



Revolutionising **FARMING** FOR

HOME-GROWN SUSTAINABILITY

INSIGHTS
NEW PERSPECTIVES
IN A BUDDING
INDUSTRY

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EDITOR'S NOTE

Sustainability has been a much-discussed topic in recent years, with organisations and individuals increasingly recognising the need for a home-grown food source. This has strengthened efforts to promote and propagate urban agriculture, preparing Singapore for a self-sustainable future with greater food security.

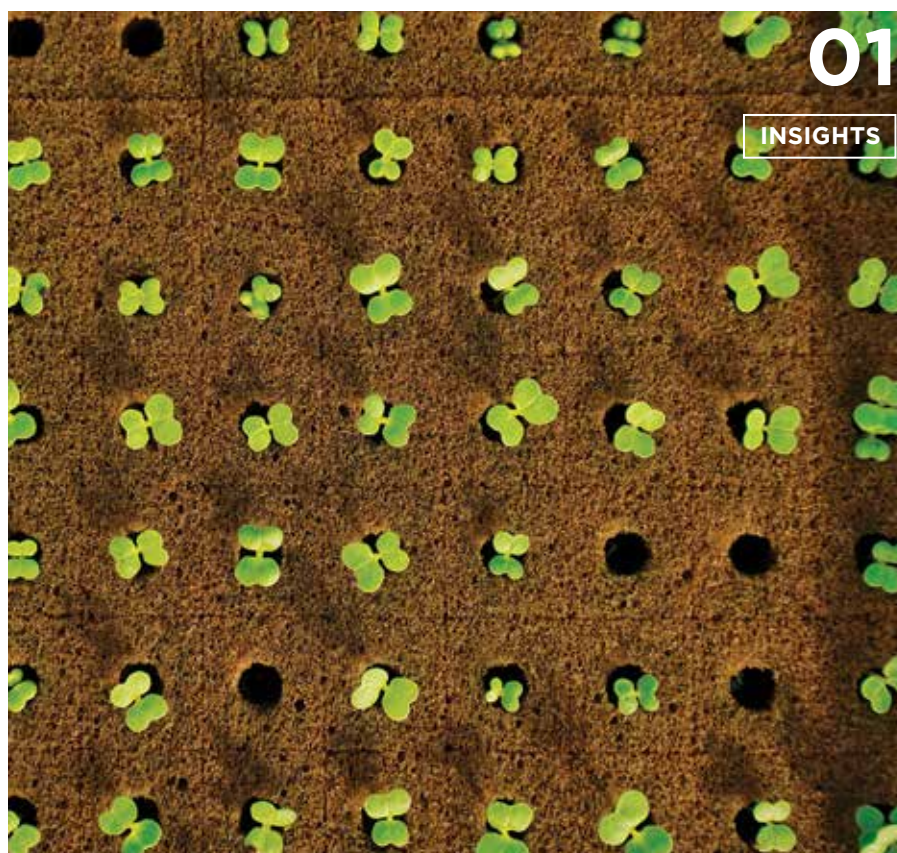
On pages 4 to 6, learn more about sustainable agriculture with Mr Allan Lim, Founder and Chairman, Comcrop, who shares how Comcrop has reinvigorated marginalised spaces through technology and determination. Allan is joined by Republic Polytechnic students, Anggun Tania and Aloysius, who are currently employed at Comcrop through the SkillsFuture Earn and Learn Programme, to shed some light on why the urban farming sector is gaining traction among youths.

In the quest for home-grown sustainability, RP has launched a Part-Time Diploma in Applied Science (Urban Agricultural Technology), along with an Agriculture Technology Laboratory (pages 7 to 10). We speak to Dr Steven Fong, Acting Programme Chair for RP's Diploma in Marine Science and Aquaculture and Programme Manager for RP's Part-Time Diploma in Applied Science (Urban Agricultural Technology), for his insights on agritechology. Learn more about the various technologies involved in urban farming and how RP is aiding this budding sector on pages 1 to 3.

Maintaining a viable source of sustenance does not consist of farming alone. In fact, it continues down the food chain to the processing stages too. Find out how our partner, Kemin Food Technologies, is helping to reinforce the local food supply through shelf-life extension on page 16. Through these collaborations with industry partners and more, RP aims to do our part to revolutionise farming for home-grown sustainability in Singapore.

From the incoRPorate editorial team

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ADVISOR

Ashley Chua

EDITOR-IN-CHIEF

Renee Loh

EDITORS

Charlene Soh
Fiona Chia

CONTRIBUTORS

Amelia Heng	Jenny Chau (Dr)	Seow Khee Wei
Amy Yap	Jimmy Quek	Song Sin Nee
Angele Lee	Julian Soh	Steven Chong (Dr)
Cheah Siew Yen	Leslie Sim	Steven Fong (Dr)
Cindy Neo	Ngiam Kee Jang	Tan Song Koy
Claudia Leung	Ong Yui Ling	Teh Kim Yew
Fahreerq Fattah	Patrick Seng	Teresa Shiu
Florence Yap	Ritu Bhalla (Dr)	Tey Boon Hui
Jacqui Chong	Shaaron Tan	Valavan S (Dr)
Janice Lim	Sharon Ng	Yeo May Lee

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SEEKING SUSTAINABILITY WITH URBAN AGRICULTURE

FARM FACT!



Early farms were extensive, with farmers using unwanted produce to feed livestock, and subsequently, the waste from livestock as fertiliser for crops — an early practice of **Circular Economy**, which is highly endorsed in today's farms.

