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► Sharing Research Beyond the Lab
Much of the research conducted in laboratories never reaches the outside world in a usable and commercial form. These advances in knowledge and technology could change and improve the world if they were shared with the marketplace, enabling the public to benefit directly. At the same time, research that is made available for commercial use can bring in funding for a university that in turn would draw more investment in research and learning, creating a virtuous cycle of continuing and growing success.

Bringing that vision to reality is the mission and endeavour of Dr Yiwu He, who arrived at The University of Hong Kong a year ago to take up the salient role as Senior Advisor to the President, along with others. Dr He’s conviction is that the benefits of research can be amplified and rippled out if their end results propagate beyond the walls of the laboratory.

How entrenched mindsets can be convinced to see the potential human and economic impact of commercially developed research is one of Dr He’s top challenges. He is committed to showing the positive potential by letting the evidence speak for itself. A case in point is his work in bringing to market a vaccine for COVID-19. “When a vaccine is successfully developed, think how many lives it can save. How much economic activity it can generate,” he said.

I call myself an integrator.

Developing research with an eye on its community impact will also bring benefits to researchers. “Innovation and commercialisation will improve your research, and you will get feedback and requests,” he remarked.

Dr He is building what he calls vertical and horizontal ecosystems to bring together the different talents and participants needed to bring the benefits of research out of the lab and onto the shelf. The idea is to create a community of researchers, developers, patent experts, regulatory experts, marketing and industry experts and others, in the belief that the best way to achieve success is to let the best people rub shoulders and work together. Networks will also be created with business, investors and other universities. “I call myself an integrator,” he uttered with a smile.
He has already made serious headway with his plans, securing HK$4 billion funding from the Hong Kong government’s Inno HK project, which will be used to fund nine subsidiaries, each working on a commercially viable university project in areas including artificial intelligence, medicine, engineering and vaccine development, and held under the umbrella of a holding company of which Dr He is also the managing director.

Dr He’s multiple roles place him in the best position to create the cross-sector networking that will be the key to his mission’s success. He has worked in a series of high-level roles, including more than a decade with pharmaceutical giant GlaxoSmithKline and nine years with the Bill and Melinda Gates Foundation. At HKU, he is also the University’s first Chief Innovation Officer, Director of Knowledge Exchange Office, and Director of Technology Transfer Office. He also leads iDendron, the University’s incubator for new businesses.

With many tasks under his belt, Dr He sees his multiple roles as the conduit to connect and complement the efforts of research with other endeavours, thereby making research more accessible. “It will be better if your research can benefit the community,” he explains. “That makes your research a lot more meaningful.”
COVID-19 has changed the lives of all of us in the last ten months, we have experienced things that we have never experienced before from quarantine, lockdown, job loss, sickness, to behaviour changes such as social distancing, consumer and even personal behaviours. It has totally disrupted our daily living in a compulsory and permanent manners. Many of us have new values, attitudes and approaches towards life. Of course, all these transformations require us to adapt, be confident, be considerate, able to critical think, be empathic and be resilient. But have we prepared the younger generation for these unexpected situations? Do they have the competencies to handle these unforeseen circumstances?

Dr Cecilia Chan believes that students need meaningful ways to develop and valid ways to showcase their skillsets. “Many employers have indicated that everyone has a degree or two these days, what employers want to see is their individuality, how they fit into the organisation,” she said. Dr Chan, Associate Professor of the Faculty of Education and Head of Professional Development at the Centre for the Enhancement of Teaching and Learning, found that students needed to improve their skills across a range of non-academic areas including teamwork, motivation, values, attitudes, integrity, creativity and common sense. It is a broad skillset she considers ‘life jewels’, or more formally, ‘holistic competency’. “Holistic competency is very subjective and the actual skills list is vast,” she explained. She also added that “some psychologists will critique that competencies cannot be learned, I agreed, it cannot be learned via a textbook or lecture, it has to be developed by experience.”

Dr Chan’s lifegoal is set to help students develop these competencies, with the first step being to self-assess their current competencies by answering questions on the Generic Skills Perception Instrument developed by Dr Chan and her researchers allowing students to be more aware of their strengths and weaknesses.

Everyone has a degree or two these days, what employers want to see is their individuality.

