Greening Industries for Sustainability

SIT showcases two sustainable engineering initiatives that aim to reduce carbon footprint

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The Singapore Institute of Technology (SIT) is examining innovative ways to green industries for a more sustainable future through the following two initiatives – utilising solar energy to power rooftop hydroponics farms and helping companies discover and implement energy efficiency improvement measures.

Harnessing Solar Energy For Rooftop Hydroponics Farms

With Singapore moving towards a more sustainable future, it has unearthed greater self-sufficiency in local food production and adoption of renewable energy resources. As SIT project is leapfrogging both areas in the form of rooftop hydroponics farms that harness electricity from the sun and use it productively to better grow more greener and healthier.

“The project aims to address compelling needs within limited land area in urban Singapore,” said principal investigator Associate Professor Steve Hartanto, from SIT’s Engineering cluster. “SIT’s first renewable energy and agricultural needs can co-exist together. Singapore, in the end, doesn’t have to sacrifice one for the other.”

The rooftop project, which started in December 2020, is funded by a grant from Temasek Foundation. Singapore-based agriculture company Aviron is lending its expertise to the project. It provides seedlings and used greenhouses, and also advices on the crops and plant growth.

Assoc Prof Sueu said that the main challenge is figuring out the best way to place the solar photovoltaic panels for maximum crop growth. While gaps need to be created between the panels to allow sunlight to reach the crops below, this also means that there is a reduction in the number of panels installed to generate electricity. Therefore, photovoltaics could help to promote crop growth and yield despite less sunlight available for vegetables to grow.

Training SMEs to be More Energy Efficient

The National Energy Efficiency Technology Centre (NTEC) aims to promote and develop energy efficiency capability, as well as adoption of new technologies in the local energy ecosystem for industrial adoption. From NTEC’s Jose Yap, industry manager, we learn that NTEC, in collaboration with RTO, provides energy and energy efficiency assessments for companies. The centre also advises how to implement new energy-efficient practices to improve energy efficiency.

The centre has made energy assessments more accessible for small- and medium enterprises (SMEs), which typically lack the capabilities and resources to identify and implement energy efficiency improvement measures. NTEC is able to diagnose the potential performance improvement and recommendations on areas of improvement, and the staff are trained to offer energy assessment services for small- and medium-sized companies.

Two assessments have been completed for companies so far, and they coincide with East Parkway Industrial, Avid Chocolate, and Delta Airline Technologies. NTEC will work with the companies to support the implementation of the recommendations through the Energy Efficiency Fund.

“Energy efficiency is a low-cost measure in Singapore’s vision of a more sustainable future,” said Prof Lin Khok Tang (Engineering cluster), who leads the NTEC. “Energy efficiency measures can be implemented through changes in human behaviour and business operations, with others can be achieved by using established energy efficiency technologies.”

The NTEC also launched two energy efficiency programmes for existing professionals this January. Another six programmes are in the pipeline. Through these programmes, existing engineers and energy managers can train towards becoming certified Energy Efficiency Opportunity Assessors andchange Engineers.
A new bursary at SIT will be open to undergraduates from all academic disciplines

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In this coming Academic Year 2021/22, a new bursary at SIT will be made applicable to all Singaporean and Singapore Permanent Resident undergraduates who qualify for financial aid. This is the P.L.A.Y. Lam Family Fund Bursary which was established recently in June 2021 (the letters P, L, A, and Y are the initials of the family’s members).

Said Mr Lam Yi Young, who made possible this bursary together with his family, “SIT plays an important role in providing tertiary education opportunities to students and in helping them gain practical job skills and be work-ready. My family and I are pleased to be able to support students at SIT in their higher education journey. In particular, we hope to be able to support those who may not be among the neediest group that already qualify for the most support, but who nevertheless require further assistance to make ends meet.”

