

HKBU patented technologies take top prizes at international invention competition

HKBU



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Little Strokes Fell Great Oaks

Taking small strategic steps is key to growing Hong Kong Baptist University (HKBU)'s capability in knowledge transfer

By Alfred Tan

Established in 1956 as Hong Kong's first privately run post-secondary institution, Hong Kong Baptist University (HKBU) has come a long way in its journey towards becoming a research-based public university. Our School of Communication has been ranked by Asian Correspondent as one of the top ten journalism schools for Asian students. Our School of Chinese Medicine is widely recognised for its world-class research in traditional Chinese medicine and herbal pharmacology. This year, we have another accolade to add in celebration of HKBU's 60th anniversary — for being the first Hong Kong-based university to win the Grand Prix at the International Exhibition of Inventions of Geneva*.

HKBU prides itself not only on its teaching and research but also on its services to the society — and knowledge transfer is a useful parameter for measuring the progress of the latter. For this very reason, HKBU established the Knowledge Transfer Office (KTO) in the academic year 2009–10, as part of an earmarked grant initiative funded by the University Grants Committee (UGC). Since its founding, KTO has taken careful steps to consolidate the

university's capability in knowledge transfer — for example, by enhancing the institutional capacity and promoting the implementation, development and progress of knowledge transfer.

Sir Brian Fender, a UGC knowledge transfer consultant, commented on the strengths of HKBU after his assessment visit to the university in late 2011. He acknowledged that:

- the KTO was established and a head was appointed
- the staff were enthusiastic and had great ambition
- the university was open to learning from international experience
- an in-house knowledge transfer partnership was in place
- ambassadors were appointed to promote knowledge transfer within and outside the university

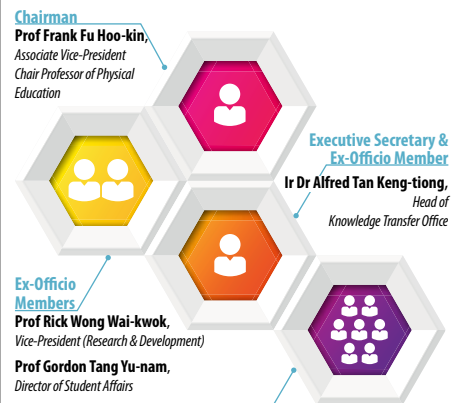
He also pointed out areas that needed improvement, including:

- the efficiency of incorporating knowledge transfer
- the drive from the senior management
- the mechanisms for achieving impact

When Sir Brian revisited HKBU in early 2015, he was astounded by the changes made since his first visit. In his audit report (see Annex 1), he wrote:

“The changes since that time have been striking. The Knowledge Transfer Office was established as an important, indeed award-winning, department within the university. It is well supported by the senior management and the HKBU Knowledge Transfer Committee[¶]. It is imaginatively, energetically and effectively led by the current director Dr Alfred Tan. The progress made is highly commendable by any standards and provides a lead for the university to develop and extend its knowledge transfer policies to incorporate the potential for making knowledge transfer a major university strength.”

Membership and Composition of Knowledge Transfer Committee



Senior Academic Members

Faculty of Arts	Dr Ester Leung Sin-man, Associate Professor of English Language and Literature
Faculty of Science	Prof Ricky Wong Ngok-shun, Associate Vice-President, Chair Professor of Biology
Faculty of Social Sciences	Prof Ma Hing-keung, Professor of Education Studies
School of Business	Mr Simon So Kwan-kow, Associate Programme Director of Bachelor of Business Administration (Hons)
School of Chinese Medicine	Prof Bian Zhao-xiang, Associate Vice-President, Director of Clinical Division
School of Communication	Prof Kara Chan Ka-wah, Professor of Communication Studies
Academy of Visual Arts	Mr Kalen Lee Wing-ki, Lecturer of Visual Arts

* In 2012, Rehab-Robotics Company Limited was awarded the Grand Prix Du Salon International Des Invention De Genève for the robotic 'Hand of Hope' jointly developed with Hong Kong Polytechnic University. In 2015, Vitargent (International) Biotechnology Limited — a company founded by the alumni of the City University of Hong Kong — was awarded the Grand Prix at the 43rd International Exhibition of Inventions of Geneva [1][2].

In particular, Sir Brian attributed the successes of KTO to:

- excellent relations with both the university's academic departments and administrative offices
- highly professional support for start-up companies, whether they are faculty-based or student enterprises
- proactive maximisation of intellectual property protection
- exemplary information and materials to promote knowledge transfer
- imaginative schemes to help staff and students engage in knowledge transfer
- support from the Innovation and Technology Commission (ITC), as well as UGC
- the capacity to contribute significantly to the university's overall strategy

As the saying goes, little strokes fell great oaks. Most often, it is the perseverance of small focused steps in the right direction that brings about great success. Through the support of the HKBU Knowledge Transfer Committee, KTO has made a paradigm shift in building, developing and advancing knowledge transfer at the university. All these would not be possible without the focus, teamwork and perseverance of the KTO team.

At KTO, we are dedicated to providing professional customer-oriented knowledge transfer services [3]. To be qualified as 'professional' and 'customer-oriented', we believe these services must not only be efficient and effective (in accordance to the guidelines of professional best practices), but also meet the goals and needs of HKBU staff and students (see articles on technology transfer at HKBU, liberal arts knowledge transfer, business entrepreneurship support and training).



Prof Cheung Nai-ho (fourth from the left), the Chief Technology Adviser of ANA Material Analysis Company Limited, Prof Cheah Kok-wai (sixth from the left), the Co-founder of Cathay Photonics Limited and Prof Ken Yung Kin-lam (fourth from the right), the Co-founder of OPER Technology Limited were interviewed in the press conference held at HKBU

For example, we have set up the Knowledge Transfer Partnership Seed Fund wherein partnerships with the wider community are used to ensure the sustainability of knowledge transfer projects beyond project completion and maximise the societal impact of research outcomes. For HKBU staff, we have initiated knowledge transfer projects to promote the success of their academic publications and grant applications. Students are encouraged to participate in these projects where they can pick up skills through direct engagement.

We have launched the Business Entrepreneurship Support and Training (BEST) programme to promote the development of staff and student entrepreneurship at HKBU. Through seminars and training workshops, we get to listen to the needs and concerns of HKBU staff and students. The speakers in the BEST programme are elected by the HKBU community through an online platform. Our Technology Start-up Support Scheme for Universities

(TSSSU) is tailored to maximise the chances of success for start-up companies that are spin-offs from the university.

TSSSU funds about four to five technology start-up companies each year. Currently, more than 80% of these companies are in their third year of operation. What these technology start-up companies lack in quantity, they make up for in quality. One of these companies, OPER Technology Limited, has been named by the Red Herring as one of Asia's and global top 100 companies. It was awarded the Gold Prize in the category 'technology start-ups' by the Federation of Innovative Technologies and Manufacturing Industries (FITMI). In 2015-16, OPER Technology Limited became a finalist at GlaxoSmithKline Neuro2020, got second place at China Healthcare Investment Conference Business Plan Competition, and was awarded a gold medal in the category 'surgery' and the Diploma of High Scientific and Technological Level of Invention at the 44th International Exhibition of Inventions of Geneva.



Chief Executive of HKSAR Leung Chun-ying, GBM, GBS, JP, (seventh from the right), Hong Kong officials and Consul General of Switzerland congratulated the HKBU team for winning the Grand Prize with its invention of “ultra-hard and anti-scratch thin film technology” at the 44th International Exhibition of Inventions of Geneva in 2016

The HKBU technology start-up company, ANA Artwork Material Analysis Limited, is conducting precious art analysis in collaboration with the French Artwork National Analytical Laboratory (C2RMF) at Louvre Museum in Paris. It received the Certificate of Merit from FITMI and a gold medal in the category ‘computer science’ at the 44th International Exhibition of Inventions of Geneva.

In 2014–15, the HKBU technology start-up company Cathay Photonics Limited received venture capital investment that was valued at HK\$50 million. It received the Special Award from the Romanian Association for Nonconventional Technologies and a gold medal (with judge commendations) in the category ‘industrial processes’ at the 44th International Exhibition of Inventions of Geneva.

“I have yet to find the person, however great or exalted his station, who did not do better work and put forth greater effort under a spirit of approval than he would ever do under a spirit of criticism.”

- Charles Schwab

Since 2014, Hong Kong Baptist University (HKBU) has established two prestigious annual awards to honour outstanding efforts and achievements in knowledge transfer: the HKBU Innovationem Award and the HKBU Knowledge Transfer Award.

The HKBU Innovationem Award is awarded to an innovation resulted from research led by a HKBU faculty for a given year. Nominees will be judged along the following criteria:

- Leadership contributions to the community, particularly in relations to the economy, social welfare and environment
- Positive impact and/or fundamental changes for long-term betterment of the community
- Exemplar contributions towards building the innovative strengths of HKBU
- Potential to raise HKBU’s global reputation

The HKBU Knowledge Transfer Award is awarded to a knowledge transfer project led by a HKBU colleague/team for a given year. Nominees will be judged along the following criteria:

- Leadership contributions to intellectual-based knowledge transfer in serving the community needs
- Positive impact and/or fundamental change for long-term betterment of the community
- Exemplar contributions towards building the research and teaching strengths of HKBU
- Potential to raise HKBU’s global reputation

The Grand Prix of the 44th International Exhibition of Inventions of Geneva was awarded to Prof Cheah Kok-wai of HKBU and Cathay Photonics Limited for the development of a glass-reinforcing process. He demonstrated that glass screens are better protected when a thin layer of sapphire is applied on their surfaces [4].

References:

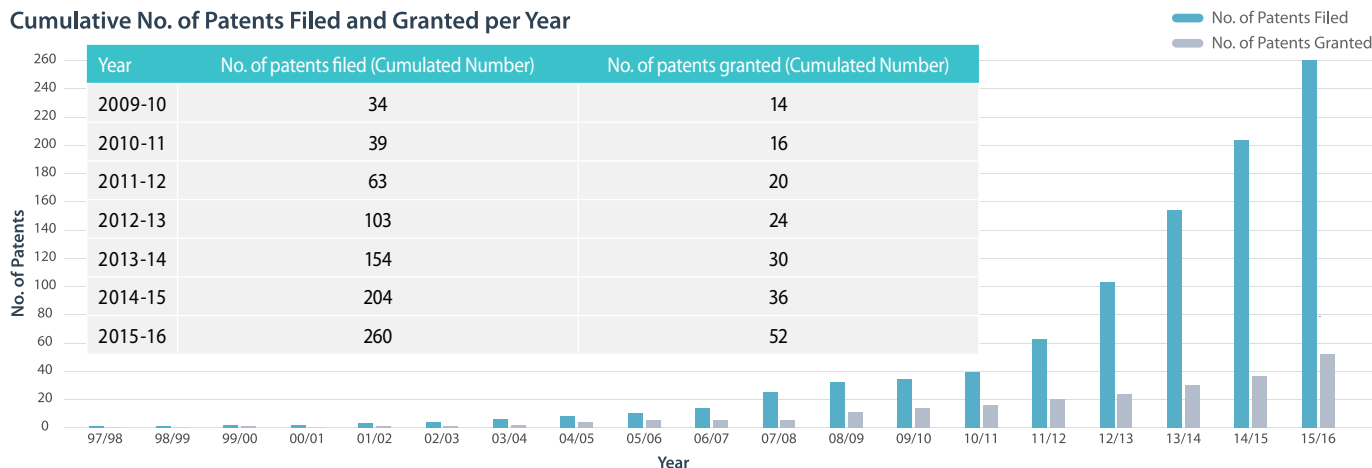
- [1] The Grand Prix of the International Exhibition of Inventions of Geneva. *La Revue Polytechnique* 5, 25 May 2012. [<http://www.polymedia.ch/RpRubText/view/132>]
- [2] The Grand Prix of the 43rd International Exhibition of Inventions of Geneva to a System for detecting toxins. Press release, 17 April 2015. [<http://www.inventions-geneva.ch/images/pdf/EN2015-SCoPresGrdPrix.pdf>]
- [3] Tan, A. K. Building knowledge transfer at Hong Kong Baptist University: A customer-oriented approach. *Going Global*, 182–188 (2016)
- [4] Prize list 2016. The 44th International Exhibition of Inventions of Geneva, 15 April 2016. [<http://www.inventions-geneva.ch/en/home-en-gb/31-programs/100-preize-list>]

Technology Transfer at Hong Kong Baptist University

Success in technology transfer at HKBU is possible by using a professional customer-oriented approach and by building interpersonal relationships with all stakeholders

By Mandy Liu & Kate Cheung

Cumulative No. of Patents Filed and Granted per Year



Technology transfer is defined⁺ as the process of transferring scientific findings from one organisation to another for the purpose of further development and commercialisation. The process typically involves:

- the identification of new technologies
- the protection of new technologies through patents and copyrights
- the commercialisation of new technologies, including the marketing and licensing of new technologies to existing private-sector companies or start-up companies

Technology transfer at Hong Kong Baptist University (HKBU) had a very humble beginning. We had our first patent filed in 1997 and granted in 1999. By the academic year 2008–09, HKBU

had only filed a total of 32 patents. However, the number of patents filed and granted has significantly increased over recent years. In fact, the Knowledge Transfer Office (KTO) currently rejects about 35–40% of all received applications after performing an in-house patentability analysis.

