAL TECHNOLOGIES SUBJECTS AT SCHOOL

81% WERE INSPIRED TO CHOOSE DESIGN AND TECHNOLOGIES SUBJECTS AT SCHOOL

92% ENJOYED THE IMMERSION DAY

Age 12 – 18 years

80% INTEREST IN CODING AND ROBOTICS HAS INCREASED

79% WERE INSPIRED TO CHOOSE DIGITAL TECHNOLOGIES SUBJECTS AT SCHOOL

70% WERE INSPIRED TO CHOOSE ENGINEERING SUBJECTS AT SCHOOL

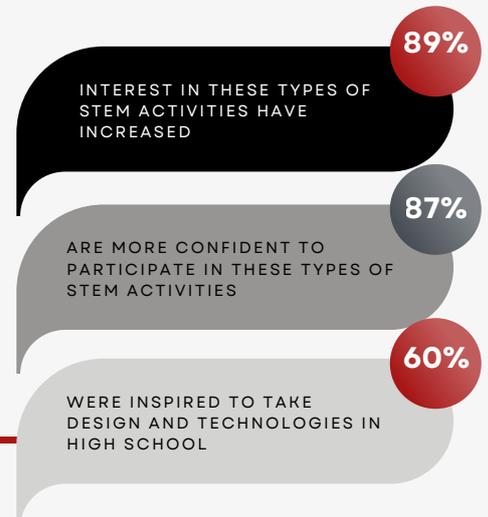*"I liked learning how to code the robots and how programs can be different depending on the robot itself"*

