ISSN: 2077-2491

Autumn/Winter 2018 ISSUE 19 第十九期

umagazine
澳大新語

融入大灣區
澳大促進人才培養科研創新

Embracing the Greater Bay Area
UM Nurtures Talent and Promotes Research and Innovation

本期附《 澳門大學年度簡報2017/2018》
UM Annual Report 2017 / 2018 enclosed

編者的話 *Editor's Words*

為配合澳門特區政府在大灣區規劃的推進落實，澳門大學作為公立大學，責無旁貸培養能迎合大灣區發展和挑戰的創新和多元人才，配合澳門未來經濟社會發展的需要。今期封面故事探討宋永華校長上任後推行的人才培養策略，以及配合大灣區發展所推出的項目，如何助力澳門更好地融入國家的發展大局。從山區裡走出來的宋永華校長，是一位傑出的科學家，兼具高瞻遠矚的教育視野，他在專訪裡跟讀者分享他的人生故事和教育理念。

人才培養需要從小做起，因此，澳大新成立了“澳門中小學生人文社科教育基地”及“澳門中小學生科技實踐基地”，在人才培養策略上走前一步，與澳門教育界緊密聯繫和合作，從中小學起開拓澳門學生在人文、社科、科技的創新視野，使學生從小就得到全人教育的發展，為未來的發展打下紮實的基礎。今期的專題訪問了身肩兩個基地人才培養重責的教授們，分享基地成立的長遠意義和現時所實施的人才培養項目。

澳大的中醫藥研究蜚聲國際，有一門由中華醫藥研究院陳新教授等授課的“中醫藥探秘”通識課程，深受學生歡迎。陳新教授的課將中醫知識與生活緊緊結合，我們特別走進他的課堂，瞭解其授課形式以及受學生歡迎的原因。

今期的人物故事，訪問了獲得卓越教學獎的法學專家稅兵教授、幼兒教育專家劉乃華教授以及歷史學家王笛教授，分享他們在教學和研究生涯裡一路前行探索的精彩故事。在“學院專欄”，請來了三位澳大學者撰寫有關基礎教育、網絡遊戲沉溺，以及量子計算的研究文章。

As a public university, the University of Macau (UM) is committed to supporting Macao's development plan in the Greater Bay Area by producing innovative, well-rounded graduates. In this issue's cover story, we interview Rector Yonghua Song, a scientist-turned-educator with humble beginnings in a remote Chinese village. Rector Song shares with us his life story, his philosophy of education, his strategies for student training, and the projects UM plans to launch to support the Greater Bay Area initiative.

Rector Song's story is a perfect example of how education received at a young age can have a far-reaching influence on one's later life. To give young students in Macao a head start, UM has established two educational bases in Macao, namely the Macao Base for Primary & Secondary Education in Humanities & Social Sciences, and the Macao Base for Primary & Secondary STEM Education. In collaboration with other educational institutions in Macao, these two bases will provide training courses in the humanities, social sciences, and science and technology, to help students achieve well-rounded development and lay a solid foundation for their future success. Two professors involved in the project explain the significance of the two bases and the training programmes currently in progress.

UM has an international reputation for its excellent research in Chinese medical sciences. But the university is just as good in teaching the discipline. A general education course in Chinese medicine, offered by Prof Chen Xin in the Institute of Chinese Medical Sciences and his colleagues, is especially popular with students. Prof Chen discloses how he engages the students by teaching knowledge with useful applications in everyday life.

Professors like Chen Xin treat teaching as a calling. Many faculty members at UM share this attitude. Law professor Shui Bing, who won the Teaching Excellence Award this year, and Prof Liu Naihua, an expert in early childhood education, offer insightful answers to the question, 'What does it mean to be a true educator?' Other articles not to be missed in this issue include the one about Prof Wang Di, a dedicated historian, as well as the three 'Faculty Column' pieces that discuss basic education, addiction to online gaming, and quantum computation, respectively.

張惠琴 Katrina Cheong

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出版 Publisher
University of Macau

ISSN: 2077-249

澳大新語 umagazine 是澳門大學之官方刊物，每年出版兩期，旨在報導教學、科研及大學發展的最新動向。
is a biannual publication of the University of Macau. It aims to provide information on the latest development of the university in teaching, research and other areas.

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澳大促進人才培養科研創新

Embracing the Greater Bay Area
UM Nurtures Talent and Promotes Research and Innovation

澳門大學近年在教學和研究領域均取得了良好的成績，在2019年《泰晤士高等教育》世界大學排名前400。五大學科領域包括工程學、藥理學與毒理學、計算機科學、臨床醫學及社會科學總論進入基本科學指標資料庫（ESI）前1%。宋永華校長表示，今日的澳大，進入了前所未有的發展時期。澳大取得的飛躍進步，有賴中央政府、澳門特區政府和社會的支持。

今期的封面故事，探討澳大在社會各個層面的支持下逐步取得的成果，並專訪了宋永華校長，瞭解其上任後如何逐步帶領澳大步入新的發展階段，以及推行的一系列配合大灣區發展推出的人才培養和科研創新的新策略。

In recent years, the University of Macau (UM) has achieved good results in teaching and research. In the *Times Higher Education* World University Rankings 2019, it is ranked among the top 400. It is among the top 1% in Essential Sciences Indicators (ESI) rankings in five subjects, namely Engineering , Pharmacology & Toxicology, Computer Science, Clinical Medicine, and Social Sciences, General. According to Rector Yonghua Song, today's UM is on the threshold of a new era, and its rapid progress would not have been possible without the support of the central and Macao SAR governments as well as people from all walks of society.

In this issue's cover story, we discuss UM's achievements in various areas and interview our rector Yonghua Song about his new strategies for talent development and innovative research to support the development of the Greater Bay Area.

配合大灣區　人才培養策略

Talent Development Strategies In Support of the Greater Bay Area Initiative

文 Chinese｜張愛華 Ella Cheong　翻譯 Translation｜陳靜 Ruby Chen　圖 Photo｜何杰平 Jack Ho

澳門大學是一所國際性的大學，有國家和澳門特別行政區政府的支持、國際化的師資隊伍、中西多元文化的教學環境、國際化管理模式，在教學、研究和人才培養上奠下了良好的基礎。宋永華校長在2018年初上任後，提出了培養創新和多元人才的教育理念，並通過多項措施來實踐。他說：“澳大未來的首要任務是加強人才培養，協助澳門建設成大灣區西岸的人才培養基地和科技創新的高地。”

The University of Macau (UM) is an international university blessed with the full support of the central and Macao SAR governments. Boasting an international faculty, a vibrant multicultural campus, and an international mode of governance, it is well-prepared for the mission of teaching, research, and student training. Soon after he assumed office as the new rector of UM in 2018, Prof Yonghua Song put forth his plan for the university to produce innovative, well-rounded graduates. He declared, 'In the future, UM's first priority is to strengthen student training and help Macao stand tall as a centre for talent development and scientific and technological innovations on the west bank of the Pearl River.'

宋永華校長
Rector Yonghua Song

新育人藍圖

澳大是澳門唯一一所進入THE和QS世界大學排名的澳門高等院校。澳大在2019年《泰晤士高等教育》世界大學排名前400。在Quacquarelli Symonds（QS）2019世界大學排名為443位。

宋永華校長表示，今日的澳大，進入了前所未有的發展時期，“澳大以往在教學和研究領域已做出了很多值得我們驕傲的成績，未來，我們要繼往開來，在現有的良好基礎上不斷完善、優化及提升。”在規劃澳大未來發展藍圖時，宋校長指出提供高品質的本科生教育是卓越大學的基本使命，“我們已開展優化通識教育、專業教育、研習教育

A New Blueprint for Training Professionals

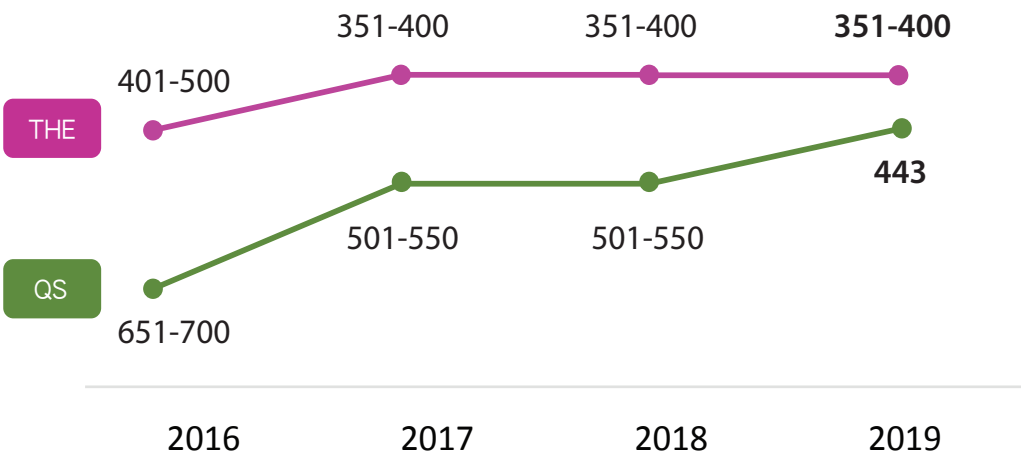
Among institutions of higher learning in Macao, UM is the only one to be included in the university rankings by the *Times Higher Education* (THE) and Quacquarelli Symonds (QS). It is ranked among the top 400 in the THE World University Rankings 2019. In the QS World University Rankings it will reach No 443 in the upcoming 2019 exercise.

Rector Song believes UM is on the threshold of a new era. 'Proud though we are of UM's past achievements in both teaching and research, we must build on our accomplishments to continuously improve, optimise, and upgrade ourselves.' In drawing a blueprint for UM's future development, Rector Song stresses that providing high-quality undergraduate education is the mission, first and foremost, of an excellent university. He says, 'We have already embarked on the path of a whole-person education that consists of discipline-specific education, general education, research and internship education, and community and peer education. Our Honours College, residential colleges, and faculties work in concert to create a synergistic effect in educating the students. At the same time, we must strive to improve the quality of postgraduate education.' He continues, 'As we are a public university in Macao, it is incumbent on us to redouble our efforts to produce innovative, well-rounded, high-minded, and China-loving graduates. In other words, we want to turn out graduates that will support the social and economic development of Macao, in tandem with the government's policies for talent development and youth training.'