The P.L.A.Y. Lam Family Fund Bursary will be open to financially disadvantaged undergraduates from all academic disciplines at SIT. It is expected to be even more impactful for bursary recipients whose monthly household per capita income (PCI) range from $1,001 - $2,250, as this group of undergraduates are eligible for relatively less support from public bursaries. (They are eligible for the Higher Education Bursary that is valued from $1,350 - $3,200, while those whose PCI is $1,000 and below are eligible for the Higher Education Community Bursary that ranges from $5,000 - $6,200). In comparison, tuition fees for a Singaporean undergraduate at SIT in the current Academic Year 2020/21 start from $7,500 annually.

Said Prof Tan Thiam Soon, President, SIT, “We are very appreciative of this bursary made possible by Mr Lam and his family. Many of our students are the first in their families to attend university and this bursary will give more of our students the extra financial help they may need to pursue their studies no matter their financial background.”
Innovative Foods for the Future

3D printed Peanut Butter Chocolate Cookies, Vegan Chick-Off-Pieces, Plant-based Seaweed Cheese with Spirulina – these top three winners at the recent Food Technology Project Subvention and Industry Engagement Day are all products created by Nanyang Tech.

Identified as a key industry for Singapore's economic growth, food technology is set to help triple the country's food self-sufficiency to about 30% by 2030. Urban farming and plant-based alternatives are seen as promising means to achieve this goal, and the government has provided support in various forms, from provision of mentor grants to forming new food guidelines.

On 13 April 2021, by the Singapore Institute of Technology and Nanyang University, the annual “Food Technology Project Subvention and Industry Engagement Day,” one of the culminating events of the Nanyang Food Technology challenge. Graduating students applied the knowledge acquired over their four years of studies as they pitched their food products and businesses to both faculty and industry partners.

These innovative projects include some collaborative look into the SSTech's like generating, prototyping, and packaging, ready to make the final pitch to the judges for developing novel ingredients and manufacturing methodologies, winning certificates as well as cash prizes for the respective teams.

Best Product: Plant-based Seaweed Cheese with Spirulina

The team consisting of Ng Wei Hua, Suhaleena, Dione Chua, Justin Ng, and Yimin Yang — with industry partner Tyson Lim, Platform Undersea, Roorkey 2019 PTE Ltd, with the result — Plant-based Seaweed Cheese with Spirulina.

Riding on the popularity of seaweed, the team — comprising Ng Wei Hua, Suhaleena, Dione Chua, Justin Ng, and Yimin Yang — partnered with existing industry ingredients manufacturer to create the plant-based Seaweed Cheese with Spirulina.

The SSTech's version of the product is infused with spirulina, a superfood that contains high nutritional benefits, such as high protein and a broad array of vitamins. It is tailored to consumers who are consciously seeking healthier cheese choices and eating healthier, more environmentally sustainable dietary options. The plant-based version comprises peas protein, algae, spirulina, and spirulina as an alternative for the meat portion of the product. It is expected to be a good source of protein and vitamins.

The team's logistic coordination of selecting and researching the spirulina and developing the recipe of the panel judges, comprehending food leaders from the Chemical Engineering and Food Technology classes, as well as members of the Industry Advisory Committee (IAC) from Nestle F&B Centre, HKR Roberts Group, and Teesside India.

Best Market Potential Product: Vegan Chick-Off-Pieces

The team consisting of Yulian Lo, Kelvin Li, Michael Tan, Kevin Tan, and Jason Ng — with industry partner Tyson Lim — created a vegan version of the Chick-Off-Pieces in response to the increasing demand for meat-free alternatives.

Through their market research, the team noted an increase in consumer interest for alternative and sustainable foods. Their innovation led them to develop a highly musky, meaty, and crispy product that is deliciously crispy when fried.

The high protein product requires no artificial preservation and provides the full experience of a solid chicken skin — without the mess that comes with being unhealthy. The team was recommended for pursuing a more popular local dish with a unanswerable product concept, and for making the product a convenient dish to prepare.