We evaluate each and every application on a case-by-case basis. If an application is determined to be patentable, it will be submitted to the Knowledge Transfer Committee (KTC) for approval. Our aim is to increase the success rate of each application by differentiating the invention from existing technologies. The process also helps draft the patent specification.

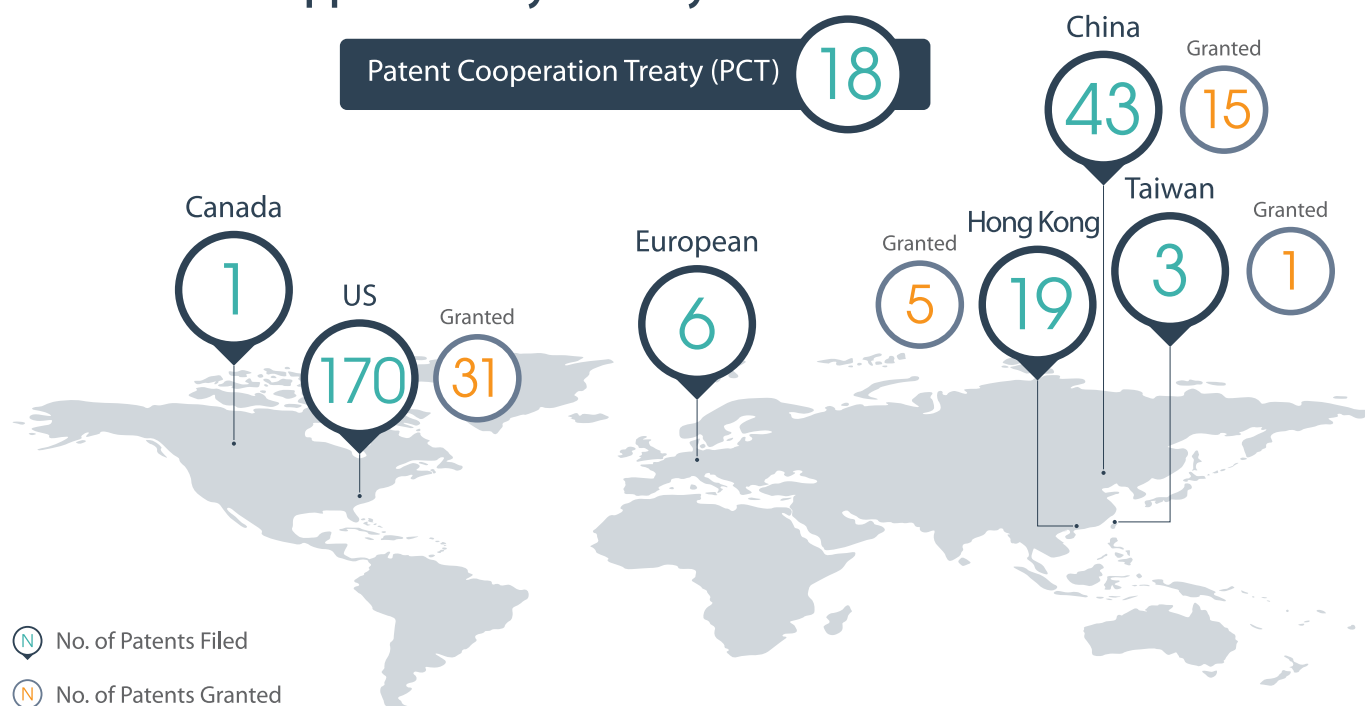
On the other hand, if an application is rejected, KTO will assist the inventors in understanding why their patent application is rejected and how the

novelty and inventiveness of the patent can be improved. For example, we had an application that was rejected two years ago but was successfully re-filed this year after its innovative features were enhanced. By providing a simple, effective and proactive intellectual property (IP) protection regime, new technologies resulted from research led by HKBU faculty can be quickly identified and their IP rights better protected. The table above summarises the number of patents filed and granted at HKBU for the past academic years.

Once a patent is granted, it will be audited once every three years as part of the patent maintenance and renewal procedure. Patent audit is the process of evaluating the renewal worthiness of a patent. In a patent audit, KTO conducts patent search and market analysis wherein the validity/priority of the patent, the likelihood of infringement,

⁺ As defined by the Association of University Technology Managers (AUTM). Source: <http://autmvisitors.net/what-tech-transfer>

No. of Patents Application by Country



the ease of infringement and the ease of detecting infringement are evaluated. The process also enables the detection of existing patent infringements. When patents are abandoned, the renewal decision of a patent is communicated to the inventors and KTC through meetings or circulation for approval. With this procedure, we save HKBU's resources by maintaining only commercialisable IPs.

“Significant achievement in patent application, project supporting and publications.”

- Prof Bian Zhao-xiang,
Associate Vice-President, and Director and Chair Professor of Clinical Division, School of Chinese Medicine

In the academic year 2013–14, KTO established a funding scheme called Strategic Patent Fund (SPF) to support patent strategic applications in another jurisdiction wherein the applying units do not contribute funding. In every case, a patent audit is conducted to evaluate the strategic worthiness of the application. The results of the application are communicated to KTC for approval.

Under the HKBU policy titled Administrative Guidelines for the Protection of IP Rights (last revised on 20 February 2014), we provide HKBU members with clear guidelines on IP ownership, income sharing and administrative procedures.

Further efforts to promote technology transfer and commercialisation

On 7 March 2014, HKBU established a wholly owned company (limited by shares) called HKBU R&D Licensing Limited (HKBURDL) to serve as the IP licensing business arm of the university. The Board of Directors of HKBURDL comprises the Vice-President of Research and Development (VPRD), the Associate Vice-President, the Head of KTO, a representative from KTC, the Director of Finance Office and three non-executive directors from the industry. The licensing income of HKBURDL totalled HK\$745,565 three months after its founding and the revenue totalled HK\$783,608 in its first year of operation.

In the academic year 2011–12, we observed an upward trend in the number of patents filed and granted. In 2015–16, HKBURDL licensed a total of 15 patents to six start-up companies. Three of these companies, namely Cathay Photonics Limited (CPL), OPER Technology Limited and ANA Artwork Analysis Limited, have received more than 15 prestigious awards. The former, in particular, has received venture-capital funding.

“Personally, I have had many opportunities interacting directly with Dr Tan and his colleagues, whether on the KT committee, in the TSSSU selection panel, or on various occasions working together towards patent filing or KT initiatives for the Faculty of Science. Throughout this experience, I am truly impressed by Dr Tan's and his team's domain knowledge, professional experience, and most importantly, contagious passion in proactively helping colleagues with their KT needs and initiatives, and in promoting the university to the community at large.”

- Prof Liu Ji-ming,
Acting Dean, Faculty of Science

Prior to the establishment of HKBURDL, all licensing requests at HKBU were handled by the VPRD. During the academic years 2012–13 and 2013–14, only one licensing request was approved.

Regions of Granted Trademark Registration







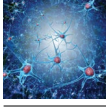
The establishment of HKBURDL further enabled the successful filing of six trademark applications — in China, Hong Kong, Malaysia, Singapore, Taiwan and Thailand. The HKBURDL trademark is now registered in China, Hong Kong, Malaysia, Taiwan and Thailand while the application in Singapore is still pending. On 11 November 2015, the licensing policy and procedures were established for HKBURDL in order to promote consistency and to provide efficient guidelines for handling licensing cases.

Creating technology transfer opportunities

To further promote technology transfer, KTO has introduced a gap fund scheme called Matching Proof-of-Concept Fund (MPCF) in 2013–14. The scheme is designed to bridge the gap between the IP rights of HKBU and the commercialisation of technologies in start-up companies or the industry. MPCF focuses on technological areas that are of key economic benefits to the society and that are in line with the research strengths of HKBU. The scheme operates on a three-to-one

(3:1) cash-matching basis up to a cap of HK\$200,000 (e.g., HK\$150,000 to be matched by HK\$50,000 from the applicant). Each year, we select around five MPCF projects to support for commercialisation and the rate of success is around one in five projects. Examples of successful commercialisation include a technology start-up company governed by Innovation and Technology Commission (ITC) and the development of a consultancy project. The table below shows the list of MPCF projects in the reporting period (project summaries are provided in the Annex 2A-E).

The benefits of knowledge transfer programmes, such as MPCF and TSSSU, are clearly evident. Despite the lack of prior experiences in technology transfer, commercialisation and entrepreneurship, we have achieved exemplar technology transfer cases in time for HKBU's 60th anniversary celebration. This is made possible by using a professional customer-oriented approach and by building interpersonal relationships with all stakeholders.

Project title	Principal investigator / Department	Project start date	Project status	Target completion date
 Laser ablation monitor and controller	Prof Cheung Nai-ho Physics	1 June 2015	Extended and ongoing	31 August 2016
 Organic optical sensor technology	Prof Zhu Fu-rong Physics	1 September 2015	Ongoing	31 August 2016
 Development of (a) gait analysis tool, (b) human balance diagnostic platform based on tri-axial	Dr Chan Mau-hing Physics	1 May 2015	Completed	30 June 2016
 A mobile-based fatigue driving detection and alarm system	Prof Cheung Yiu-ming Computer Science	1 July 2015	Completed	30 June 2016
 Biocompatible three-dimensional nano-matrixes for the induction of stem cell differentiation	Prof Ken Yung Kin-lam Biology	1 April 2015	Completed	31 March 2016

Liberal Arts Knowledge Transfer

Knowledge transfer at HKBU requires impactful research from rigorous academic disciplines — the results of which contribute enormously to HKBU, as well as our community

By Mike Ng

Established in 2010, the Knowledge Transfer Partnership (KTP) programme encourages Hong Kong Baptist University (HKBU) faculty members to transfer their research and knowledge to the society through collaboration with external commercial enterprises as well as non-profit organisations. The flagship initiative is much more than just a seed funding supported by the University Grants Committee (UGC). The Knowledge Transfer Office (KTO) proactively assists HKBU colleagues at the very early stage of their projects, often during the proposal development stage. Reinforcing a strict vetting mechanism, only projects underpinned by high-quality research works and well-sustained by committed external partners are approved. The vetting panel of each application comprises at least one member of the Knowledge Transfer Committee (KTC) from the same faculty/school/academy of the applicant, and at least one KTC member from a different faculty/school/academy. This ensures that project benefits and knowledge are disseminated not only to a small sector but also to the community at large.

Throughout the lifespan of the KTP project, KTO provides support to the involved partners — for example, by recording project events and collecting feedbacks. Moreover, KTO does not terminate the support at the end of the project lifespan. We understand that

for certain projects, impacts may take a longer time to materialise. Therefore, long-term impact assessment and evidence archiving are also the duties of KTO. This year, the KTP Project Sharing Luncheon Series was held wherein principal investigators of past successful KTP projects were invited to share their experiences.

Services to the community as one of our mission focuses



Tackling a social problem is a recurring theme of KTP projects. This year it is exciting to witness two KTP projects that aim to address long-term social problems from very different perspectives and approaches.

To nurture the artistic needs of children with special educational needs (SEN), Dr Victor Lai Ming-hoi at the Academy of Visual Arts (AVA), in collaboration with the Hong Kong Society for Education in Arts, worked on a KTP project titled *Just-tifying Touch*. Experienced artists, assisted by HKBU AVA students, were invited into the classrooms of

participating schools. They worked with school teachers to teach SEN children the skills to create artworks with tactile sensory experiences using textured materials. This KTP project created an inclusive multi-sensory learning opportunity for SEN children to express their artistic creativity through hands-on guidance from artists, teachers and HKBU AVA students. At the end, the artworks were exhibited in a public exhibition. The project achieved social impacts by raising public awareness about the needs of SEN children and demonstrating the potential of tactile art in visual arts education. Moreover, the project gave our young HKBU artists a valuable opportunity to contribute to the community and broaden their experiences. This is in line with HKBU's commitment and devotion to whole person education (see Annex 3A).