Traditional agriculture often conjures images of vast, sprawling farmlands comprising various vegetables and livestock. These expansive farms were responsible for 80% of our food supply during the early years. However, the stamping out of farms due to space constraints arising from urban growth, along with hygiene concerns, has shrunk that percentage to less than 10% today, prompting a need to rethink and revolutionise our farming options through new agricultural technologies. The move towards a more sustainable way of farming aims to boost the local food supply and improve self-reliance.

Relying almost entirely on external food sources is not a viable way for a country to survive indefinitely. The global food supply is not inexhaustible, and can easily be affected by climate change, export bans, and transport route disruptions; making food security a major concern. To address the pressing need for self-sustainability, the Singapore Government has launched the *30 by 30* initiative — having local farmers produce 30% of Singapore's nutritional needs locally by 2030. This initiative will be coordinated and implemented by the Singapore Food Agency (SFA), with local farmers helming the urban agriculture movement.



Dr Steven Fong, Acting Programme Chair for RP's Diploma in Marine Science & Aquaculture and Programme Manager for RP's Part-Time Diploma in Urban Agricultural Technology, shares his views on sustainability and urban agriculture in Singapore.

A recipient of the SPRING Capability Development Grant, Dr Fong is an Aquaponics/Urban Farming Systems consultant for Greenology Pte Ltd. The CITES certified breeder of Asian Arowana *S. formosus* is also recognised for starting Singapore's first multi-tier Recirculating Aquaculture System for Jade Perch *S. bacoo*, Tilapia *O. niloticus*, and Asian Seabass *L. calcarifer*.

HOW CAN WE ACHIEVE SUSTAINABILITY?

Given the highly-urbanised, built environment in Singapore, modern farmers have to seek ways to circumvent the scarcity of tillable land. This includes farming on rooftops or other unused open spaces. Although unfamiliar to some, urban farming in Singapore is not a brand-new concept. Along with RP, various organisations¹ have been generating awareness and promoting urban farming activities. The increased awareness of urban farming and the need for

sustainability on a national level eventually led to the inception of the *30 by 30* initiative.

Growing Vertically

The best option for increasing yield per unit area is to go vertical. The growing of crops within a limited land space often relies on the usage of A-frames, which also reduces water and soil usage. Local farm Sky Greens has innovated the A-frame solution for large scale use — utilising rotating tiers of multiple growing troughs mounted on towering 9 metre A-frames. This ensures that all plants receive a uniform amount of sunlight, irrigation, and nutrients.

Keeping Safe

Another limiting factor of agriculture is the environment, along with the worry of pests and airborne plant diseases. Smaller plots are typically protected with netting to reduce pesticide use, while some farmers have deployed greenhouse technology, designed to keep out the tropical heat as well as protect the plants against pests and diseases. Further research

in breeding and biotechnology to create heat and drought tolerant crop varieties are also effective ways to alleviate climate-related issues.

Staying Indoors

Optimal conditions for farming would, of course, be within a controlled environment — namely indoor agriculture. The usage of artificial lighting in indoor farming eliminates the need for natural sunlight. These plants are either grown directly in hydroponic systems or supported on inert substrates moistened with nutrient solution, effectively eradicating the need for soil.

In most indoor gardens, the micro-climate (temperature, humidity, and carbon dioxide levels) is managed via full-time live monitoring systems through Internet of Things (IoT), and plants are watered through micro-irrigation. If these indoor farms tap into renewable energy sources, and recover, reconstitute, and reuse all liquids, urban agriculture can be an environmentally sustainable and viable food source in Singapore.



Dr Jenny Chau, Programme Head, Part-Time Diploma in Applied Science (Urban Agricultural Technology), School of Applied Science (SAS), RP (first from right) and Dr Steven Fong (second from right) educating RP SAS students on indoor farming at the Agriculture Technology Laboratory

¹ Some of these organisations are Ground-Up Initiative (GUI), Kranji Countryside Association, Edible Garden City, Bollywood Veggies, Comcrop, Sky Greens, Panasonic, and Sustenir Agriculture.

What else can be done?

Sustainability goes beyond the act of farming; it includes post-harvest technology, circular economy, and the physical location of urban farms.



Ensuring packaging and cold-chain tracking to

reduce food spoilage and extend shelf-life

Producing better crops to reduce wasteful trimmings



Recycling trimmings to supplement animal feed

Increasing farm and population proximity to reduce transport carbon emissions



BENEFITS OF URBAN FARMING

There are various benefits to be reaped from urban farming. A sustainable local food source naturally results in heightened food security, with healthier produce as local farmers can regulate chemical usage during the farming process. This lessens the burden of uncertainty that comes with an external food source, and brings about a sense of belonging as urbanites bond over a shared responsibility, learning new agriculture methods along the way. Lastly, with agritechnology, land usage in Singapore can be efficiently maximised for agriculture.

HOW RP CONTRIBUTES TO THE URBAN AGRICULTURE SECTOR

Recognising the urgency for sustainability in Singapore, RP began researching urban agritechnology three years ago. The Part-Time Diploma in Applied Science (Urban Agricultural Technology) was then developed in consultation with the

industry and the Agri-Food and Veterinary Agency (AVA), which has since been reorganised into the Singapore Food Agency (SFA). Individuals keen on working in the agriculture sector can sign up for the course, available both as a part-time diploma and in the SkillsFuture Earn and Learn Programme format, to pick up skills in agricultural technology.

RP also recently opened an in-house Agriculture Technology Laboratory², which is used for research on urban farming. The activities conducted in the laboratory contribute to the knowledge and skills required for the agriculture sector. RP is working closely with our industry partners such as Comcrop (pages 4 to 6) to facilitate training, grow the talent pool, and collaborate on research into further developing the agriculture sector in Singapore.