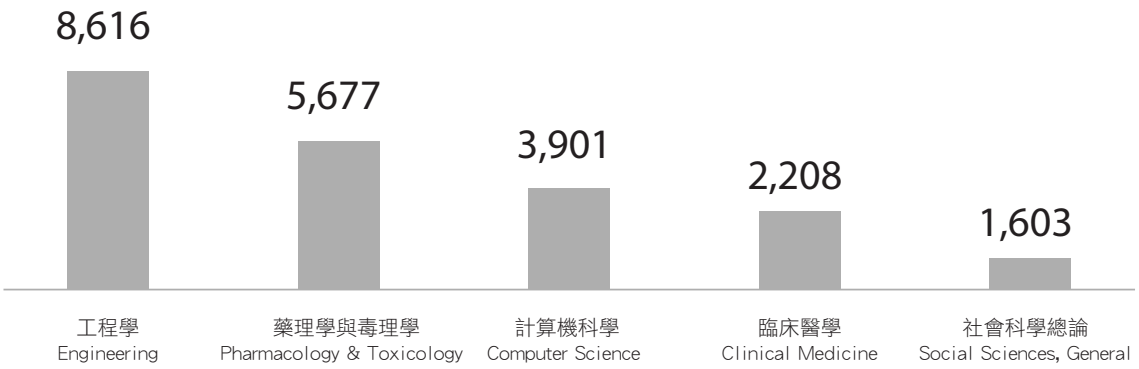
International Rankings by Subject

The programmes UM currently offers cover a wide array of disciplines, with some programmes being ranked among the top in the world. It is among the top 1% in Essential Sciences Indicators (ESI) rankings in five subjects, namely Engineering, Pharmacology & Toxicology, Computer

澳大近年在THE和QS世界大學之排名
UM's Upward Trend in THE & QS Wold Univesiy Rankings (WUR)



澳大進入基本科學指標資料庫（ESI）前1% 的五大學科領域
UM is ranked among the top 1% in ESI in five subjects



及社群教育在內的全人教育模式，發揮榮譽學院、住宿式書院系統與學院的協同育人優勢。與此同時，採取系列措施提高研究生教育品質。他強調說：“澳大作為澳門的公立大學，未來的首要任務是要繼續加大力度培養具備家國情懷並志向遠大，具有多元和創新思維的人才，全力配合澳門未來經濟社會發展的需求，及澳門特區政府青年培養和人才發展戰略，積極發揮大學協同育人的優勢。”

學科進入世界排名

澳大的學科涵蓋廣泛，其中多個學科位處世界前沿。五大學科領域：工程學、藥理學與毒理學、計算機科學、臨床醫學及社會科學總論進入基本科學指標資料庫（ESI）前1%。在語言學科，包括英語、葡語和中文，以及微電子和中醫藥等領域都具有良好的優勢。“款待及休閒管理學”世界排名前50，“語言學”、“心理學”、“工程與科技”與“計算機科學”排名前200，“法學”與“教育學”排名前300。

凝聚重點培養人才

在新的辦學願景和目標驅動下，宋永華校長上任的第一年已積極落實一系列的培養多元和創新人才的工作，凝聚重點，全力為澳門特區政府培養中葡雙語、中國歷史文化、數據科學、創新創業，以及物理、化學及生物科學等方面的人才。

宋校長牽頭引領成立的“澳門中小學生人文社科教育基地”以及“澳門中小學生科技實踐基地”，

Science, Clinical Medicine, and Social Sciences, General. In some disciplines, such as English, Portuguese, Chinese, microelectronics, and Chinese medical sciences, the university enjoys a competitive advantage. In the World University Rankings by Subject, UM is ranked among the top 50 in Hospitality and Leisure Management; in the top 200 in Linguistics, Psychology, Engineering and Technology, and Computer Science; in the top 300 in Law and Education.

Identifying Key Areas for Talent Development

Driven by a new vision, Rector Song began to implement a series of strategies designed to train innovative, well-rounded graduates during his first year in office, with a clear focus on such areas as Chinese and Portuguese languages, Chinese history and culture, data science, innovation and entrepreneurship, physics, chemistry, and biological sciences.

The Macao Base for Primary & Secondary Education in Humanities & Social Sciences, and the Macao Base for Primary & Secondary STEM Education, which were initiated by Rector Song and are comprised of the Confucius Institute, the Chinese-Portuguese Bilingual Teaching and Training Centre, and the Centre for Chinese History and Culture, represent UM's effort in designing a strategy for a panoramic vision that takes in basic education, higher education, and community resources to prepare itself for a bigger footprint in Macao, a special role in the Greater Bay Area, and a pivot towards the nation and the world. This is a vision that has the full support of the government. Rector Song says, 'We aim to build a platform and a better learning environment to facilitate the growth of the youth in Macao. The Centre for Chinese History and Culture will launch various programmes, including a master's degree programme in Chinese history and culture, an instructor programme in Chinese history and culture, and a certificate programme in the civilisation of Macao and China. We hope to produce graduates who have a deep understanding of their motherland and of

是澳大從科技和社科結合基礎教育、高等教育、社團力量以及政府支持的全方位“立足澳門、融入灣區、面向全國、走向世界”的佈局。宋校長希望“培養更多瞭解國家、瞭解澳門、德才兼備的優秀新一代澳門青年。”澳大還全面推出“澳大濠江人才計劃”，包括澳大濠江博士生獎學金、澳大濠江博士後獎學金、澳大濠江傑出訪問學者、澳大濠江學者，為澳門本地培養更多高端人才，回饋社會。

創新人才迎社會發展

“創新，不是紙上空談，創新靠的是甚麼？靠的是創新人才！”宋校長說：“在科技創新領域方面，澳大將繼續透過澳大協同創新研究所培養創新創業人才。”該研究所轄下的創新中心將繼續招募入駐及孵化團隊，致力為學生提供創新創業的培訓機會及相關專業諮詢服務，以及推薦團隊到灣區內參加創業比賽，促進學生融入灣區及激發他們參與創新創業的主動性和積極性。數據科學中心主力進行跨領域的數據研究，引領數據科學應用於各專業層面。

為進一步回應社會對大數據技術課程的需求，宋校長說：“澳大正籌備於2019/2020學年開辦數據科學碩士學位課程，透過跨學科合作教授與大數據有關的技術。此外，澳大亦計劃開辦應用物理及化學理學士學位課程和綜合科學教育學士學位課程，培養本地高中的物理、化學及生物老師，以及初中的綜合科學老師，並致力提升老師統籌STEM學科的能力，為澳門培養更多物理、化學及生物科學的理科專才。”

Macao, graduates who have both expertise and integrity.' He points out that the university has launched the UM Macao Talent Programme which consists of four parts, namely the UM Macao PhD Scholarship Programme, the UM Macao Postdoctoral Fellowship Programme, the UM Macao Distinguished Visiting Scholar Programme, and the UM Macao Fellow Programme. 'These programmes are our way of repaying society for its support by training high-calibre professionals,' he says.

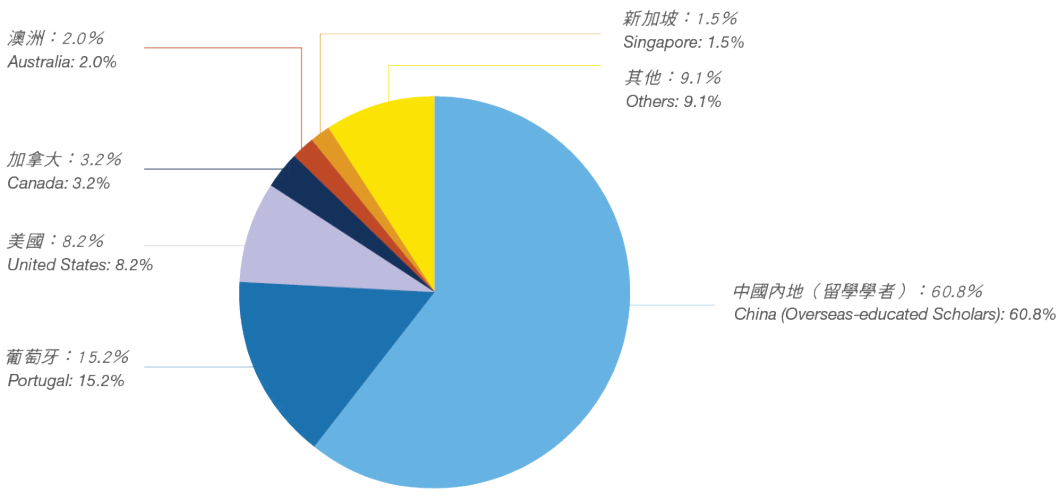
Creating Innovative People to Meet Future Challenges

'We shouldn't just pay lip service to innovation. What does innovation entail? It calls for innovative people,' says Rector Song. 'In the area of scientific and technological innovation, UM will continue to train innovative entrepreneurs through the Institute of Collaborative Innovation.' The Centre for Innovation under the institute will recruit promising teams for business incubation. The centre is committed to providing training and consultation for entrepreneurially-inclined students, and will recommend teams for entrepreneurial competitions in the Greater Bay Area, to better encourage students to contribute to the Greater Bay Area by starting their own businesses. The Centre for Data Science collates and studies data from various sources and its applications in different areas.

In view of the growing demand for academic programmes in big data technology, Rector Song says, 'We plan to launch a master's degree programme in data science in the 2019/2020 academic year, which will adopt a multidisciplinary approach to the teaching of related technologies. We also plan to offer bachelor of science programmes in applied physics and chemistry, as well as a bachelor's degree programme in integrated science education. Through these programmes, it is hoped that we can better train local high school teachers of physics, chemistry, and biology, as well as junior high school teachers of integrated science. We want to help the teachers improve their skills in

師資來自十多個國家

The International Composition of the Faculty Team



澳大學生的未來，充滿發展的機遇，宋校長有信心地說：“澳大擁有一批來自全球10多個國家的優秀教學人員，致力培養多元和創新人才，希望能夠為大灣區和國家發展提供人才支撐。大灣區規劃及一帶一路建設為澳門和年輕人的發展提供了更多就業和創業的機會，我們鼓勵學生以創新的思維，為澳門融入大灣區、融入國家發展出一分力。”

coordinating STEM subjects so we can produce more professionals in physics, chemistry, and biology.'

Rector Song is optimistic about the prospects of UM graduates. He says, 'UM boasts an outstanding faculty team comprised of scholars from around the world. The university is committed to producing well-rounded, innovative graduates to support the development of the Greater Bay Area and China. The Greater Bay Area initiative and the Belt and Road initiative have created many employment and entrepreneurial opportunities for young people in Macao. We encourage our students to think creatively, and to help Macao integrate into the Greater Bay Area and contribute to the development of China.'

