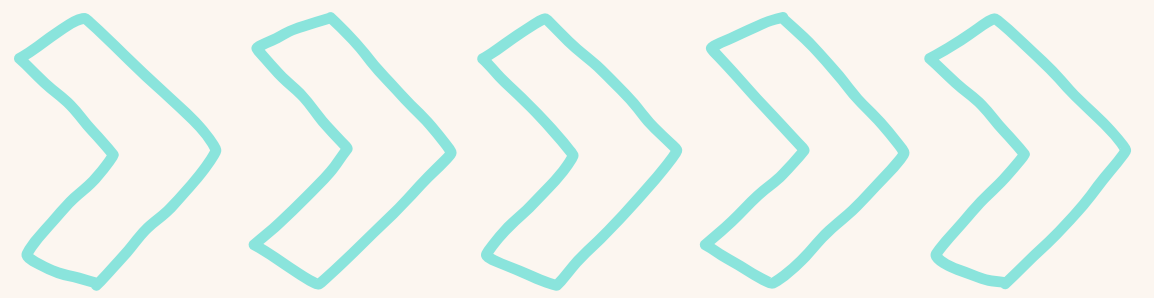


Community Leadership and Social Innovation Centre (CLASIC)



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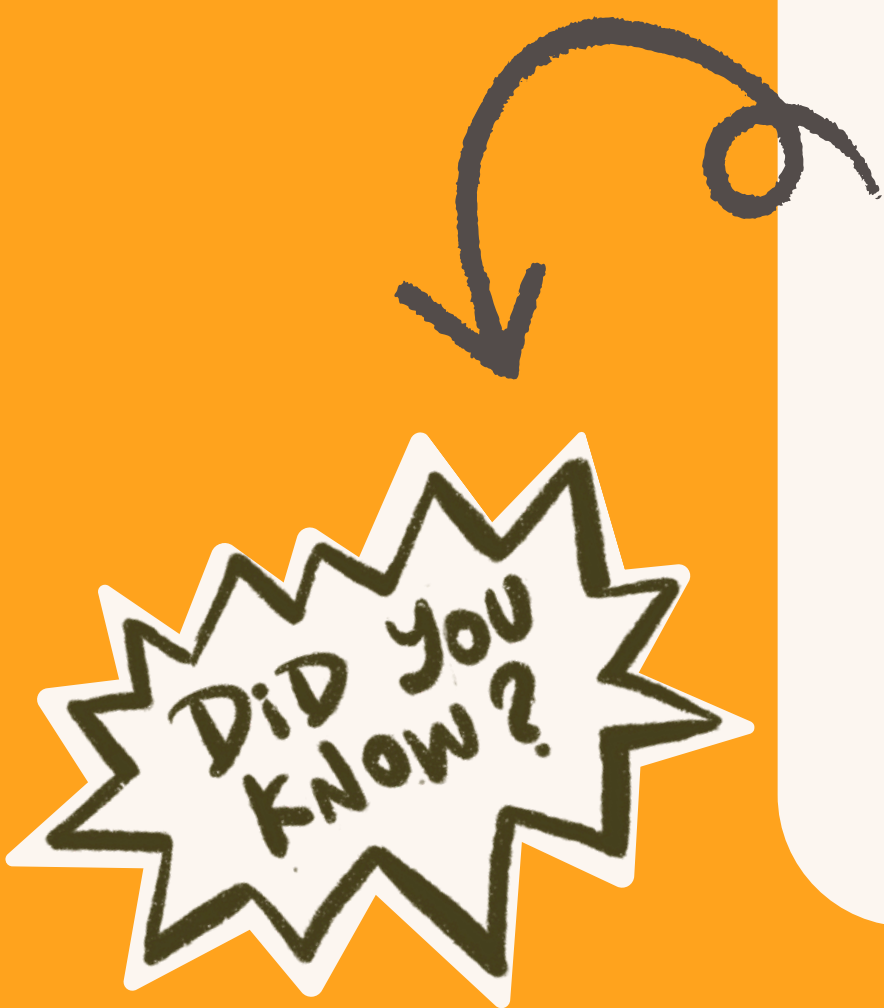
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Sustainable Practices