EDISCOVERY DAYS

Age 6 – 11 years

81% LIKED DOING THESE TYPES OF STEM ACTIVITIES

71% WOULD LIKE TO TAKE DESIGN AND TECHNOLOGIES IN HIGH SCHOOL

70% WOULD LIKE TO TAKE DIGITAL TECHNOLOGIES IN HIGH SCHOOL

61% WOULD LIKE TO TAKE ENGINEERING IN HIGH SCHOOL

Age 12 – 16 years

89% INTEREST IN THESE TYPES OF STEM ACTIVITIES HAVE INCREASED

87% ARE MORE CONFIDENT TO PARTICIPATE IN THESE TYPES OF STEM ACTIVITIES

60% WERE INSPIRED TO TAKE DESIGN AND TECHNOLOGIES IN HIGH SCHOOL
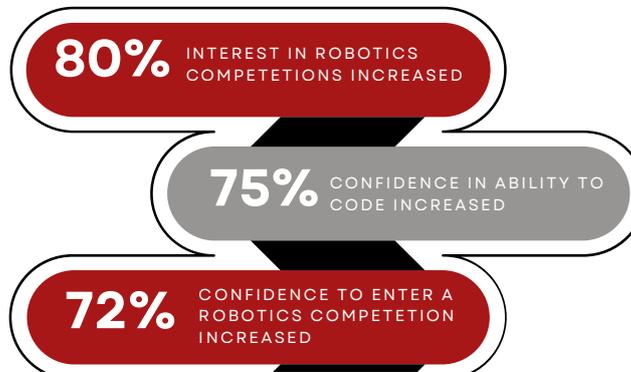
STUDENT IMPACT

INQUIRY-BASED LEARNING

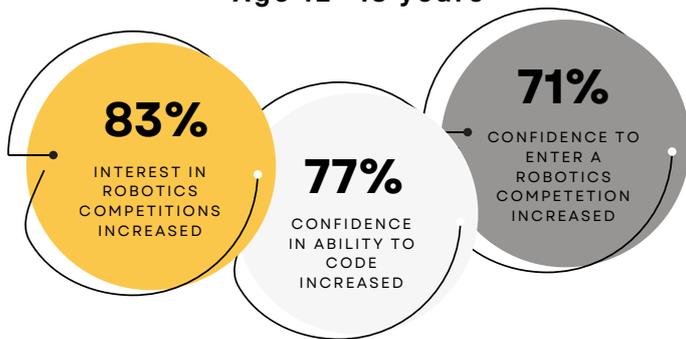"I liked learning how to change things that go wrong and work out why they didn't work."
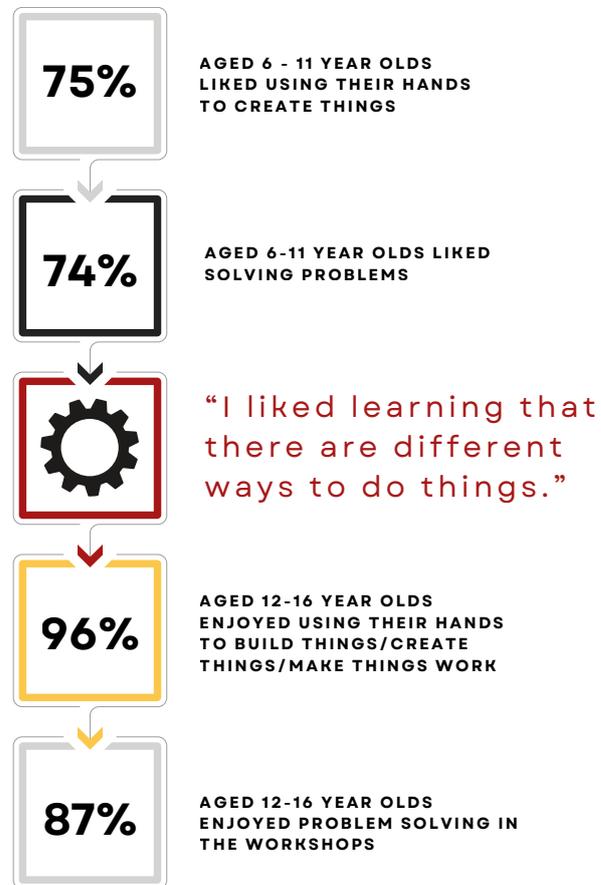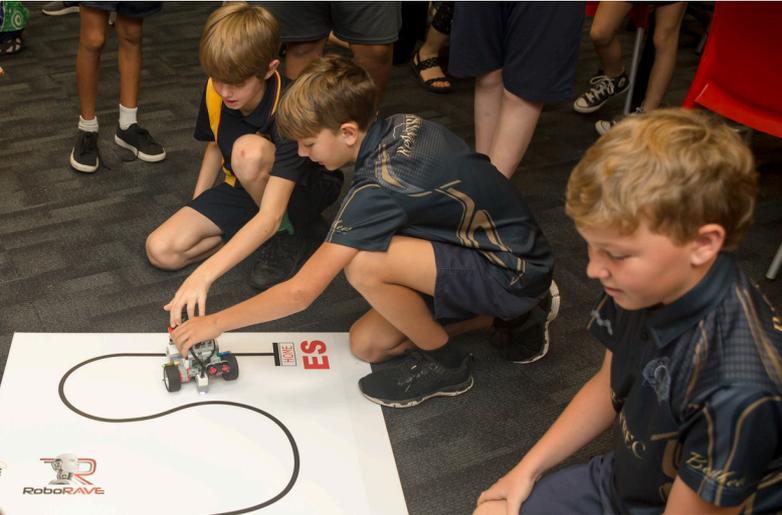

IMMERSION DAYS

Age 6 – 11 years

80% INTEREST IN ROBOTICS COMPETETIONS INCREASED

75% CONFIDENCE IN ABILITY TO CODE INCREASED

72% CONFIDENCE TO ENTER A ROBOTICS COMPETETION INCREASED

Age 12 -18 years

83% INTEREST IN ROBOTICS COMPETITIONS INCREASED

77% CONFIDENCE IN ABILITY TO CODE INCREASED

71% CONFIDENCE TO ENTER A ROBOTICS COMPETETION INCREASED

EDISCOVERY DAYS

75% AGED 6 - 11 YEAR OLDS LIKED USING THEIR HANDS TO CREATE THINGS

74% AGED 6-11 YEAR OLDS LIKED SOLVING PROBLEMS

"I liked learning that there are different ways to do things."

96% AGED 12-16 YEAR OLDS ENJOYED USING THEIR HANDS TO BUILD THINGS/CREATE THINGS/MAKE THINGS WORK

87% AGED 12-16 YEAR OLDS ENJOYED PROBLEM SOLVING IN THE WORKSHOPS

STUDENT IMPACT

AWARENESS OF STEM OPPORTUNITIES

IMMERSION DAYS AND EDISCOVERY DAYS

The RoboCoast STEM Outreach Project enabled youth to participate in different types of STEM hands-on activities which interested them. Participants who attended events at a USC campus location, reported that the experience encouraged thoughts of one day attending university and engaging in post schol study. At the Immersion Days and eDiscovery Days, students engaged with a range of STEM experts and role models from university, schools, business and industry sectors, to raise their aspirations of STEM pathways into university and STEM careers.
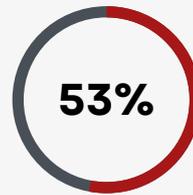
Age 6 – 11 years