1.國家教育部向澳大贈送“博雅之壁”雕塑
The 'Wall of Wisdom' sculpture from the Ministry of Education

2.澳大第三個國家重點實驗室：智慧城市物聯網國家重點實驗室於2018年10月8日揭牌
The State Key Laboratory of Internet of Things for Smart City was inaugurated on 8 October 2018

3.澳大作為首批成員單位加入“一帶一路”國際科學組織聯盟
UM is among the first to join the Alliance of International Science Organisations in Belt and Road Region

重要事件回顧 Major Milestones

國家關懷

- 2018年6月，習近平主席回覆澳大的聯名信，肯定了澳門高校科技創新取得的新進步，並希望澳門高校培養更多愛國愛澳人才，創造更多科技成果，助力澳門經濟適度多元可持續發展和助力粵港澳大灣區建設。
- 2018年4月，國家教育部向澳大贈送“博雅之璧”雕塑，該雕塑承載了澳大的校訓精神和“大博”、“大雅”的人才培養理念，以及喻意澳大弘揚中華優秀傳統文化和傳統美德。
- 2018年10月9日，國家科技部考察澳大微電子、中醫藥、以及智慧城市物聯網三個國家重點實驗室。國家科技部副部長張建國肯定澳大在培育人才、提升國際聲譽、推動產學研合作的努力。
- 2014年12月，習近平主席視察澳大，讚揚澳大在辦學制度理念創新。
- 2013年11月7日，時任國務院副總理汪洋主持新校園啟用儀式。
- 2009年12月20日，時任國家主席胡錦濤為新校園主持奠基儀式，希望澳大建成一所具有一流設施、一流師資、一流人才、一流成果的世界一流大學。
- 2009年1月，時任國家副主席習近平視察橫琴島，在訪問澳門期間宣佈中央決定開發橫琴島，澳大新校園項目正式啟動。

政府支持

- 澳門特別行政區行政長官崔世安作為澳大校監兼大學議庭主席，在出席2018年澳大大學議庭及校董會聯席會議上，期盼澳大配合澳門特區未來經濟社會發展的變化和需求，發揮大學協同育人的優勢，加強對各類高端人才培養。
- 崔世安校監在2018年澳大畢業禮上致辭時表示，支持澳大積極改革課程體制，努力建構完備的書院體系，深入探索全人教育的理念和實踐。
- 澳大獲頒授2016年“教育功績勳章”，為首間獲此勳章的高等院校。

社會認同

- 2009年12月，澳門大學發展基金會成立，其宗旨在於支持及促成澳大實現其學術及教育之目標，使澳大在本地及國際上具有更佳之競爭力，並為此而創設所需及有利之條件。
- 每年有多位澳大成員獲澳門特區政府頒授功績勳章及獎狀，多位澳大學者於澳門科學技術獎頒獎禮中獲嘉許並囊括多個獎項。
- 澳大獲眾多港澳社會賢達及校友捐款支持住宿式書院、圖書館、教學樓的建設及發展。
- 獲眾多機構及個人慷慨捐贈，向品學兼優的學生頒發獎學金。

Support of the Central Government

- In June 2018, President Xi Jinping replied to a joint letter from UM. In the letter, President Xi recognised the new progress made by higher education institutions in Macao in scientific and technological innovation, and expressed his hope that these institutions would produce more graduates with a love for their homeland and for Macao, attain new achievements in science and technology, promote the moderate diversification of Macao's economy for sustainable development, and contribute to the development of the Guangdong-Hong Kong-Macao Greater Bay Area.
- In April 2018, the Ministry of Education gifted UM a sculpture 'The Wall of Wisdom'. Inscribed with the university motto and the words 'Great Knowledge' and 'Great Character', two ideals UM students aspire to, the sculpture symbolises UM's commitment to disseminating fine traditional Chinese culture and traditional Chinese virtues.
- On 9 October 2018, the Ministry of Education visited three state key laboratories at UM, in microelectronics, Chinese medical sciences, and the Internet of Things for smart cities. Zhang Jianguo, vice minister of science and technology of China, praised the university for its efforts in talent development, in enhancing its international reputation, and in fostering collaboration with industry and research institutes.
- In December 2014, President Xi Jinping visited UM and praised UM for its innovative education system and philosophy.
- On 7 November 2013, then State Council Vice Premier Wang Yang officiated at the inauguration ceremony for the new campus.
- On 20 December 2009, then Chinese President Hu Jintao officiated at the groundbreaking ceremony for the new campus and expressed his hope for UM to become a world-class institution with world-class facilities, world-class faculty team, world-class graduates, and world-class achievements.
- In January 2009, then Vice President Xi Jinping visited Hengqin Island. During his stay in Macao, Xi announced the central government's decision to develop Hengqin Island. That was when the new campus project officially kicked off.

Support of the SAR Government

- While addressing the 2018 Joint Meeting of the University Assembly and University Council, Chui Sai On, chief executive of the Macao SAR, chancellor of UM, and chair of the University Assembly, expressed his hope that UM would anticipate and meet the changes created by the fast social and economic development of Macao, make use of the integrated approach to education, and redouble its effort in training high-calibre professionals in various fields.
- In his speech at the UM Congregation 2018, Chui said the SAR government would continue to support UM in its reform of the curriculum structure, in the development of a sound residential college system, and in the implementation of whole-person education.
- UM became the first university in Macao to receive the 2016 Medal of Merit—Education from the SAR government.

Support of Society

- In December 2009, the University of Macau Development Foundation was established, with the aim of supporting UM to attain its academic and educational goals, helping UM increase its competitiveness locally and internationally, and creating all necessary and favourable conditions for such purposes.
- Each year, numerous UM members receive medals or certificates of merits from the SAR government. Many UM scholars have received prizes at the Macao Science and Technology Awards.
- Many prominent community members and UM alumni from Macao and Hong Kong have made donations to the university, to support the construction and development of residential colleges, university library, and classroom buildings.
- Numerous institutions and individuals have made donations to the university in the form of scholarships to reward outstanding students.

澳大參與大灣區發展項目

UM Participates in the Greater Bay Area Initiative

文 Chinese & English｜葉浩男 Davis Ip　圖 Photo｜何杰平 Jack Ho

廣受關注的粵港澳大灣區發展為三地的協同創新繪畫藍圖，亦為澳門大學帶來嶄新機遇。為配合澳門特區政府在大灣區規劃的推進落實，澳大在科研創新、人才培養和學術合作等領域精益求精，與大灣區各地的科研機構和企業緊密合作，致力成為大灣區的人才培養基地和科技創新高地。

The Guangdong-Hong Kong-Macao Greater Bay Area development scheme, as a blueprint for collaborative innovation, presents important opportunities for the University of Macau (UM). Aligning itself with the Macao SAR goverment's commitment to the integrated development of the Greater Bay Area, UM has been emphasising technological innovation, nurturing talent and academic collaboration across the region. Working closely with research institutions and enterprises, UM aims to transform itself into the Greater Bay Area's talent-nurturing hub and locus of technology.

澳大安排學生到大灣區城市考察和交流
UM arranges for students to visit the Greater Bay Area

匯聚資源 開拓科技創新

澳大目前有一系列具針對性的計劃助力大灣區建設“國際科技創新中心”，同時呼應國家主席習近平今年6月對澳門高校提出的“創造更多科技成果”的期望。澳大校長宋永華教授指出，大學致力成為大灣區的人才培養基地和科技創新高地。“澳大正積極建立一個擁有高端基礎設施和核心技術的實驗平台，促進學術研究，並創造一個世界級的學術環境與一流的教學和科研團隊。”作為澳門公立大學，澳大在眾多學科擁有卓越的研究團隊，包括專攻微電子、中醫藥和智慧城市物聯網研究的三個國家重點實驗室，將會為大灣區的發展添注動力。

澳大與大灣區各地的科研機構和企業緊密合作，涵蓋生物醫學、物理和中醫藥研究等範疇。校方在2011年成立珠海澳大科技研究院，2017年將該院遷至國家級新區橫琴新區，著力促進澳大科研成果在內地的產業化和推廣。過去數年，研究院在國家科學技術部和國家自然科學基金會的支持下開展了一系列研究項目。

深耕珠海之際，澳大亦放眼珠江三角洲另一端的深圳。宋永華校長表示，澳大與深圳大學和南方科技大學等深圳院校均有合作專案，包括博士生聯合培養項目。澳大應用物理及材料工程研究所將於年內落實與深大建設聯合實驗室及合作研究的項目，並與總部設於深圳的華為公司建立合作研究關係。

另一方面，鑑於澳大與中山大學在化學合成、光電與能源材料方面的研究各有優勢，雙方在今年5月成立了“教育部聯合重點實驗室”。宋永華校長相信，“兩校的深度合作將是大灣區內高校跨境合作的典範”。在相關的研究領域上，校方今年7月更與

Gathering Resources for Technological Innovation

Supporting the Greater Bay Area to become a global technology and innovation hub, UM has taken targeted steps which echo President Xi Jinping's expectations for Macao's tertiary institutions – more achievements in science and technology. UM Rector Yonghua Song stresses that the university strives to become a talent-nurturing hub and technological platform for the Greater Bay Area. 'UM is proactively building laboratories with top facilities and core technologies to advance our studies and create a world-class faculty in both teaching and research," Song says. As the only public comprehensive university in Macao, UM has reputable research forces in a wide range of subject areas. Among them are three state key laboratories which focus on microelectronics, Chinese medical sciences and Internet of Things for smart cities, which are ready to give fresh impetus to the Greater Bay Area.

In biomedical sciences, physics and Chinese medical sciences, UM enjoys strong partnerships with academic institutes and enterprises in Greater Bay Area cities, notably Zhuhai, where the Zhuhai UM Science & Technology Research Institute was founded in 2011. Recognising opportunities in Zhuhai's rapidly developing Hengqin New Area, UM relocated the institute there in 2017 to foster the promotion and commercialisation of its research outcomes in mainland China. Over the years, the institute has undertaken various research projects as sponsored by national entities including the Ministry of Science and Technology of the People's Republic of China and the National Natural Science Foundation of China.