The Government's plans for an Agritech Cluster in the north of Singapore places RP favourably right at the heart of this corridor, and we are working towards growing our presence in the agriculture sector. RP has also been in talks with industry experts, Surbana Jurong and SembCorp, to discuss potential partnerships in the sector.

Want to grow your first greens and join the league to achieve home-grown sustainability? Scan these QR codes to sign up for RP's extensive range of courses focusing on Agritechnology!

SkillsFuture Earn and Learn Programme (ELP) leading to the Diploma in Applied Science (Urban Agricultural Technology)

An ELP leading to a full qualification diploma, which prepares fresh school-leavers and industry newcomers for a career in agriculture-related industries



Part-Time Diploma in Applied Science (Urban Agricultural Technology)

A part-time diploma to prepare individuals for a career in agriculture-related industries



Agriculture 101

A 2-day introductory course to urban agricultural technology



² Find out more about the Agriculture Technology Laboratory on Pages 7 to 10!

A FRESH LOOK AT FARMING

Allan Lim pioneered sustainable urban farming in Singapore eight years ago. Today, his company Comcrop owns the largest rooftop farm in Asia, right here in Woodlands. Allan has now set his sights on cultivating the next generation of farmers through working with youths and the larger community.

Allan Lim, Founder and Chairman of Comcrop, is interested in sustainability and feeding people. Whether through stocking supermarkets with fresh, locally-grown vegetables; enhancing Singapore's food security; or even providing jobs to the general public; he has found a niche in urban farming.

TRANSFORMING MARGINALISED SPACES

The built environment in Singapore today leaves a mere 1% of land for agricultural use; and trying to grow the industry is challenging in this urban landscape. Allan looks up for inspiration. According to him, every rooftop can be a farm, with the proper design and operation — a huge, high-risk investment, but one that brings a “solution for the future”.

Comcrop unveiled its second facility on the roof of a JTC development in Woodlands last year. A sprawling 36,000 sq ft “plant factory” six times the size of Comcrop's first



rooftop farm in *SCAPE, the former carpark now supplies fresh produce to food manufacturing companies within the building and other establishments including major supermarkets.

"Hydroponics is the key," Allan asserts. Lightweight and versatile, it has helped Comcrop achieve flexibility in its operations. Allan stresses that a skilled workforce is also essential. "You cannot

have transient labour because the expertise — the know-how — must be there. It's the people behind the tech," he says, adding that "whoever owns the skillset and technology can be food secure."

As to the kind of technology Comcrop adopts, Allan remains open, "as long as it is affordable and promotes sustainability". What then, does sustainability mean to him?

A THRIVING MODEL OF SUSTAINABILITY

Environmental Sustainability

Comcrop's farming practices require only a fraction of the water, land, and chemicals needed with traditional methods. Situating urban farms strategically also reduces transportation distance, lessening the environmental impact.

Community Sustainability

Farming brings people together. Community, the "Com" in Comcrop, is the driving force behind the organisation. Through agritechnology, the farming community is enabled and empowered, resulting in higher food security.

Financial Sustainability

Occupying underutilised spaces instead of building expensive indoor farms allows Comcrop to sell its produce, namely herbs, salad greens, and Asian greens, at affordable prices.



Mr Allan Lim, Founder and Chairman, Comcrop with Mr Peter Barber, CEO, Comcrop

SOWING SKILLS WITH RP

Comcrop is committed to grooming a new generation of farmers, in line with Singapore's Food Security Roadmap, and to fulfil a personal goal of Allan's — reaching out to and helping youths. Partnering RP for the SkillsFuture Earn and Learn Programme (ELP) in Urban Agricultural Technology¹ is the perfect opportunity to realise this ambition.

"We're training the first batch of agricultural professionals," he beams, envisioning them going on to spearhead urban agriculture in other countries. Allan lists programme requirements as a willingness to work, enthusiasm, and resilience, stating that "One must be fast, ready to react, practical, [and] effective."

Contrary to what some may think, farming holds a growing appeal among youths, many of whom Allan used to meet at *SCAPE in Orchard Road, before they ceased operations at the farm on 31 July 2019. For pioneering ELP participants from RP, Anggun Tania Chua and Aloysius Tan, the collaboration with Comcrop is a chance to achieve their dreams in the agricultural sector.

“Farming creates meaningful work and opportunities for everyone.”

Allan Lim, Founder and Chairman, Comcrop



Mr Allan Lim with RP's ELP participants and budding urban farmers, Anggun Tania Chua and Aloysius Tan

The ELP marks the first time the company has recruited in this manner. New workers usually begin their careers as volunteers — mainly youths aged 18 to 25 years old, as well as the occasional elderly and special needs persons. "We let them get their hands dirty before they make up their minds that this is what they want to do," Allan quips.

Partnering with MINDS, Comcrop offers a buy-back scheme for its special needs workers. The company pays workers for healthy, successfully sprouted seeds, increasing the success rate by 400%. "It more than enabled them — it empowered them," Allan shares, "the workers have taken ownership of what they do."

Digging in for the Long Run

Allan encourages young people to take up farming, citing personal growth as one of the benefits. In a job where "everything is a challenge", farmers need to find their motivation every day. In fact, Allan himself has hit rock bottom several times, with crop failures being the major stumbling block for him. However, he picks himself up each time, choosing to celebrate the joys of farming instead.

A Blossoming Industry

One of Comcrop's core goals is "Making Farming Fun Again", and it was with this goal in mind that Allan founded the company in 2011, as a means to bring people together through farming. Comcrop's move towards rooftop gardening began seven years ago, at a Garden City Action Community meeting, where Allan proposed the reinventing of "green roofs" into urban farms.

The idea took hold and within six months, the company's first rooftop garden at *SCAPE began

to take shape, paving the way for future urban farms in Singapore.