People with hearing impairment face many challenges in everyday life, especially in times of emergency. To them, using the 992 SMS Emergency Call Service can be a daunting task. The current system requires the caller to manually type in the details of the emergency situation, hampering the speed for any first responders to arrive.



To tackle this problem, Dr Carmen Lam Ka-man and her team from the Department of Computer Science created an emergency-call mobile application called *Easy 992*. They have ensured the application is user-friendly so that help is accessible in three clicks. The first trial is expected to roll out soon with the support of external partners, including Hong Kong Police Force and the Chinese YMCA of Hong Kong Y's Men's Centre for the Deaf (see Annex 3B).

Research focus on health

This year, researchers at the School of Chinese Medicine have addressed two common health problems — depression and chronic kidney disease.



The KTP project titled *Fighting against Depression*, led by Dr Zhang Ge and his team, helped patients and their families spot depression at the earliest possible stage. Simple techniques that can be applied to daily life, such as dietary tips, acu-point massage and exercise to manage depression, were disseminated to the public through seminars and workshops. Guidance was provided to professional counsellors from the Joyful (Mental Health) Foundation, the external partner of this KTP project, to strengthen the impact and sustainability of the project (see Annex 3C).



The other KTP project in health, led by Dr Xu Min and Dr Xu Daji, addressed the problem of chronic kidney disease. Based on 20 years of research by the principal investigators from traditional Chinese medicine and integrated nephrology care, the KTP project titled *Chinese Medicine and Nephropathy Care* provided the public with important information on the treatment of chronic kidney diseases. The goal was to reduce the financial burden and psychological pressure of patients and their families (see Annex 3D).

The ethos of whole person education

HKBU faculty members are eager to translate their research knowledge into a holistic education. Prof Kara Chan Ka-wah from the School of Communication, an internationally cited researcher in advertising strategy, gender roles, environment and health, found that in the Diploma of Secondary Education (DSE) curriculum for Hong Kong secondary schools, students are required to study Independent Enquiry Study (IES) course wherein social



science research is conducted. However, students and their teachers often find IES difficult due to lack of experience and training in social science research. The KTP project titled *Supporting IES Among Secondary School Students* introduces different social science research methodologies to secondary students and their teachers. The knowledge and resource pack developed in this KTP project attracted a lot of attention from both the secondary education sector and the public. The extensive media coverage has further extended the impacts of this project. As a recognition of the project's utmost value for community engagement through knowledge transfer, it was awarded the **HKBU Knowledge Transfer Award 2016** (see Annex 3E).



Knowledge Transfer Award 2016 presentation by Mrs Pamela Chan Wong Shui, BBS, JP, Deputy Chairman of the Council, HKBU to Prof Kara Chan Ka-wah (left)

The above five exemplar KTP projects show that knowledge transfer at HKBU requires impactful research from rigorous academic disciplines. The results contribute enormously to HKBU, as well as our community.

Business Entrepreneurship Support and Training (BEST)

Entrepreneurship effectively promotes knowledge transfer to the broader community

By Becky Poon

There were next to no cohesive discussion about entrepreneurship among students and academic staff at HKBU before 2012–13. Entrepreneurship is recognised as an effective strategy to promoting knowledge transfer from the university to the broader community. Therefore, the Knowledge Transfer Office (KTO) took the lead to sow the seeds of entrepreneurship at HKBU.

Since 2012, KTO has received the support of Strategic Development Fund (SDF) to launch a three-year BEST programme. The goal of the programme is to nurture the creativity of students and graduates, so they become socially responsible business leaders and entrepreneurs to support Hong Kong's knowledge-based economy. The BEST programme comprises three entrepreneurship initiatives, namely Entrepreneurship Challenge (E-Challenge), Entrepreneurial Sharing and Networking (ESAN), and Entrepreneurship Space (E-Space). All these programmes were initiated in response to student needs across different disciplines so that entrepreneurship could flourish on campus.

Apart from students and graduates, KTO also provides support and training in promoting staff entrepreneurship

at HKBU. In 2014, we launched the Technology Start-up Support Scheme for Universities (TSSSU) with the help of the Innovation and Technology Commission (ITC). The scheme is designed to meet the needs of potential spin-offs from the university. In particular, KTO has invited professionals and key stakeholders of the Hong Kong entrepreneurship ecosystem — including Hong Kong Science Park, Cyberport and Hong Kong Business Angel Network — to join the vetting panel of our TSSSU scheme. They provide not only professional assessment but also enormous support services to HKBU technology start-up companies, in the form of incubation space and investment pitching.

Since the inception of TSSSU in 2014, a total of five technology start-up companies have been funded and supported. These companies were all spin-offs led by HKBU academic staff, research students or alumni. Currently, more than 80% of these companies are still in operation. In particular, three start-up companies have had remarkable global successes as mentioned in the previous article on HKBU's achievements at the 44th International Exhibition of Inventions of Geneva.

Sowing the seeds of entrepreneurship at HKBU

The BEST programme has successfully sprouted entrepreneurial minds and created an entrepreneurial culture on campus over the last three years. To keep up this momentum, KTO has got the 'green light' from the university to extend the BEST programme to early 2017. This extension marks a good time to redefine the objectives of BEST — from 'cultivating entrepreneurial minds' to 'experiencing and accelerating entrepreneurship culture'. Here are some of the new initiatives that have already been kick-started to achieve this new objective:

Connecting with Successful Local Entrepreneurs

— A total of three entrepreneurs sharing sessions were held in 2015–16. All the speakers were successful local entrepreneurs or young start-up company owners. These include Mr Steven Lam Hoi-yuen, the Co-founder and CEO of GoGoVan, and Mr Ricky Wong Wai-kay, the Chairman and Founder of Hong Kong Television Network Limited. Both shared their entrepreneurial experiences and practical advices on start-up ventures and the running of a business. Over 70% of the student participants rated positively towards these sharing sessions and said that they got useful information from the speakers on how to equip themselves prior to starting their own entrepreneurial journey (see Annex 4).

Pre-crowdfunding Challenge — The new initiative, launched in November 2015, encouraged students to share their innovative business ideas through a self-created 'kickstarter-style' video. Shortlisted videos were posted on our BEST Facebook page for public voting to gain as many 'likes' as possible. Positive

feedbacks were received from the student participants as they experienced a real taste of raising capitals, achieving their business goals and leveraging social media for greater business exposure.

The Entrepreneurship Society —

Entrepreneurship will never be successful without a strong network of entrepreneurial students on campus. KTO understands that the driving force of peers can be a powerful tool to promote an entrepreneurship culture among students. Therefore, under the support and guidance of KTO, the first Entrepreneurship Society led by HKBU students was formed in 2015. The society was led by a group of passionate students aimed at providing opportunities and network to nurture students' entrepreneurship knowledge, skills and visions. This freshly minted society had already attracted 120 students to join, which is impressive when compared to other societies. The Entrepreneurship Society co-organised the inaugural HKBU Entrepreneur Bazaar with KTO, which was the first bazaar fully run by HKBU students on campus. The bazaar offered a platform for students to sell their products in the market and have a taste of running a true business (see Annex 5).

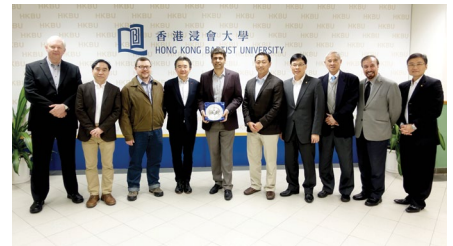
Massive Open Online Course (MOOC) Entrepreneurship Education Scholarship Scheme —

Established in October 2015 with the generous donation from Ms Ming Pang of KADOSH Health & Beauty Co. Ltd, the MOOC scholarship scheme provides HKBU students with an opportunity to receive entrepreneurship education from top international universities. A total of 25 students joined the scheme and nine of them completed the course and received full reimbursement.

“The course in MOOC facilitates my capability to create strategies and bring innovation to the market. It also helps me develop a holistic business model canvas for my future venture.”
- Miss Huang Min-xuan,
(MSocSc) in Media Management

KTO understands that there is an urgent need of entrepreneurship training for incubation companies and HKBU spin-offs during the initial stage of development. Despite being experts in their respective technological areas, these companies and spin-offs are inexperienced in running a real business. Thanks to a further grant support from the UGC, KTO has initiated a new project called the **Online-to-Offline (O2O) Entrepreneurship Training Platform**. This platform offers dedicated training and related support services to students and start-up companies, and may open up to all stakeholders of the Hong Kong entrepreneurship ecosystem at a later stage. We have engaged Prof Ikhlaj Sidhu, the Founder and Chief Scientist, and Dr Ken Singer, the Managing Director of the Sutardja Center for Entrepreneurship and Technology at the University of California, Berkeley, as our O2O platform consultants. Our O2O platform will adopt an inductive game-based approach — otherwise known as the Berkeley Method of Entrepreneurship (BMoE) — in teaching our students. The visit of Prof Sidhu and Ken in March 2016 had marked an important milestone for the commencement of this project. They introduced BMoE to HKBU's senior management and faculty members and exchanged ideas on entrepreneurship education and entrepreneurial mind-set training. A fireside chat with our students and key stakeholders of the Hong Kong entrepreneurship ecosystem, and meetings with our TSSSU companies were also held during this visit. All

participants found these meetings to be very useful — especially for our TSSSU companies, as they have obtained insightful advices from entrepreneurship experts that helped them review their business plans. KTO has successfully linked up a world famous university with HKBU to develop Hong Kong's first entrepreneurship training platform.



Prof Ikhlaj Sidhu (fifth from the left), the Founder and Chief Scientist and Dr Ken Singer (fifth from the right), the Managing Director of the Sutardja Center for Entrepreneurship and Technology at the University of California, Berkeley, were meeting with HKBU senior management on 21 March 2016

In celebration of the HKBU 60th anniversary, KTO launched the inaugural HKBU Entrepreneur Day on campus in May 2016. The idea was to celebrate HKBU's achievements in winning the Grand Prix of the 44th International Exhibition of Inventions of Geneva, the 2016 HKBU Knowledge Transfer Award, and entrepreneurship at HKBU. The event attracted over 130 guests from the government sector, entrepreneurship stakeholders, HKBU alumni, senior management, staff and students (see Annex 6).

Looking back in time, KTO has devised various strategies to nurture entrepreneurship at HKBU. From sowing seeds and sprouting entrepreneurial minds, to accelerating the growth of HKBU's start-ups — all were strategically built upon our focus on providing professional customer-oriented knowledge transfer services. We believe that the entrepreneurial momentum will continue to flourish at HKBU and bring benefits to the society.



The HKBU Innovationem Award



The HKBU Knowledge Transfer Award

KT Awards 2016

Hong Kong Baptist University

The HKBU Innovationem Award

This Most Promising Innovation of the Year Award is awarded to an innovation resulted from the research outcome of faculty at Hong Kong Baptist University for a given year, wherein said innovation is judged to be possessing the utmost innovative value in service to the community.

The HKBU Knowledge Transfer Award

This Exemplar Knowledge Transfer Project of the Year Award is awarded to a knowledge transfer project led by a HKBU colleague/team which is judged to have utmost value for community engagement through its knowledge transfer.

HKBU

ANNUAL REPORT ANNEXES Knowledge Transfer Office 2015 - 16



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The Annex

Knowledge Transfer Office, Hong Kong Baptist University



► Annex 1

Summary report on visit from 20 April to 27 April 2015

by Sir Brian Fender, June 2015

Summary

The starting point for this commentary is to assess the progress made by KTO since a visit to the University in the latter part of 2011. The substantial comments made to the UGC at that time were that the strengths of the University were:

- the Knowledge Transfer Office is now established and head appointed
- the staff are enthusiastic and can be expected to develop greater ambition
- the University is open to learning from international experience
- the use of an in-house knowledge transfer partnership
- the appointment of KT ambassadors to promote knowledge transfer within the University and externally

The areas for improvement or of risk were:

- incorporation of KT has been rather slow
- limited evidence of drive from the senior management
- range of mechanisms for achieving KT impact is limited

The changes since that time have been striking. The Knowledge Transfer Office is established as an important, indeed award winning, department within the University. It is well supported by the senior management and the HKBU Knowledge Transfer Committee. It is imaginatively, energetically and effectively led by the current director Dr Alfred Tan. The progress made is highly commendable by any standards and provides a lead for the University to develop and extend its knowledge transfer policies to incorporate the potential for making knowledge transfer a major University strength. Details of the approach underlying the visit, the range of university staff consulted and possible future steps are outlined.