Best Innoative Product: 3D Printed Peanut Butter-Chocolate Cookies

The team consisting of Koh Yi Ku, Diyana Yen Ting, Guei Li Ling, Doon Li, and emojis — with industry partner Tyson Lim — took the main inspiration of peanut butter and chocolate.

The idea is to make Peanut Cookies in vending machines, where customers can choose the cookie being printed on the spot after customising their desired sweetness level, shape, and size. The team noted that previous proposals that can be made through a mobile app, and the project is not fit for a gift box (a gift box printed behind machine will not work).

The judges lauded the team's effort in overcoming challenges, including printing the cookie through a leisurely route. The team managed to modify the process and formulate to overcome the constraint, and developed a product that is unique, innovative, and attractive.

*The SSTechs have outlined themselves. Most of them addressed technically challenging problem statements, and did a good job in developing commercially viable and marketable products that are expected to succeed well.*
Launched in October 2020, the Community Leadership and Social Innovation Centre (CLASSIC) has since set in motion a grant scheme, a module revamp, as well as a pipeline of projects aimed at benefitting the community.

The problems of today’s world are often multifaceted and need to be looked at from all angles with the relevant contexts in mind.

Social innovation projects allow students to apply diverse approaches to achieve impactful solutions for challenging issues and promote a more resilient community that drives for continuous improvement.

With a mission to strengthen the SIT DNA value of being “Grounded in the Community”, the Community Leadership and Social Innovation Centre (CLASSIC) at SIT has been set up as a one-stop centre that curates, coordinates, and oversees community and social innovation projects and initiatives across the university. CLASSIC aims to make SIT an academic partner of choice amongst philanthropic, community and industry partners for community-related projects and initiatives.

One such partner is the Vangjesh Foundation, which aims to “promote, foster, develop and improve education in Singapore and to provide financial support for the needy students and other charitable bodies to aid social development of the society.” The Foundation made a generous lump sum gift of $50,000 in December 2020 to make possible the Vangjesh Foundation Community Leadership and Social Innovation Grant to support programmes and projects under CLASSIC.

Empowering Future Talents to Lead with Impact

By drawing on the expertise of SIT academic staff and complemented by SIT’s own involvement across various clusters and domains, CLASSIC curates projects that would enhance the quality of life of identified beneficiaries. Each project will involve at least two SIT students, who will be mentored by a faculty member or a Professional Officer. Students will be exposed to community projects that enable them to be more attuned and sensitized to the needs of different segments of the community, informed of their industry practices, and motivated in the exploration of innovative solutions that benefit the wider community.

Change Management Module Refresh

SIT is also expanding the breadth of its curriculum to afford greater interdisciplinarity in learning. Complementing students’ learning in their domain expertise, the curriculum will be enhanced with knowledge in understanding how change occurs, why it occurs, and what can be done to anticipate, encourage, and manage it. CLASSIC has recently revamped the “Change Management” module to incorporate a stronger focus on social context elements. These elements will develop a student’s keen understanding of how situations and problems need to be assessed holistically, and the skills for arriving at diverse sets of ideas and meaningful solutions. The module refresh will be introduced for selected programmes in Academic Year 2023, and is scheduled to be rolled out across all SIT degree programmes by 2025.

Creating Practical Solutions through Impactful Projects

A CLASSIC project grant scheme has been established to fund service-learning, social innovation, or community-related projects undertaken by SIT students under the mentorship of faculty members and Professional Officers. Project proposals will be evaluated based on criteria such as the opportunity for students to interact with community members, academic staff to leverage their professional expertise, and the community impact they hope to achieve.