Along with its strong presence in Zhuhai, UM also sets eyes on the other side of the Pearl River Delta, with Shenzhen high on the agenda. As Song pointed out, UM cooperates, in forms such as joint PhD programmes, with Shenzhen University and Southern University of Science and Technology. UM's Institute of Applied Physics and Materials Engineering (IAPME) is to set up a joint laboratory with Shenzhen University later this year, in addition to their many collaborative research projects. IAPME is

澳大與香港浸會大學和廣東省中醫院在廣州啟動“粵港澳大灣區中醫藥創新中心”
Representatives from UM, Hong Kong Baptist University, and Guangdong Provincial Hospital of Chinese Medicine gather in Guangzhou to launch an innovation centre for Chinese medical sciences

澳大在2018/2019學年錄取了270多名來自大灣區廣東省9市和香港的優秀學生
UM admitted over 270 outstanding students from the Greater Bay Area (nine cities in Guangdong province and Hong Kong) in the 2018/2019 academic year

粵港澳的物理學會在澳大合辦“粵港澳大灣區物理學會2018聯合年會”，為區內的科技合作開創平台。

在另一優勢學科中醫藥研究方面，澳大與粵港兩地的院校設有多個合作平台。今年8月，澳大與香港浸會大學和廣東省中醫院在廣州啟動“粵港澳大灣區中醫藥創新中心”。該中心著力建設“教育部粵港澳聯合實驗室”，促進在防治免疫相關疾病方面的中醫藥學術研究、產業轉化與臨床應用。

培養人才 把握灣區機遇

大灣區發展為粵港澳的青年開闢廣闊的成長和事業發展空間，港澳居民赴粵尋找機遇蔚然成風。宋永華校長表示，澳大正從多方面提升本地青年在區內的競爭力，尤其著重培養中葡雙語人才和促進創新創業，為他們在大灣區的多元發展累積力量。為協助培養高水平的中葡雙語人才，澳大在2017年5月成立中葡雙語教學暨培訓中心，強化澳門乃至整個大灣區與葡語國家的連結。

在協助學生於大灣區創業方面，澳大協同創新研究所培養創新創業人才，為青年提供創業知識和專業諮詢，協助他們化理念為實踐，投身區內龐大的市場。澳大近年更積極推薦學生創業團隊參與“百萬獎金創業大賽”等區域性創業比賽，部分獲獎團隊更已在大灣區開展創業孵化。

與此同時，澳大鼓勵和安排學生到多個大灣區城市考察、交流、創業和實習，今年暑假就有多名學生到橫琴的公共機關和銀行實習，親身探索大灣區的

also building a research partnership with the Shenzhen-headquartered telecommunications giant Huawei.

In synthetic chemistry, optoelectronics and energy materials research, UM and Sun Yat-Sen University (SYSU) established a Ministry of Education joint key laboratory in May, hoping to play to their complementary strengths. This indicates each university's renewed commitment to academic partnership. As Rector Song says, the two universities' in-depth cooperation will serve as a model for cross-border cooperation among their counterparts in the Greater Bay Area. In the same vein, UM joined the physical societies in Macao, Hong Kong and Guangdong in hosting the first Joint Annual Conference of Physical Societies in Guangdong-Hong Kong-Macao Greater Bay Area on the UM campus in July to offer platforms for technological cooperation.

UM is gaining momentum in its intra-Greater Bay Area cooperation in Chinese medical sciences. In August, representatives from UM, Hong Kong Baptist University, and Guangdong Provincial Hospital of Chinese Medicine gathered in Guangzhou to launch an innovation centre for Chinese medical sciences, which is tasked to promote research projects on immune deficiency diseases and their commercialisation and clinical applications, and to build a Ministry of Education joint laboratory.

Preparing Students for Bay Area Opportunities

The Greater Bay Area's accelerating growth provides young people in Macao with tremendous scope for personal growth and professional development. As people from Macao and Hong Kong are increasingly keen to seize the region's new opportunities, Song says UM supports its students on all fronts to boost their competitiveness. In particular, great importance has been given to training Chinese-Portuguese bilingual professionals and promoting of innovation and entrepreneurship, with both initiatives aiming to prepare Macao's young people for endeavours in the Greater Bay Area. In May 2015, UM inaugurated its Chinese-Portuguese Bilingual Teaching and Training Centre to nurture high-calibre bilingual professionals who can strengthen links between Portuguese-speaking countries and Macao as their gateway to the Greater Bay Area.

To support students' business plans in the Greater Bay Area, UM's Institute of Collaborative Innovation works to equip them with professional knowledge and skills, so that they can put their innovative entrepreneurial ideas into action to tap into the region's huge market. UM sponsors students to join the One Million Dollar Entrepreneurship Competition and other regional competitions. Encouragingly, some awarded UM student teams have already started businesses in the Greater Bay Area.

Gaining first-hand experience is a good way to learn, particularly evident in UM's efforts to encourage and facilitate students to visit, intern and open businesses in the Greater Bay Area. Among them are UM students who undertook internships at public entities and banks in Hengqin last summer. Meanwhile, this year UM admitted over 270 students from Hong

發展。此外，澳大在新學年錄取了270多名來自香港和大灣區廣東省9市的學生，期望增進區內青年的互相瞭解，迸發創新創業的火花。

締造平台 深化學術合作

粵港澳三地高等院校林立，各有優勢，但大灣區的深度協同發展絕非一校之力足以支撐。正如澳大副校長（學術）倪明選教授指出，大灣區教育資源豐厚，關鍵在於學校間如何合作。“譬如在實驗室儀器平台共用方面，不可能每間學校都花大量經費去購買設備，如果能通過平台共用，鼓勵大家合作，才能優勢互補，共同發展。”

有見及此，澳大在2016年與中山大學和香港中文大學共同發起“粵港澳高校聯盟”，並與區內多所高校成立了“粵港澳高校圖書館聯盟”和“粵港澳高校創新創業聯盟”等協作平台，更擬年內在依托中山大學超算中心的基礎下成立“超算聯盟”，強化三地在超級計算的研究和應用上的合作。澳大亦與華南理工大學簽署合作協議，推進兩校及粵澳兩地高等教育的發展，鼓勵資源共享。

粵港澳大灣區發展為澳大締造難得的機遇。舉目前瞻，宋永華校長強調澳大會繼續配合大灣區的發展策略，“成就立足澳門、融入灣區、面向全國、走向世界，共同建設澳門、服務國家、貢獻人類的卓越大學”。

Kong and nine neighbouring cities in Guangdong, seeking to enhance understanding among young people from different parts of the Greater Bay Area and inspire new possibilities for innovation and entrepreneurship.

Building Platforms for Strong Collaboration

The in-depth integration as enshrined in the Greater Bay Area's developmental vision calls for stronger collaboration among the region's many tertiary institutions, which show a great variety of strengths and patterns. As UM Vice Rector (Academic Affairs) Lionel Ni says, while the region is rich in academic resources, the real question is how its tertiary institutions will cooperate for the best possible outcome. 'On issues such as laboratory appliances, it is infeasible that every institution spends heavily on them. Their complementary development can only be achieved through resource sharing via various platforms.'

In 2016, UM, SYSU and the Chinese University of Hong Kong launched the Guangdong-Hong Kong-Macao University Alliance, followed by intra-Greater Bay Area alliances on interlibrary collaboration, entrepreneurship and innovation. A Greater Bay Area alliance on supercomputing, with UM as a member, is to be launched and attached to the National Supercomputer Center in Guangzhou on the SYSU campus. In addition, UM and South China University of Technology signed a collaboration agreement in August to promote the development of both sides and the overall higher education in Macao and Guangdong.

The Greater Bay Area's development has been generating new opportunities for UM. Looking forward, Rector Song reaffirmed that the university will keep striving for excellence, in light of the city cluster strategy, to position itself in Macao, integrate with the Greater Bay Area, and develop relations with China and beyond.

澳大與中山大學在化學合成、光電與能源材料方面的研究各有優勢，共同成立“教育部聯合重點實驗室”

In synthetic chemistry, optoelectronics and energy materials research, UM and Sun Yat-Sen University establish a Ministry of Education joint key laboratory to play to their complementary strengths

從科學家到教育家
宋永華校長的教育理念

From a Scientist to an Educator
Rector Yonghua Song's Philosophy of Education

文 Chinese | 張愛華 Ella Cheong　翻譯 Translation | 陳靜 Ruby Chen　圖 Photo | 何杰平 Jack Ho

電氣工程學家宋永華教授不僅是一位傑出的科學家，更是一位胸懷“得天下英才而教育之”夢想的教育家。2018年1月9日，宋永華教授帶著他的教育夢想來到澳門，出任澳門大學新校長一職。他把自己從出生到2017年的人生分成三個重要的階段：求學、出國、回國。由接任澳大校長的一刻起，他的人生又進入新的階段。“我希望把以往在高校積累的管理和教學的經驗貢獻澳大，幫助澳大實現教育的願景。”

Prof Yonghua Song is a scientist by training and an electrical engineer by profession. Yet he feels called to a different and higher mission: to turn out identifiable talent for the country and a better world. This higher purpose now defines his life. To his scientific mind, his pre-UM personal story is divided into three stages: schooling, going abroad, and returning home. On 9 January 2018, the day he took over as UM's new rector, the fourth stage of his life began. Henceforth he will call upon his past experience and every fiber of his being to lead this university to its destiny. To him, the rectorship is not simply a job; it is a mission which he was born to fulfill. His actions and words demonstrate that he is ready for the challenge.

大山裡來的孩子

1964年1月，宋永華校長出生於四川巴中一個窮鄉，他的父母抱著“窮莫丟書”，堅持咬實牙關供他完成大學學位。他的母親曾回憶說：“永華6歲入學，在和平鄉那個地方，6歲小孩上學是一件稀罕事。永華讀書著迷是出了名的，他一門心思就在學習上，從來不浪費時間。”

宋校長以往接受傳媒訪問時，經常強調說大山讓他學會自強不息，大山讓他懂得知難而進，大山人的性格讓他一步步走向成功。他從小刻苦學習，在16歲那年考上成都科技大學，1989年在中國電力科學研究院獲博士學位，成為他家鄉的第一位博士。1991年在清華大學完成博士後便到英國留學訪問。他說出國純屬偶然，“在1989年，我在北京的一次國際學術會議上發表的文章引起了一些人的興趣，之後就有幾所英國大學邀請我去講學。”這次偶然帶來的機會，把他引向人生的第二階段。

融入陌生環境

在英國的10多年，是宋校長人生大放異彩的第二階段，也贏得了英國學術界和工業界的認可。他在1991年赴英國從事教學和科研工作，抵英後，先在布里斯托大學做英國皇家學會的訪問學者，隨後在幾所大學做科研和教學工作，後來再從事行政管理工作。這與一般的留學生出國求學，完成學業後再工作的過程不同。他曾撰文描述這段艱苦的經歷，“剛到英國面對陌生的環境和人，一切都要重新開始，因此必須要端正心態。我剛去英國時，只能做一些學術交流，講述在國內做的研究，後來才進入自己感興趣的學校，從事教學和研究。”

A Boy from the Village

Born in January 1964 in a dirt-poor village in Bazhong city, Sichuan province, Rector Song, along with his family, saw learning as the only ticket out of their inter-generational poverty. His parents, by the sweat of their brow, did the impossible--they put him through college. His mother proudly remembers the day when he started school at the age of six, then unheard of in their village. Soon, he became a famous bookworm. He devoured books. He digested what he read. He had no time for anything else.

Later in life, in media interviews, he would tell the world that the hardships of the hills taught him never to stop trying to better his life, that no difficulties are insurmountable, and that success comes one small step at a time. By age 16, his hard work had paid off; Song made it past the gates of Chengdu University of Science and Technology. By 1989, he earned his PhD from the China Electric Power Research Institute, becoming the first person in his village to hold a doctoral degree. Two years later, another PhD degree followed, this time from the nation's top-ranked Tsinghua University. Song was flying high. Then something happened that was entirely serendipitous. In 1989, he presented an article at an international academic conference in Beijing. It ignited the interest of certain scholars in attendance. Two years later, they invited him to the United Kingdom to deliver a series of lectures. That accidental opportunity proved a turning point in life. Thus began the second stage of his life.