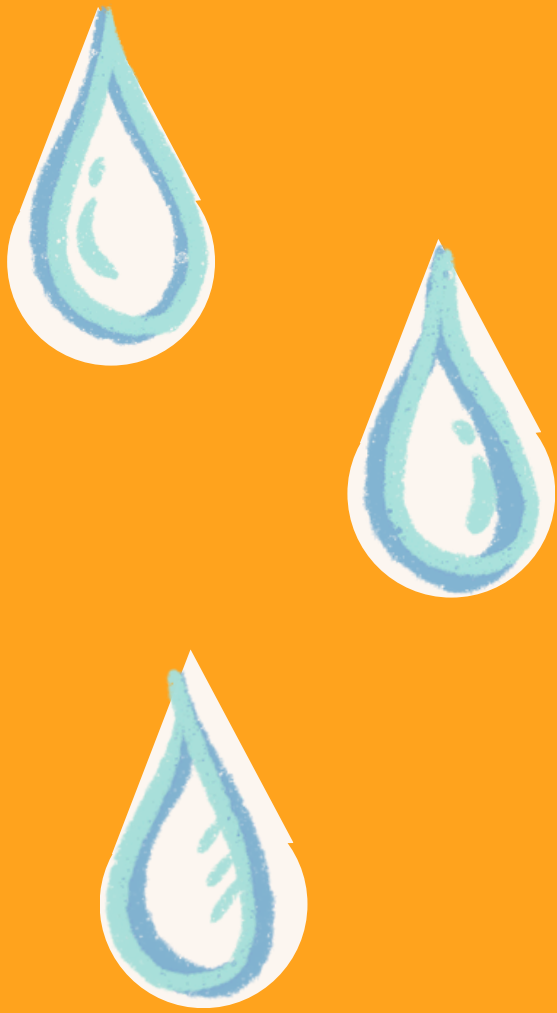
A Smart Meter to Enhance Control of Water Usage and Cost

Currently, households in Singapore are not able to identify the specific water-related activities that cause excessive water usage should there be a surge in water usage. The Public Utilities Board (PUB) has installed water meters outside each dwelling unit in Singapore, including smart water meters, to monitor water usage readings for each household. However, these are aggregated water meters that provide the overall water usage for the entire household and are not able to monitor the water usage for specific water points within the household.



Households in Singapore account for about 45-50% of the total water consumption in Singapore. This proportion is relatively high compared to domestic waste generated (25%) or carbon emissions (6%). In addition, with increasing water tariffs, households may see more of their household expenses go towards water bills.

Hoping to help households better manage their water usage and bills, a social enterprise, ECOSOFTT Pte Ltd and CLASIC exchanged ideas and eventually proposed a project to develop and install smart meters that can monitor water usage at different outlets, beginning with low-income households. The smart device is capable of storing data for a period of at least two weeks and data should be retrievable so that they can be analysed to determine the water usage at the different water points of the household. This will help users to better understand and adjust their usage behaviour to manage their water bill.



Under the guidance of Engineering faculty, Assoc Prof Steven Tay, a group of Mechanical Engineering Year 2 students worked on the proposal as a Specialised Engineering Project in Trimester 3, AY2021. The journey began with research including visits to rental units to understand the size and layout of the flats and the families' water consumption.

households can improve water consumption tracking to save money



To bring the project to the next phase, CLASIC has awarded a project grant to fund the production of more meters for the students to conduct a 2-week trial in 20 low-income households between July and August 2022. The project has received warm support of the Public Utilities Board (PUB) and the Singapore Plumbing Society has generously agreed to sponsor the installation of the devices in the identified flats. The findings would be shared with the participating families to encourage them to manage their water usage and the data collected will be presented to PUB to enhance their understanding of water consumption patterns in low-income households.

Recycle More and Do It Right: Designing Recycling Receptacle for All Households

To promote recycling right and encourage higher recycling rates among Singaporeans, the National Environment Agency (NEA) planned to produce a recycling receptacle for distribution to households in Singapore. The objective is to encourage correct recycling practices and good habits within the family and from home.

NEA invited SIT students to contribute designs of a household recycling receptacle for NEA's consideration. The receptacle would allow for different types of common recyclable items including bottles, egg cartons, and small boxes to be placed inside. It was expected to be compact, foldable, and attractive and at the same time, expandable, sturdy, waterproof, and washable.

