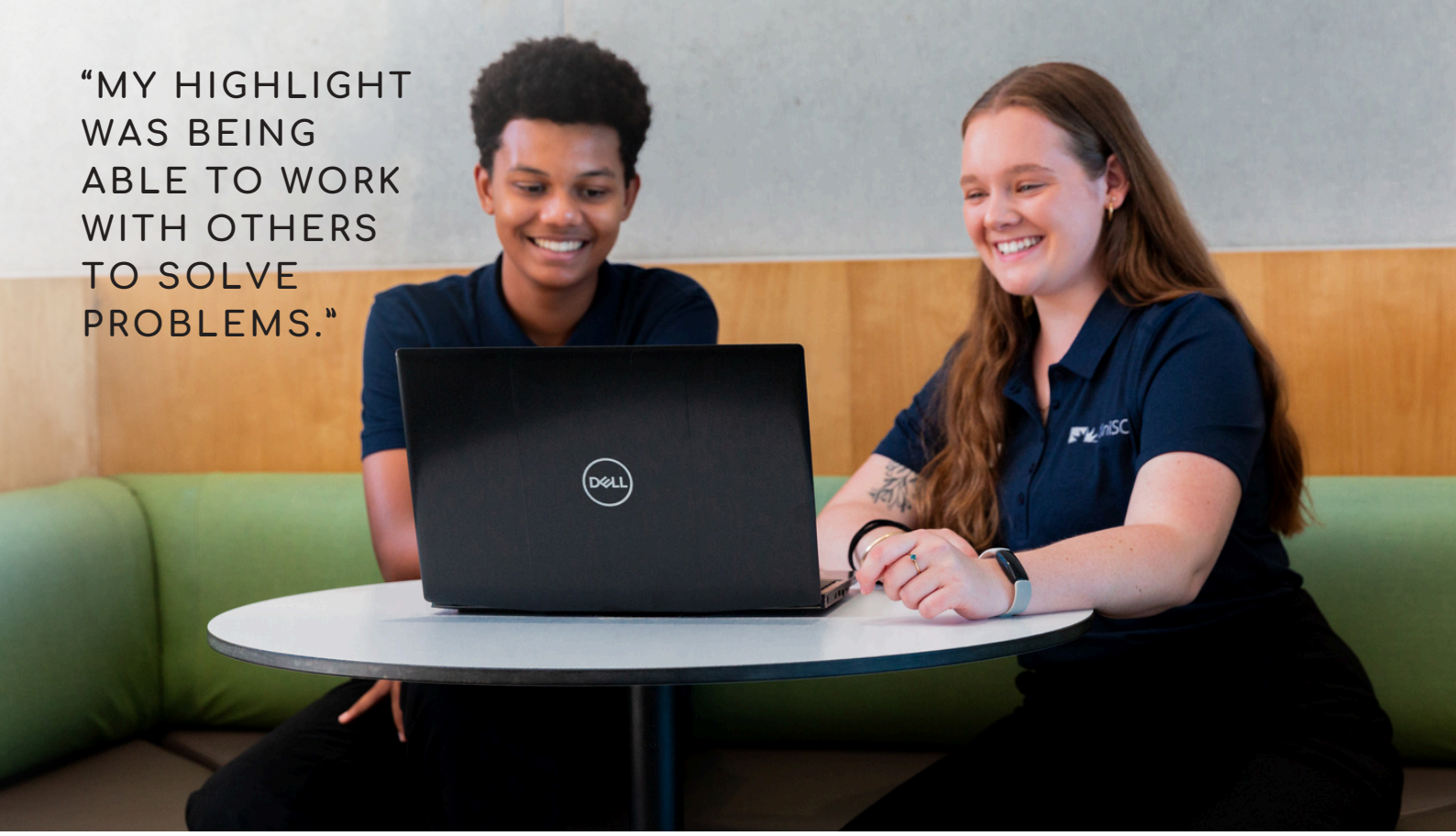
PROJECT REPORT

January - December

2023

MindSET-do



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Project Overview

MindSET-do an ongoing initiative under the University of the Sunshine Coast (UniSC), commenced in 2019 with a focus on engaging potential undergraduate students from socio-economically disadvantaged backgrounds, including Indigenous Australians, individuals from low socio-economic status (SES) backgrounds, and those residing in regional or remote areas. The project specifically targets schools and communities associated with the UniSC HEPPP School University Partnerships Clusters in SDI Quartile 1 and 2 schools.