With the cessation of operations at *SCAPE, Comcrop is thankful for all the support they have received over the years, and continue to receive, as they look for a new home to succeed the *SCAPE farm.

Today, developers such as their Woodlands landlord, JTC, are "LUSH 3.0² policy welcoming and supportive, willing to try new things," Allan quips appreciatively, adding astutely that he was thankful for their first farm's role in trailblazing the industry and changing mindsets.

Propagating the Concept

Allan continues to conduct outreach through visiting farmers markets and customising programmes for different groups of people with varying proficiency levels, ranging from kindergartners to researchers. He wishes to see Singaporeans embracing local produce and is grateful to have a capable operations team, allowing him to focus his time on educating the public about hydroponics and why local produce might cost more.

Allan strongly believes that farming is really about the next generation. "Food security for Singapore will be the responsibility of the 20-year-olds of today," he notes. "I hope they find it a rewarding career."



² Scan this QR code to find out more about LUSH 3.0!

¹ Find out more about the SkillsFuture ELP in Urban Agricultural Technology on Pages 7 to 10!

Nurturing Urban Agriculture at RP



Guest-of-Honour, Dr Koh Poh Koon, Senior Minister of State for Trade and Industry (middle), pouring water into an aeroponics system to signify the launch of the SkillsFuture ELP in Urban Agricultural Technology

A large portion of Singapore’s food supply is imported from overseas and is hence susceptible to global fluctuations. The lack of physical space and natural resources means that the local agriculture scene has to adopt alternatives to traditional farming. The idea is to leverage technology and automation to grow more with less — to boost local food security and achieve home-grown sustainability.

In meeting the evolving needs of the agricultural industry, RP has introduced a SkillsFuture Earn and Learn Programme (ELP) in Urban Agricultural Technology, the first of its kind in Singapore. The ELP leads to a Part-Time Diploma in Applied Science (Urban Agricultural Technology), with the first intake having commenced classes in June 2019.

Developed in consultation with the Agri-Food and Veterinary Authority of Singapore (AVA), which has since been reorganised into the Singapore Food Agency (SFA), and key members of the industry, the course aims to equip individuals with the necessary knowledge and technology to navigate and propagate urban agriculture.

The programme is offered in both ELP and non-ELP formats. The ELP format leads to a part-time diploma and allows fresh Institute of Technical Education (ITE) graduates to develop their skills while preparing themselves for entering the workforce. The diploma can empower students with the knowledge and skills required for career progression and future wage increments. Meanwhile, the non-ELP format is aimed at adult learners who are looking to switch careers or hone their skills for a better career progression in the agro-technology and agri-business industry.

Individuals taking the course will have to complete **five Modular Certificates**, with a focus on the following agricultural technologies:

- 🌀 Agribusiness
- 🌀 Farming Process and Management
- 🌀 Food Production
- 🌀 Sustainable Farming
- 🌀 Urban Farming Technology and Systems

Urban Farming at RP

Graced by Dr Koh Poh Koon, Senior Minister of State for Trade and Industry, the 154 square-metre Agriculture Technology Laboratory was opened on 9 January 2019.

The state-of-the-art learning facility comprises the necessary technologies to facilitate high-tech farming in a controlled environment. Students from the Part-Time Diploma in Applied Science (Urban Agricultural Technology) will have access to these growing systems, which are typically used in the industry. One such system,

the vertical plane cultivation system, is ideal for urban agriculture in a country with limited green space like Singapore.

The laboratory allows for multidisciplinary teams consisting of students from the various RP Schools to participate in research projects pertaining to agricultural technology. It further acts as a platform for industry-related projects and workshops, and facilitates research in agriculture technology, to develop solutions for increased agricultural productivity, in a bid for sustainability.



Dr Koh taking an introductory tour of the Agriculture Technology Laboratory with RP's management



The Future of Agriculture

Meeting the aims of the Farm Transformation Map (FTM) announced at Budget 2017, RP's new part-time diploma and laboratory are set to aid in the development of urban farming, with four local farms¹ involved in the first intake of the programme.

Programme graduates will be equipped with the necessary skills to pursue a career in agriculture farming or agribusiness. Prospective job roles include agrotechnologist and agrotech specialist, among others — such specialised roles will help Singapore gear up for a future of agricultural self-sustainability.



Dr Jenny Chau, Programme Head, Part-Time Diploma in Applied Science (Urban Agricultural Technology) with Dr Steven Fong, Programme Manager, Part-Time Diploma in Applied Science (Urban Agricultural Technology) at the Agriculture Technology Laboratory

Sustainable Farming with SAFEF

At the launch event, RP also inked a Memorandum of Understanding (MOU) with Singapore Agro-Food Enterprises Federation Limited (SAFEF) to foster knowledge exchange and continuing education learning opportunities.

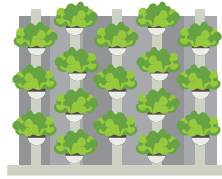
This partnership will see RP collaborating with local farms through research projects and internship opportunities for our students. Industry experts can use this opportunity to share their expertise with budding urban farmers, leading to future advancements in the urban farming sector. These farms will offer on-the-job training and internship opportunities to programme participants.



The start of a sustainable partnership between SAFEF and RP

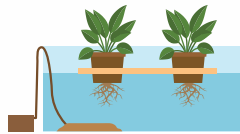
¹ Comcrop, Liteleaf, Sustenir Agriculture, and Vegeponics.