Methodology

In advance of the visit a list of themes to be explored was prepared and some key people identified. The themes and underlying questions were circulated and nearly 30 staff interviewed individually. The schedule was impeccably organised

by KTO; all the comprehensive range of individuals from different parts of the University had been well briefed and where frank and open in discussion.

In the individual interviews the impact of the KTO was explored and its future direction within the wider university strategy discussed.

A range of literature prepared by the KTO was available. There were two meetings of the senior management team of KTO once in the presence of Dr Tan once without. A lunch was organised involving the whole team.

Role of the Knowledge Transfer Office

The Office's successes include:

- excellent relations with both academic and support departments in the University
- the provision of highly professional support for start-up companies, whether based on faculty or part of student enterprise
- the proactive maximisation of intellectual property protection
- exemplary production of information and materials to promote knowledge transfer
- imaginative schemes to engage with staff and students in knowledge transfer
- the attraction of ITC as well as UGC support
- the capacity to contribute significantly to the University's overall strategy

Building on success: future role and responsibilities of the KTO

The way in which the KTO has impacted on the University in a relatively short time with widespread internal support across the University provides an opportunity for an enhanced role.

Such a role would be based on the assumption that knowledge transfer is not only a distinct mission for universities but that it will increasingly be integrated into the mainstream activities of teaching and research.

This gives a window of opportunity for HKBU to establish a position of leadership in Hong Kong based on the existing support of KTO's activities, its long standing and important contribution to Hong Kong welfare through Chinese medicine and the way in which knowledge transfer can contribute to whole person education.

For that to happen the University will need to consider examining its policies so that knowledge transfer is seen to include activities beyond the present traditional remit. This involves engagement with business and the community through research contracts, research partnerships, and consultancy. It should include university courses tailored to particular business and community needs as well as the provision of events such as musical performances and public lectures.

Over time the University should consider at the outset what benefits to Hong Kong society will arise from any proposed research programme. It would also include the consideration of enterprise is an important part of the student experience when devising new undergraduate courses or preparing bids to the UGC for student places. This is not to say of course that all the University's activities would be dependent on their impact on society but that it would be an important strategic element.

It is important to emphasize that the benefits of this approach would be greater than an expanded role and improved outcomes in knowledge transfer. The discussions initiated around research programmes and a resulting greater strategic focus can be expected to lead to an **improvement in overall research performance**. This will be particularly true if Hong Kong follows the UK path of linking the assessments of research and impact. But **teaching** would also benefit from a curricula better connected to society's needs and greater opportunities for whole person education.

I have also been encouraged in my recommendations by the greater career satisfaction they can offer staff, the opportunities they will give to emphasise the distinctive nature of HKBU education as well as wider PR advantages. They also open up the possibility of much closer and rewarding links with alumni.



"P-LEAF could be used to investigate artists' materials in a novel way!" I said to my team

▶ Annex 2A

Laser ablation monitor and controller

by Cheung Nai-ho, Professor, Department of Physics

Our new testing and authentication technology can bring economic impact

Our granted patent technology (US 8,671,759 B2) described a method that quickly and accurately determined the small amount of material removed in pulsed laser ablation. We provide a new technology which utilises acoustic signal to measure the mass removed from the surface. One potential application is the real time monitoring of laser refractive

surgery. This new technology was built on the granted patent to realise the real time monitoring and control of laser ablation for the applications, such as laser machining, laser surgery and ultra-micro analysis. At the moment, the amount of material removed in pulsed laser ablation is determined offline after the event. Even then, the mass removed

is typically estimated from the crater geometry and the sample density, neither of which can be measured precisely. This technology can report the mass removed in real time to allow feedback control in order to avoid damage on the sample.



The invented fluorescence technique can be applied to the analysis of unique items such as questioned documents, artworks and antiques

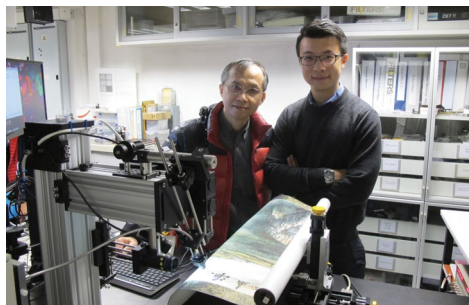
My research team has also pioneered the use of this technique for the identification of pigments, ceramics and metals in and the in situ examination of objects that are of artistic and historical importance. I led a team of my students to form a technology spin-off company, ANA Artwork Material Analysis Company Limited (ANA), in November 2014. Currently, ANA is working closely with Hong Kong Conservation Office and Laboratoire de Recherche des Monuments Historiques (LRMH) in France to transform the technique into an important analysis tool for museums and analytical laboratories in artwork and heritage preservation.

With our experiences in analytical spectroscopy, we overcame the “one-wavelength-one-transition limitation of LEAF” in 2005. A more universal LEAF probe that could analyse a huge range of (even unknown) elements at one single excitation wavelength was also developed. We further reviewed the mechanism and applications of the technique and concluded that P-LEAF could tackle three real-world problems due to its high sensitivity. The first was the direct analysis of thin layers of dried paint for heavy metals such as lead when detection limits were well below the

regulatory level. The second was the analysis of valuable yi xing potteries when two look-alike specimens were differentiated based on practically non-destructive single-shot P-LEAF spectra. The third was the elemental analysis of ink when characters written with different brands of ink could be discriminated non-destructively. In this way, our research works represented a fundamental contribution to analytical spectroscopy.

In the past decade, my team successfully demonstrated the strengths of this laser plumes and published a series of papers in top-tier international analytical journals. A US patent was granted in early 2014 and we received three-year TSSSU grants.¹ In recognition of this achievement, we won a gold medal at the 44th International Exhibition of Inventions of Geneva in 2016.²

Our technology is more sensitive than conventional ones and it induces no visible damage to the sample. It can be applied to the analysis of unique items such as questioned documents, artworks and antiques. Based on the fluorescence spectra, the specimens can be sorted with high accuracy. So far, five personnel including President, Marketing Manager, Project Manager, Analyst and Administration Officer are employed to run the start-up business. Recently, my team has further developed an automated P-LEAF system that would potentially give a high commercial value.



Prof Cheung Nai-ho (Left) and Dr Bruno Cai (Right), the President of ANA Artwork Material Analysis Company Limited

References

1

TSSSU grants with a total of HK\$2,490,000 supported by ITC were awarded to ANA Artwork Material Analysis Company Limited from 2 December 2014 to 31 March 2017.

2

References to the Corroboration of Impact and Benefit include:

- Computer World Hong Kong (22 April 2016), A18, All 31 HK participants win awards at Inventions Geneva
- Hong Kong Commercial Newspapers (香港商報) (22 April 2016), A14, 「浸大揚威 日內瓦國際發明展」
- Hong Kong Economic Times (香港經濟日報) (22 April 2016), 「浸大『鐵甲玻璃』奪國際發明展大獎」
- Oriental Daily News (東方日報) (22 April 2016), A16, 「浸大三雄 贏六國際發明獎」
- Sing Tao Daily (星島日報) (22 April 2016), 「日內瓦國際發明展浸大獲最高殊榮」
- Sing Tao Daily (星島日報) (22 April 2016), F6, 「日內瓦國際發明展 浸大首參賽獲最高殊榮」
- Ta Kung Pao (大公報) (22 April 2016), 「浸大三項專利技術在『第44屆日內瓦國際發明展』獲大獎」
- Wen Wei Pao (文匯報) (22 April 2016), A25, 「浸大納米膜奪日內瓦大獎」
- Apple Daily (蘋果日報) (21 April 2016), A15, 「浸大3 專利技術奪國際發明獎 激光鑑定藝術品」
- HK01 (香港01) (21 April 2016), 「日內瓦國際發明展 浸大奪三獎」
- Oriental Daily News (東方日報) (21 April 2016), 「浸大藍寶石納米超硬薄膜 奪日內瓦發明大獎」

Organic optical sensor technology

by Zhu Fu-rong, Professor, Department of Physics

Recent trend in OLED/OPD applications

Organic optical sensor technologies can be used for device authentication in touch fingerprint sensors in their application. Examples of such applications include website logins and payments. To stay ahead of the completion, the optical sensor technology based on an integration of organic light transmissible devices, such as organic photo detectors (OPDs), light-emitting diodes (OLEDs) and organic thin film transistors would provide significant cost benefits as well as the functional superiority for a broad range of applications. Furthermore, the merits of design and fabrication flexibility contributed from the stable materials and simple process could readily construct multi-layered functional devices.

Current literature reports integrated organic optical sensors with OLED and OPD fabricated on waveguides. For example, the structure included a 45° cut mirror, which helps direct light from the OLED into the waveguide. The methods of incorporating optical fibre and inorganic waveguide in the hybrid sensors were reported. In these configurations, the designs display evident deficiencies and limitations. The proposed organic optical sensor technology based on the monolithic integration of OPDs and OLEDs possesses the design and fabrication flexibility that would potentially allow for the construction of multi-layered micro sensors and arrays.



Applications of this technology would ultimately result in the potential materialisation of wearable units, lab-on-chip, flexible and compact information sensors at commercially viable costs. At present, we are exploring a new organic optical sensor concept based on the integration of OPDs and OLEDs. This novel structure offers the possibility of having greater freedom for device fabrication and engineering. The proposed organic optical sensors can be fabricated using a solution-processed approach, vacuum thermal deposition or a combination of both techniques.

The aim of our project is to explore and demonstrate the new device concept of organic optical sensors composing vertically integrated OPD and OLED units. In addition to being light-weight and ultra-thin, the design and

fabrication flexibility of an integrated OLED/OPD device also maintain its low cost benefits. At the moment, the focus of R&D investments on miniaturisation is giving rise to smaller and wearable devices.

The performance of the functional organic sensors in relation to the optimisation of light coupling between the OLED and OPD components, as well as the examination of the optical and frequency responses are explored in this project. Further research efforts and funding support will be required for the organic optical sensor technology to become a commercial possibility. We considered this technology can be applied on a variety of applications such as wearable units, finger print identification, image sensors, smart light sources and compact information systems.

▶ Annex 2C

Development of (a) gait analysis tool, (b) human balance diagnostic platform based on tri-axial

by Jeffrey Cheung Tai-kin, Visiting Professor, Department of Physics

Simple can be harder than complex



Miss Li Xi-nan (Left), Prof Jeffrey Cheung Tai-kin, the Founder of Booguu Company Limited (middle) and Mr Xu Hong-yuan (right) participated at the E-day held by HKTDC on 13-14 May 2016 at HKCEC

In this program, my research team and I are developing two laboratory inventions into commercial products that will benefit personal health as well as making positive impact on Hong Kong's economy. In collaboration with Dr Chan Mau-hing, we invented two versatile devices including a Balance Scale and a Portable Gait Analyser. Despite their compact size and simple operation, their performance can match or even exceed those by the more elaborating systems. Their cost effectiveness also opens up the potential to reach the consumer market. The Balance Scale measures the balance index which is an important physical well-being indicator. It can also determine a person's posture condition and fall assessment. Another function is to use it for balance training via realistic game simulation. The Portable Gait

Analyser measures the bio-mechanics of walking, running and other physical activities in unprecedented spatial and temporal details. Results can be used for diagnosing gait impairment related medical conditions, assessing the effectiveness of therapeutic solutions, footwear design, sports medicine and athletic training. Collaborations with medical institutions on clinical trials are currently underway.

The core technology is based on Inertial Measurement Unit for data gathering and an array of new concepts such as Gait Events Assignment, Gait Force Imaging, Gait Wheel and Gait Force Spectrum for analysis. It is a disruptive approach for analysing human movement in static (e.g. body balance) and dynamic state (e.g. walking). Its simplicity and versatility have opened up a broad range of applications from a personal health monitoring to

professional medical imaging system. As the inventor of this technology, I established a technology start-up company called Booguu Company Limited, in February 2016 to pursue its commercialisation^①. The two products were filed patents in the US and PCT^②. Thus, not only it revolutionises the health care practice but also secures its shares in the market place. With a rapid demographic shift toward an aging population and the ever increase in awareness of physical well-being, the introduction of these products can benefit the society. In addition, its tremendous commercial potential can also have a positive impact on Hong Kong's economy.