60%

Want to know more about jobs which use these STEM skills

58%
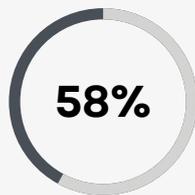
Would like to go to university and study STEM when they finish high school

Age 12 – 16 years

53%

Were interested to know what jobs they can do in STEM fields

43%
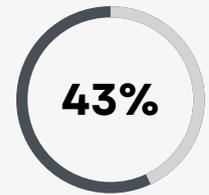
Are now thinking of going to university to study in a STEM field

"The highlight was the tour because I never really thought about going to university so now I know that this is the one I want to go to"

TEACHER IMPACT

TESTIMONIALS

The RoboCoast Immersion Day really set a number of balls rolling with my class and our school last year.

For myself, it gave me a new area of digital technology exploration to pursue. My school had a small number of LEGO Spike Prime kits that were not being utilised and I had not had any experience with these bots or the associated digital program.

Through the Immersion Day and the level of skills I gained, I was able to develop small programs to do with my class. These expanded after more PD through RoboCoast. It has led me to this year incorporating our expanded robotics set into our wider Digital Technologies curriculum.

"The RoboCoast Immersion Day was a vital step that set up a whole plethora of learning opportunities for myself, my class and our school. Such a valuable experience."

Hamish Black
Sunshine Beach State School

"The teachers enjoyed seeing the students learn through inquiry and we have used the competition mats."

Michelle Campbell
Pine Rivers State High School

COMMUNITY IMPACT

TEACHER CONFIDENCE AND EMPLOYMENT

The project provided USC with the opportunity to engage preservice teachers as presenters and assistants. This provided preservice teachers with the opportunity to build their skills in many areas of the Australian Professional Standards for Teachers. They were provided with the opportunity to put into practice the knowledge and skills they obtained from their degree, in the areas of STEM, inquiry-based learning, inclusion and behaviour management. Preservice teachers who participated in the project reported feeling more confident to teach STEM and increased confidence in their STEM skills.

39 preservice teachers assisted at the eDiscovery Days

24 preservice teachers assisted at the Immersion Days

Teachers who attended the Immersion Days with their students, learnt how to use inquiry-based approaches to coding and robotics education. They accessed online resources, were given competition mats and were informed about how to establish robotics clubs in their schools.

The eDiscovery Vacation days employed members of the community to present workshops such as Sarah Eisenmenger from ZEST Robotics, Jamison Harvey from Royal Robotics, Shane and Shira Gingell from Out of the Bots, as well as inservice teachers and preservice teachers. In 2020, Sarah and Jamison were Year 12 students from Chancellor State College who had created their own small businesses.

UNEXPECTED IMPACT

TESTIMONIALS

An unexpected impact from the eDiscovery school holiday program was the number of students who identified that the highlight of the workshops were the friends they made.

"I loved making new friends and learning."

An unexpected impact from the Immersion days was the number of students who commented about the presenters. The presenters and the volunteer preservice teachers who deliver the Immersion Days are all trained in using an inquiry-based approach to teaching. Students are encouraged to use Computational Thinking concepts like decomposition, abstraction, and evaluation as well as approaches like debugging, collaborating, and persevering to solve the challenges.

"I was nervous at first, but the presenters made us feel welcome"

CASE STUDY 1

MURRUMBA DOWNS IMMERSION DAY

Undurba State School

Robotics at Undurba has developed in the last 18 months from nothing, with no robots, to a thriving extra-curricular lunch time and after school Robotics Club with 90 students and 6 staff involved, as well as an integral part of STEAM Curriculum across years 3-6. Our progression is due to attendance at a number of RoboCoast Immersion Days with a range of staff and students.

The Immersion Days have been catalyst for developing our own robotics and curriculum knowledge and skills in this area. We now have 7 staff who have attended Immersion Days. They now lead Robotics Club groups as well as STEM Curriculum with their year levels. Their colleagues are surprised by the engagement and learning that takes place with their students using inquiry-based approaches with Robotics.

We have also been able to develop relationships with RoboCoast and USC staff as well as other local schools who attend the Immersion Days. We have formed a local robotics network in schools in our district who support each other, as well as organise and run our own competitions. We continue to call on RoboCoast and USC staff for support and advice.