Agricultural Technology at the Laboratory



Vertical Plane Cultivation System

- Seedlings are planted in matrix media and inserted into tower housing
- Towers are hung and irrigated by hydroponic systems



Tray-Based Horizontal Hydroponic Growing System

- Uses Deep Water Culture (DWC)
- The plant's roots are submerged in a nutrient solution



Conduit-Based Horizontal Hydroponic NFT System

- Uses Nutrient Film Technique (NFT)
- A thin layer of nutrient solution flows around the roots using shallow tubes
- The upper part of the roots are exposed to oxygen in the air



Substrate Growing System

- Hydroponic system
- Root zone is physically supported by media
- Plants are fed by applying nutrient solution to the media

Showcasing Creativity at Symbiosis 2019



Hands-on demonstration by DGD students on how the *Resist* game works

Held at *SCAPE on 28 March, Symbiosis 2019 featured 46 projects from RP School of Technology for the Arts' (STA) five creative arts diploma programmes². This included intellectual games, enthralling theatre projects, and user experience designs, among others, some of which tackled social issues of today.

Making Walking Sticks Modular

A group of RP's Diploma in Design for User Experience (DDUX) students developed a modular walking stick, named *CanCane*, allowing users to modify the walking stick to their preference. A marriage of technology and design, the walking stick both functions as an ambulatory tool, and improves the lives of the elderly through assistive technology.

Ground surveys showed that although smart canes exist in the market, many seniors found them to be too costly and laden with unnecessary features. Apart from having sensors to monitor user health and enhance security and social well-being, *CanCane* can be customised with various attachments such as a camera and an EZ-link card holder.

² Diploma in Arts & Theatre Management (DATM), Diploma in Design for User Experience (DDUX), Diploma in Game Design (DGD), Diploma in Media Production & Design (DMPD), and Diploma in Sonic Arts (DSA)

Games Against Drugs

Designed by RP's Diploma in Game Design (DGD) students, *Resist* is an educational card game meant to highlight the dangers of drugs to the youth of Singapore. The game captures the interest of players through the use of zombies to represent drugs, and educates them through question cards. The DGD students hope that this game will equip youths with the knowledge of the harmful effects of drugs and the consequences of taking them, leading them to stay away from drugs.

Through the Eyes of a Refugee

Another team of DGD students took the digital path, choosing to create a first-person point-of-view video game titled *Refugee Life*. The students took the initiative to learn how to design a 3D game in order to spread awareness and empathy for refugees. Playable on both mobile and PC, the game was designed to bring to light the plight of refugees. Taking the role of a refugee, the player has to avoid danger and seek out resources in order to bring their family safely to a refugee camp.



The game creators of *Refugee Life* preparing to showcase their project at RP Symbiosis 2019



DDUX students showcasing their project, *CanCane*

The Learning Journey of a Train Controller

“As emerging technologies and market forces create new disruptions across many industries, Singapore needs a highly-skilled and adaptable workforce that is ahead of the curve.”

Mr Yeo Li Pheow, Principal/CEO, RP, on the importance of grooming Singapore's workforce

At RP Open House 2019, we launched the RP-LTA Rail Operations Management Lab to much fanfare. The event, along with the launch of the RP-RSA-Ensign Cyber Threat Intelligence Centre, was graced by Dr Janil Puthuchery, Senior Minister of State for Transport and Communications and Information.

Students from RP's Diploma in Engineering Systems & Management (DESM) will gain hands-on practice in the lab, modelled after Operations Control Centres (OCC) for urban rail lines, which are generally located within train depots.

Developed in conjunction with Land Transport Authority (LTA), the lab incorporates both RP's engineering competency and LTA's proficiency in rail operations in order to establish a deeply-skilled rail workforce.

The lab features an Integrated Supervisory Control System (ISCS) which allows the retrieval of field inputs and remote control of field devices for sub-systems in trains, tunnels, passenger stations, and power substations.

Senior Minister of State for Transport and Communications and Information, Dr Janil Puthuchery, getting a first-hand experience of the lab





The RP-RSA-Ensign Cyber Threat Intelligence Centre is officially opened

The lab also features a Video Wall Display System which displays the critical systems' schematics, similar to a real-life urban rail line with six stations.

Students will have the chance to experience different roles within an OCC. The lab provides an authentic, realistic, and immersive learning experience through the simulation of the driverless railway systems that are currently also used in Singapore. These simulations also develop students' crisis management skills in the case of emergencies.

A Collaboration in Transportation

In conjunction with the opening of the lab, RP has inked a joint MOU with LTA, SMRT Corporation (SMRT), and SBS Transit in order to further develop a future workforce of skilled individuals. Current and future DESM students can benefit from the lab and the new partnerships.

The collaboration includes the development of the Rail Transit System (RTS) curriculum. Students can expect internship opportunities, alongside a chance to participate in industry projects. RP staff will also have attachment opportunities to gain experience in the operations and maintenance of the RTS. These initiatives are aimed at gearing up a skilled workforce that can propel the rail industry forward and move Singapore towards being a car-lite nation in the near future.

Securing the Nation Digitally

In today's digital landscape, no individual, organisation, or government body is truly safe from cyber threats and malicious digital attacks. As a result, Singapore has seen an increase in cybersecurity awareness in recent years, and

an urgency to groom a workforce capable of handling such cyber threats.

RP Open House 2019 also saw the opening of the RP-RSA-Ensign Cyber Threat Intelligence Centre. The Centre presents realistic cyber threat scenarios for students from RP's Diploma in Infocomm Security Management (DISM) — training them to manage and mitigate these threats.

The Centre is the result of a joint laboratory agreement between RP, RSA, and Ensign InfoSecurity. Some of the key research includes Internet of Things (IoT) and mobile malware, with a focus on cyber threat monitoring and threat intelligence. Equipped with high-end industry-standard security monitoring hardware from RSA, the facility also taps onto Ensign InfoSecurity's technical expertise in decoy network systems.