Finally, we have already secured partnership with three entities for performance validation through clinical trials under strict medical protocol. These partners are: (1) Pedorthic Technology Limited (one of the largest gait impairment institutes in Hong Kong with eight clinics and a workshop); (2) School of Chinese Medicine, HKBU (clinical trial on the effect of treatment on patients with lower back pain related to gait problems) and (3) Department of Physical Education, HKBU (monitoring balance index and assessment of fall-risk for senior citizens, and application to athletic performance monitoring and training). With the core intellectual properties already under patent protection and the partnership in place, now it is the

perfect window of opportunity to pursue commercialisation. The target market consists of hospitals, rehabilitation clinics, footwear manufacturers, sports centres and research institutes. This technology can solve the unique problem. Firstly, the balance scale is compact and easy to operate yet with accuracy matching the traditional devices. The portability and low cost make such device ideal for household use and also for field application such as collecting data from a large senior population from various convalescent homes. Secondly, the Portable Gait Analyser is a game changer as it can deliver the level of performance comparable and in some cases superior to the traditional setting in a small package. It has no site and physical

activity limits so measurements can be made in the most natural stance covering a broad range of different physical activities.

These new technologies can create more job opportunities in two areas, including (1) Manufacturing/sales of both devices in: Balance Scale and Portable Gait Analyser; and (2) User among medical profession of these medical devices in particular the Portable Gait Analyser, it will help provide more accurate diagnosis of the symptoms and assessment of the therapeutic procedure. Finally, they are new technology with higher flexibility and adaptability. Not only they provide solution to the existing needs but also open up new applications such as athletic training and sports

apparel design. Therefore, it definitely would help boost the economy.

References

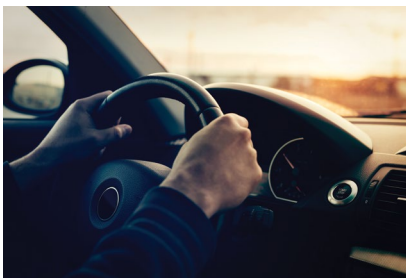
- 1 TSSSU grants with a total of HK\$800,000 supported by ITC were awarded to Booguu Company Limited from 24 May 2016 to 31 March 2017.
- 2 Two US patents titled “Gait measurement with 3-axes accelerometer/gyro in mobile devices” (US 14/622,933) and “Combined device that measures the body weight and balance index” (US 62/322,397) were filed on 16 February 2015 and 14 April 2016 respectively while the other patent titled “Gait measurement with 3-axes accelerometer/gyro in mobile devices” (PCT/CN2015/073227) was filed in PCT on 17 February 2015.

Annex 2D

A mobile-based fatigue driving detection and alarm system

by Cheung Yiu-ming, Professor, Department of Computer Science

According to statistics, fatigue driving causes one in five fatal crashes on the road in the US



This technology has potential for making economic impact. Driver fatigue causes many traffic accidents around the world. For example, in 2012, more people in New South Wales died in fatigue-related crashes than drink-driving accidents. Under such circumstances, we have realised the practicality of a high reliable

and efficient fatigue driving detection and alarm system in prevention of traffic accidents. To resolve this, our research team has developed a system to precisely detect driver fatigue to aim at preventing loss of life.

This innovative system requires only a smartphone to run. Using the eye and head pose tracking technology, the system analyses the driver's eyelid and head pose captured by the video camera of a smartphone. An alarm is automatically set off to alert the driver when the symptoms of drowsiness manifest themselves. The system can work under complex environment such as rapid change of light intensity, post and head movement and frequent eye blinking. Without additional

equipment cost except a smartphone, the system features simple operation, high reliability, efficiency and mobility. The technology was filed a US non-provisional patent and a PCT in 2014 and 2015 respectively³. Undoubtedly, commercial potential of this technology is huge. Most importantly, the technology can significantly reduce the chance of traffic accidents and save lives.

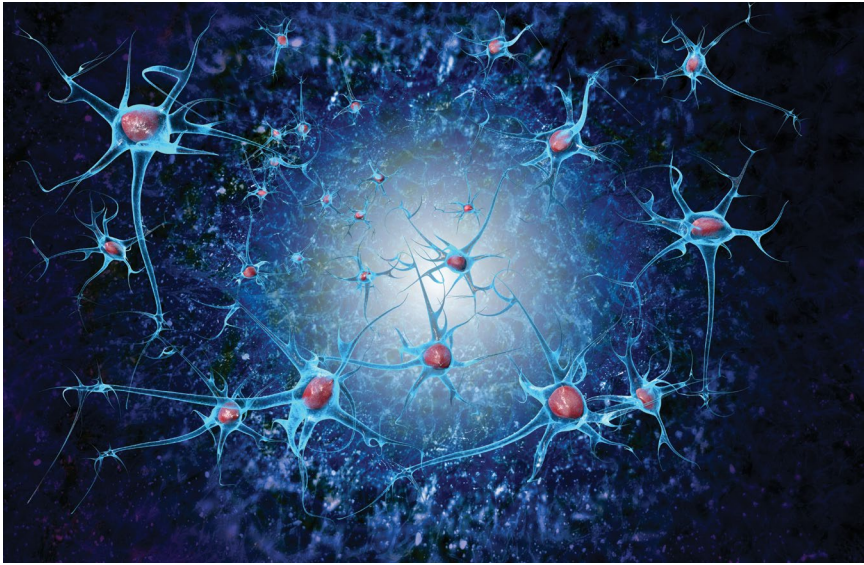
Reference

- 3 Two patents titled “Method and Apparatus for Eye Gaze Tracking” (US 14/474,542) and (PCT/CN2015/084452) were filed on 2 September 2014 and 20 July 2015 respectively.

Biocompatible three-dimensional nano-matrixes for the induction of stem cell differentiation

by Ken Yung Kin-lam, Professor and Associate Head, Department of Biology

Cell therapies: possible therapies for incurable diseases



This technology has potential for making social, public health and economic impacts. At present, there are over 100 million people in the world are diagnosed with neurodegenerative diseases including Alzheimer's disease and Parkinson's disease. Neurodegenerative diseases are progressive and fatal human diseases. At present, there are no satisfactory treatment that can offer an ultimate cure to repair the degeneration/ loss of neurons. Most of the current treatments are only for symptoms relief. Therefore, cell replacement therapy raises the only hope for the patients. Unfortunately, the safety of using embryonic stem cells and induced pluripotent stem cells is questionable, including the genetic instability and risks of immune rejections. These shortcomings thus hinder the exploration of neural stem

cell therapy and regenerative medicine for neurological disorders. My research team has successfully demonstrated simple magnetic separation for the in situ stem cell harvest in adult subjects. The extraction of stem/ progenitor cells from choroid plexus lining along the subventricular zone can be effortlessly performed with their strategically designed magnetic iron oxide nanoparticles with the conjugation with antibodies (Ab-MNPs). This unique characteristic leads them to develop a new tailor-made neurological disorder therapy as the cells can be extracted, modified and re-applied to the same subject. A US non-provisional patent was granted with the Autologous Neural Stem Cell Harvest technology (US 9,109,203 B2).

In order to advance this technology, with the joint effort of Dr Huang Zhi-feng from the Department of Physics, our

team developed 3D nanostructures with controlled morphology to physically induce stem cell differentiation without the addition of growth factors. This can overcome the shortcomings of the conventional methods for the induction of stem cell differentiation without using chemicals and growth factors. We believe this innovation can offer a safer and more controllable method for the enhancement of stem cell proliferation and differentiation for the tailor-made stem cell therapy.

As the neurodegenerative disease is still incurable at this moment, the restoration of the degenerating neurons becomes imperative for the treatments of the diseases. Both embryonic stem cells and induced pluripotent stem cells have been proposed as the sources of cell replacement therapy. However, the use of these cells raises considerable safety and ethical issues. Genetic instability of these cells may increase the incidents of cancers to the recipients.

It has been revealed that the ependymal cells on the superficial linings can be made accessible by the nanoparticles and collected without harming the subjects. My team invented a new method to enhance the cell proliferation and differentiation without using the conventional methods which are potentially carcinogenic and potent. They can extract, modify and re-apply the neural stem cells isolated from the patients themselves. The genetic integrity and stability of the extracted stem cells can be maintained. However, only a limited number of stem cells



OPER Technology Limited received the Diploma of High Scientific and Technological Level of Invention at the 44th International Exhibition of Inventions of Geneva

can be harvested. The present invention can provide another mean to enhance the cell proliferation and differentiation without using the conventional methods which are potentially biohazard. The clinical outcomes of these nanostructures are solely based on the mechanical support. They can minimise the adverse effects of the current synthetic drugs (e.g. possibility of long-term toxicity, contraindications, induction of addiction, high potency, over-dosing, allergic reactions due to

the drugs interactions with different individuals) and enhance the effectiveness by their tailor-made nano-based treatments.

With the KTO's support, two US patents were filed this year¹ and a technology start-up company, OPER Technology Limited (OPER) was established in November 2014, and successively received three-year TSSSU grants that were supported by Innovation and Technology Fund². OPER is currently run by five staff including CEO, Scientific Officer, Research Assistants and Administrative Staff and its office is located in the Hong Kong Science Park. OPER aims to build up a larger portfolio, extend our researches to other co-operators and bring them into clinic. Besides, OPER won a few of prestigious prizes including Gold Medal in Surgery Category and received a Diploma of High Scientific and Technological Level of Invention of the 44th International Exhibition of Inventions of Geneva³. In May and June 2016, OPER was awarded the Innovationem Award 2016 at HKBU and Youth Entrepreneurship Award by The Hong Kong General Chamber of Small and Medium Business respectively.

From the technical perspective, a safer and more controllable treatment was established. Noteworthy, the present invention can be licensed to hospitals around the globe for conducting the autologous cell replacement therapy. Moreover, it can cure the diseases, thereby reducing the economic burden due to the huge medical costs as well as the indirect costs related to the social and family issues. From the entrepreneurial perspective, this is an exemplar technology transfer case in Hong Kong. In the near future, the feasible clinical applications will be achieved in order to tackle the neurological diseases. With all promising findings, it is strongly believed that the technologies would have significant implications to the community.

¹ Two patents titled "Dual-Mode Contrast Agent and Uses Thereof in Real-time Monitoring and Harvesting of Neural Stem Cells" (US 14/804,348) and "Growth Factor Free Cell Differentiation and Proliferation of Neural Stem Cells by Inorganic Nano-matrix" (US 62/340,500) were filed on 21 July 2015 and 23 May 2016 respectively.

² TSSSU grants with a total of HK\$3,280,000 supported by ITC were awarded to OPER Technology Limited from 2 December 2014 to 31 March 2017.

References

3

References to the Corroboration of Impact and Benefit include:

- Computer world Hong Kong (22 April 2016), A18, All 31 HK participants win awards at Inventions Geneva
- Hong Kong Commercial Newspapers (香港商報) (22 April 2016), A14, 「浸大揚威 日內瓦國際發明展」
- Oriental Daily News (東方日報) (22 April 2016), A16, 「浸大三雄 贏六國際發明獎」
- Sing Tao Daily (星島日報) (22 April 2016), 「日內瓦國際發明展浸大獲最高殊榮」
- Sing Tao Daily (星島日報) (22 April 2016), F6, 「日內瓦國際發明展浸大首參賽獲最高殊榮」
- Ta Kung Pao (大公報) (22 April 2016), 「『第44屆日內瓦國際發明展』香港公司斬獲獎項」
- Ta Kung Pao (大公報) (22 April 2016), 「浸大三項專利技術在『第44屆日內瓦國際發明展』獲大獎」
- Wen Wei Pao (文匯報) (22 April 2016), A25, 「浸大納米膜奪日內瓦大獎」
- HK01 (香港01) (21 April 2016), 「日內瓦國際發明展浸大奪三獎」
- Sing Pao Daily News (成報) (21 April 2016), 「6科學園公司日內瓦悉數獲獎」
- M2 Communications (20 April, 2016), M2, All innovations from the HKSTP delegation commended at the 44th International Exhibition of Inventions of Geneva
- SCMP (17 Nov 2015), Why Hong Kong universities aren't turning inventions into stuff that sells
- HKET (22 Oct 2015), 「科技界『放榜』科技園3企入圍」
- Wen Wei Po (文匯報) (9 Oct 2015), A26, 「浸大蓄新科技獲百亞創企金獎」

Just-tifying touch

Social inclusion for SEN children achievable by multi-sensory artistic creation

“Just-tifying touch” a KTP project by Victor Lai Ming-hoi, Associate Professor, Academy of Visual Arts (AVA), has two external partners: *Hong Kong Society for Education in Art (HKSEA)* and *Arts in Heritage Research Limited (AHR)*. HKSEA was founded in 1992 and is one of the major non-profit organisations promoting art education in various local sectors. AHR is also a non-profit organisation. It aims to promote a better understanding and future development for Hong Kong’s art and heritage environment.