The scales measure eight competencies: cultural sensitivity and global citizenship; interpersonal and leadership competencies; problem-solving and critical thinking skills; self-understanding and resilience; information literacy; moral values; creativity and lifelong learning and knowledge transfer competencies. This self-assessment method often leads quickly to a eureka moment as students realise the importance of these competencies before moving on to a framework that shows them what they need to improve these skills and how these competencies can be assessed.
Dr Chan has also designed a set of tools to help educators incorporate development of holistic competencies into their activities and teaching, she is currently developing a set of online interactive trainings. This dual and practical approach is instigating strategic change to the education landscape globally while developing and strengthening students’ mindsets on their holistic competencies. Students have reported increased self-confidence and better leadership skills after completing the programme. The instrument is being used in both schools and universities worldwide, enabling benchmarking to be carried out across disciplines and countries and at the same time, providing students an individual profile. Universities such as University College London, University of Glasgow, The University of Sydney, Queen Mary University of London, The Chinese University of Hong Kong, The Hong Kong University of Science and Technology, Hong Kong Baptist University, Lingnan University, The Education University of Hong Kong, National University of Ireland, Maynooth University, INTI International University Malaysia are all joining Dr Chan’s project to shift the culture of higher education.

The results are multifaceted benefits for everyone involved. Students learn to benchmark and improve their own competencies, teachers are enabled to understand their students better which improves their teaching, and the results can allow universities and employers to compare skillsets across countries and cultures.

Dr Chan also designed a four-day programme of HC development activities called the ‘HAVE, U Can’ programme, that reached more than 1,000 secondary students at seven schools across Hong Kong and another programme for students in six Hong Kong universities. One aspect was encouraging students to develop their social and community skills by striking up conversations, such as with elderly people sitting in a park to help build students’ community spirit.

“It also toughens them up, builds up the resilience, as sometimes their overtures are rejected. This prepares them for rejection and unforeseen circumstances,” said Dr Chan. “Universities and schools can provide the opportunities for students to develop these competencies. Learning to be a person in society is very important. Universities should really do more by integrating the curriculum with the communities so students take part as responsible global citizens, so life jewels can be developed in a meaningful approach. That I believe should be a large part of any university’s future vision.”

Dr Cecilia Ka Yuk Chan received the Faculty Knowledge Exchange Award 2020 of the Faculty of Education for the project ‘Transforming Holistic Competency Development and Assessment in Higher Education and Beyond’.
If you were to teach a robot how to behave like a human, what would you focus on? For Dr Ping Luo, Assistant Professor of the Department of Computer Science, the answer is quite literally staring us in the face. Very often, our emotions are shown on our faces. If you can understand the signals being sent by different facial expressions, the underlying emotions become clear. For a robot, understanding these visual cues is the key to mastering the understanding of human behaviour.

Dr Luo’s aim is not just to enable robots to interpret and understand human behaviour, but to use this information to build human/AI paired systems that outperform their singular counterparts to create the ‘brain’ of what he calls ‘social robots’. Social robots understand human behaviour and mimic human behaviour to the extent that they can act like a human.

Dr Luo was named one of the ‘Innovators Under 35 Asia Pacific’ by MIT Technology Review for his work in computer vision and building AI technologies that can understand human behaviour. He has already filed more than 80 patents in different countries and his technology is being used in smart cities, smartphones and autonomous vehicles. One practical application of his work is in Harbin’s metro stations, where the use of his facial recognition technology means that no travel card needs to be scanned for access. Cameras scan passengers’ faces and then deduct the fare from their cards automatically.

His technology is based on deep learning and was developed using celebrity data. By trawling social media, Dr Luo gathered thousands of facial images of celebrities and used these as the data needed for deep learning. The result is a large-scale CelebFaces Attributes (CelebA) Dataset which is the biggest of its kind in the world and the most widely used database for generating face images. “The original purpose was to achieve accuracy of the face recognition system,” he explained.
Dr Luo has also developed DeepFashion, a comprehensive fashion dataset built using 801,000 different fashion images. In technology terms, DeepFashion is similar to face image recognition, but teaching a robot to recognise fashion images is more difficult than facial images, as faces have a generally rigid structure while fabric changes shape as it flows around the body. DeepFashion can enable consumers to virtually try on clothes. In the future, the computer could design clothes for individual users.

Ultimately, he believes social robots could perform important roles in providing care to people in need, for example, by helping elderly people to move around, in a hospital or home setting.

One of Dr Luo’s vision and next challenge will be to build a robot that looks appealing enough to be accepted by humans, which is proving a hard all. “It’s very difficult to build a human-like robot,” he said.
Young people who experience mental health problems such as stress or depression often find it difficult to ask for help, even from friends and family, for fear of stigmatisation or meeting a lack of understanding. Hollo, a free mental health companion app, makes it easy to access practical support and help with a few clicks of a smartphone. The app is designed to help sufferers monitor their condition and understand some of the triggers that make them feel better or worse. It also provides quick access to emergency services.