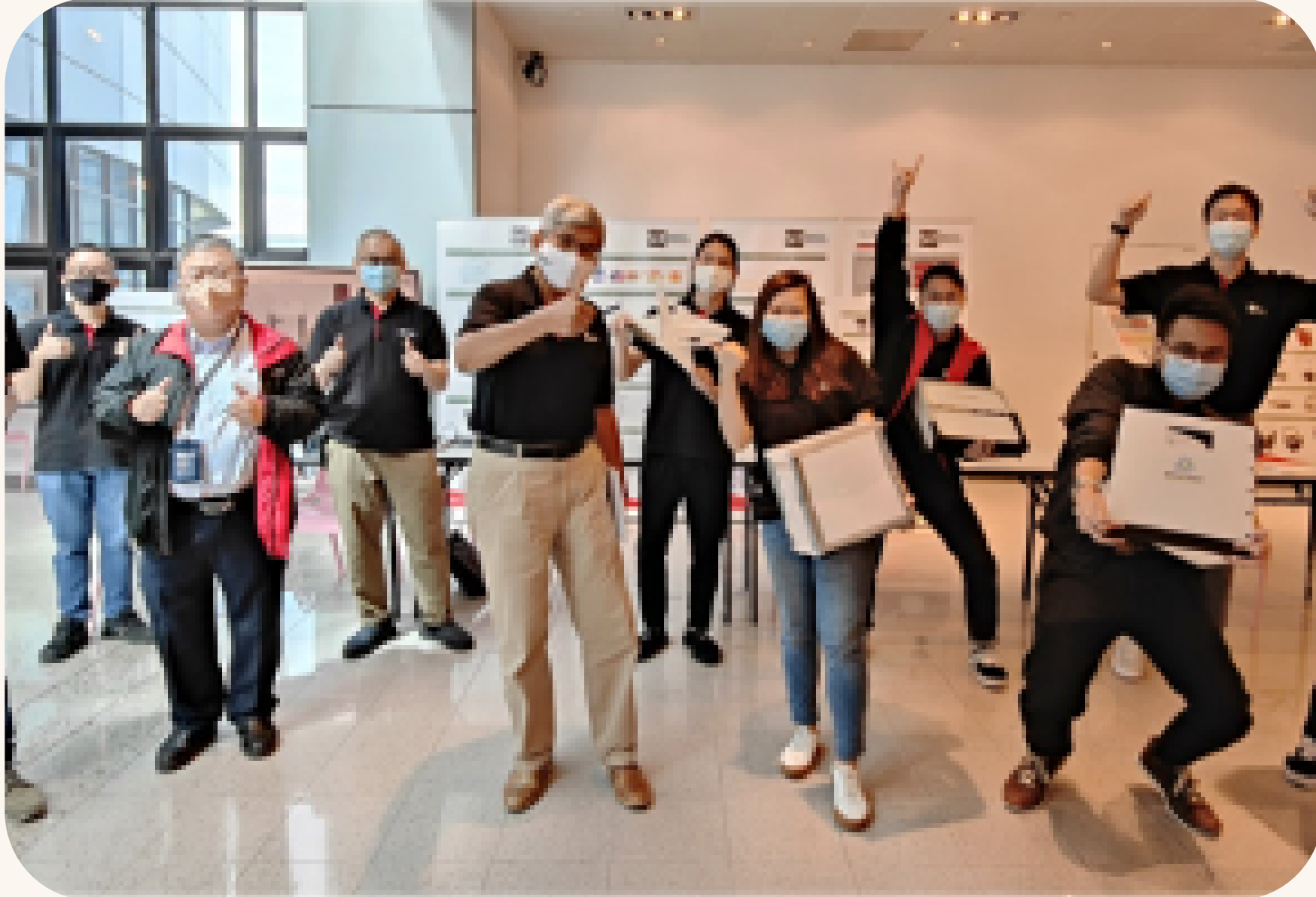


BLOOBPOX

Senior Professional Officer,
Mr Kwong Kwok Kuen took up the challenge to lead a team of Professional Officers Division staff and students in creating receptacle designs that would meet NEA's stringent requirements. The project team successfully presented a range of prototypes and design concepts to an appreciative NEA audience on 22 Sep 2021.



This project is timely not just for NEA but for SIT too – sustainability is a national issue that the university strongly advocates, and as we prepare to move to our new Punggol campus, you may spot one or two of our favourite student-designed recycling receptacles in households in the Punggol Digital District or at our new SIT Punggol campus soon. .





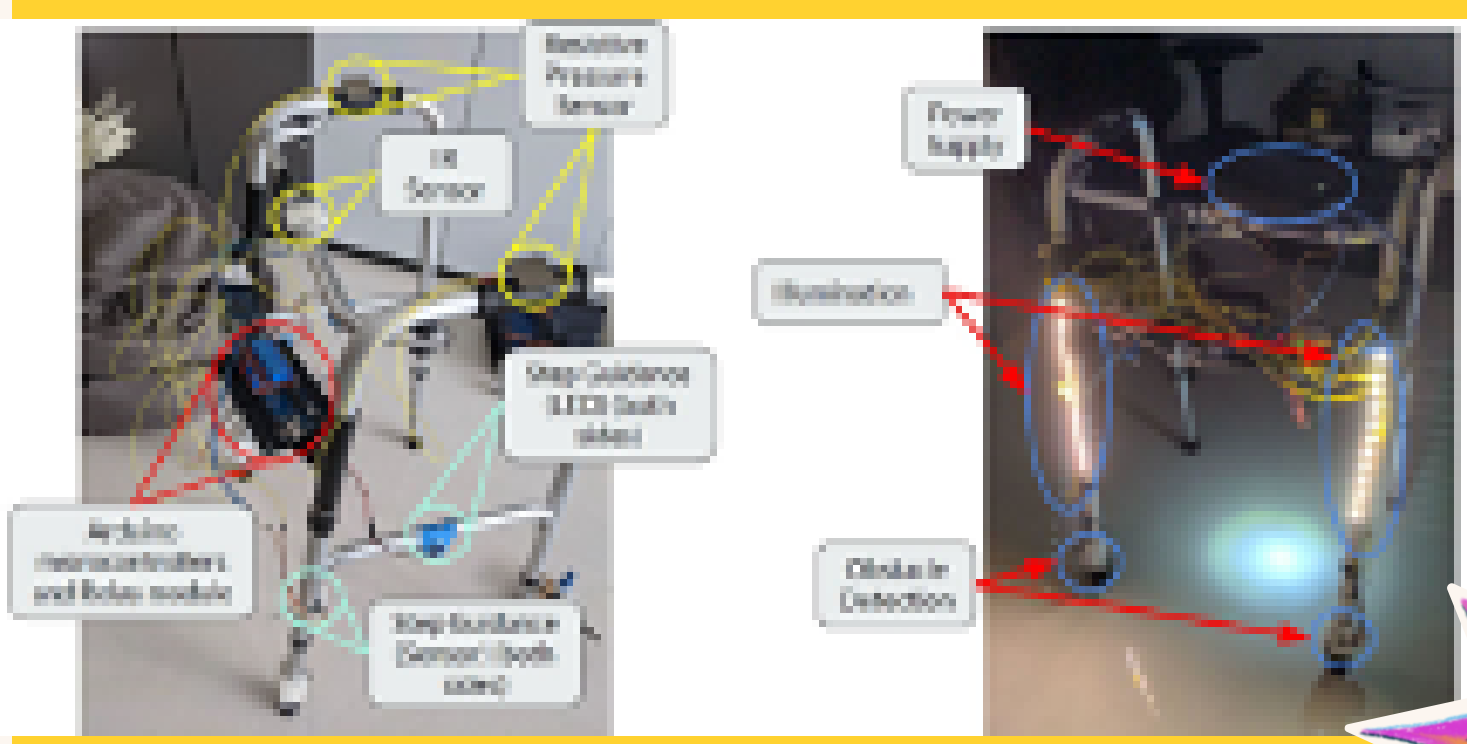
CAAN – Smart walker with sensors for enhanced safety