The CLASSIC team is currently facilitating 13 projects (and counting) and working with a wide spectrum of partners, including industry leaders, secondary schools, and social service agencies. One of the projects is a collaboration with Keppel Offshore and Marine (KOM) to engage the elderly residents and staff of KOM’s newly constructed nursing home in Pasir Ris. The CLASSIC team is currently facilitating 13 projects (and counting) and working with a wide spectrum of partners, including industry leaders, secondary schools, and social service agencies. One of the projects is a collaboration with Keppel Offshore and Marine (KOM) to engage the elderly residents and staff of KOM’s newly constructed nursing home in Pasir Ris.

“Working together on community projects will allow students across disciplines to learn that to formulate practical solutions for issues that impact society often require a holistic assessment of the environment and its stakeholders. This is where they can further develop their criticality, as well as analytical and critical thinking skills, which are crucial for the future economy,” commented Prof. Hassim Ibrahim, Director, CLASSIC. “Do keep us in mind if you have ideas for a community project!”

Click here for more information — Community Leadership and Social Innovation Centre (CLASSIC)
Bringing Necessities, Easing Anxieties

Amid the pandemic, Krithi Pushpanathan spent many hours at the frontlines to provide assistance and daily essentials to migrant workers.

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During the circuit breaker period, Krithi Pushpanathan volunteered with Transient Workers Count Too (TWCT) five times a week to help migrant workers affected by the lockdown. She worked with the Small Essential Needs team, contacting workers stuck in the dormitories and bringing them daily necessities to help them cope with the anxiety of their situation.

The Class of 2020 Pharmaceutical Engineering alumnus has also been tutoring primary school children at Cheng San Family Services Centre for the past four years.

When asked why volunteering is such a big part of her life, Krithi replied that she used to feel that she had been living life mostly for herself instead of others. "The basic commitment with TWCT and tutoring was just one time a week each. I also had a friend who told me stories about what migrant workers were going through, and I felt I wanted to help this vulnerable group of people. So I just tried it, made friends with fellow volunteers who are very passionate, and didn’t look back."

Krithi is still volunteering with TWCT today, and another part of her role involves helping with case work, assisting workers to write to the Ministry of Manpower if they have work issues requiring intervention. Her two volunteering activities are balanced together with her work as a Research Engineer in SST, which involves researching methods of bringing down the cost of expanding T-Cells through development of serum-free media.

When asked how she finds the time to volunteer regularly, Krithi said that it was a matter of finding the right passion for oneself. "When you do have the opportunity to help, it’ll be something you remember easily if you want to do it. You’ll definitely make time for it if it is something that you like. It’s just a matter of finding out what you like to do and how you would like to give back."

Krithi is a SINDA Excellence Award 2020 winner, SIT Scholar and recipient of the AbbVie Outstanding Student Award in Pharmaceutical Engineering (2020). She will be going to Imperial College London later this year to pursue a Master’s degree in epidemiology.
Strength and Control through Pilates

SIITizens focus on taking things slow through Pilates, a simple yet effective home workout to train your body’s muscle control and coordination.

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The workout incorporated exercises such as bicycle crunches (top), which trains one’s upper core muscles, as well as stretches to strengthen your spine (bottom).

On Saturday, 5 June 2021, SIIT alumni gathered online to try Pilates, the latest installment in a series of home workouts organised by the SIIT Alumni Sports Network. The class of 25 alumni was led by Ms. Betsy Chen from Pilates studio Off Duty Pilates.

Pilates is a low-impact workout that helps to strengthen, lengthen and tone your muscles through controlled, repetitive movements. Ms. Chen started the session with simple stretches to get the participants moving and warm up the spine. She focused on slow, concentrated movements, which got the participants’ muscles burning in no time.

Ms. Tracy Tay, a Hospitality Business alumnus, joined the session to try something different from her usual exercise routine, which includes spinning and HIIT. “The instructor was very clear, and I felt my whole body aching the next day!” she said. “I think with frequent practice of Pilates, I can tone parts of my body and build muscle strength.”