Hollo was founded by Cameron van Breda, a fifth-year student studying Molecular Biology and Biotechnology, who was motivated to help those suffering from mental illness after losing a friend to suicide. He sees the app as a way to encourage people to seek help while avoiding stigmatisation. “In Hong Kong, one in seven people will suffer a mental health problem in their lifetime, but only 35 per cent of them will reach out for professional help because of the stigma associated with mental health issues,” he explained.

While patients may often forget the details of their daily routine, the app is able to record them, providing health workers with extensive and personalised data that can lead to faster treatment and less trauma for their patients.

The app was incubated at iDendron and is designed to be an easily accessible go-to tool in times of stress, and offers objective analysis and friendly suggestions to better their mental fitness. It targets 12 to 24 year-old youth and works in both English and Chinese, introducing them to therapy and counselling practices through online gamified journaling and mindfulness activities. With leveraging Azure analytics and AI services, it helps track users’ mental health through different metrics like sleep quality, heart rate, stress level and social media sentiment among others. For example, by using the camera to look at the user’s face and comparing it to its internal facial pictures bank, the app can assess the user’s emotional status. Clicking on the ‘Help’ icon leads to a fast connection to professional help, with 24-hour hotlines operating in different languages and support services from NGOs.
Health professionals find the app very helpful for monitoring the daily habits of their patients, such as their exercise and sleep routines, to better understand their emotional fluctuations and to enable them to provide more accurate diagnosis and treatment before the patients’ situation is going to get worse. While patients may often forget the details of their daily routine, the app is able to record them, providing health workers with extensive and personalised data that can lead to faster treatment and less trauma for their patients.

Cameron has had plenty of positive feedback on the app. “Strangers have reached out to share their experiences in mental health,” he said. “It gives people hope that help is coming.”

He believes that education targeting the next generation is the best way to reduce the stigma associated with mental health problems. Although that may take some time, he says that if his app can help even one person feel better, it will have been worth all his efforts.

Hollo is an evidence-based app for bettering mental health fitness that uses the power of AI to further new and existing practices.
More than a thousand years ago, people in parts of Fujian Province lived collectively in multi-level homes built in circular structures called Tulou, where life revolved around farming and the inhabitants shared a convivial central courtyard. Each family lived in a vertical slice of the structure and the outer wall bound them together as a community while also serving as a collective defence.

While some Tulou have been abandoned as occupants moved to the cities, others are still inhabited and have evolved in different ways. The courtyards, for instance, have varied uses – some are used as a school, a temple or a marketplace, with inhabitants of different Tulou visiting each other’s courtyards to make use of the facilities.

For Mr John Lin, Associate Professor of the Department of Architecture, the Tulou offered an intriguing opportunity to reinvigorate the structures with a view to encouraging renovation, raising public awareness and at the same time increasing the likelihood of preservation. “A lot of the unique culture of places is being slowly eradicated,” he explained. By reinvigorating the Tulou, he hoped to help its inhabitants become more self-reliant and to spread ideas about how to use Tulou in ways more suited to modern life.
The project also provided an opportunity to allow students a hands-on experience in designing and constructing new structures while at the same time respecting and preserving the ancient original buildings. At one Tulou, more than 40 Hong Kong students took part in the building of a new wooden tower with a staircase inside. Located in the middle of the courtyard, it provides shared access to the different levels of the Tulou. The team also built a ‘Plug-in’ – a wooden funnel-like structure that provides a stepped entrance to an inner room of the Tulou on the ground floor, which now houses a library. The sheltered steps of the Plug-in have become a favourite place for young children to gather and play.

Just as adding the tower provides a new way of connecting the existing floors, the project’s impact lies in showing the potential for the different ways of revitalising a space. The project also provided the villagers with a way of preserving their treasured memories and sharing and celebrating them in a new museum. That has led to more visitors and tourism, bringing more business to the locals and in turn, to more appreciation of the unique Tulou structures.

“We’re really celebrating how adaptive architecture is, and shining a light on the fact that these constructions have been evolving throughout their existence, and proving that this can still be a way of life if we adapt them,” said Mr Lin.