Team CAAN is made up of Year 2 SITizens, Chan Wei Han, Mohammed Ibrahim Adam, Nicholas Goh Jie Wen, and Astor Tran Kei Chuen from the Telematics (ITS) programme. The team designed a smart walker for elderly persons with walking difficulties and higher risks of falling, to get through their rehabilitation phase safely.

Through their consultations with AWWA, the SITizens created an enhanced version of the walker that comes with sensors and components for added safety features. The enhanced walker could detect obstacles, provide step guidance, night light activation, and infrared sensors to check if the user is within the walker's frame.

Team CAAN with their industry mentor and community partner.

From left: Mr Tan Hock Kwang, Senior Manager, Durapower Technology (Singapore) Pte Ltd; Astor Tran; Nicholas Goh; Ms Pan Myint Wai Wai, Physiotherapist, AWWA; Chan Wei Han and Mohammed Ibrahim.



Prototype assembly made up of various pressure and infrared sensors and microcontrollers.



Team MECIT – IoT Device to Assist with Photo-taking

Anyone can be creative, but not everyone has the chance to exercise their creativity. Recognising this, SIT's Team MECIT took a shot at making photography as accessible as possible for people with muscular dystrophy (MD).

Team MECIT, comprising (from left, clockwise) Alencia, Yi Xuan, Yucan and Hakiim, constructed an IoT device (right) with an app that helps users to conveniently capture photos.

(Photos: Muhammad Abdul Aliimul Hakiim bin Mohammed)



Yu Yucan from BEng (Hons) in Information and Communications Technology (Software Engineering), Yeo Yi Xuan, and Muhammad Abdul Aliimul Hakiim bin Mohammed, who are reading BEng (Hons) in Information and Communications Technology (Information Security), teamed up with Alencia Tan from BEng (Hons) in Mechanical Design and Manufacturing Engineering to frame a solution. Learning that persons with MD typically rely on their caregivers to take photographs and videos, the team focused on developing a hands-free, portable, and easy-to-use Internet-of-Things (IoT) device.

Team MECIT's prototype allows users to position a mobile phone attached to a motorised arm on a wheelchair, snap pictures and review them straight away. As users navigate the various options on the app by winking, they can enjoy a more independent form of recreation and expression.



The team not only produced a practical and promising prototype, but also supplemented their innovation with a public outreach plan that made them clinch T4G's Best Advocate mini-challenge. In August 2022, MECIT members participated in Muscular Dystrophy Association (Singapore)'s 22nd anniversary by running 22km in 22 days. They posted their journey on their Instagram account to spread awareness of the condition and encouraged others to participate in the challenge. The team recounts that it was a meaningful activity to be part of.

Urban Farming Program – Collaboration between Singapore Institute of Technology and Yusof Ishak Secondary School

Yusof Ishak Secondary School (YISS), in collaboration with SIT's Young Explorers in STEM (YES!) Program, has launched an innovative Urban Farming initiative for its students. This initiative aims to spark student interest and impart knowledge in cutting-edge technologies such as 3D printing and block programming.

Initially, students were introduced to the fundamentals of Tinkercad. They engaged in mini-tasks designed to reinforce their understanding. This approach not only provided exposure to 3D modeling but also encouraged students to design cases for sensors used in urban farming. This practical application of their skills made the learning process both meaningful and immediately useful.

Following this, the program included a tutorial on Microbit. This allowed students to experiment with their built sensors and learn about radio communication between different Microbits. Subsequently, they explored the use of M5Core kits with integrated sensors. The culmination of the program involved teaching students how to integrate the knowledge and skills acquired from both the initial and latter stages, facilitating communication between the Microbit and M5 Core using UART. Throughout these stages, YES mentors provided step-by-step guidance.