This project implements a diverse range of interactions, creating meaningful touchpoints that offer participants a spectrum of opportunities to develop Science, Technology, Engineering, and Mathematics (STEM) skills while gaining insights into various career pathways. The structure of the initiative is designed to progressively heighten the complexity and challenge in each stage, ensuring that participants are actively involved in the learning process. This approach fosters a deeper retention of knowledge and skills among the participants.

Primary Program

The Primary program engages students in Years 4-6 through a structured series of hands-on educational experiences encompassing career and technical education (CTE) within primary school settings.

These sessions are facilitated by UniSC preservice teachers/students, offering young learners an opportunity to acquire practical skills vital for their future educational journey and careers. Simultaneously, UniSC preservice teachers gain familiarity with the Australian Digital Technologies and Design and Technologies curriculum, honing their proficiency in utilising technology and STEM resources within the classroom. This not only enriches student participation and learning but also bolsters the post-study employability of preservice teachers and/or UniSC students.

The lessons are designed to align with the Australian Curriculum, enabling integration into schools' units of study and term schedules. This alignment ensures that the lessons are delivered at optimal times, synchronising with the STEM curriculum being taught during specific terms.

YEAR 4:

Serious Game Design using Scratch

YEAR 5:

Microdrones with an environmental application

YEAR 6:

Controlling Light using an Arduino

Secondary Program

The Secondary Program is dedicated to igniting and nurturing positive aspirations toward higher education among students from low socio-economic backgrounds, instilling in them a belief in their capabilities and fostering favourable attitudes towards pursuing further studies. It's crafted not only to enlighten students in Years 7-10, attending low SES schools, about alternative pathways to STEM careers and university studies beyond traditional sciences but also to extend this knowledge to teachers, parents, and the wider community.

This initiative delivers professional development to UniSC student presenters, equipping them with a comprehensive understanding of educational curricula and proficiency in leveraging technology and diverse STEM resources in the classroom. This not only elevates student engagement and learning but also significantly enhances the post-study employability of UniSC students. All program resources are accessible online, ensuring widespread availability and professional development sessions are open to teachers, facilitating their continuous learning and growth.

YEAR 7:	YEAR 8:	YEAR 9:	YEAR 10:
Creating Self-driving cars with Arduino/ Micro:bit	Exploring Sustainable Neighbourhoods	Focusing on Brain, Health & Wellbeing	Engaging in Citizen Science initiatives

Community Program

The Community STEM Initiative, designed in collaboration with regional communities, aims to inspire individuals of any age from low socio-economic backgrounds by providing exposure to STEM through engaging experiences with local industry experts.

These ongoing STEM experiences span across Sunshine Coast, Moreton Bay, Gympie and Fraser Coast, offering activities including low-cost robotics, coding and Lego League clubs, after school STEM programs, and a library STEM program in conjunction with Sunshine Coast Libraries.

Parent/Caregiver workshops were new in 2023, providing valuable hands on STEM information and activity sessions at 5 low SES high schools in the Gympie and Sunshine Coast regions with school students and their parent or care giver.

Robotics Clubs

Our Community Robotics Clubs offer a multi-week program designed to equip students in Years 5, 6, or 7 with essential skills in building and coding robots. The program prepares them to compete at the two-day RoboRave competition on the Sunshine Coast.

Coding Clubs

A 5-week course introducing coding to primary school students from years 3 to 6. Using Scratch, students create games and animations, fostering digital literacy and vital skills such as logic, creativity, and collaboration.

Queensland Mental Health Week

In conjunction with UniSC Academics, two online professional advice and research finding sessions were provided during QMHW providing valuable information to the community.

STEM Activities

In conjunction with Sunshine Coast Libraries and a high school, a multi-week STEM program was provided to primary school students at Beerwah and Caloundra to provide them with access to hands on STEM activities.

Parent/Carer Workshops

These workshops enabled students in low SES schools access to STEM information sessions and a hands on STEM Workshop attended by students and their parent/caregiver.

Events Program

- Science & Engineering Challenges
- Drone Competition
- Maths Modelling Challenge
- National Science Week
- SuperStars of STEM

The Events program orchestrates diverse activities and annual STEM events targeting students from Years 6 to 12, along with parental involvement, aiming to spark an interest in STEM. It collaborates with schools, offering curriculum-aligned experiences to nurture student aspirations in STEM and partners with UniSC and industry experts to provide engaging content to the broader community.

Through on-campus events and multi-school challenges, it fosters collaboration, passion for STEM, and provides students a taste of university life by connecting them with academic staff, peers, and industry professionals.