Mr Chun-han John Lin of the Department of Architecture received the Faculty Knowledge Exchange Award 2020 of the Faculty of Architecture for the project ‘Rethinking the Collective: Renovation Strategies for Strengthening the Tulou Community’. ☞

During the project, students learned first-hand about traditional timber craftsmanship and the practical realities of rural to urban transformation and its impact on communities.
Hong Kong’s minority groups often miss out on healthcare information that locals take for granted. This can happen because of a lack of local language skills or a tendency to move in different social or community circles. One important area of knowledge affected is access to dental care, where neglect may lead to serious gum disease, tooth decay and high levels of pain.

For the last three years, Dr Prasanna Neelakantan, Clinical Assistant Professor in Endodontics of the Faculty of Dentistry, has been working closely with NGOs including the Indian, Pakistani and Nepali associations of Hong Kong to deliver much-needed primary checks and information on where to go for follow-up treatment to the city’s South Asian communities. With the Faculty, he launched the ‘Gateway to Dental Health’ in 2017 to help improve the oral health of the city’s non-ethnic Chinese communities. In the last couple of years, he has held seven dental health fairs, providing practical and hands-on dental care, including initial dental screening, application of fluoride, demonstration of brushing and flossing techniques, and providing information on where to go for dental treatment in Hong Kong.

His awareness of the need for dental care among these populations arose through his social contacts when people he met asked for his advice on where they could go for treatment. “That’s when it dawned on me that some of these people had been ill for so many years with no knowledge on existing services available and methods to seek treatment,” he explained.

Treatment is provided by a team of volunteer helpers including graduates and postgraduate students, who get a valuable opportunity to learn about patient care and the chance to treat patients from different cultures.
Dr Neelakantan takes his expertise directly to his target audience, conducting dental fairs at schools and other places where the city’s Indian, Pakistani, Nepalese and Sri Lankan residents congregate, and spreading the word about the service through radio interviews and Facebook. For these groups, “in terms of cultures and language, there’s a lot of similarities,” he said.

As well as working with the community-based national associations, he also partners with Health in Action, whose health professionals assist in providing primary advice, and Voices of Diversity. As the scale of the need becomes apparent, he is hoping to find donations or philanthropic support to expand the scope of his work. “We’re just scratching the surface,” he said, estimating that he has reached about one to two per cent of those in need. “Our funding is limited to screening. To provide treatment, we need a lot more funds.”

Although Dr Neelakantan’s work has been curtailed by the pandemic, he has continued his outreach by leading a webinar conducted in Urdu, Hindi and English, sharing oral health care tips and answering questions on the topic.

We have uncovered an obvious need for oral health education and dental care services; something that cannot be ignored.

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Dr Prasanna Neelakantan and his team members, Professor Chun Hung Chu and Dr Mike Yiu Yan Leung, received the Faculty Knowledge Exchange Award 2020 of the Faculty of Dentistry for the project ‘Empowering Non-governmental Organizations to Improve the Oral Health Status of Non-Ethnic Chinese (Ethnic Minorities and Migrant Workers) in Hong Kong’. ☘️
Facility Knowledge Exchange Awards 2020

Warm congratulations are also extended to the following colleagues who have won the Faculty Knowledge Exchange (KE) Awards 2020 of their respective Faculties:

**Faculty of Arts:**
Dr Yee Wan Koon, School of Humanities
‘Faultlines, Gwangju Biennale 2018, Curatorial Project by Yee Wan Koon’

**Faculty of Business and Economics (HKU Business School):**
Dr Rujing Meng, Faculty of Business and Economics
‘Enhancing the ETF Investing Ecosystem in Hong Kong and Mainland China’

**Faculty of Engineering:**
Dr Shien Ping Tony Feng and team members – Dr Yu Ting Huang, Miss Xun Wang, Miss Kaiyu Mu, Miss Xinya Wu, Mr Chunlin Pang, Department of Mechanical Engineering
‘Direct Thermal Charging Cell for Waste Heat to Electricity Conversion’

**Faculty of Law:**
Mr Haochen Sun, Department of Law
‘Intellectual Property and the Public Interest’

**Li Ka Shing Faculty of Medicine:**
Professor Keiji Fukuda, School of Public Health, and team members – Ms Bernadette Tsui, Associate Vice-President (Development & Alumni Affairs); Professor Yuen Ying Chan, Technology-Enriched Learning Initiative; and Mr Laurence Yat Long Tang, Development and Alumni Affairs Office
‘Combating COVID-19 through Knowledge Exchange’