However, certain planned aspects of the program were not completed. This includes the integration of all sensor data and its transmission to the cloud for continuous monitoring. The intended platform for this was Losant, a proprietary software solution.

This initiative is more than just a learning experience; it's a steppingstone into the future of technology. It's about inspiring our students to think creatively, solve problems, and see the tangible impacts of their work in urban farming.



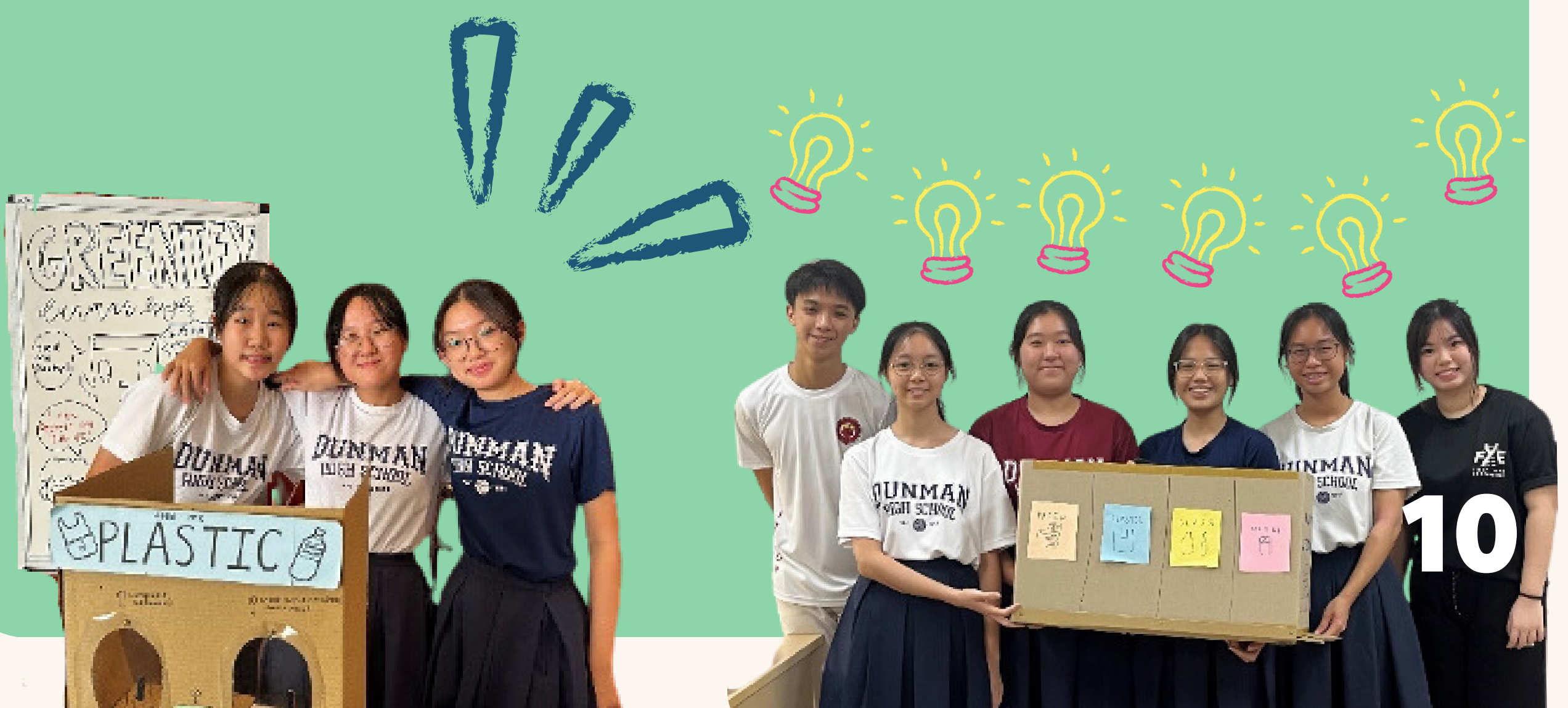
Project Inspire - Collaboration between SIT, CLASIC (Community Leadership and Social Innovation Centre), YES! Program and Victoria Junior College (VJC)



In May 2024, the second run for Project Inspire, a transformative design thinking bootcamp for secondary school students, concluded recently, leaving a trail of inspiration and innovation in its wake. This collaborative effort by the CLASIC (Community Leadership and Social Innovation Centre) in SIT with the commitment of student mentors in YES!Program and Victoria Junior College (VJC), empowered young minds to identify and address social issues through creativity and problem-solving.

Over three intensive days, students delved into the world of design thinking, where they learned to empathize with community members, identify key challenges related to plastic waste, and develop innovative solutions. The boot camp featured workshops on design thinking principles, and prototyping techniques, and even included community immersion experiences where students interacted directly with residents to gather valuable insights and understand their perspectives on the issue.