Additionally, the Events program actively seeks to reach underrepresented groups in STEM, ensuring inclusivity and diversity in all its initiatives, and strives to break down barriers to STEM participation, particularly for girls, and students from disadvantaged backgrounds.

Primary Regional Tour

The MindSET-do Primary Regional Tour initiative is aimed at bridging educational gaps and fostering equitable learning experiences for students in regional and rural areas of Queensland. The experience focuses on providing students in these regions with the same enriching in-class experiences in Science, Technology, Engineering, and Maths (STEM) as students in urban areas.

The Regional Tour is a four-day experience enabling pre-service teachers to deliver STEM lessons in regional and remote areas. This hands-on approach not only benefits the students but also provides aspiring educators with invaluable practical experience, exposing them to diverse teaching environments. The initiative seeks to broaden their skill sets and instil confidence teaching in the classroom.

The initiative fosters collaboration between UniSC and regional schools by ensuring a positive learning environment for pre-service teachers, and students in regional and rural areas benefit from an enriched STEM curriculum, contributing to their overall academic development and fostering a passion for these subjects.

"I REALLY ENJOYED THE FIRST TIME WE LEARNT HOW TO CODE THE WORKING WITH THE LED'S AND BREADBOARD. THANK YOU FOR THE AWESOME ADVENTURE!"

School Engagement

Primary Schools

Pacific Paradise State School
Cooran State School
Pomona State School
Gundiah State School
Kawungan State School
Kippa-Ring State School
Humpybong State School
Kuluin State School
Noosaville State School
Jinibara State School
Pialba State School
Bribie Island State School
Wondai State School
Tinana State School
Lawnton State School
Nambour State College
Pumicestone State School
Wheatlands State School
Durong South State School
Cloyna State School
Windera State School
Cherbourg State School
Burnside State School
Tiaro State School
Narangba State School
Peachester State School
Beerburrum State School
Albert State School
Golden Beach State School
Sunshine Beach State School
Hervey Bay State School
Kuluin State School
Moreton Downs State School
Scarborough State School
Clontarf Beach State School
Bellmere State School
Bray Park State School
Beerwah State School
One Mile State School
Yarrilee State School
Gympie Central State School
Gympie West State School
Gympie East State School
Burpengary Meadows State School

Secondary Schools

Beerwah State High School
Noosa District State High School
Gympie State High School
James Nash State High School
Goomeri State School
Gympie Flexible Learning Centre
Pine Rivers State High School
Caloundra State High School
Burnside State High School
Beerwah State High School
Kingaroy State High School
Redcliffe State High School
Pine Rivers State High School
Urangan State High School
Aldridge State High School
Deception Bay State High School
Hervey Bay State High School
Maroochydore State High School

44 primary schools

18 secondary schools

"THE HIGHLIGHT FOR ME WAS THAT THE TEACHERS WERE VERY HELPFUL, THANK YOU."

"I LOVED BEING ABLE TO LEARN ABOUT THIS TOPIC AND WITH SUCH AN AMAZING TEACHER!"

Student Impact - Schools

YEAR 4

92%

Are interested in more lessons like this

Are eager to keep learning tech at school

78 percent

Feel more informed about future study options

64%

90%

Gained confidence in coding

YEAR 5

91 percent

Enjoyed the lessons

Improved coding skills

87%

Were inspired to continue learning technologies

Are more confident in career and study choices

83 percent

YEAR 6

96%

Viewed the presenters as role models

Gained confidence in coding

91 percent

Were motivated to pursue or continue:

74%

63%

Believe they can pursue higher education in the future

60%

YEAR 7

98 percent

Loved participating in the lessons

Learned more about future study options

65%

Have more confidence to pursue higher education

72%

Gained confidence in coding

85 percent

YEAR 8

85%

Want to do more lessons like this

Improved understanding of sustainable neighbourhoods

95 percent

Gained insight into future study and career options

70%

78%

Believe in future university or TAFE possibilities

YEAR 9

99 percent

Enjoyed the lessons

Are more confident in body sciences activities

90%

80%

Know more about their future study and career options

Gained confidence in coding

85 percent

YEAR 10

88%

Found the lessons enjoyable

Have better understanding of citizen science

84 percent

Have more confidence to pursue higher education

80%

78%

Want to do more lessons like these

Impact - Community

ROBOTICS & FIRST LEGO LEAGUE CLUBS

100%
understanding of robotics & coding had improved

98%
are now more confident to participant in robotics & coding activities

85%
believe it is possible to go to university or TAFE in the future

CODING CLUBS

89%
were inspired to choose or to continue learning STEM topics at school

100%
are now more confident to participant in coding activities

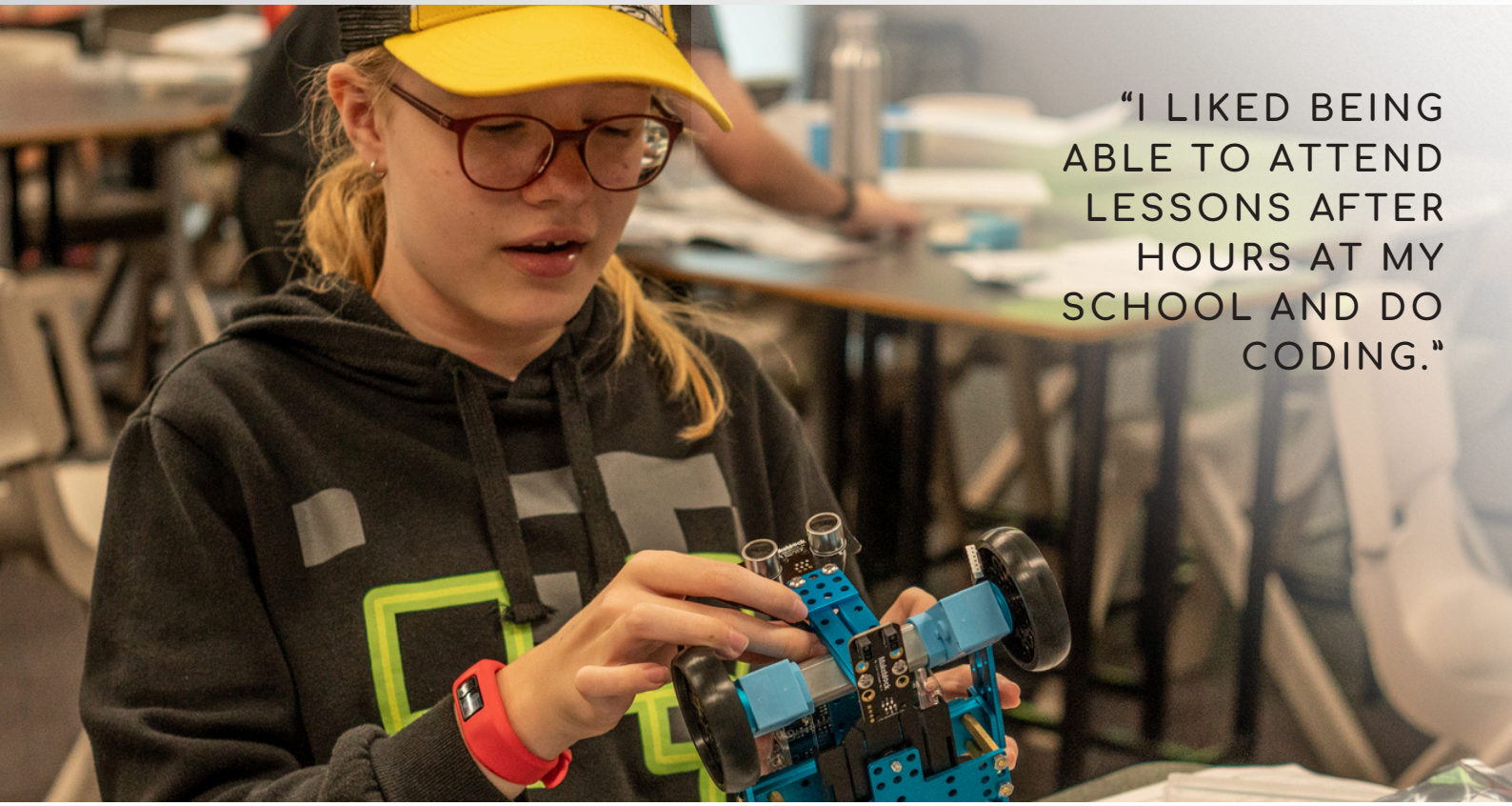
82%
believe it is possible to go to university or TAFE in the future

STEM ACTIVITIES

71%
were inspired to choose or to continue learning STEM topics

66%
feel more confident about making career & study choices

81%
believe it is possible to go to university or TAFE in the future



"I LOVED LEARNING MORE ABOUT STEM AND WORKING IN A TEAM TO SOLVE A PROBLEM."