Just-tifying touch workshop “Pebble Path: a New Tactile Experience”

The needs of school children with special educational needs (SEN) are often neglected by society at large, just as the role of tactile communication is often neglected in arts. This project created an inclusive learning opportunity for these children to express their artistic creativity by engaging their sense of touch with hands-on guidance from artists, teachers and

AVA students. The incorporation of both visual and tactile components symbolised the creation of an inclusive learning environment for school children with SEN and encouraged a different perspective to experiencing art. The aim was to promote the use of tactile communication in Visual Arts by demonstrating that school children with SEN can benefit from a multi-sensory learning experience. By combining the elements of vision and touch, this project sought to foster public awareness and acceptance of children with SEN and thereby boost social harmony. The project has three participating schools: *Sam Shui Natives Association Lau Pun Cheung School, C.C.C. Kei Shun Special School and H.K.S.Y.C. & I.A. Chan Nam Chong Memorial School.*

This project led the way for a more informed discussion on social inclusion and its various models. Social inclusion has often been understood in a narrowed way. In fact, the potential for formalising touch as a communication tool via deliverable leads to a deeper investigation of our relationship with the society. This facilitates an interdisciplinary model for the humanities as well as the social science for further collaboration and researches. The project also demonstrated the need for a less ‘academic’ approach to enable ordinary people to associate with the potentials as well as the importance of ‘touch’ as a mode of communication and equal rights. Victor believes that while it is unfair to say that the society is being dominated by visual and audio communication, it is important to advocate the status of ‘touch’ as a way to understand the world while it is within the norm and etiquette, especially for a society where touch is treated with some reservation. The project also informed teaching at HKBU as AVA students benefited from their training with artists and their classroom experience in SEN schools reflect their learning outcomes in the creation of their own artwork.

Over the past decades, Victor has produced many impactful publications on art and has conducted more than 16 exhibitions. He has also won several important external competitive grants, including the University Grants Committee (UGC) General Research Fund and grants from the Hong Kong Arts Development Council.

This project was underpinned by Victor’s prolific and high quality engagement and research in painting, community art and visual art education. Selected references to the research include:

- **Lai, M.H.** *Process of Expression: Victor Lai’s Work on Paper 1990-2010*, Hong Kong. *Asia One Product & Publishing Limited* (2010)
- **Lai, M.H.** et al. *Art Criticism & Visual Art Education*, Hong Kong. *HKIEd* (2007)

Around 20 pieces of artwork produced in the project were showcased in a public exhibition at the Jockey Club Creative Arts Centre in early March, 2016. The exhibition extended the project impact by reaching out to a wider audience. The project and the exhibition have provided a publicly accessible platform for the public and raised their awareness of students with SEN and benefits of tactile communication.

The processes and outcomes of the project were also recorded in “*Just-tifying touch: “Flying with Art” Inclusion Project Booklet*”. The booklet provides readers with an insight to the artists’ conceptual ideas behind the teaching and the creative processes that underlie the students’ artwork. Detailed teaching plans of the artist workshop which list art making tools and materials, teaching concepts, learning objectives and their respective assessments, detailed teaching and learning steps, etc., were included in the booklet.

This publication further extends the impact of the project as it can serve as a teaching kit for teachers to practice and apply in their classrooms.

Media exposure, for example the coverage of the project and exhibition by newspaper *Sing Tao Daily*, has further strengthened the project impact. HKSEA Chairman has also testified that in this project Victor acted as a facilitator to reveal the theories or research in association with haptic art through various levels of activities in lessons in order to realise knowledge transfer. The collaboration of the artists and teachers to work out a teaching plan has brought up new ideas and teaching techniques which are conducive to transferring knowledge to their classrooms.

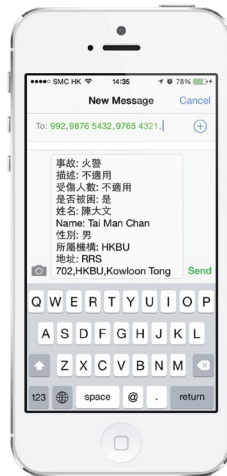
Easy992 – emergency call mobile application for hearing-impaired persons

Technology makes emergency calls much easier for the underprivileged

“Easy992 – emergency call mobile application for hearing-impaired persons” is a KTP project undertaken by Carmen Lam Ka-man, Lecturer and her team from the Department of Computer Science. People with normal hearing can find accurately reporting an emergency difficult under stressful conditions. For people with hearing impairment who has to use the 992 SMS Emergency Call Service of the Hong Kong Police Force, the task can be daunting. Carmen and her team addressed this social problem using computer technology.



Screenshot of Easy992 mobile app



Message ready to be sent by Easy992 mobile app

The external partner of this project, *Chinese YMCA of Hong Kong - Y's Men's Center for the Deaf*, was established in 1967. Their objective is to serve the hearing-impaired and their families as well as the general public. Their aims are to assist the hearing-impaired to develop their potential, build their self-confidence, develop their independence and enhance their ability to integrate into the society. They know very well the drawbacks of the 992 emergency call system.

The current 992 system makes emergency call to the Police through SMS messages. Before users can use this service, they need to register with designated organisation and get the SMS reply from an authorised telecommunications company. To make an emergency call, users need to type in information like location (with district, street name, building name, door plate), description of the emergency situation (e.g. need police, fireman or ambulance; being trapped, robbed, injured, medical history, etc.), number of injured people or people being trapped if applicable. After that, users will receive a SMS confirmation from the Police and then wait for rescue. The main problem of the current 992 SMS emergency service is that it requires users to type in lots of information in details correctly which may be difficult under emergency situations. Moreover, although hearing difficulty tends to be more common for those of advanced age, the onset of hearing loss can happen at birth due to congenital disorders. Many children diagnosed with significant hearing impairment often suffer from developmental delay and other impairments as well. As a result, the usage of the current system is very low and the hearing-impaired persons cannot really benefit from it.

Underpinned by Carmen's expertise and research in computer science and programming, the project team worked closely with *Chinese YMCA of Hong Kong - Y's Men's Center for the Deaf* and developed a mobile phone application software ("app") called Easy992. The app is very user-friendly and getting help would only be three taps away.

Easy992 contains a list of common emergency situations for the user to choose from and the list allows for customisation. The system stores the user's personal information and medical history so that when there is an emergency, a message with this information can be generated instantaneously. In addition, by using the GPS function on smartphones, it can inform the emergency dispatcher of the exact location, thereby reducing error. A shake of the phone triggers a message to the next of kin alerting them of the emergency and the user's location. Both Android and iOS versions of Easy992 were developed. It is expected to be adopted by the Hong Kong Police Force after some technical concerns are resolved.

The impact of the project will be huge once fully deployed. Lives can be saved as people with hearing or other impairments can make emergency calls more easily. The project also raised public concerns over the needs of hearing-impaired persons as well as the needs of other underprivileged groups.



KTP Sharing Session, 26 April 2016

Fight against depression

Curing depression through self-manageable techniques



Poster of public seminar, April 2016 at HKBU

“Fight against depression” is a health-related KTP project. Having identified the lack of a channel for the public to access mental health information, Zhang Ge, Associate Director and Associate Professor of Teaching and Research Division and his team from the School of Chinese Medicine (SCM) launched this project to tackle a prevalent mental health problem: depression.

One of the objectives of this project was to help patients and their families spot depression at the earliest possible stage so that they could regulate their emotions. This was achieved by disseminating proper knowledge on depression to the general public. Based on the project team’s expertise on Chinese medicine and depression curing research, various techniques of managing depression in our daily life, such as dietary advice, acupoint massage and exercise, were promulgated to the community and the public. The project also provided guidance and training to counsellors on Chinese medicine knowledge to enhance the efficiency

and effectiveness of their works. They can in turn train the patients and their families of the techniques to alleviate symptoms caused by depression.

Depression has become increasingly prevalent, posing a serious threat to mental health and wellbeing in the 21st century. According to the Hong Kong Government’s statistic, there are over 86,000 persons with mental illness or mood disorder in Hong Kong. The external partner of this project is Joyful (Mental Health) Foundation. It was established in 2004 and is a non-profit making charitable organisation with trustees, consultants and council members from different professions including specialists in psychiatry, clinical psychologists, lawyers, artists, celebrities and media practitioners. The project research team comprises experts in Chinese medicine and mental illness treatment. One of the references to the underpinning research of this project was published in the book “戰勝抑鬱症” (Wang Yong-qin, Carrie Yu, Carol Leung, Hong Kong: Wan Li Publisher, 2010). Two authors of the book are participated in the project team.

Through the four public seminars and one workshop designed for counsellors, around 800 participants have benefitted from the project.

To provide easy reference, the team published a booklet “戰勝抑鬱情緒” with 10,000 copies which had been already distributed to the public, boosting the sustainability of this project.

Impact assessment conducted for one of the seminars held at HKBU showed that the workshop was remarkably satisfactory in the eyes of the majority of respondents. They not only learned

about the concepts and the application of Chinese medicine on depression treatment, but also were inspired to learn more about the subject. It is encouraging to find out that over 90% of the respondents agreed that they basically understood the content taught in the seminar (Figure 1). Impact assessment conducted for one of the seminars held in Kwun Tong shows that all the respondents agreed that they would think about new issues (e.g. relationship between liver/spleen disorders and depression, related treatments, common ingredients used) (Figure 2). Respondents perceived the seminar positively in improving their interest and motivation in learning more related knowledge via other channels.

“I basically understand the contents presented in the workshop.”

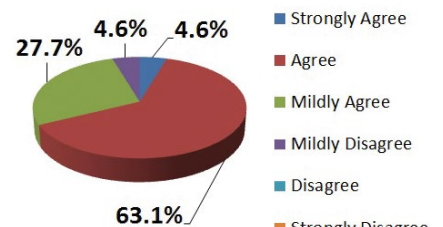


Figure 1. Basic understanding of the contents presented in one of the seminars held at HKBU

“After acquiring related knowledge, I will think about new issues.”

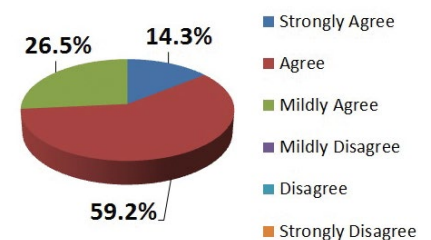


Figure 2. Thinking about new issues after attending one of the seminars held in Kwun Tong

In the long term, the project is expected to make a lasting and positive impact in curbing the spread of depression, thus reducing the undesired knock-on effects on the patients, their families and even society at large.

Chinese medicine and nephropathy care

Chinese medical treatment for kidney diseases relieves patients of financial and psychological pressure

“*Chinese medicine and nephropathy care*”, a KTP project by Xu Min, Assistant Professor of Teaching and Research Division and Xu Daji, Senior Lecturer of Clinical Division from the School of Chinese Medicine (SCM), collaborated with three external partners to transfer the knowledge of Traditional Chinese Medicine (TCM) treatment for chronic kidney disease to the general public by providing professional training and workshops, publishing popular science books and articles, holding press conferences and providing free medical consultations. The three external partners are: *Hong Kong Association of Traditional Chinese Medicine, Hong Kong Registered Chinese Medicine Practitioners Association, and the Alliance for Renal Patients Mutual Help Association*. The project also promoted exchanges within the Chinese medicine profession and helped renal patients and their families reduce financial burden and psychological pressure.

Min’s research focuses on osteoporosis, phytoestrogens, endocrine dyscrasia and tumors. Recently he has also started the relevant research on nephrology care. Daji’s research fields are in internal disease treatment of chronic renal failure, chronic nephritis, IgA nephropathy, lupus nephritis, gouty nephropathy, hypertensive nephropathy, hematuria diseases, diabetic nephropathy and various proteinuria conditions. He is an expert in the research of integrating Chinese and Western medicine on nephrology care and has conducted teaching and research works especially on the combination of Chinese medicine with dialysis treatment for over 20 years.