Getting Acclimatised to a New Environment

Song was to spend more than a decade in the UK. Those ten years saw the full flowering of his professional career; he came to the attention of academia and industry alike. His career, however, did not take the conventional route favoured by Chinese students who studied overseas and who usually sought gainful employment upon graduation. In Song's case, he began as a visiting scholar of the Royal Society at the University of Bristol. From that tentative position, he managed to secure concurrent appointments in teaching and research at several universities. He soon graduated to administrative and managerial roles. But it was not all roses and sunshine, as he recalled in a later article describing those bittersweet



1.任浙江大學常務副校長和浙江大學國際聯合學院創院院長（中），與國際聯合學院負責人合照。
A group photo of Yonghua Song (middle), executive vice president of Zhejiang University and founding dean of the university's International Campus, with management personnel of the International Campus.
2.任英國布魯內爾大學副校長時與該校校長合照
Yonghua Song as the vice president of Brunel University, with the university's president
3.任英國利物浦大學副校長時與該校校長合照
Yonghua Song as the vice president of the University of Liverpool, with the university's president

回想這段經歷，宋永華校長認為，無論去到哪裡，在哪個單位，做甚麼工作，即使現在來到澳大，也是以融入當時當地的環境去做事情，去想事情，不能以一種主觀和脫離現實的態度去做。要以當地的思維去想問題，不能只想到讓環境接納自己，更多的是要主動去融入環境。“融入不了大環境，無法讓別人瞭解你，你也無法去瞭解別人，這就大大限制了自身能力的發揮。”上任澳大不久，宋校長就開始融入澳門社區，拜訪政府部門和社會各界，以加強聯繫和聽取各界對澳大發展的建議，更好地服務澳門。2018年6月，宋校長更獲選為“培養中葡雙語人才聯盟”首任主席及發言人，履新短短半年，已獲得各高校成員的信任和支持。

首位英國華人大學副校長

宋永華校長堅持做事一定要最到最好，“要做出好成績，就一定要有真才實學，並且要腳踏實地去做。”他在1997年被英國布魯內爾大學聘為電氣與計算器工程系教授，時年僅33歲的他成為英國歷史上最年輕的工程學教授。2004年被評選為英國皇家工程院院士，成為首位登上英國工程學術界最高殿堂的留英學者，同年並被任命為英國布魯內爾大學副校長，負責管理研究生的工作，成為英國直接進入大學高層管理的第一位華人副校長。2007年英國利物浦大學邀請宋永華教授出任副校長，同時兼任在蘇州的西交利物浦大學執行校長。

宋校長長期從事電力系統領域的研究，在能源、資訊及控制工程等方面的研究促進了電力市場的發展。他在英國帶領研究團隊進行了大量的科學研究，研究成果在英國國家電網、德國西門子公司等

times. ‘When I arrived in the UK, culture shock hit me hard,’ he said in the article. ‘All alone in a new country, I found myself surrounded by total strangers. Nothing came easy. But I realised that attitude was everything. I stayed upbeat and positive. In my early days in the UK, the only avenue open to me were some academic exchange activities where I introduced my research work in China to local scholars. Only later was I able to do research and teaching at local universities. ‘

Looking back on that chapter of his life, Rector Song says, ‘No matter where you are or what job you do, you should try your best to integrate into the local society. You must not be removed from reality or be trapped in your own subjectivity. Instead, you must try to see the world from the local point of view and melt into the local community. Don’t wait for the world to come to you.’ He likes to say: ‘If you do not integrate, you cannot operate.’ He is a man who obviously practices what he preaches. At UM, no sooner had he warmed his seat than he began calling on government departments and representatives from all walks of life to solicit their suggestions for a better UM. Within a few short months, in June 2018, he was elected the first president and spokesperson for an alliance dedicated to training bilingual professionals in Chinese and Portuguese, an election that spells implicit trust in the new leader.

The First Chinese Pro-Vice-Chancellor of a British University

A perfectionist, Rector Song is like the late British Prime Minister Winston Churchill who was famous for saying that ‘I have a very simple taste. I only want the best.’ Success, however, takes know-how and hard work. But he was prepared to be the best. When in 1997 he was appointed professor of electronic and computer engineering by Brunel University, he was only 33 years old, becoming the youngest Chinese professor of engineering in British history. Better things were to follow. In 2004, he was elected fellow of the Royal Academy of Engineering, another unprecedented honour for an expatriate scholar. That same year, he was appointed pro-vice-chancellor for graduate studies at Brunel University, the highest post ever occupied by a Chinese academic. It was the exclamation point of his career in the UK. In 2007, the University of Liverpool lured him away to serve as pro-vice-chancellor and cross-appointed him as the executive vice president of Xi’an Jiatong-Liverpool University in Suzhou, China.

宋永華校長與學生交談
Rector Yonghua Song chats with the students

知名公司得到應用。俄羅斯、意大利、捷克、澳洲等國家在進行電網建設的過程中都曾向他諮詢過。他說：“在英國大學擔任管理層的幾年，我一直從事高等教育管理，對國外的高等教育和人才培養有了較為全面的瞭解，也對國內外高校高端人才的培養有了更深入的思考。擔任英國高校領導的經歷，給了我對高等教育思考和實踐的機會，我希望能對國家的人才培養作出貢獻。”

回國統管高層人才引進

2009年宋永華校長應邀回國發展，開啟了人生的第三階段。回國後他出任清華大學電機系教授、海外高層次人才引進計劃專項辦公室主任，統管全國人才。2012年出任浙江大學常務副校長兼浙江大學國際聯合學院（海寧國際校區）院長，負責推動浙大的發展規劃、國際化及高層次人才的引進工作，為他的教育事業開創了另一高峰。回國之後，他在國際教育和交流中繼續發揮重要角色，一直和英國、歐洲、美國以及內地很多高校一直保持著良好的關係。

宋永華教授選擇回國的原因很多，他在媒體上也多次就此問題回答。他說：“最大原因是我喜歡教師這份工作。我在英國多年，一直沒有放棄過教學，也了解創新型高端人才的培養，我希望幫助國家培養更多高端人才。”

In his own discipline, Rector Song's research in electrical power systems, specifically in energy, information, and control engineering, has promoted the development of the electric power industry. The research team he led has yielded fruitful results which have been adopted and applied by such industrial powerhouses as the National Grid UK, and Siemens. He became such an authority on the subject that the governments of Russia, Italy, Czech Republic, and Australia have all consulted him when constructing electric grids in their countries.

Looking back, Rector Songs says, 'Those years in the senior management at British universities gave me an overview and insights into the workings of higher education and how British universities nurture talent. I began to think how universities in and out of China can benefit from these insights to produce high-calibre graduates. Those years afforded me an opportunity to reflect on higher education and gain practical experience, experience which I hope to draw on in making a contribution to higher education in China.'

A Talented Professor Returns Home and Turns Talent Hunter

The year 2009 ushered in the third stage of Rector Song's life when he was invited to return to China to serve as a professor of electrical engineering at Tsinghua University, and more importantly as the director of an office in charge of recruiting talented people from overseas. In 2012, he became the executive vice president of Zhejiang University and the founding dean of its International Campus, responsible for formulating growth strategies and spearheading the internationalisation of the university, as well as recruiting talented people. Since returning to China, Song has been the driving force in promoting international education and exchange. He has built a network of relationships with many universities in the UK, Europe, the United States, and of course mainland China itself.

Why did Song choose to return to China? This is a question that has been put to him many times during media interviews. The reasons are numerous, the most important being the love of teaching. 'During my years in the UK, I never gave up teaching. I also have an intimate knowledge of how innovative people are nurtured and I hope to help my country create more high-calibre professionals,' he says.

No Stranger to Macao

There is great clarity in how he sees the challenge before him. 'Both mainland and Macao are experiencing rapid economic growth. This calls for talented people in various fields who love their homeland, who are innovative, globally competitive and well-versed in cross-cultural communication,' he says. 'We need people who possess these qualities and skills to move our society forward. I hope UM will become a magnet for talent. I will tap my many years of managerial experience in higher education to meet this challenge. No stone will be unturned in serving my country and Macao.'

與澳門淵源深厚

宋永華校長來到澳大後，他的人生進入新的階段。他說：“國家和澳門經濟發展迅速，都需要具備家國情懷、創新能力、跨文化溝通與理解能力、有全球競爭力的各類高端人才來推動和引領社會向前發展，我希望能把自己積累多年的教學和高校管理經驗帶來澳門、為國家和澳門培養人才做點貢獻。”他選擇來澳大主要有四個原因，“澳大作為澳門特別行政區唯一的綜合性公立大學，有澳門政府和社會各界支持的優勢，加上身處珠三角和粵港澳大灣區內，可以看到澳大未來的發展潛力非常之大；澳大擁有國際化的管理模式、師資團隊和創新的教育理念，在學科、研究、資源等有一定的基礎；澳大定位清晰，有明確的辦學理念和教育追求，行之有效的教學模式，這些辦學理念都符合我對大學教育、人才培養的認知；最後是我跟澳門很有淵源。2002年我被委任為澳門特別行政區政府科技委員會顧問，此外在2008年四川大地震中，我曾經就讀的家鄉小學倒塌了，獲得了澳門同胞的捐贈重建，所以我一直對澳門有一種特別深厚的感情，很希望有機會為澳門做點貢獻。”

提升辦學水平

上任近一年，宋永華校長貫徹處事的宗旨，踏踏實實地為大學做事，逐步落實他的教育理念，推動澳大全面提升教學、研究和社會服務的水平。他說：“澳大以往在教學和研究領域已做出了很多值得我們驕傲的成績，還建立了學院與書院相輔相成的協同育人體系。”在提升澳大辦學水平方面，宋永華校長表示，高等院校要發展得好，必須要有策略性的願景和社會的支持。在規劃未來發展藍圖時，他透過四個方面來促進澳大和澳門高等教育的發展：1、優化協同育人的學習體系，促進每位學生在不同層次和不同方面成才；2、營造人盡其才、才盡其用的和諧工作環境，發揮每位教職員的專長和潛能；3、進一步構建開放合作的研究機制，提升每項研究成果的創新性和影響；4、持續完善植根澳門的社會服務平台，將服務澳門的意識落實到經濟社會發展的每一個可能領域。

Rector Song spells out the reasons for joining UM. He says, ‘First, UM is the only public comprehensive university in the Macao SAR backed by the Macao SAR government and the community at large. Second, its strategic geographical location in the Pearl River Delta region and the Guangdong-Hong Kong-Macao Greater Bay Area turns it into a cornucopia of opportunity for the university. Third, UM is an international university with an international governance model, staffed by an international faculty team dedicated to innovative education, with ample resources, to make rapid progress in teaching and research possible. Fourth, UM has a well-defined vision and mission I can totally embrace. Finally, my connections with Macao go back a long way. As far back as 2002, I was already serving as an advisor to the Science and Technology Committee of the Macao SAR government. Something else tugs at my heartstrings. The primary school I attended in my hometown in Sichuan province was destroyed by the big earthquake of 2008. The school was later re-built with the money donated by Macao residents. Macao was therefore more than just a name. I had fond feelings for her long before I even set foot here. I’ve always wanted to do something for Macao in return.’