Impact - Events

SCIENCE AND ENGINEERING CHALLENGE (SECONDARY)

90% enjoyed the event
77% would like to participate in other STEM activities like this
60% have an increased interest in science and engineering
67% are more likely to consider going to university or TAFE in the future

SCIENCE AND ENGINEERING DISCOVERY DAY (PRIMARY)

90% enjoyed the event
63% would like to participate in other STEM activities like this
61% believe it is possible to go to university or TAFE in the future

OTHER EVENTS

63% learned more about their future study and career options
61% feel more confident about making career and study choices
87% believe it is possible to go to university or TAFE in the future

Parent/Carer Workshops

The MindSET-do Program offers Parent/Carer Workshops aimed at promoting STEM pathways and higher education opportunities. These workshops, held at schools, engage parents/carers and their children in STEM activities and discussions. Featuring speakers from local industries, school representatives, and university marketing representatives, the workshops cover topics such as the future of work and pathways to university. With sessions available during school hours or in the evenings, the goal is to raise awareness of STEM subjects, encourage interest in STEM education, and facilitate transitions into tertiary studies and STEM careers for students and their families.

STUDENT FEEDBACK:

96% ENJOYED THE WORKSHOP WITH THEIR PARENTS/CARER
82% WERE INSPIRED TO PURSUE STEM AT SCHOOL
93% HAVE AN IMPROVED UNDERSTANDING OF UNIVERSITY PATHWAYS
91% GAINED INSIGHT INTO FUTURE STUDY AND CAREER OPTIONS
68% ARE MORE CONFIDENT IN MAKING CAREER AND STUDY DECISIONS
91% BELIEVE IN UNIVERSITY OR TAFE POSSIBILITIES

PARENT/CAREGIVER FEEDBACK:

98% ENJOYED THE WORKSHOP WITH THEIR CHILD/STUDENT
96% MORE CONFIDENT IN SUPPORTING THEIR CHILD/STUDENT'S STEM SUBJECT SELECTION
95% HAVE AN IMPROVED UNDERSTANDING OF STEM CAREERS
94% HAVE A BETTER UNDERSTANDING OF UNIVERSITY PATHWAYS

Professional Development

MindSET-do PD programs are designed to enhance teaching skills and promote effective STEM education. Through a combination of face-to-face and online training sessions, it provides an enriching learning experience for teachers and UniSC students and UniSC preservice teachers from various schools and regions. PD and training activities are an opportunity for participants to deepen their understanding of lesson content before delivering programs into schools or for their personal professional growth. Tailored workshops are available, catering to specific year levels or individual interests, ensuring that participants (eg teachers, UniSC students or the community) receive targeted support aligned with their needs.

One of the key highlights of the program is the practical application of a hands-on STEM learning approach, allowing participants to actively engage in the learning process. This hands-on experience enables educators to grasp STEM concepts more effectively, translating into improved teaching practices and inspiring students with interactive and exciting learning opportunities.

For UniSC preservice teachers and UniSC students, the PD activities follow an intensive and structured method. The process includes PD sessions, hands-on learning elements, opportunities for peer practice, and subsequent in-class experiences to deliver lessons. This comprehensive approach ensures that Presenters are well-prepared and equipped with practical teaching skills, ready to embark on their paid employment as Presenters in the program.

Research

The team's various research initiatives encourage early interest in STEM careers, foster long-term aspirations, enhance the role of mathematics in STEM education, and support STEM classrooms in Queensland. These research projects collectively aim to address the challenges and opportunities surrounding STEM education, particularly focusing on encouraging early interest and career aspirations in STEM fields among primary school students.

Overall, these projects collectively contribute to the enhancement of STEM education by targeting various stakeholders and addressing key challenges, ultimately aiming to inspire and prepare the next generation of STEM professionals.

MINDSET-DO PROJECT:

Early STEM exposure for primary students

SUNSHINE COAST STEM ASPIRATIONS:

Regional collaboration for sustainable STEM workforce

LONGITUDINAL STEM STUDY:

Assessing effectiveness of early STEM initiatives

MATHS AND DIGITAL TECHNOLOGIES PROJECT:

Integrating maths and tech in primary schools

MindSET-do

MindSET-do is a widening participation program developed by the University of the Sunshine Coast (UniSC) to increase participation in tertiary education in STEM fields.

It is partly funded by the Australian Government Department of Education, Skills and Employment under the Higher Education Participation and Partnerships Program.