Mr. Jonas Chandra, a Systems Engineering (ElectroMechanical Systems) alumnus enjoyed how engaged his body felt during and even after the workout. “I usually do HIIT workouts, so I thought Pilates would not be that strenuous. I was so wrong,” he recalled. “The exercises felt very targeted and my muscles ached at places it never ached before. I would definitely go for more classes and recommend my friends to join me.”

A fruitful Saturday morning with a satisfying workout!
A Therapeutic Match

The SIT Alumni Mentoring Programme concluded its successful inaugural cycle in March 2021. We catch up with a trio of participants from the Health & Social Sciences cluster to find out how their mentoring journey went.

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After months of only communicating via text messages and Zoom calls, (clockwise, first from left) mentee Sharifah, and mentees Marcus (clockwise, both from left) and Damien (clockwise, second from left) finally met in person at the mentor–mentee events, together with care from other clusters.

The SIT Alumni Mentoring Programme had a rather rocky start. It launched amidst the COVID-19 pandemic, meaning its participants would mostly only be able to meet virtually, not the most ideal situation for a mentoring relationship. Nevertheless, the programme is currently well underway through its second cycle—and gaining traction among SITians.

Among the SITians who joined the programme looking to learn from each other through their academic and professional experiences are alumni mentor Mr. Sharifah Bashah and his two student mentees, Mr. Damien Lim and Mr. Marcus Chen.

Sharifah, an Occupational Therapy alumnus, decided to take on the role of a mentor for the first time through this programme. Her interest is in grooming future therapists and sharing real-life experiences about working in the healthcare industry, such as the difference between working in a hospital setting and the social service sector. "Back when I was in school, we could only have such casual conversations with therapists in the workforce during clinical rotations. But that can be stressful as you are being assessed, or you simply may not have the time," she explained. She also emphasised the importance of maintaining a work-life balance. "Prioritising and managing our time starts from when we are students, and it is good practice as a stepping stone for when we enter the workforce," she said.

She was matched with Damien and Marcus, both Year 2 students in the Physiotherapy degree programme. Sharifah recalled that the mentees were initially worried that her being in a different discipline would limit the learning experience. However, the difference between the two professions actually helped them better understand the difference and how physiotherapists and occupational therapists work together.

Sharifah has also learned to be a better communicator through her mentor role. "My mentees have very different personalities and I had to be mindful of being adaptable in the way I communicate with each of them. In the beginning, they were both a bit shy and unsure, so I had to do most of the talking. When they became more comfortable, they would ask more questions and we could joke with one another."

Damien said he was thankful to have a senior open his eyes to the workings of his future career. "My mentor is very nurturing, and I appreciate that apart from academics, she also taught me important soft skills as a Physiotherapist," he said. "I learned that it is important to identify the professional version of me at work and the personal me at home, so that I can manage my emotions, especially when dealing with critically ill patients."

Marcus said the programme has given him a deeper understanding of the healthcare industry. "It got to learn more about the different healthcare settings available and whether it would fit my career goals. I found that Intermediate and Long Term Care is a good fit for me," he said.

The trio plans to keep in touch through social media and messaging apps, now that their mentoring cycle has concluded. And it appears that the SIT Alumni Mentoring Programme has found legs beyond SIT. Having been inspired to use her newfound mentoring knowledge, Sharifah has started a mentoring programme at work within her team, where new therapists are paired with seasoned therapists. She also supports them by facilitating reflection sessions throughout their mentoring journey.

The SIT Alumni Mentoring Programme

This is a six-month-long programme bringing together SIT alumni and students to foster personal and professional growth, as well as exchange knowledge and skills through mentorship. Organised by the SIT Advancement & Alumni Division and supported by SIT Student Life, the programme’s first cycle was officially launched in September 2020.

A total of 43 alumni mentors were matched with 52 student mentees in Cycle 1, where each mentor could choose to take on one or two mentees. The programme will soon be completing its second cycle in August 2021, where 45 mentors were matched with 50 mentees. As many as 10 mentors have joined the programme for the second time since the first cycle.