Taking Higher Education to New Level

During his first year in office, Rector Song has proved his mettle as an education leader. He says, ‘I am proud of what UM has achieved in teaching and research. I am also very proud of its faculty-based system and the residential colleges to turn out well-rounded students, but we cannot afford to rest on our laurels.’ Going forward, Rector Song believes that a strategic vision society supports is critical to greater success. He believes that this university is destined to greater heights, and Song has the blueprint to take us there. In it, he focuses on four key aspects: (1) fine-tuning our education model to nurture talented students at different levels and in different fields; (2) creating a work environment with harmony at its heart to maximise employee productivity and creativity; (3) turbo-charging collaboration in research to maximise output, innovativeness and social impact; and (4) putting community

宋永華校長（右）就職典禮由校董會主席林金城博士(中)主持
University Council Chair Dr Lam Kam Seng (middle) officiates at the inauguration ceremony for Rector Song Yonghua Song (right)

宋永華校長表示，一流大學的標準是要能夠吸引一流的老師和一流的學生到來，更要為本地和世界做出有影響力的貢獻。澳大的發展願景還有許多方面，包括要回應和滿足本地社會發展的實際需求，提供最卓越的教學及創新科研，服務澳門，其次是提升國際化程度，與世界接軌。“我們培養人才首先必須要滿足澳門社會的需求，他們應是具有家國情懷、國際視野、全球競爭力、創新思維及對社會有承擔的領袖人才和世界公民。”宋永華校長擁有在中西不同高校的管理經驗以及熟悉歐美和亞洲高等院校的辦學和運作規律，這是他出任澳大校長的優勢。“國家和澳門特區政府對澳門高等教育發展的高度重視，我身為澳大校長，任重道遠，希望把自己積累多年的教學和高校管理經驗，協助澳大提升整體的辦學水平，培養出能夠為國家和澳門做貢獻的優秀人才。

2019年將迎來建國70週年暨澳門回歸祖國20週年。宋永華校長高興地說：“澳大將透過籌備一系列的活動與社會一起總結經驗，展示澳大的辦學成果，並藉此良機更好地規劃未來，探索繼續為國家和澳門作出貢獻的路向。”

宋永華校長（中）及馬許願副校長(全球事務)（右二）訪問安哥拉高等教育及創新科技部

Rector Yonghua Song (middle) and Vice Rector (Global Affairs) Rui Martins(2nd from right) visit the Ministry of Higher Education, Science, Technology and Innovation of Angola.

上任後，宋永華校長走訪各機構，加強與社區聯繫和聽取各界建議。

After assuming office as UM's new rector, Prof Yonghua Song visited various organisations in Macao in an effort to strengthen UM's ties with the local community and listen to comments and suggestions from different sectors of society.

service high on our agenda and building a better platform to make it happen so as to promote the socioeconomic development of the Macao society.

To Rector Song's way of thinking, whether a university becomes truly first-class ultimately depends not only on whether it can attract the best scholars and students, but also on whether it can create a positive impact on the local and international communities. UM's vision is kaleidoscopic: meeting the needs of the rapidly-developing Macao society, offering top-quality education, carrying out innovative research, serving the local community, and becoming a truly international institution. To the question 'What kind of graduates do we want to produce?' his answer is simple: They must, first and foremost, be able to meet the needs of the local community. Their heart must inhabit the homeland, but their mind must be globally guided. They must be internationally competitive, intellectually critical and creative and yet socially responsible. In a nutshell, we want to produce future leaders and global citizens.' Rector Song himself embodies these attributes, with a wealth of experience at high levels in higher education, at home and abroad. He is poised to take the university to a place it has never been. He is acutely aware of the high expectations of our governments, both local and central, and fully feels the weight of responsibility on his shoulders. But here is a leader who is equal to the task, in aptitude and attitude, in determination and sense of destiny.

The year 2019 will mark the 70th anniversary of the founding of the People's Republic of China and the 20th anniversary of Macao's return to the motherland. To mark both milestones, Rector Song says UM will organise a series of events to take stock of the past, showcase its current achievements, and plan for a future where the university can make a greater contribution to Macao and China.

短片：立足澳門、走向世界—澳門大學宣傳片
Video: Going Global from Macao – A Promotional Video about UM

中小學生文理基地 培育未來多元人才

Macao Bases for Primary and Secondary Education in Humanities and Science Nurture Future Leaders and Well-rounded Talents

文 Chinese & English | 余偉業 Kelvin U
圖 Photo | 何杰平、蔡俊祥，部分由受訪者提供 Jack Ho, Hasen Cai, with some provided by the interview

作為澳門的公立大學，澳門大學未來的首要任務是繼續加大力度培養具有多元和創新思維的人才，全力配合澳門未來經濟社會發展的需求，以及澳門特區政府青年培養人才發展的戰略。有見及此，澳大成立“澳門中小學生人文社科教育基地”及“澳門中小學生科技實踐基地”，透過優秀的師資隊伍及豐富的教學資源，及早開拓澳門青少年在人文、社科、科技的創新視野，使他們從小就得到全方位發展。

In line with the needs of Macao's future economic and social development, as well as youth development strategies, the University of Macau (UM), as a public university of Macao, continues to give top priority to nurturing students and equipping them with innovative, creative and critical thinking skills in order to produce high-calibre professionals in various fields. In light of this mission, UM recently inaugurated two Macao bases for primary and secondary education, one in humanities and social sciences; the other in STEM . With outstanding faculty members and supportive teaching resources, UM believes that the two bases will broaden the horizons of Macao youth in humanities, social sciences, and science and technology, facilitating the delivery of whole-person education from an early age.

澳大成立“澳門中小學生人文社科教育基地”及“澳門中小學生科技實踐基地
UM inaugurates two Macao bases for primary and secondary education, one in humanities and social sciences, and the other in STEM.

重視中小學生文理培育

“澳門中小學生人文社科教育基地”由澳大主導，澳門基金會、澳門教育暨青年局、澳門中華教育會及澳門天主教學校聯會參與共同建設，由澳大的中國歷史文化中心、孔子學院、中葡雙語教學暨培訓中心及澳門研究中心組成。而“澳門中小學生科技實踐基地”以澳大科學暨工程推廣中心為核心，將推出一系列STEM[1]教育計劃，支持社區科學推廣活動，為中小學師生提供可持續培訓。澳大兩基地將與澳門的教育機構及中小學合作，推出一系列培訓計劃及教學活動，鼓勵青年學子擴寬自身視野，推動澳門在人文、語言、社科、科普教育的發展，為澳門、大灣區多元人才的培養打下堅實的基礎。

發揮人文、中葡雙語優勢

在人文教育方面，澳大中葡雙語教學暨培訓中心與澳大孔子學院通力合作，開拓適合中小學師生的培訓課程和活動。人文學院兼孔子學院院長靳洪剛教授說：“人才培養最核心的部分，就是對人本質的瞭解、對社會的瞭解、對人類發展規律的瞭解，這也是

Addressing the Learning Needs of Students

Initiated by UM and jointly established with Macao Foundation, the Education and Youth Affairs Bureau of Macao (DSEJ), the Chinese Educators Association of Macau (CEAM), and Macao Catholic Schools Association (MCSA), the Macao Base for Primary and Secondary Education in Humanities and Social Sciences is comprised of UM's Centre for Chinese History and Culture (CCHC), the Confucius Institute, the Chinese-Portuguese Bilingual Teaching and Training Centre, and the Centre for Macau Studies (CMS). Meanwhile, with the Centre for Science and Engineering Promotion (CSEP) as the core component, the Macao Base for Primary and Secondary STEM Education will support science promotion in Macao and provide continuous training for local teachers and students. The two bases will collaborate with Macao's educational institutions and primary and secondary schools to launch a series of training programmes and teaching activities to enhance education in humanities, languages, social sciences and STEM, laying a solid foundation for nurturing talent for the future of Macao and the Greater Bay Area.

Enhancing Humanities and Chinese-Portuguese Bilingual Education

With respect to humanities education, the Confucius Institute and the Chinese-Portuguese Bilingual Teaching and Training Centre at UM will

[1] STEM是科學（Science）、技術（Technology）、工程（Engineering）及數學（ Mathematics）四個學科的首字母縮略字
[1]STEM is an acronym for the fields of science, technology, engineering and mathematics.

靳洪剛教授
Prof Hong Gang Jin

整個人文社科的教育體系的目的。只有透過不同方面瞭解人類，才能使人成為人才，繼而進一步創新創業，為人類的生命共同體做出貢獻。”靳教授指出，中葡雙語中心和孔子學院通過各種渠道，為中小學師生提供學習人類語言、文化、文學、哲學倫理道德的機會，讓學生從小就得到全人教育的發展。

為配合特區政府實現“一中心、一平台”的發展目標，澳大在不同層面推動中葡雙語人才的培養；其中，培訓葡語專業教師為人文社科基地的重點項目之一。因此，中葡雙語中心與教育暨青年局語言推廣中心合作，開辦了一系列培訓澳門中小學教師（母語為中文）的葡語進修課程；同時，也設立葡語為第二語言教學碩士專業，供從事葡語教學相關工作的人士報讀；還召開了葡語教學國際研討會，吸引來自葡萄牙、巴西、莫桑比克、美國、意大利、內地、香港和澳門的專家學者參與，在多學科視野下探討葡萄牙語作為第二語言的教學工作，剖析如何根據學生的需要和特點，尋找適合他們學習葡語的教學方法。另外，孔子學院向母語非為漢語的居民、外地僱員、留學生等提供國際漢語課程，以融合中葡語言的元素作為定位，從語言學的角度推廣特有的文化互通。

弘揚中華歷史文化

為提高澳門青少年對中華傳統文化的認知，澳大中國歷史文化中心先後開展多項活動，向廣大中小學生展示中華文明的博大精深。該中心先和中華學生聯合總會合作，與培正中學、海星中學、浸信中學和菜農子弟學校簽訂協議，共建中國歷史文化推廣基地；再走進澳門各中小學校，舉辦了30多場“中國歷史文化名師名校系列講座”。該中心更首次

work closely together to develop training courses and activities suitable for primary and secondary school teachers and students. Prof Hong Gang Jin, dean of the Faculty of Arts and Humanities (FAH) and director of the Confucius Institute, says that 'The key to cultivating leadership and nurturing talents lies in our understanding of the nature of human beings, of how our society works, and of the laws that govern human development. That is exactly the purpose of the entire educational system of humanities and social sciences. Only through understanding human beings in different aspects can a student develop his or her great talent and then innovate and start a business, and ultimately contribute to the community of human life as a whole.' Prof Jin adds that the centre and the institute will provide opportunities through various channels for primary and secondary school teachers and students to learn languages, cultures, literature, philosophy, ethics and morality, so as to encourage students to start whole-person education that fosters spiritual, intellectual, humane, social and physical development from an early age.