After we attended a Girls Only Immersion Day in late 2021, the number of girls who applied to be part of our Robotics club increased so that more than half our year 3 and 4 students are girls.

At the end of 2021, a number of our year 6 students who began their robotics interest by being the first to attend an Immersion Day, applied successfully to be a part of the Engineering Program, at our local high school for 2022.

Pam Kohn - Undurba State School
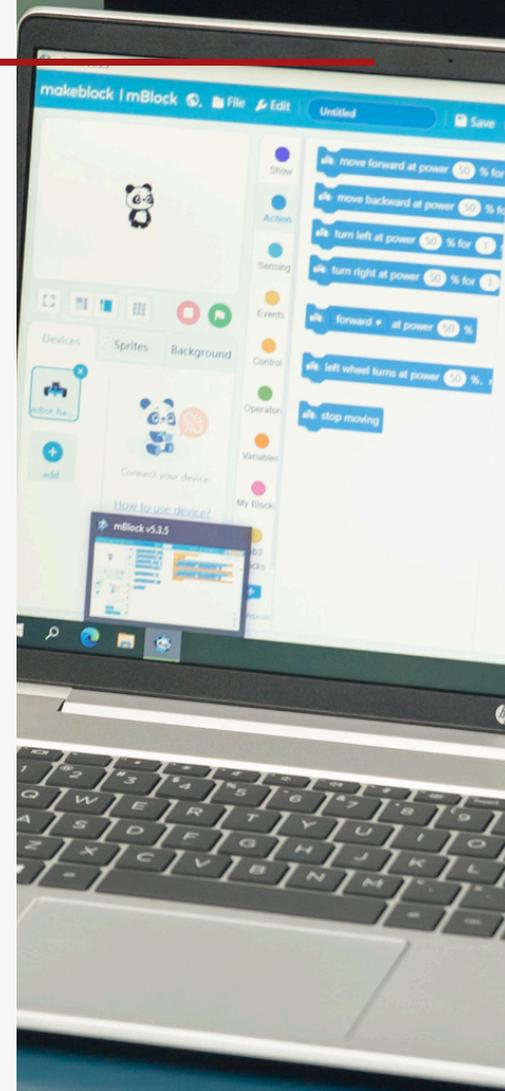
CASE STUDY 2

CURRIMUNDI IMMERSION DAY

◎ **Talara Primary College**

Our students attended an Immersion Day at Talara Primary College on Monday 15 February 2021. For our school, we had used LEGO EV3 robots and were making a switch to LEGO Spike Prime robots. Ten specific students were invited: those who had participated in the FLL team in year 7, academic enrichment students in year 7 who indicated an interest in robotics, and year 7 and 8 students who had indicated an interest but were unsure of their suitability. The students invited were 50/50 male/female students.

Our student were tasked with three priorities:
- Familiarise themselves with LEOG Spike and software
- Consider usability within current robotics programs at the college, and
- Prepare to lead the implementation with the FLL team in 2021 convert to LEGO Spikes for the competition.

The students indicated that they learnt a lot. Several students who attended did lead the implementation of LEGO Spikes at the FLL competition in 2021, our results were exemplary: one team gaining the highest score at the regional competition and winning the robot games, while the other team won the overall event and progressed to Nationals. Our FLL robotics team now contains over 50% female students, and our year 8 Digital elective is currently just under 50% of students (which included all the female students who attended the Immersion Day).

On a more personal note, several students who had experienced social difficulties at school were able to bond with students they didn't know, and several friendships flourished after that day. It was wonderful to see. As a teacher I was thrilled with the day and the progress our teams made. It would have taken us over a term of lunch times to make that sort of progress.

Thank you for organising the event. We look forward to attending more in the future.

Corinne Salmon - Grace Lutheran College

CASE STUDY 3

GIRLS ONLY IMMERSION DAY

Pine Rivers State High School

Thank you for the opportunity to attend the free Girls Only Immersion Day at USC Moreton Bay campus at the end of 2021.

The proximity of the event to our school meant students could attend the day for only the cost of GoCard train travel. This was beneficial as our ICSEA has dropped below 1,000 (985 in 2021) and our students and their families struggle to meet the rising costs of living. As a result, many students do not attend excursions as the costs are prohibitive.