Students will learn to analyse cyber attacks and understand the motives, methods, and tools behind cybercrime. They will also have the opportunity to work with technical experts and security analysts from both organisations in order to glean insights into real-world solutions and technologies. DISM students, staff, and engineers from Ensign InfoSecurity and RSA will be able to enhance their technical skills through this collaboration.

Teaming Up Against Cyber Threats

RP also signed an MOU with Ensign InfoSecurity at the Open House, providing students with the chance to undertake internships and to collaborate with industry partners on their Final Year Projects. Through the training of students in creating decoy network systems and analysing cyber attacks, Ensign InfoSecurity hopes to develop a workforce of cyber professionals and strengthen the local cyber ecosystem.

A Marketplace to Bring Start-Ups Together

Start-ups are now commonplace in Singapore, with more individuals innovating and developing their own businesses. RP's Enterprise Services Centre organised the inaugural RP Start-Up Marketplace on 6 March in a bid to bring the start-up community together.

We have partnered with *SCAPE to help grow Singapore-based start-ups from RP, and connect them with partners and resource builders to optimise their businesses. More than 10 resource builders were involved in the event. These organisations included shared service, incubation service, and facility providers, among others.

Event participants gained insights on how to overcome start-up challenges from a fireside chat titled *Start, Run, Grow your business — How to leverage on resources that you don't have*. This was coupled with clinic sessions whereby participants could learn about sharpening business ideas, finance management, and digital marketing and branding from industry experts and practitioners.



Successful Start-Ups — CombineSell and Telepod

Positioned as a single service platform for various online marketplaces, CombineSell is the brainchild of 2017 Graduates from RP's Diploma in Supply Chain Management.

Through the help of RP's Enterprise Services Centre, they managed to bring their start-up off the ground and have successfully concluded their second round funding, valued at \$200,000. Additionally, CombineSell also signed an agreement with Louken Group at the event, strengthening their partnership through an investment by Louken Group.

Telepod is a dockless e-scooter sharing system, brought to life by 2016 Graduates from RP's Specialist Diploma in Mobile Applications. The business has taken off in several high-traffic locations such as Suntec Convention Centre, the National Library, and the National Stadium. Overseas expansion plans are also in the pipeline for Bangkok and a partnership in the United States of America.

Starting New Partnerships

The event also saw the signing of two MOUs with Action Community for Entrepreneurship (ACE) and Louken Group. The new partnership with ACE will allow RP start-ups to partake in training and workshops, in addition to receiving business grants and membership packages. RP students can look forward to undertaking internships, and collaborating on ACE's corporate innovation projects along with RP staff. The agreement with Louken Group will also provide entrepreneurship and start-up related internship and attachment opportunities for RP staff and students.



Building the start-up community at the inaugural RP Start-Up Marketplace

Meeting Our New Partners at SOI Project Day



RP SOI students enthusiastically presenting their project to an industry partner

The annual RP School of Infocomm (SOI) Project Day was held on 13 February 2019, showcasing 30 Final Year Projects by students and seven projects by staff. The event also featured industry talks by Alibaba Cloud and Puppet.

Among the projects showcased were *Hive* and *Happy Family*, both of which employ Internet of Things (IoT) as part of the project innovation.

Hive utilises blockchain integration with IoT to lock and unlock doors and gates, and *Happy Family* combines Artificial Intelligence (AI) with IoT to track the emotions of family members in a home setting.

Respective MOUs with Alibaba Cloud, Puppet, Trevis Technology, and Whizpace were signed prior to the event day, and representatives of the organisations were invited to attend SOI Project Day. Through inculcating young talents with knowledge in Applied AI, Cloud, and IoT, the three-year collaboration is poised to support Singapore's Smart Nation initiative.



RP SOI students will have the opportunity to participate in local and overseas internships with three of our partners — Puppet, Trevis, and Whizpace — and acquire knowledge in technological developments related to:

- Artificial Intelligence
- Business Analytics
- Big Data
- Cloud Computing

RP students can look forward to academic awards and overseas internships. They can also access the Alibaba Cloud Academy Cooperation Program and leverage the learning resources available to them. RP and Alibaba Cloud are also in the midst of discussion for a joint laboratory for AI, Cloud, and IoT training and development activities.

6th International PBL Symposium 2020 EMBRACE DISRUPTION, RETHINK LEARNING

25 - 27 March 2020, Republic Polytechnic

Join us at the 6th International Problem-Based Learning Symposium 2020 (6th IPBLS2020) to discuss the notion of disruption and how it impacts learning!

To find out more, visit:



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Distinguished speakers at 6th IPBLS2020



Prof Andy Hor
Vice President and Pro-Vice-Chancellor (Research)
The University of Hong Kong, Hong Kong



Mr Ben Nelson
Founder, Chairman, and CEO
Minerva Project, USA



Prof Dragan Gašević
Professor of Learning Analytics
Monash University, Australia



Dr Thieu Besselink
Founder
The Learning Lab, Netherlands





MAKING FOOD LAST LONGER WITH KEMIN

Unnecessary food wastage as a result of food going bad is becoming an increasingly common issue in developed nations today, escalating the urgency to ensure proper ingredient manufacturing and shelf-life extension. The lack of a local sustainable food source within Singapore, along with the upcoming ban on partially hydrogenated oils, further exacerbates this issue, prompting an overhaul of current food processing methods for better food longevity — one of Singapore's sustainability solutions.

Recognising the importance of keeping food and beverages fresh and safe for longer periods, RP has inked a Memorandum of Understanding (MOU) with Kemin Food Technologies (KFT), Asia division. A key player in the ingredient manufacturing industry, KFT Asia believes in improving food sustainability through shelf-life extension. Some of their methods include Kemin antimicrobial solution which extends the shelf-life of vending

machine meals, and Kemin natural solution, an alternative to synthetic preservatives.