Armed with newfound knowledge and fueled by a passion for making a difference, the students tackled diverse community issues. From tackling environmental concerns to promoting social inclusivity, their proposed solutions showcased remarkable ingenuity. Prototypes constructed through cardboard brought their ideas to life, demonstrating their potential to create positive change.



The culmination of the boot camp saw students presenting their solutions to a panel of judges and community members. The presentations were a testament to the learning and growth experienced throughout the program. Students confidently articulated their ideas, demonstrating their understanding of design thinking principles and their commitment to addressing real-world challenges.



The success of Project Inspire extends beyond the individual participants. The program serves as a beacon, inspiring future generations to embrace innovation, collaboration, and social responsibility. By fostering a love for design thinking and empowering young minds to tackle community issues, the program paves the way for a brighter and more sustainable future.

The unwavering commitment of SIT YES! Program mentors who dedicated their time and expertise to guide and inspire the students also played a crucial role in making the program a success.



As Project Inspire continues to evolve and inspire, its impact on young minds and the communities they serve will undoubtedly continue to resonate for years to come. Together, we can empower the next generation of thinkers and change-makers to build a better tomorrow.



SIT Community Challenge 2023



SIT Community Challenge (SIT CC) 2023 was a journey that started with "Enhancing sustainable development efforts and education in the Punggol community" as a challenge statement to all four secondary schools in the Punggol district. As SIT is moving to our new campus in Punggol in 2024, we wanted to use this opportunity to:

- **Interact with our new Punggol neighbours through partnership and collaborative initiatives;**
- **Increase secondary school students' awareness of the importance of environmental sustainability through education and action**
- **Encourage SITizens to ideate and co-create socially innovative solutions to address the challenge statement together with the secondary school students**



The seven-month SITCC 2023 journey includes an opening talk to all four secondary schools (Yusof Ishak, Punggol, Edgefield and Greendale) to garner interest and team participation in May 2023, targeting secondary 2 and 3 students in each school. This is followed by a design thinking training session from SIT faculty to all four schools in June. Thereafter, the teachers at each secondary school shortlisted 4 to 5 teams to attend the boot camp on 26 Aug 2023 with a total of 19 teams.

During the boot camp, James Dyson engineers guided the 19 finalist teams in design prototyping through a hands-on approach, equipping them with real-life experience. Students were further assisted by both SIT student mentors and student ambassadors during the process. After the boot camp, SIT student mentors continued to mentor the students in building and refining their prototypes.



Examples of SIT Community Challenge Projects by Students

Project Name: Project Jardinière by 5 Potatoes from Punggol Secondary School

The problem:

- High demand of water
- Water insecurity
- Plants are either overwatered or underwatered, which is detrimental to their growth

Their proposed solution:

5 Potatoes proposed Jardinière, an automatic watering system which waters plants just enough; not too much, not too little. They also filter input water to ensure cleaner water for plants.

Project Jardinière by 5 Potatoes won the Most Impactful Award during the SIT Community Challenge 2023.



Project Jardinière

OUR PROBLEM

- High demand of water
- Water Insecurity
- Plants are either overwatered or underwatered, which is detrimental to their growth

OUR SOLUTION

We propose Jardinière, an automatic watering system which waters plants just enough; not too much, not too little. We also filter input water to ensure cleaner water for plants.

BACKGROUND INFORMATION

Plants today require significant maintenance, and optimal conditions. Jardinière helps solve these problems by delegating the maintenance of the plants to a machine, allowing people to spend time doing other things: reading a book, studying, etc.

LIMITATIONS

- Project Jardinière does not spread water by a large area so we only used a few seeds/limited battery supply to last during rainy seasons.
- Solar power does not provide enough energy.
- The structure of the automatic watering system is weak.

CHALLENGES

- Finding the right materials required for the prototype.
- Making the bottle which contains the filtering system to have a strong structural support.
- There are time constraints when planning the prototype. It is difficult to put everything into one piece.

POTENTIAL FOR FUTURE DEVELOPMENT

This project can be installed in all of Singapore's rooftop gardens as well as community gardens. It will bring more convenience to gardeners as the automatic watering system will be able to monitor the plant's growth 24/7. The automatic watering system will be powered by solar energy which will encourage others to use renewable energy. Water is also being reused to promote water conservation. Hence, it will build a more environmentally sustainable city.

Made by: 5 potatoes
Members: Della, Christabel, Ryan, Vrean, Gerard
School: Punggol Secondary School

Project Name: The Zero Waste Kitchen by team YISS-2 from Yusof Ishak Secondary School



The problem:

Although sustainable food usage is a hot topic today, there is still no sure-fire way to help individuals handle their food waste (besides making it a habit which might be difficult for some)

Their proposed solution:

The team's app aims to help people manage food waste sustainably in their own households. It also helps them to better connect with their communities and spread awareness of food sustainability. This multi-purpose app allows users to reduce their food waste as it provides a myriad of ways to recycle and reduce their food waste and turn leftovers into something delicious and sustainable!

The Zero Waste Kitchen by YISS-2 won the Most Innovative Award during the SIT Community Challenge 2023.