Daji has found that Chinese medicine would help the chronic kidney disease patients alleviate their symptoms such that their quality of life would be improved at the same time. Selected references to the underpinning research of this project include:

- Xu, W., **Xu, M., Xu, D.J.** et al. Genomics, proteomics and metabolomics in the assessment of herbal nephrotoxicity. *Hong Kong Chinese Medical Journal*, 9 (3):75-77 (2014)
- **Xu, M.** et al. Effects of Chinese herbal medicine in the treatment of ketamine-associated urinary tract dysfunction: a report of 12 cases. *Hong Kong Chinese Medical Journal*, 8 (4): 40-41 (2013)
- **Xu, D.J.** 中西醫結合腎臟病諮詢手冊. 廣東科技出版社, (July 2010)

Traditional Chinese Medicine (TCM) regards the kidney as much more than their physical functions. Kidneys are actually regarded as the “root of life” with functions closely related to every aspect of our development from birth to death. Underpinned by the extensive knowledge and research of the project team, the project has offered a new insight that TCM treatment on chronic kidney diseases can help improve kidney functions and alleviate symptoms naturally. The TCM concepts on nephropathy of ‘replenishing vital energy and nourishing blood’, ‘clearing heat and eliminating dampness’, and ‘coordinating Yin and Yang in the body’ were disseminated through seminars of the project. Participants were taught the know-hows (e.g. recommended herbal formulae and selected food intakes) needed to care for their kidneys in the perspective of TCM, hence increasing their health awareness and understanding of the relationship between TCM and renal diseases. The project has also enabled

renal disease patients, their families and care-takers to realise the increased variety of treatment options. Impact assessments conducted pre and post the seminars have shown that the events were effective in disseminating the nephropathy research based knowledge of the project team.

5,000 booklets on nephropathy care entitled “慢性腎病中醫藥療法” (i.e. treatment of chronic kidney disease) which consolidated the knowledge and research of this project were printed. They were distributed to the public via Hong Kong public libraries, eight affiliated Hong Kong Baptist University Chinese Medicine Clinics, and three cooperative partners.

Media coverage and public dissemination which further enhanced the impacts of this project included the interview with Daji on nephrology care in *Radio Television Hong Kong* (RTHK) program “知識會社” (i.e. knowledge society) and the spread of the knowledge and research of this project in the health-related column of *am730* (local free newspaper, circulation volume is in terms of hundred-thousand copies daily) called *am Health*.



Public seminar, November 2015 at HK Central Library



Interview by RTHK programme “知識會社”, July 2015

► Annex 3E

Supporting IES among secondary school students

Research methodologies give a strong helping hand to students



Meet-up with participating students from HKBUAS Wong Kam Fai Secondary School

“Supporting IES among secondary school students” is a KTP project conducted by Kara Chan Ka-wah, Professor from the Department of Communication Studies. The Diploma of Secondary Education (DSE) curriculum requires students to conduct Independent Enquiry Study (IES) projects which are very often social science research projects in small scale. Students are, however, limited by the methodologies at their disposal. Underpinned by Kara’s extensive research expertise in advertising, gender roles, environment and health, this project is the first of its kind to introduce to students various social science research methodologies, which even their teachers may know nothing of.

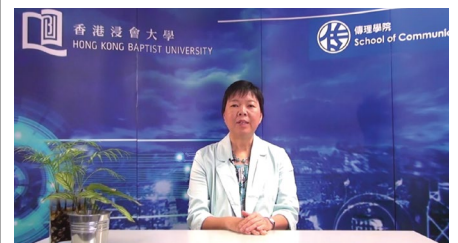
The external partner of the project is *Hong Kong Baptist University Affiliated School Wong Kam Fai Secondary and Primary School*. The school is the first secondary and primary through-train school affiliated to a university in Hong Kong. It caters whole person development by providing a safe learning environment for the students, and empowering them to be spiritually mature, wise and informed, artistic, physically strong, creative and civic-minded.

The journal articles of Kara have won five awards at the Emerald Literati Network Awards for Excellence. Her researches over the years include: over 15 journal articles and a book published on the topic of gender roles and identities; research findings and feature stories published in magazines such as *Media Digest*; development of a Master of Arts course titled “Youth, Media, and Consumption” and an interdisciplinary General Education course titled “Children as Consumers: Marketing to the Youth”.

Some of Kara’s published articles were selected as reading exemplars for Hong Kong secondary students. These empirical involvements in her research have deepened her understanding of youth and consumption and provided her the practical knowledge of providing scaled-down, layman version of her work for secondary students as the core base of this project. Selected references to the underpinning research of this project include:

- **Chan, K.** *Girls and Media; Dreams and Realities*, Hong Kong. *City University of Hong Kong Press*, ISBN 978-962-937-226-2 (2014)
- **Chan, K.** and Ng, Y. L. Canadian Chinese adolescent girls’ gender roles and identities. *Intercultural Communication Studies*, 22(2), 19-39 (2013)
- **Chan, K.**, Ng, Y. L. and Luk, E. Impact of celebrity endorsement in advertising on brand image among Chinese adolescents. *Young Consumers*, 14(2), 167-179 (2013)
- **Chan, K.** and Ng, Y. L. How Chinese adolescent girls perceive gender roles: A psychographic study. *Journal of Consumer Marketing*, 30(1), 50-61 (2013)

One of the important findings from Kara’s research and engagement is that the current requirement of IES places much burden on senior secondary students and their supervising teachers. Students expressed difficulties in getting access to academic journals that are almost exclusively available to subscribers. Even when they get access to the journals, they have difficulties in digesting the published papers. Students also have a



Video clip introducing focus group as a research method

limited understanding of different social science research tools that are available for the enquiry process. The project addressed these barriers by providing training sessions for supervising teachers to broaden their knowledge and skills on social science research, as well as rewriting selected published papers into articles at a level appropriate to students' comprehension. Questionnaires and interviewing protocols adopted in the studies were used as examples to illustrate step-by-step the research process.

The project supported students and teachers of the external partner by developing teaching videos and other materials that introduce to them four social science research methodologies, namely focus group interviews, content analysis, sample survey and the visual method. The website [http://www.coms.hkbu.edu.hk/ies_support/] of the project hosts the videos, their transcripts, easy-to-understand examples based on original research papers, original research papers and examples of research materials such as questionnaires. A resource pack in the form of a 104-page book was published and disseminated to the secondary school community and public libraries.

The project created a platform for all involved partners to pool their knowledge, expertise and ideas. In doing so, the sum of the consolidated project is greater than its parts. The role of the teacher as trainer ensured the continuation of knowledge transfer while in the subsequent teaching schedule the knowledge and materials (i.e. booklet and online platform) could be re-utilised. Students would continue to demonstrate self-management skills in pursuing an investigative study on a self-chosen topic after the seed fund has been exhausted. According to the

Liberal Studies (LS) teachers of the external partner, the teaching materials had been incorporated in their works.

The accumulated expertise and networks of all parties were fully utilised by working on the showcase project together, hence increasing their knowledge and skills in guiding their students to build up their IES portfolio. The project enabled teachers to share their experience and give their insights on how to guide students to digest the published references. As a result, the project raised the awareness of the partners in social science research, hence broadening their knowledge and skills, complementing each other's initiatives and creating a more holistic approach in their respective works.

The project offered new insights into the current DSE curriculum in Hong Kong. It also addressed issues on senior secondary students' capability in IES. The teaching manual and the online platform had been successfully incorporated into the teaching curriculum of the external partner. The empirical materials generated would be developed into case studies, and subsequently disseminated in teaching and learning conferences and through academic publications. The project facilitated the teaching of IES by sharing Kara's knowledge and research expertise.

Kara and Mr William Lee Wai-kim, LS Panel Head of the external partner, were invited to speak to LS teachers at teacher development forums organised by the Hong Kong Professional Teachers Union. Kara also met Dr Li Kit-chuen, Curriculum Development Officer (LS) of the HKSAR Education Bureau. Dr Li agreed to add a link at the website of the Education Bureau to the

project website and also invited Kara to speak to LS teachers in Hong Kong at their development forums in 2016–17.

To recognise this project's tremendous values in community engagement through knowledge transfer, Kara was awarded the **HKBU Knowledge Transfer Award 2016**.



Seminar attended by Liberal Studies teachers

References

Moreover, some journalists were using the research guidelines in the booklet to assess the validity of social science studies conducted by various organisations. The project enhanced the understanding of social science research methodology and its practices in the general public. Media coverage which corroborated the project's impacts include:

- HKBU On Campus (March 2016) Enhancing secondary school students' teaching and learning, Issue 99
- Media coverage by DBC Radio Campus Channel (29 May 2015)
- Ming Pao (明報) (13 May 2015) 「學者辦網站 教專題探究 年收30約訪 嘆學生照搬結論」
- Sing Tao Daily (星島日報) (13 May 2015) 「浸大通識支援網 助中學生專題研究」
- Ta Kung Pao (大公報) (13 May 2015) 「浸大支援通識科專題探究」

► Annex 4

Insightful sharing by successful local entrepreneurs

“I like competition. It will drive you to put 200% effort to stand out from the competitors” – Mr Steven Lam Hoi-yuen, Co-founder of GoGoVan



GoGoVan is a dominant logistics player in Hong Kong with its mobile app connecting customers to van drivers. The start-up founded by Mr Steven Lam and two other co-founders has been flourishing since its establishment in 2013 — expanding to various Asian regions and raising US\$16.5 million from Centurion Private Equity and Ren Ren. Students may think that

competition will only threaten the market share of the company. However, Steven thinks the fierce competition in the market would give him positive insights. It drove him and his team to optimise their mobile app to become more customer-focused and this made GoGoVan successfully stand out from the competition. To Steven, competition is not an obstacle, instead, it is the critical element to stimulate his innovation and inspire his courage.

“Innovation is crucial to the continuing success of my business” – Mr Peter Choi, Founder of Marryfun



One of the speakers in the sharing session co-organised with Unleash Foundation, Mr Peter Choi, the current owner of Marryfun, Palapple and Hiwave Dry Seafood, talked about how innovation helped boost his family’s traditional dry seafood business and paved his way on the start-up venture. Concerning that it is a traditional Chinese ritual to include dry seafood when preparing

for the “pre-wedding customs”, Peter has designed a mobile app that links up traditional Chinese rituals with web technology. The “crossover” turned the traditional Chinese dry seafood business into an online retail store and led to great success in both sales and exposure. The business was recently featured in Google Internet market report and Wall Street Journal Asia. Building on his innovative idea, Peter has further created another online platform “Marryfun” to offer the most preeminent and innovative wedding services for couples. His sharing has inspired students on how innovation can help a business survive in a competitive market.

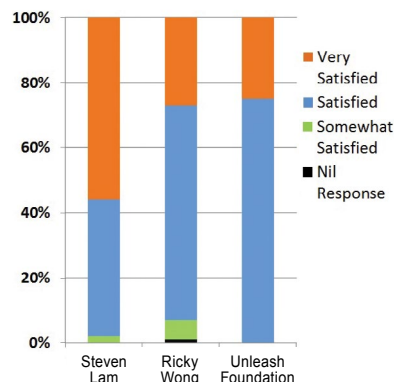
From the charts at the right, the majority of participants provided positive responses at these entrepreneurs sharing sessions. KTO believes organising heart-to-heart talks between entrepreneurs and students can stimulate and inspire students’ entrepreneurial minds. The authentic sharing had impressed students and they could explore the character traits of different entrepreneurs during their entrepreneurship journeys.

“Don’t be afraid of failure. Be persevere and always look for something new” – Mr Ricky Wong Wai-kay, Founder of Hong Kong Television Network Limited (HKTV)



“Is there any specific genes of being an entrepreneur?” Perhaps this is the most popular question our students want to ask Ricky. After cashing out of City Telecom (CTI), Ricky renamed his company as HKTV in 2013. “Doing telecommunications was no longer challenging for me, I want to do something I like,” he said. Daring to face challenges and eager to explore something you are passionate for — is believed to be part of the crucial factors that drove Ricky to pursue his “TV” dreams. The failure to attain a free TV license has never ruined his dreams. Instead, it prompted him to seek business opportunities in mobile TV and Internet shopping. While the e-shopping mall business is now rapidly expanding, the construction work of HKTV’s multimedia centre is due to complete by the end of this year. Ricky is still optimistic and ambitious on his entrepreneurship journey.

Overall rating of the seminars



► Annex 5

Entrepreneur Bazaar - The FIRST Bazaar at HKBU run by aspired young people



Between 14 — 18 March 2016, the Li Promenade on Shaw Campus at HKBU was filled with people and noise. Many staff and students went to the Li Promenade for one purpose — to support 11 stalls run by our entrepreneurial students. **Entrepreneur Bazaar**, organised by KTO and co-organised by Entrepreneurship Society, was the first bazaar that was wholly run by HKBU students.