RP will work closely with KFT Asia on research and development projects, focusing on developing novel ingredients and value-added product applications for food and human nutrition industries in Singapore and overseas. This includes establishing an interactive platform for idea and knowledge exchange between RP, KFT Asia, and local Small and Medium-sized Enterprises (SMEs), to develop technical solutions for the food industry.

Students can also look forward to internship opportunities with KFT Asia, along with further learning opportunities for both staff and students through conducting studies that benefit the food and beverage industry. This partnership aims to value add to the future of food sustainability in Singapore, with fresher, safer, and longer lasting food products in the market.

IMPROVING WORKPLACE SAFETY WITH NEA

On April 8, RP and National Environment Agency (NEA) signed a Memorandum of Cooperation (MOC) to enhance the competence and professionalism of the workforce in the environmental and related sectors in Singapore.

RP will work with the Singapore Environment Institute (SEI) of NEA to offer Basic Ionising Radiation Safety (BIRS) Courses, along with other related joint programmes. Both parties will jointly develop a training and certification framework for the courses, to be facilitated through the formation of a Joint Curriculum Development Committee.

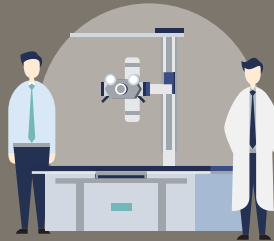
The Joint Curriculum Development Committee will conduct regular reviews of the courses and, through an Exam Board, maintain examination standards and award certifications. There are plans for 10 runs of the BIRS courses in 2019, to be conducted by NEA-endorsed lecturers from RP School of Applied Science (SAS), with an expected total attendance of 300 participants.



Mr Aw Eng Lim, Director, Corporate Services Group, SEI (left), touring the RP facilities for the BIRS courses with Dr Lim Boon Whatt, Director, SAS, RP (right)

The courses offered will prepare participants for the relevant NEA licence applications, allowing them to conduct ionising radiation works in the workplace.

BASIC IONISING RADIATION SAFETY (GENERAL) for L5/L6 Licences



▲ The course also prepares participants for the L5/L6 (non-NDT work) licence-qualifying test administered by the Radiation Protection and Nuclear Science Department.

WHO

- Company radiation safety officers responsible for the safe use and transport of radioactive sources, or the use of X-ray machines
- Workers handling radioactive materials and irradiating apparatus

WHAT

- Learn to exercise safe handling of radioactive materials and/or irradiating apparatus during the course of work

BASIC IONISING RADIATION SAFETY (INDUSTRIAL RADIOGRAPHY) for R1 Licences



▲ The course also prepares participants for the R1 (NDT work) licence-qualifying test administered by the Radiation Protection and Nuclear Science Department.

WHO

- Industrial radiographers using and transporting radioactive sources, gamma-ray projectors, or X-ray machines for the purpose of performing industrial radiography

WHAT

- Learn to exercise safe handling of radioactive materials and/or irradiating apparatus during the course of work
- Understand the practical aspects of Non-Destructive Testing (NDT)

CUSTOMISED BIRS COURSE RUNS



RP offers course runs of the BIRS to both public applicants and company-sponsored participants. The BIRS course content and case studies can be customised to cater to companies' industry needs. Contact RP at ace-help@rp.edu.sg if you are interested to train your company's personnel with specific industry focus.



FURTHERING EDUCATION WITH ALTI

The five polytechnics¹, along with the Institute of Technical Education (ITE) and Singapore University of Social Sciences (SUSS) jointly signed an MOU with Army Logistics Training Institute (ALTI) on 10 April.

This five-year partnership will facilitate further education progression pathways for ALTI and Combat Service Support Command (CSSCOM) personnel, through the recognition of prior

learning and accreditation of selected modules and courses from the institutions involved in the MOU. Staff and students from these institutions will also get to share and exchange knowledge, best practices, and technological expertise with ALTI/CSSCOM personnel.

There will be joint seminars, learning symposiums, conferences, training courses, and forums for networking to aid in the

professional development of staff. Additionally, students and staff of the institutions can look forward to participating in learning journeys organised by ALTI/CSSCOM, as part of National Education.

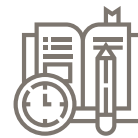
As part of the MOU, RP will be providing the following Continuing Education and Training (CET) programmes for ALTI/CSSCOM:



SkillsFuture Earn and Learn Programmes



Short Courses



Part-Time Full Qualification Diplomas (Part-Time Diplomas and Specialist Diplomas)

EMBRACING FINTECH WITH PAYPAL

RP, along with the four other polytechnics and ITE, has signed an MOU with American online payment company, PayPal, to roll out financial technology modules for students in information and communications technology courses.

The three-year industry-based applied learning programme includes four modules —

Payments 101, PayPal Solutions, API Integration, and Testing in PayPal Sandbox. Students can further enhance their technical knowledge through the application of PayPal's payment solutions in industry projects and internships.



¹ Nanyang Polytechnic, Ngee Ann Polytechnic, RP, Singapore Polytechnic, and Temasek Polytechnic.

IMPROVING CUSTOMER EXPERIENCE WITH HARVEY NORMAN

RP begins another year of collaboration with Harvey Norman, with an MOU inked by Mr Kenneth Aruldoss, Managing Director, Harvey Norman and Dr Michael Koh, Deputy Principal, Academic Services, RP.

Both parties will work together to roll out more joint programmes and projects. RP students can look forward to internship programmes and field trips, along with the chance to be awarded scholarships, book prizes, and sponsorships. RP staff can also participate in exchanges with Harvey Norman, while Harvey Norman staff will have more opportunities to take part in CET training and upgrade their skills.