In line with the development orientation of 'One Centre' and 'One Platform' of the SAR government, UM has spared no effort to cultivate Chinese-Portuguese bilingual talents and initiated various projects at different levels. Among them, offering trainings to Portuguese language teachers is one of the key projects of the base. In collaboration with the Education and Youth Affairs Bureau of Macao (DSEJ), the centre has launched a series of training programmes to teachers from primary and secondary schools whose first language is Chinese. Moreover, FAH has launched a Master of Arts in Second Language Acquisition programme for language instructors who teach Portuguese as a second language. At a recent international conference titled 'Confluences in Portuguese: Linguistics, Literature and Translation,' organised by FAH, many experts and scholars from Portugal, Brazil, Mozambique, France, Italy, Japan, mainland China, and Macao shared their research findings, experience, and expertise in the area of teaching Portuguese as a second language. Prof Jin notes that such a regular conference has been an important

澳大為高中生辦全澳首個“澳門與中華文明證書課程”
UM offers the first certificate course in Macao and Chinese civilisation for all high school students in Macao

以規範化的社會科學調查方法，獲取“澳門中小學生國家歷史文化認知指數”，填補了就澳門青少年對國家以及澳門歷史文化認知的科學測量的空白。另外，還創辦首份《澳門少年報》，以通俗易懂的語言，介紹中國歷史文化和國家新面貌，至今已出版三期。同時，也顧及澳門葡文、英文學校母語非漢語的學生的學習需要，該中心以葡文、英文編撰中國歷史文化兒童讀物，推出首部漫畫《女媧補天》，述說趣味盎然的中國傳奇故事。這些創舉均得到澳門中小學師生的良好迴響。

中國歷史文化中心主任郝雨凡教授說：“澳大擁有國際化的優秀師資隊伍，除了做好相關學科的研究外，也應當對澳門年輕一代傳承中華文化起到一些作用。”該中心將向澳門中小學師資隊伍提供系統性的培訓，如今年首屆開辦的“中國歷史文化碩士學位課程”；同時，該中心與清華大學（北京）合作，開設“中國歷史文化導師培訓項目”，結業學員將獲清華大學相關證書。郝教授表示，透過多元的培訓，相信有助中小教師的教學質量提升。此外，該中心開設了全澳門首個、面向高中生的“澳門與中華文明證書課程”，讓他們提前修讀大學課程，領略中華傳統文化的精髓，還與澳門中華教育會合作，重編“中國文化基本常識”達標工程讀物，並成為達標工程的長期合作夥伴。郝教授表示，希望透過人文社科基地的努力，為澳門青少年親近中國傳統文化，創造優越且寬鬆的客觀條件，吸引更多年輕子弟在身體力行中自覺弘揚傳統文化。

中葡雙語中心和孔子學院通過各種學習，讓學生從小得到全人教育的發展。

The Chinese-Portuguese Bilingual Teaching and Training Centre and the Confucius Institute help students achieve well-rounded development

郝雨凡教授
Prof Hao Yufan

professional gathering in the field of Portuguese Studies and Portuguese as a Foreign Language, as it provides a platform for participants to have an in-depth discussion on how to tailor teaching methods to students' individual needs. Meanwhile, the Confucius Institute provides international Chinese courses to local residents whose native language is not Chinese, foreign employees, and international students. The courses will feature the Sino-Luso cultural and linguistic uniqueness of Macao.

Carrying Forward Chinese History and Culture

To enhance the awareness of Chinese traditional culture in local youth, the Centre of Chinese History and Culture (CCHC) at UM has initiated a great number of activities for primary and secondary school students to delve into the gem of Chinese civilisation. Earlier this year, CCHC and the General Association of Chinese Students of Macau (GACSM) signed collaboration agreements with four schools in Macao, namely Pui Ching Middle School, Escola Choi Nong Chi Tai, Macau Baptist College, and Escola Catolica Estrela do Mar, for the promotion of Chinese history and culture. CCHC has also held more than 30 public lectures by prominent scholars for primary and secondary school students. To scientifically measure local youth's perceptions of the status of China and levels of understanding of Chinese history and culture, the centre launched Chinese History and Culture Perceptions Index Survey for Primary and Secondary School Students in Macao for the first time. Furthermore, the initial three issues of *Macau Juveniles*, a periodical publication launched by CCHC, introduce students to Chinese history and culture and new developments in the country in plain language. Meanwhile, taking into account the learning needs of students from local Portuguese and English schools whose native language is not Chinese, CCHC compiles children's books that introduce intriguing Chinese folktales, fables and stories in Portuguese and English. So far the feedback from the schools about these pioneering projects has been positive.

Prof Hao Yufan, director of the CCHC, says that the university has an excellent international faculty and staff. Apart from doing well in research, they ought to play a role in transmitting Chinese culture to younger generations in Macao. In view of this, CCHC organises systematic training of

林玉鳳教授
Prof Agnes Lam Iok Fong

推動澳門知識傳播

在深化中小學生對澳門社會、經濟、文化層面的認識，澳大澳門研究中心推出一系列活動，啟發學生對澳門知識的興趣。該中心主任林玉鳳教授表示，中心從事研究澳門不同項目30年，累積了大量澳門資料，因此將陸續建立儲存澳門知識的資料庫，較吸引中小學生的有昆蟲學，當中介紹到澳門特有的昆蟲物種，如“澳門細蟻”。相關資料庫將對外開放，並向中小學生推廣使用，成為認識澳門的重要途徑之一。率先建立的是“澳門經濟數據庫計劃”，由澳門研究中心與澳大圖書館共同開展。林教授冀“構建一個全面涵蓋澳門主要經濟指標的數據庫，令研究人員、學生及公眾更方便取得有關資料，更掌握澳門經濟及社會發展的需求。”

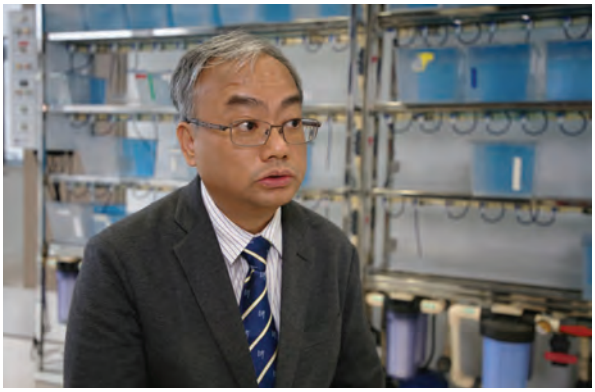
科普工作持之以恒

至於科普教育推及全澳中小學方面，澳大澳門中小學生科技實踐基地之科學暨工程推廣中心過去一直與不同教育單位合作開展項目，協助各中小學進一步發掘學生科學方面的潛能，鼓勵善用澳大科研資源，拓展本地科普教育。該中心定期舉辦“中小學教師科技創新培訓工作坊”，由科技學院教授介紹各自領域的最新研究與應用，以加強中學教師與澳大科技實踐基地之間的交流與聯繫，啟發創新思維。針對啟發中小學生科技潛能，澳門中小學生科技實踐基地每年舉辦科普夏令營、專題講座，帶領學生參加國際性比賽和交流。該中心主任譚錦榮教

primary and secondary school teachers, such as the first Master Programme of Chinese History and Culture. In collaboration with Tsinghua University (Beijing), the centre offers a training programme for instructors of courses in Chinese history and culture, and the participants will receive a certificate from Tsinghua University after they finish the programme. Prof Hao believes that such training will improve the quality of teaching of Chinese history and culture. Besides, CCHC offers the first certificate course in Macao and Chinese civilisation for all high school students in Macao, allowing them to take university classes in advance and appreciate the beauty of Chinese traditional culture. In partnership with the Chinese Educators Association of Macau, the centre will edit and revise the book of general knowledge of Chinese culture to prepare the local youth for standardised Chinese history examination. 'We hope that in our continuous effort, young people will align themselves to traditional Chinese culture, and more favourable conditions could be made to attract them to be proud of their roots and to carry forward the Chinese traditions and cultures,' says Prof Hao.

Disseminating the Knowledge of Macao

In order to enhance the understanding of primary and secondary school students about the social, economic and cultural issues of Macao, the Centre for Macau Studies (CMS) has launched a series of activities to interest students in learning about Macao. Prof Agnes Lam Iok Fong, director of the CMS, says that the CMS has engaged in researching different projects in Macao for 30 years and thus accumulated a large amount of Macao data. Now the CMS will establish a database for storing knowledge of Macao in an organised meaningful fashion which will be open to the public. 'We'd like to encourage primary and secondary school students to use it frequently. They will find some interesting subjects, such as entomology, from which they will learn Leptanilla macauensis, an insect species from Macao. The database will soon be one of the primary sources for them to better understand Macao,' says Prof Lam. In the first phrase, the CMS will work with the UM library to launch the Macao Economic Database. 'This will be a comprehensive database, including all of Macao's major economic indicators. It will help researchers, students, and the public to better understand the need of Macao's economic and social development.'



譚錦榮教授
Prof Tam Kam Weng

澳門中小學生參與科普夏令營
Primary and secondary school students from Macao participate in a science popularisation summer camp

授表示，全澳有八、九成以上的中學都有參與澳大科普活動，共同合作推廣科普。

該基地未來將力推“科普外展計劃”，進一步鞏固及深化科普工作所取得的進展。譚教授表示，基地將搭建流動性科普平台，即把汽車改頭換面，變成流動的趣味科學平台，到訪不同的中小學，分享學習科學的樂趣。另外，還開展“中學聯絡教授”的項目，透過委派不同教授與各中學作整體協調，協助中小學在推廣科普相關工作，從而提供“點對點”的支援，藉此更全面瞭解學校科普上的實際需要。最後，該基地將積極與海外的科普教育單位合作，尤其葡語國家的科普平台，開辦不同的國際科技交流活動，讓中小學生接觸世界不同學校的最新科技和創新思維。

Discovering Potential via STEM Education

As for promoting STEM education to primary and secondary schools in Macao, the Macao Base for Primary and Secondary STEM Education has launched various programmes with different education units for over a decade. All of the programmes engage local schools to make good use of the abundant resources of the Base of STEM Education and discover students' interests and potential in science and technology. For instance, the base offers a training workshop in technological innovation for primary and secondary school teachers on a regular basis. Professors from UM's Faculty of Science and Technology (FST) introduced the latest research and applications in their areas of expertise in the workshop this year. The workshop not only facilitates and enhances communication between secondary school teachers and the base, but also inspires new ideas. The base has also organised summer camps for STEM promotion for 11 years in a row to encourage local students to seek their interest in science, whilst building a strong mentorship with students who are active in international competitions and exchanges. Prof Tam Kam Weng, director of the CSEP, says that more than 80 per cent of the secondary schools in Macao have participated in or even collaborated with UM's activities that promote STEM education.