The Zero Waste Kitchen
Yusof Ishak Secondary School
Poon Xi Song, Yong Wing Ben, Darius Kong Sheng Jie and Cuan Tih (YISS-2)

Problem statement

Although sustainable food usage is a hot topic today, there is still no sure-fire way to help individuals handle their food waste (besides making it a habit which might be difficult for some)

OUR PROPOSED SOLUTION

Our app aims to help people manage food waste sustainably in their own households. It also helps them to better connect with their communities and spread awareness on food sustainability. The multi-purpose app allows users to reduce their food waste as it provides a myriad of ways to recycle and reduce their food waste and turn leftovers into something delicious and sustainable.

OUR TARGET BENEFICIARIES

1. Food Centres and restaurants to partner with us to carry out the hydroponics activity and spread awareness about reducing food waste.
2. Teenagers that can be made more aware of reducing food waste especially during this era of technology. Our app allows them to reduce food waste and be more aware about food sustainability.
3. Improve community interaction by providing local with vegetables. When community members want to plant the hydroponics vegetables, they can head to the restaurant or hawker centre. This will also provide restaurants and hawker centres with a myriad of fresh local produce.

Limitations and challenges

Some of the challenges we faced are:

- We did not know how to improve the prototype at first and we were stuck with only the concept of an app. We resolved it by considering what is most accessible and user-friendly for the general public.
- We were inexperienced with designing an app. Subsequently, we used an app called MIT App Inventor to design the Zero Waste App.

Some of the limitations of this prototype are:

- Both the physical and online prototypes can only represent the design and concept of a said sustainability app.
- The app has limited functions and may not cater to every resident's needs.

Shopping list maker, Recipe maker, Homepage, Tips and tricks, Chat, Reward system

LEADERS FOR TOMORROW
THINK LEARN LEAD BETTER



The SITCC 2023 finale event was held at Punggol National Library on 4 Nov 2023 and was open to the public, where the secondary school students' prototypes and posters were presented. A panel of judges evaluated the prototypes and presentations by all 19 teams. Eventually, the judges identified nine winners who were awarded prizes for their time, effort, and ideas.

We hope our prototype can make a difference in other's lives!

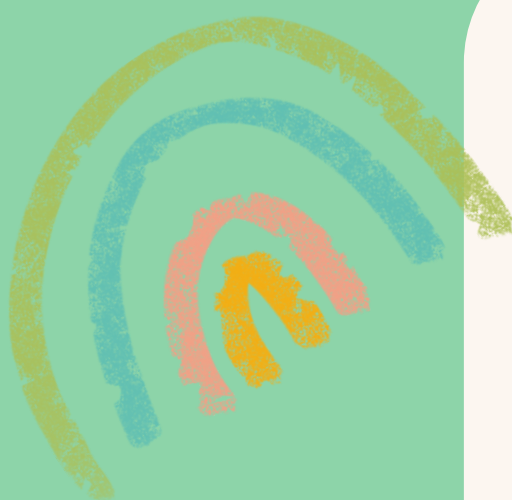


SITCC 2023 has inspired SIT and secondary school students to better understand the importance of environmental sustainability through the innovation process while obtaining support from the community and through partnerships.

The support and inputs rendered by SIT staff, teachers, and parents of secondary school students during the finals cemented the importance of environmental sustainability to the general public and secondary school students involved, beyond their typical school curriculum. Through this event, SIT students learned the importance of environmental sustainability and the role of community mentorship.



In addition, SITizens had the opportunity to apply the skills and knowledge they have learned in their respective degree programmes in a real-world setting, as well as exercise community leadership through organising SITCC 2023.