Our students (and teachers) were new to robotics. We borrowed the robots provided on the day which was enormously helpful as we did not have to carry all of the equipment on the train. The girls and two accompanying teachers really enjoyed the day and learnt a lot. The day helped the girls develop an understanding of block programming and to not be afraid of coding. Their skill levels were varied depending on their exposure to robotics in primary school. The day provided a solid starting point to get them all familiar with LEGO EV3 robots.

The accompanying teachers enjoyed seeing the students learn through inquiry - trial and error. Robotics teaches students to be persistent and resilient - particularly when their programming doesn't work straight away. Seeing the students get excited when their programming works after a prolonged mental wrestle is why we teach.

The day also gave our younger students an opportunity to see inside our local university and raise awareness of STEM as a career.

Thank you for the opportunity to attend the day and for the robotics mats we were able to take home with us. We have put them to good use.

Michelle Campbell- Pine Rivers State High School
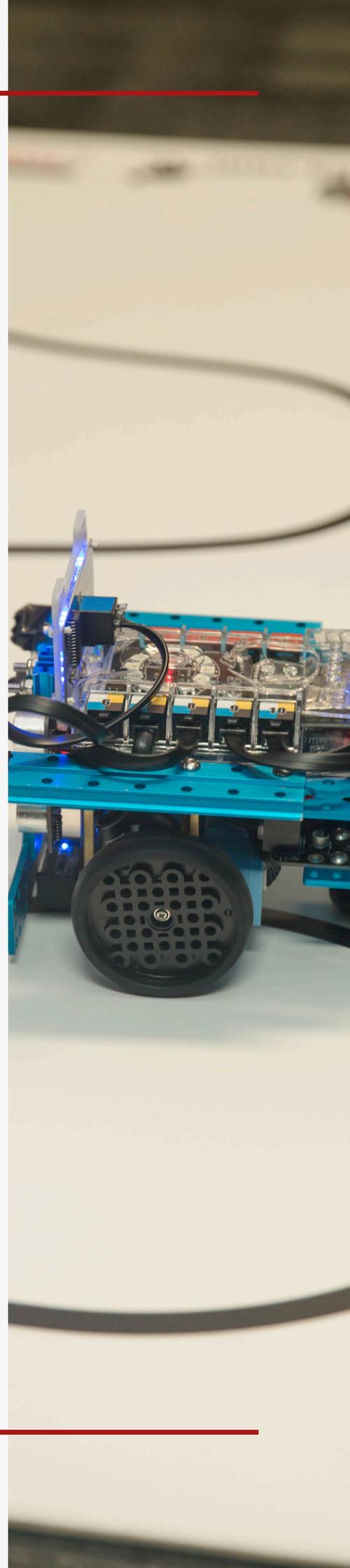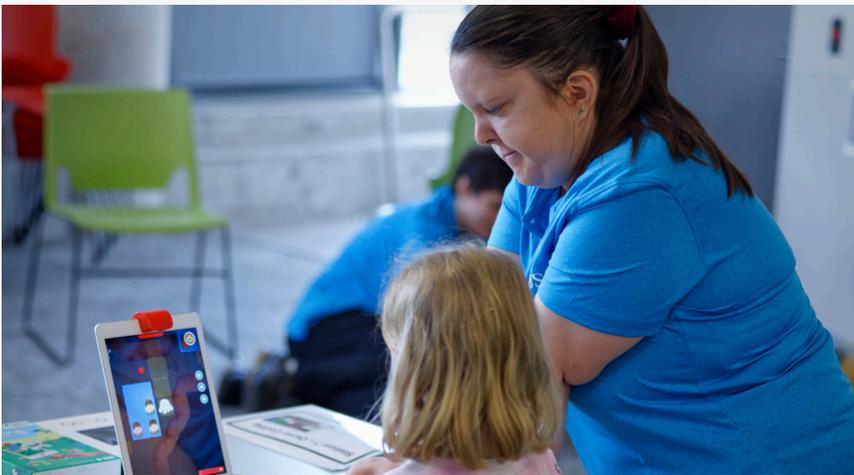
CASE STUDY 4

EDISCOVERY DAY

USC Campus

It was a valuable experience to provide my children with the opportunity to undertake a program on a university campus and demystify what university is all about.