The bazaar had attracted 19 students to launch 11 stalls in the Li Promenade at HKBU campus. The stalls sold a large variety of products such as DIY accessories, household decorations, Chinese herbal skin products and snacks. The stall owners welcomed this new initiative as they could make use of this platform to test their products in the market and learned practical skills on how to run a real business such as pricing strategies and transactions.



Miss Judy Tam (left) is currently studying at the School of Chinese Medicine and formed an online shop by selling DIY Chinese herbal skin products. She found Entrepreneur Bazaar as a good opportunity for her to showcase her products and had interaction with customers by answering their queries and advising which products best suit them. She treasured this face-to-face interaction as she could get the feedback directly. Most importantly, customers were more willing to buy after testing their products at the stall.

The Entrepreneur Bazaar had successfully promoted entrepreneurship on campus. All stalls participants agreed that the activity had enriched their experiences on entrepreneurship, and most of them found the Entrepreneur Bazaar was a good trial market for the potentials of their products.

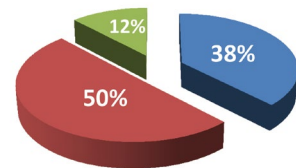


Dr Alfred Tan, Head of KTO (right) with four committee members of Entrepreneurship Society

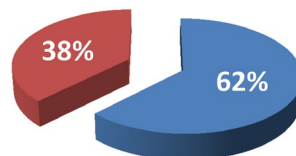


"I am passionate in designing accessories. Each of my end-products is unique and with special meaning. I enjoyed participating in the bazaar as this was a very good platform for me to test the market and most importantly, to interact with different people and share business ideas with my peers." – Miss Chan Long-yan, Faculty of Arts (left)

The bazaar offered me a good chance to test the market potentials of my products



The bazaar enriched my entrepreneurial experience



■ Strongly Agree ■ Agree ■ Neutral

The Inaugural HKBU Entrepreneur Day - a day of celebrating entrepreneurship

Organised by HKBU Knowledge Transfer Office and co-organised by Hong Kong Trade Development Council (HKTDC), HKBU Entrepreneur Day was successfully held on 27 May 2016. The inaugural HKBU Entrepreneur Day was attended by over 130 guests from the government sector, entrepreneurship stakeholders, HKBU alumni, senior management, staff and students. The event aimed at celebrating remarkable achievements of HKBU knowledge transfer and innovation research projects as well as technology start-up companies.



"KTO has done well to facilitate the transfer of knowledge and innovation to the commercial realm, especially between universities and industry, and establish tools to activate entrepreneurship", Mr Cheng Yan-kee, BBS, JP, Chairman of the Council, HKBU

On the HKBU Entrepreneur Day, Mr Cheng had delivered a speech for recognising the effort of KTO in nurturing entrepreneurship to effectively promote knowledge transfer to the broader community. He had specially praised those outstanding achievements of TSSSU companies in the 44th International Exhibition of Inventions of Geneva.

The representative of the co-organiser, Ms Adeline Wong, Assistant Executive Director of HKTDC, encouraged students to take advantage of the entrepreneurial environment at HKBU to test out their ideas and hone their business skills.



Apart from awards presentation ceremony, winners of the KT awards, Tech heroes and HKBU alumni entrepreneurs were invited to share their experience in starting up their business and/or launching their successful KT projects with the theme – "When Tech heroes meet with young entrepreneurs." This was an insightful sharing which aroused lots of interaction between speakers and audience for discussion of innovative technology as a disruptive business.

KT Awards Presentation



Starting from the left: Prof Ken Yung Kin-lam, winner of HKBU Innovationem Award; Prof Kara Chan Ka-wah, winner of HKBU Knowledge Transfer Award; Ms Annie Choi, Commissioner for Innovation and Technology; Ms Adeline Wong, Assistant Executive Director of Hong Kong Trade Development Council; Mr Cheng Yan-kee, BBS, JP, Chairman of the Council, HKBU; Mrs Pamela Chan Wong Shui, BBS, JP, Deputy Chairman of the Council, HKBU; Prof Rick Wong Wai-kwok, Vice-President (Research & Development)

"It's my honour to come back to HKBU again to meet with fellow teachers and schoolmates. I'm pleased to share my start-up experience to students and the event is a very good channel in promoting entrepreneurship at HKBU." — Miss Viola Lam Yuen-lee, 2009 Alumni, Founder and CEO of FS Education



The 44th International Exhibition of Inventions of Geneva Awards Presentation



Mr Cheng Yan-kee, BBS, JP, (seventh from the left), presented the awards to our HKBU Tech Heroes, Cathy Photonics Limited led by Prof Cheah Kok-wai (sixth from the left); OPER Technology Limited led by Prof Ken Yung Kin-lam (sixth from the right) and ANA Artwork Material Analysis Limited led by Prof Cheung Nai-ho (fourth from the right) who won awards at the 44th International Exhibition of Inventions of Geneva held in Switzerland

UGC Required Performance Indicators

Performance Indicators	2013-14	2014-15	2015-16	2016-17 (Projection)
Number of patents filed in the year (with breakdown by country and type)	Country	Country	Country	Country
	34 (US)	28 (US) ^{N1}	36 (US)	40 (US)
	7 (CN)	7 (CN)	8 (CN)	9 (CN)
	1 (EU)	6 (PCT)	3 (PCT)	6 (PCT)
	2 (PCT)	5 (HK)	6 (HK)	6 (HK)
	2 (HK)	3 (EP)	1 (EP)	1 (EP)
	1 (TW)	1 (CA)	2 (TW)	
	Type	Type	Type	Type
	1 (A47)	2 (A47)	1 (A47)	2 (A47)
	37 (A61)	28 (A61) ^{N1}	32 (A61)	37 (A61)
	1 (B82)	1 (A63)	1 (A63)	1 (C02)
	1 (C02)	1 (B82)	3 (C02)	5 (C07)
	1 (C07)	3 (C02)	1 (C05)	1 (C12)
	1 (C12)	2 (C07)	3 (C07)	3 (G01)
	3 (G01)	3 (G01)	1 (C12)	6 (G06)
	2 (G06)	7 (G06)	3 (G01)	7 (H01)
		3 (H01)	5 (G06)	
		6 (H01)		
Number of patents granted in the year (with breakdown by country and type)	Country	Country	Country	Country
	2 (CN)	5 (US) ^{N1}	13 (US)	13 (US)
	4 (US)	1 (CN)	1 (CN)	3 (CN)
			1 (HK)	2 (HK)
			1 (TW)	
	Type	Type	Type	Type
	2 (A61)	2 (A61) ^{N1}	13 (A61)	13 (A61)
	2 (G01)	1 (A23)	1 (B82)	1 (B82)
	2 (G06)	1 (C07)	1 (C02)	1 (C02)
		1 (G01)& 1 (G06) ^{N1}	1 (G06)	1 (C07)
			1 (G06)	
			1 (H01)	
Number of licenses granted (with breakdown by type)	1 (Royalty)	14 (Royalty)	16 (Royalty)	18 (Royalty)
Income (on cash basis) generated from intellectual property rights	HK\$6,504,793	HK\$6,831,150	HK\$5,609,403 ^{N2}	HK\$6,170,343
Expenditure involved in generating income from intellectual property rights	HK\$3,000,000	HK\$3,871,950	HK\$2,645,239 ^{N2}	HK\$2,909,763
Number of economically active spin-off companies	3 ^{N3}	3 ^{N3 & N4}	3 ^{N3 & N4}	3
Net income generated (or net loss arising) from spin-off companies	HK\$1,217,004	(HK\$836,000) ^{N5}	HK\$365,000	HK\$401,500
Number of collaborative researches, and income thereby generated	16 HK\$8,974,416	16 HK\$10,316,741	17 HK\$21,091,809 ^{N6}	18 HK\$23,200,990
Number of contract researches (other than those included in "collaborative researches" above), and income thereby generated	40 HK\$10,995,171	61 HK\$23,851,333	66 HK\$23,975,291	73 HK\$26,372,820
Number of consultancies, and income thereby generated	246 HK\$21,494,406	234 HK\$19,676,326	224 HK\$22,264,857 ^{N7}	246 HK\$24,491,343
Number of student contact hours in short courses or e-learning programmes specially tailored to meet business or Continuing Professional Development (CPD) needs	36,812	53,153	61,126 ^{N8}	67,239
Number of equipment and facilities service agreements, and income thereby generated	245 ^{N9} HK\$7,095,461	230 ^{N9} HK\$6,761,607	233 ^{N9} HK\$7,589,008 ^{N10}	256 HK\$8,347,909

Performance Indicators	2013-14	2014-15	2015-16	2016-17 (Projection)
Income received from CPD courses	HK\$5,022,723	HK\$3,460,893	HK\$3,133,580 ^{N11}	HK\$3,446,938
Number of public lectures / symposiums / exhibitions and speeches to a community audience	497	512	565	622
Number of performances and exhibitions of creative works by staff or students	108	137	82 ^{N12}	90
Number of staff engaged as members of external advisory bodies including professional, industry, government, statutory or non-statutory bodies	138	156	124	136

N1: The difference with 2014-15 CDCF was due to the difference in reporting timeframe.

N2: The decrease in income was due to decrease in sales of products.

N3: Company with some institutional ownership and using intellectual property from the institution.

N4: Breakdown of the spin-off companies.

*Institute for the Advancement of Chinese Medicine Ltd.

- Year of establishment: 1999.

- Size of employment: 3 (the General Manager, the Assistant Marketing Manager and the Product Development Officer), with other supporting staff contracted from HKBU.

- Nature of business: R&D of Chinese medicine products, testing and certification services, clinical trials, and publication of books.

*HKBU R&D Licensing Ltd.

- Year of establishment: 2014.

- Size of employment: 9 (administrated by KTO).

- Nature of business: Intellectual properties commercialisation and trading.

*HKBU Science Consultancy Company Ltd.

- Year of establishment: 2011.

- Size of employment: All contracted out to HKBU for the experts and professionals required.

- Nature of business: Provision of consultancy projects on science disciplines.

N5: The significant decrease in net income was due to additional cost for moving into Hong Kong Science & Technology Parks Corporation and a closure of laboratory.

N6: The income was significant increased due to an increase in the average of funding received per collaborative project such as Innovative and Technology Fund Collaborative Project.

N7: The income was increased due to an increase in the average of income per consultancy project.

N8: New projects and training courses were conducted in 2015-16.

N9: This number included data from Jockey Club Creative Arts Centre (JCCAC), the Academic Community Hall and The Chinese Medicine Teaching and Research Laboratory of the School of Chinese Medicine at HKBU.

N10: More rental income was recorded in 2015-16.

N11: More free courses were conducted in 2015-16.

N12: The number of performance and exhibitions were decreased as the events were open to HKBU staff, students and invited guests only in 2015-16.

HKBU Specific Performance Indicators

Performance Indicators	2013-14	2014-15	2015-16
Number of placements / internships, and average length	1,539 (places) 2.87 (months)	1,628 (places) 1.97 (months)	2,400 (places) ^{N1} 1.63 (months) ^{N2}
Books and other media for non-academic audiences	449	1,109	1,041
Number of mentors by University and non-University staff	257	313	367 ^{N3}
Number of videos produced by BU available for open access	1,455 ^{N4}	1,471 ^{N4}	1,694 ^{N4}
Download count of postgraduate theses to addresses outside HKBU	25,259 ^{N5}	30,579 ^{N5}	11,227 ^{N5}
View count of BUTube outside HKBU	141,263 ^{N6}	159,971 ^{N6}	129,187 ^{N6}
Number of positive media impact related to knowledge transfer coverage, including print, on-line and electronic media	1,228	1,359	1,551 ^{N7}
Number of staff available for media contact	331	329	344
Number of appointments of external members to HKBU advisory boards, committees or panels	235	261	274
Number of other activities related to Knowledge Application outside HKBU	28	46	104 ^{N8}

N1: The significant increase in number of placements/internships due to the introduction of new policy "One Belt, One Road" in the Mainland China.

N2: The average length was determined by organisers.

N3: New project and new mentorship programmes were conducted in 2015-16.

N4: This was an accumulated number.

N5: This number included the pageview of abstracts and actual downloads.

N6: Number of visits of BUTube was increased but the number of pageview was decreased.

N7: More articles were regularly published in 2015-16.

N8: More weekly courses, talks and workshops were conducted in 2015-16.