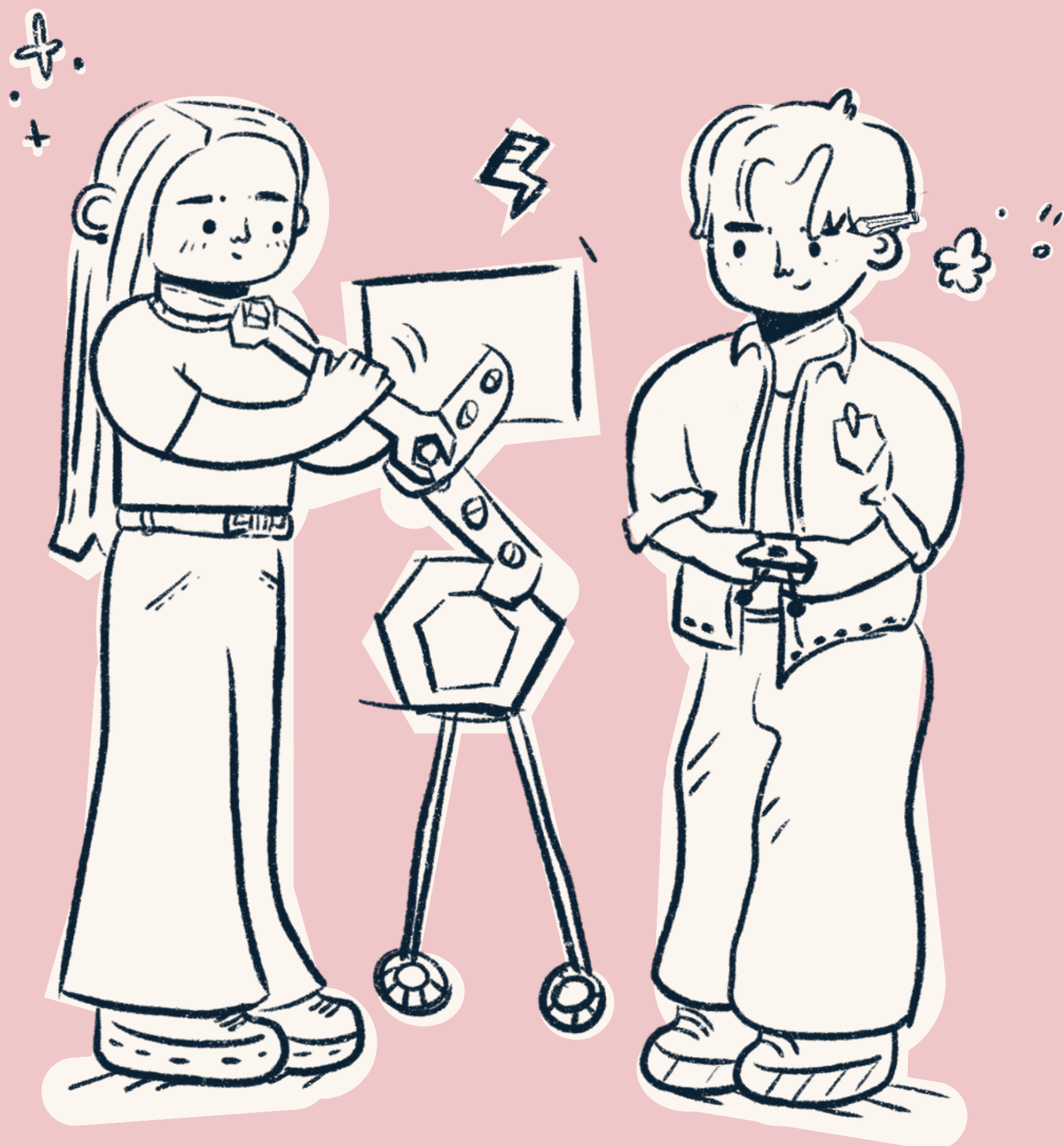


USI2001 Social Innovation Project Module

There are many current issues and challenges faced in our pluralistic society, such as diversity and inclusivity, changing demographics, environmental concerns, and sustainable practices, among others. The inclusion of the Social Innovation Project module as a graduation requirement will create opportunities for SIT students to address some of these multi-faceted issues and challenges in a multi-pronged, problem-solving approach, and through inter-disciplinary collaboration.

In this module, students apply the principles and mindset of being socially attuned and human-centred to understand the interdisciplinary and diverse factors, concerns, needs, and expectations that different stakeholders in society have when addressing these issues and challenges.

This experience will nurture students' ability to see the broader connection of issues and challenges and bring about an awareness of the multiple considerations that need to be weighed in, including social, environmental, and sustainability factors, in the planning and decision-making process involved in the course of their work – such as being cognisant of the circular economy, how companies operate, and corresponding investments made in the sectors involved. This experience will also prepare students for the interdisciplinary nature of work teams and demands of stakeholders, regardless of the industry they venture into after graduation from SIT.



Examples of USI2001 Projects by Students

Project Name: Re:Connect



Problem statement: How can we develop empathy among youths towards the elderly?

Ideation: The team chose to target young people who were still in the schooling phase of their lives and teach them through a three-part workshop that would take place during their schooling time. They wanted to raise understanding and empathy for the difficulties that the elderly encounter so that youths can treat them with more care and respect. With this understanding, they would be able to educate and pass on their morals and values to the next generation. As a result, regardless of age, a more inclusive society is fostered, and so are sustainable development and lifestyles within the community.

Solution: A card game that will be played constantly amongst different generations to teach young people how to be more empathetic towards and reconnect with the elderly in their lives.

Project Name: CAREPACT



Problem statement: How can caregivers be better equipped with relevant and timely caregiving knowledge?

Ideation: Singapore faces a rapidly ageing society and this proportion of citizens aged 65 and above is expected to increase even further, to make up approximately 1/4 of Singapore's population. There are more citizens who are suffering from chronic diseases than a decade ago (Choo, 2019).

For both domestic and family caregivers, caregiving duties can bring about many different challenges. To tackle these challenges, support for them can be broadly classified into 4 categories:

- Emotional Support
- Physical Resources
- Medical Information
- Financial Assistance

Solution: CAREPACT: Mobile Application - Provide caregivers with relevant caregiving -knowledge and services at their convenience - Perform as a compact outlet that delivers timely and relevant information to help caregivers to better manage their caregiving responsibilities - The resources aim to alleviate feelings of burnt-out and improve the caregivers' overall well-being

Meet the Team!

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