I hear them often talking about the local campus with their friends with a level of connection that I would not have had as a primary school student. Participating in the STEM eDiscovery School Holiday Program has provided them both (boy 10 years old and girl 8 years old) with exposure to develop their robotics skills and for my daughter in particular, a positive belief in her capability to explore STEM through school and perhaps even as a career longer term.
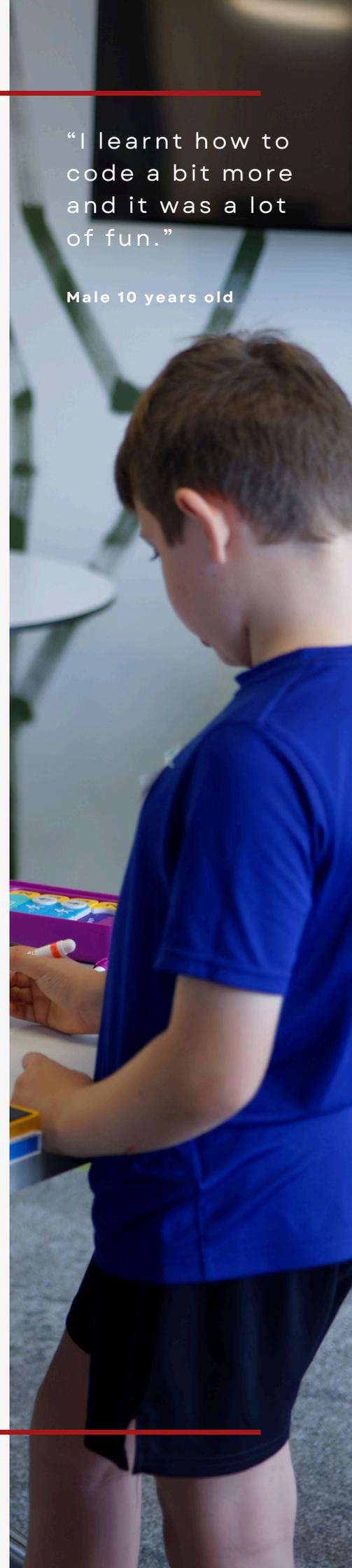
Parent

"It was good, maybe I will be a scientist or a dancer."

Female 8 years old

CASE STUDY 5

EDISCOVERY DAY

📍 **USC Campus**

I thought the eDiscovery School holiday program was excellent. There are so many opportunities for children who like sport, but as the parent of a very bright child who loves reading, coding, mathematics and building / problem solving, there isn't as much choice for activities in a regional area. I also struggle to find him the extension he needs and craves in these areas. Robotics and some technology can be costly, and providing opportunities to explore these emerging fields can be cost prohibitive.

I found the university program wonderful to show my son a whole world of technological equipment (cool gadgets and tech!) that got him excited about the field, and extended his learning. I also like that he got to share these experiences with like-minded peers. They had fun, and learned a lot. It was great to see them being social and they felt connected with others who shared their passions.

It is always a challenge to keep their bright minds active in the school holidays, and this was a great day out on all fronts. I also really liked that my son was also given the opportunity to experience the university environment, making it a less daunting place, and showing him the campus, staff and opportunities available into the future.
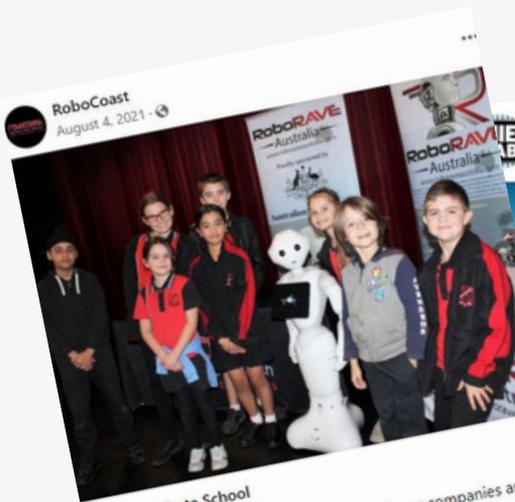
Parent

"It was a blast, and it was really fun. I liked all the coding stuff. I wish we could do these more often. It would be cool to do more in gaming and coding. It was a bit easy and it would be good to have a harder or more advanced option too."

Male student

MEDIA & COMMUNICATIONS

RoboCoast
August 4, 2021 · 🌐

Beerwah State School
July 22, 2021 · 🌐

Roborave comes to Beerwah SS! What do car companies and robots have in common? Sponsoring teams in the World Championships for line-following robots!