**Faculty of Social Sciences:**
Dr Kathy Wong, Department of Psychology; Dr Paul Wai Ching Wong, Department of Social Work and Social Administration, and team members – Dr Sonia Man Kuen Chan, Mr Wan Hap Lui, Ms Elsa Lai Yi Chiu, Ms Sin Ting Ho, Miss Chui Ying Leung, Ms Lourdes Mei Oi Lam, Miss Tsz Wing Lee, Miss Conita Chi Ping Cheng, Dr Man Yan Tse, Ms Yu Wan Chan, Miss Ning Lee, Miss Sin Kwan Mak, Miss Mei Ling Lo, Miss Sin Yi Ho, Miss Karen Kin Ching Wu, Department of Psychology; and Dr Janet Siu Ping Lau, Miss Kylie Chiu Yee Lui, Mr Mong Yin Lau, Ms Carmen Ka Mun Wong, Ms Yan Yin Lam, Mr Wing Yip Lai, Miss Gigi Pui Chi Lau, Mr Chun Ming Tsui, Mr Wai Kei Leung, Faculty of Social Sciences
‘JC A-Connect: Jockey Club Autism Support Network’

**HKU Three Minute Thesis (3MT®) Competition 2020**

The 3MT Competition is an academic competition that challenges research postgraduate students to explain their research within 3 minutes to a general audience, using only one static PowerPoint slide. The 3MT was developed by The University of Queensland, Australia in 2008. The HKU 3MT Competition has been an annual event jointly organised by the Graduate School and the Knowledge Exchange Office since 2011.

This year 20 final-year PhD, MPhil and PD students participated in the HKU 3MT Competition. The Heat was held virtually in May 2020, while the Final Competition was held on June 23, 2020. The range of topics is again fascinating: from inclusion of mental disability in the criminal justice system, to clinical
Visualise Your Thesis is an exciting competition introduced by The University of Melbourne that challenges research postgraduate students to present their research in a 60 second, eye-catching digital display.

The HKU Visualise Your Thesis Competition (HKU VYT) 2020 is organised by the Knowledge Exchange Office, with support from the Graduate School. The judging panel included Professor John Bacon-Shone, Professor Frederick Leung, Professor Julia Kuehn, and Professor Xuechen Li. Competition submissions were judged on their visual impact, and how well the content presents the research to a non-specialist audience. The Competition was successfully held in May – August 2020 and the winners are:

**Champion**
Ms Qiuying Liao  
PhD candidate, Li Ka Shing Faculty of Medicine  
‘Inhalable Voriconazole Dry Powder Formulation Prepared by Spray Freeze Drying’  
(Primary Supervisor: Dr Jenny Ka Wing Lam)

**1st Runner-up and Viewers’ Choice Award Winner**
Ms Ka Wing Katherine Lee  
PhD candidate, Faculty of Education  
‘Exploring University Students’ Self-efficacy in Leadership Skills’  
(Primary Supervisor: Dr Cecilia Ka Yuk Chan)

**2nd Runner-up**
Mr Chi Hang Man  
PhD candidate, Li Ka Shing Faculty of Medicine  
‘Delivery of siRNA Targeting PD-L1 as a Novel RNA Therapy Strategy for Non-small Cell Lung Cancer’  
(Primary Supervisor: Dr Jenny Ka Wing Lam)

**2nd Runner-up**
Ms Meng Jiang  
PhD candidate, Faculty of Dentistry  
‘Clinical Trial on Restoring Untreated and SDF-treated Dentine Caries Lesions’  
(Primary Supervisor: Professor Edward Chin Man Lo)

**Online People’s Choice Award Winner**
Ms Kanmani Chandra Rajan  
PhD candidate, Faculty of Science  
‘How to Save Oysters from Ocean Acidification?’  
(Primary Supervisor: Dr Thiyagarajan Vengatesen)

Watch the 2020 gallery on our VYT website:  
https://www.vyt.hku.hk/2020gallery

Watch the presentations of the awardees and finalists on our 3MT website:  
https://www.ke.hku.hk/hku3mt/
Finding Experts
The HKU Scholars Hub is the University's online expertise directory, which makes HKU researchers and their research visible. It provides an expert finder for businesses, industries, social enterprises, the public sector, and interested student applicants to find HKU experts for contract research, consultancies, and postgraduate student supervision etc.
Please visit the HKU Scholars Hub at https://hub.hku.hk/.

Tech Ready
For a complete list of HKU technologies that are currently available, please visit: https://www.tto.hku.hk

Entrepreneurship Series
Visit http://www.dreamcatchers.hku.hk for the DreamCatchers programmes

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