02

Projects and collaborations under this partnership include:

- ★ Internship programmes for RP's Diploma in Customer Experience Management with Business (DCXB) students
- ★ Scholarship awards for DCXB students
- ★ Store visits as part of the Service Quality and Professional Etiquette module
- ★ Opportunities to work on the customer journey mapping project as part of students' Final Year Projects (FYP)

01. The MOU Signing Ceremony between the seven institutions and ALTI
02. Smiles all around as we enter another year of collaboration with Harvey Norman
03. To many more years of amicable partnership between RP and IHG



03

CHECKING IN WITH INTERCONTINENTAL HOTELS GROUP

We renewed our partnership with InterContinental Hotels Group (IHG), a partner who has provided educational hotel tours for students, hosted Local and

Overseas Industry Immersion Programmes (IIP/OIIP) at various IHG properties, and offered related career opportunities for graduating students.

RP students can participate in attachment programmes and site visits, while graduating students have the opportunity to work with IHG hotels on their FYPs. IHG will also award more scholarships, book prizes, and sponsorship for our students, along with facilitating outreach programmes.

RP staff can look forward to staff exchanges and joint research for the enhancement of the hospitality curriculum. IHG hotel staff will also be able to further develop their skills through RP's comprehensive variety of CET programmes and courses.

ENGINEERING A CITY OF LOVE

A team of RP School of Engineering (SEG) lecturers received the 2018 Cities of Love Social Sustainability Merit Award in the corporate category for their positive impact on the community. Presented in April by Dr Teo Ho Pin, Mayor of North West District, the award recognised the team for their initiative, "Incorporating Service-Learning in Engineering Design Module".

The introduction of Engineering-In-Community (EIC) into the Engineering Design module has provided our students with the opportunity to interact with elderly beneficiaries directly. A total of 874 Year 1 students taking the module worked together with five Voluntary Welfare Organisations (VWO)¹, befriending and teaching more than 155 beneficiaries over the course of a five-day workshop.

Through the workshop, the students eased the beneficiaries into using mobile phones, and



The recipients of the Cities of Love Award

taught them to use applications such as Google Translate. They brought the beneficiaries to visit the Singapore Sports Hub, Singapore Sports Museum, and Shimano Cycling World to expose them to the different types of sports technology. The students also collaborated with the National Library Board to arrange library visits and keep the beneficiaries up to date with the current book borrowing process in Singapore.

The students designed a variety of useful prototypes through their interactions with the beneficiaries. The experience was fascinating to both the students and the VWOs involved. RP's Diploma in Industrial & Operations Management (DIOM) student, Shannon Luke Ong, echoed this sentiment saying, "Today's lesson was very interesting. I had the opportunity to share my knowledge about gaming

Some of the student-created prototypes include:

- ♥ Trolley with Brakes
- ♥ Umbrella with Built-in-Fan
- ♥ Foldable Chair with Arm Handle
- ♥ 3D Printed Spoon Stabiliser
- ♥ Foldable Walking Chair Prototype
- ♥ Wearable Electronic Reminder for Medications

applications with the elderly." The team also had the honour of being part of the People's Association Youth Movement (PAYM) Service-Learning Festival, where they shared their project with Minister for Social and Family Development, Mr Desmond Lee.



Our students and the beneficiaries gamely trying out the cycling technology at Shimano Cycling World



¹ Fei Yue Senior Activity Centre (Teck Whye), Woodlands Care Corner Senior Activity Centre, Orange Valley Senior Activity Centre, Sunlove Marsiling Senior Activity Centre, and Pacific Activity Centre.

FINDING THE LIGHT WITH HIMAWARI WELLNESS APP

A joint development by students from RP School of Sports, Health, and Leisure (SHL) and RP School of Infocomm (SOI), the *Himawari Wellness* mobile application was launched at the Singapore Mental Health Conference on 30 January 2019. The event was graced by President Halimah Yacob, who visited our booth and tried out the app for herself.

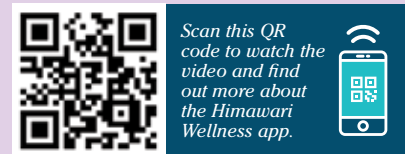
Himawari, meaning "sunflower" in Japanese, symbolises the joy and light which our students hope the app can bring to its users. Conceived with valuable input from the Institute of Mental

Health, the social wellness app was developed by the students with funding from Tote Board's Social Innovation Research grant.

The students hope that their app can encourage individuals with mental health issues to actively engage their social support network on their journey to recovery. This includes caregivers, friends, and colleagues. Students from RP School of Management and Communication (SMC) supported the launch with a video titled, *Wellness, Not Illness*, featuring app user, Julius.



President Halimah Yacob at the app launch



TEA AND TALKS WITH CHANGI FOUNDATION



The beneficiaries and donors at the inaugural tea session with Changi Foundation

RP hosts a series of tea sessions for donors of private bursaries annually, providing them with the opportunity to meet their award beneficiaries in person. The sessions also allow our students to express their gratitude to the donors for aiding them financially in their education journey.



This year, we held our inaugural tea session with Changi Foundation

on 14 January 2019. Students who received the Changi Airport Group (CAG) Education Award had the chance to meet with the Head of Changi Foundation, Ms Ivy Choo, who shared about the foundation's philosophy on giving.

Launched in April 2012, Changi Foundation was founded to aid and support disadvantaged youths, a cause championed by CAG

Make a Difference
in the Life of Our Students

Scan this QR code to find out how you can donate to the Republic Polytechnic Education Fund (RPEF)!

since 2010. The CAG Education Award is a programme which is supported by Changi Foundation and managed by Community Foundation of Singapore.



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