Today... See more

MIE Lab shared a link.
December 10, 2021 · 🌐

eDiscovery school holiday program
At eDiscovery, young explorers and scientist...

RoboCoast
October 14, 2021 · 🌐

Many thanks to the teaching staff and students at Noosa Flexible Learning Centre for manufacturing competition and robotics equipment to go out to schools far and wide! Looking forward to placing more orders with this newly formed advanced manufacturing tech start up.

+6

eDiscovery workshops to make holiday lea

... 2021 🐦 📘

...s calling all aspiring scientists, explorers, artists and actors to stretch their creativity ...nnovation at eDiscovery sessions over the school holidays.

...ents aged from 8-15 years can select from a packed program of fun, low-cost holiday ...shops at USC campuses at Sunshine Coast, Fraser Coast and Gympie.

...-tech activities range from animating sumo robotic wrestlers to micro-drone ...ntures, while budding artists can help craft magical flowers and would-be actors can ...re key elements of drama, including improvisation and characterisation.

...workshops will be led by USC academics and experts, innovators and artists from local ...munities.

...Discovery initiative is a partnership between USC and RoboCoast, with funding ...gh a RoboCoast STEM (Science, Technology, Engineering and Math) Outreach ...ct grant from the Department of Industry, Science, Energy and Resources.

...partnership aims to provide students with opportunities to engage with a range of ...nologies through experiment...

...ers are limited. Booking d...
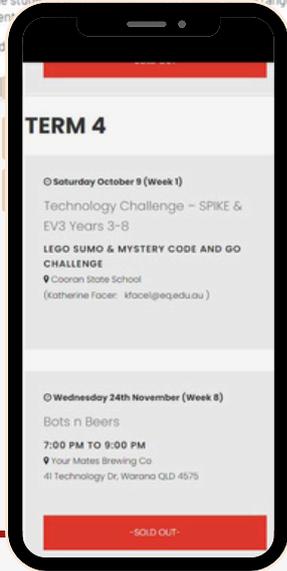
Robotics Immersion Days

...th RoboCoast Sunshine Coast Robotics Association with the ...ment of Industry, Science, Energy and Resources are hosting ...ays in the region.

...ry schools are invited to bring along 10 students and teachers ...nd code LEGO robotics (EV3 and Spike Prime) or mBot Ranger ...n.

...ts work with a partner to build, code and compete in a Sumo ...arn alongside their students as well as having the opportunity ...st expert presenters about how they run robotics clubs in their ...tegrate robotics into their curriculum.

...laptops or robots these can be loaned for the duration of the

...ne
...on dates and registrations visit RoboCoast.

TERM 4

⊙ **Saturday October 9 (Week 1)**

Technology Challenge ~ SPIKE & EV3 Years 3-8

LEGO SUMO & MYSTERY CODE AND GO CHALLENGE
📍 Cooran State School
(Katherine Facer: kfacel@eq.edu.au)

⊙ **Wednesday 24th November (Week 8)**

Bots n Beers

7:00 PM TO 9:00 PM
📍 Your Mates Brewing Co
41 Technology Dr, Warana QLD 4575

-SOLD OUT-

ZEST Robotics
Binary Designer
Peregian Community College
Nambour State High School
St Andrews Anglican College
Caloundra Christian College
Tewantin State School
Coolum State High School
Out of the Bots
Undurba State School
Peregian Digital Hub
Coolum State High School
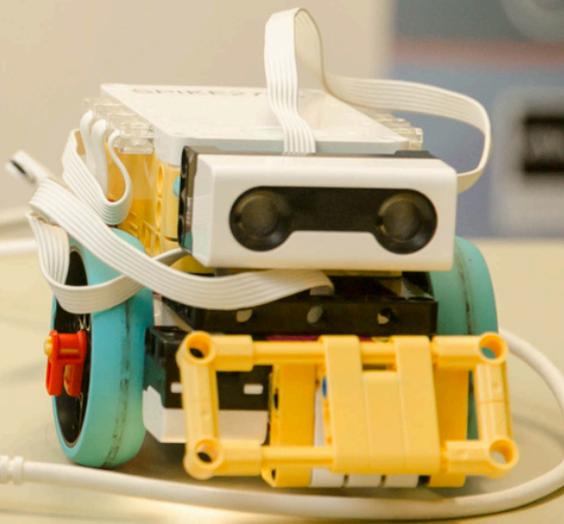
FUTURE PLANS & SUSTAINABILITY

KICKSTART SUSTAINABLE CHANGE VIA A ROBOT LOAN SYSTEM AND SUPPORT

USC in partnership with RoboCoast Sunshine Coast Robotics Association have created a robotics loan system, utilising the robots purchased with grant funding. These kits will be utilised in future youth engagement projects, professional development and collaborative activities with schools, teachers and the wider community.

We have already loaned robotics kits to high school students, small businesses and community organisations for youth workshops and teacher professional development. We will continue to provide these resources and support.

The RoboCoast Sunshine Coast Robotics Association will deliver Immersion days in the Sunshine Coast region in the future. They will also continue to support regions to deliver their own Immersion days and local robotics competitions in their regions. Regions will be able to ask schools to bring along their competition mats and can loan robotics kits for their events.

Due to all of the positive feedback from the Girls Only Immersion Day at Moreton Bay, USC in partnership with RoboCoast Sunshine Coast Robotics Association will continue to deliver this event in Term 4. In 2021, we had a female guest speaker from Google speak to the students via Zoom about her journey into a STEM career. In 2022, we will build on the enjoyment students had in visiting the campus and include further careers information and tours of our mechatronics labs included in the event.

The eDiscovery School Holiday program will continue to be delivered at USC campus locations. USC is committed to deliver projects which are designed to overcome barriers which can impact on underrepresented youth access and participation in STEM events and activities.

FINANCIALS

FINANCIAL STATEMENT

USC

Funding Body:	Department of Industry, Science, Energy & Resources
Project Name:	RoboCoast STEM Outreach Project
Chief Investigator:	Dr Natalie McMaster
External Ref:	MAKERI000080
Internal Ref:	1.036.05484

EXPENDITURE-Cash	20/21	21/22	Total
Advertising & Promotion	3,605	2,782	6,387
Displays	0	0	0
Travel	1,694	10,883	12,577
Equipment	30,079	15,879	45,958
Graphic Design	2,000	0	2,000
Materials	674	1,268	1,942
Other Eligible Expenses	5,551	24,893	30,444
Prizes	500	0	500
Venues & Equipment Hire	0	0	0
Total-Cash	**44,103**	**55,705**	**99,807**
EXPENDITURE-In Kind			
Advertising & Promotion	0	3,000	3,000
Displays	0	800	800
Travel	0	0	0
Equipment	0	32,490	32,490
Graphic Design	0	0	0
Materials	0	0	0
Other Eligible Expenses	6,383	5,787	12,170
Prizes	0	0	0
Venues & Equipment Hire	2,780	12,240	15,020
Total In Kind	**9,163**	**54,317**	**63,480**
TOTAL PROJECT	**53,266**	**110,022**	**163,288**

Summary In Kind Contributions	20/21	21/22	Total
University of the Sunhine Coast	3,883	38,837	42,720
RoboCoast	5,280	15,480	20,760
Total In Kind	**9,163**	**54,317**	**63,480**

CERTIFICATE

UNIVERSITY OF THE SUNSHINE COAST
PROJECT NUMBER: MAKER1000080
FOR THE PERIOD 01 NOVEMBER 2020 TO 30 APRIL 2022

We confirm that, to the best of our knowledge and believe, having made such enquiries as we considered necessary for the purpose of appropriately informing ourselves:

Statement of grant income and expenditure

1. We have fulfilled our responsibilities for the preparation of the statement of grant income and expenditure in accordance with the cash basis of accounting and the terms of the grant agreement with the Commonwealth, represented by the Department of Industry, Science, Energy and Resources dated [enter date]; in particular, the statement of grant income and expenditure presents fairly in accordance therewith.
2. All events subsequent to the date of the statement of grant income and expenditure which require adjustment or disclosure so as to present fairly the statement of grant income and expenditure, have been adjusted or disclosed.
3. [Where applicable] The effects of uncorrected misstatements are immaterial, both individually and in the aggregate, to the statement of grant income and expenditure as a whole. A list of the uncorrected misstatements is attached to this representation letter.
4. That all Grantee contributions and other financial assistance were spent for the purpose of the project and in accordance with the grant agreement and that the Grantee has complied with the grant agreement and relevant accounting policies.
5. That salaries and allowances paid to persons involved in the project are in accordance with any applicable award or agreement in force under any relevant law on industrial or workplace relations.

Name: **Elizabeth Cannon**
Position: **Chief Finance Officer, USC**
Date: **26/05/2022**