In the near future, the base will launch an outreach programme for STEM education with the objective of further strengthening partnerships with local primary and secondary schools. Prof Tam says that the programme will go through several phases: first, a mobile platform for STEM education will be set up – vehicles will turn into mobile laboratories and tour to various schools, offering enjoyable science experiments for students. Second, the base will initiate the project of staying in touch with secondary schools – assigning individual professors as a point of contact with particular schools to help solve the problems encountered in promoting STEM education. This project aims to provide more comprehensive support to local schools for a better understanding of their actual needs. Lastly, the base will liaise with overseas counterparts, especially those from Portuguese-speaking countries, to establish a collaborative platform to promote STEM education, where primary and secondary school students of Macao will get to know the latest technologies and innovative ideas through international competitions and exchanges with various schools from around the world.

短片：澳大科技實踐基地助中小學科普教育
Video: UM's Macao Base for Primary & Secondary STEM Education Supports Science Popularisation

短片：靳洪剛談澳大中小學人文社科教育基地
Video: Hong Gang Jin Discusses UM's Macao Base for Primary & Secondary Education in Humanities & Social Sciences

短片：澳門研究中心30年積累澳門知識資料庫
Video: Centre for Macau Studies Accumulates 30 Years of Knowledge about Macao

中醫藥通識課　知識與生活結合

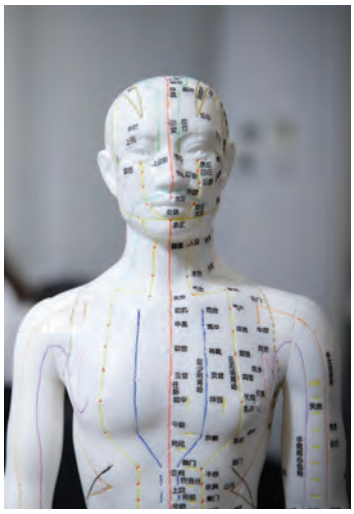
GE Course in TCM Teaches Knowledge with Everyday Applications

文 Chinese｜庄瑜婷、校園記者陸美賢 Cravina Chong, UM Reporter Savanna Lok
翻譯 Translation｜陳靜 Ruby Chen　圖 Photo｜何杰平 Jack Ho

每當講授穴位時，他會先介紹穴位及其功能，然後會在自己身上展示，教學生怎樣找到穴位的正確位置，並播放教學影片，強化大家對該穴位的認識；他還會向學生展示針灸使用的針具模型和艾灸條，一起討論不同類型的針該應用於哪一個穴位……這是中華醫藥研究院副院長陳新教授和兩位老師於2017/2018學年首度開設的“中醫藥探秘”通識課程，這種將知識與生活結合的課程很受學生歡迎。

The general education course in traditional Chinese medicine (TCM), which is taught by Prof Chen Xin, deputy director of the Institute of Chinese Medical Sciences (ICMS), and his ICMS colleagues, has been very popular with the students since it was launched in the 2017/2018 academic year, as the knowledge acquired from the course can be easily applied in everyday life.

陳新教授指導學生運用穴位保健，例如按壓內關穴助舒緩學習壓力。
Prof Chen Xin teaches students the health benefits of acupuncture. For instance, massaging the Neiguan acupuncture point can help relieve stress from studying.



陳新教授利用人體模型讓學生記住人體的穴位
Prof Chen Xin uses a model of the human body to help students memorise the locations of the acupuncture points

認識中醫傳統文化

陳新教授來自九代中醫家族、擁有中醫學博士和免疫學博士雙學位以及美國馬里蘭州執業針灸醫師資格，2014年來澳大前在美國國家腫瘤研究所長期從事研究工作，並在美國國家衛生研究院（NIH）研究生院講授中醫藥及針灸課程達10年之久，在教學上具有豐富經驗。目前主要帶領研究團隊展開中藥的免疫藥理學、免疫生物學和轉化醫學三個領域的研究 。

曾在美國工作和生活16年，陳教授有感澳門和內地的學生對中醫藥和針灸方面的瞭解並不足夠，“中醫針灸在中國流傳到西方，但現時在美國更普遍，因此我希望開辦這門中醫通識課，讓澳大學生認識中醫的歷史、現狀以及走向國際的一些趨勢，以及幫助學生瞭解中醫藥現代化及其在現代醫療保健體系中的作用等。”他也希望學生能夠將課堂上學到的一些中醫藥知識，運用在日常生活當中。例如，讓學生瞭解中醫藥防病治病的優勢所在，幫助自己和家人正確選擇中醫藥治療。

課程生活化吸引學生

陳教授的班上有來自全校各個學院的學生，其中以人文社科的學生最多，佔全體人數的六成。“學生來自不同背景，要他們理解博大精深的中醫理論是一件困難的工作。”因此，陳教授在課堂上運用大量影片、實物展示及介紹歷史上著名中醫事跡的形式去授課，以吸引學生的興趣。

Introducing Students to TCM

Prof Chen comes from a family which has practiced Chinese medicine for nine generations. With a PhD degree in Chinese medical sciences and another PhD degree in immunology, he was a licensed acupuncturist in the State of Maryland, United States. Before joining UM in 2014, he was a visiting fellow in the US National Cancer Institute and taught courses in Chinese medical sciences and acupuncture at the graduate school of the US National Institutes of Health for ten years. His research team is currently working on projects in three areas, namely immunopharmacology, immunobiology, and translational medicine.

Having worked and lived in the US for 16 years, Prof Chen is acutely aware of the relative lack of knowledge about TCM among students in Macao and mainland China. He says, ‘Acupuncture originated in China, but it is now more commonly practiced in the US, so I hope this GE course will help UM students understand the past, present, and future of TCM, as well as its modernisation and role in the modern medical healthcare system. I also hope students will apply the knowledge learned from this course in their daily life. For instance, after completing the course, they should know the advantages of treating disease with TCM and how to choose the correct medicines for themselves and their family members.’

Knowledge with Everyday Applications Is a Draw for Students

The students in Prof Chen’s class come from different faculties, with 60 per cent of them specialising in humanities or social sciences. Since teaching the profound theories of TCM to students from diverse backgrounds is quite challenging, Prof Chen uses a lot of videos and physical aids in class and livens up his lectures by telling stories about famous Chinese medicine doctors in history.

陳新教授收藏的古時中醫使用的醫針
Prof Chen Xin’s collection of medical needles used by Chinese medicine doctors in ancient China

王鈺青
Sunny Wang

陳教授認為研究和教學工作相輔相成，“研究對我的教學非常有幫助，而向不同的本科生上通識課也有助啟發我的研究。在中醫藥教學的過程當中，我會加入一些關於免疫學的知識。譬如中醫說外邪是從口鼻而入，現在我們也知道如果感冒病毒進入人體，其實也是通過口腔、眼睛、鼻子的黏膜進去。”在課上，學生對於針灸穴位的保健作用很感興趣，“每次講到如何利用穴位來保健以及解決自己的一些問題，例如治療失眠和焦慮緊張情緒，同學都會主動跟著我的示範去找出正確的穴位。”

在陳教授和同事們的指導下，“中醫藥探秘”通識課程上有十多位同學的課堂報告獲得在第16期《澳門中醫藥雜誌》上發表的機會，健康科學學院四年級學生王鈺青和人文學院英文系三年級學生胡鸝藻就是其中兩位。

王鈺青表示，當目睹陳教授在課上展示如何通過科學儀器測量穴位時，同學們都露出驚訝的表情，“能利用科學技術把無形的東西化為有形的型態呈現出來，是一件很有意義的事情。”一個學期的課程結束後，王鈺青對中醫藥有更全面和科學的認知，“網絡上不乏五花八門的資訊，對於網絡上傳播未經證實的中醫相關資料，若輕信可能有損健康。因此我希望將來能夠從事普及中華傳統醫學的相關工作，捍衛中華傳統醫學的名聲。”

胡鸝藻在上完這門中醫通識課後，更加入了陳新教授的暑期課題研究小組，在實驗室擔任學生助理，嘗試跨領域的學習。她表示課堂上的陳教授風趣幽默又平易近人，跟他在研究室裡嚴肅認真的一面截然不同。她回憶說，“同學們都最期待老師教穴位按摩，每次一到這個時候就會相當活躍，因為大家又有自己動手的機會了。”

Prof Chen believes that research informs and enhances teaching and vice versa. ‘My research has been very beneficial to my teaching, and teaching this GE course to undergraduate students from different backgrounds also inspires my research,’ he says. ‘In teaching TCM, I will teach a little bit about immunology. TCM believes that exogenous pathogens get into our body through the mouth or the nose, which is consistent with modern medical knowledge. For instance, the influenza virus gets into the human body through the mucuso in the mouth, eyes, or nose.’ Students in his class are particularly interested in the health benefits of acupuncture. Whenever Prof Chen demonstrates how to treat minor ailments such as insomnia and anxiety by inserting needles into the different acupuncture points, students would watch him with rapt attention and try to find the correct locations on their bodies.

Under the guidance of Prof Chen and his colleagues, more than ten students from this GE course got their class presentations published in the 16th issue of the *Journal of Chinese Medicine in Macao*. Among them are Sunny Wang, a fourth-year student from the Faculty of Health Sciences; and Lily Hu, a third-year student of English studies from the Faculty of Arts and Humanities.

According to Wang, students were amazed when Prof Chen demonstrated how to locate the different acupuncture points with a scientific instrument. ‘It is significant to locate invisible acupuncture points through modern technology,’ she says. After attending the course for a semester, Wang gained a more complete and scientific understanding of TCM. ‘There is a lot of information floating around on the internet, but spreading misinformation about TCM on the internet can pose a health threat to those who believe it. So I hope to find a job that allows me to popularise knowledge about TCM lest the false information sullies its good name,’ she says.

學生對針灸穴位的療效特別感興趣
Students are particularly interested in the health benefits of acupuncture

胡鸝藻
Lily Hu

在陳教授的課堂上，每當講授穴位時他會先介紹穴位及其功能，然後會在自己身上展示，教學生怎樣找到穴位的正確位置，並且播放教學影片，強化大家對該穴位的認識。他還會向學生展示針灸用的針具模型和艾灸條，一起討論不同類型的針該應用於哪一個穴位。胡鸝藻有感“雖然是通識課，但老師通過這種方式讓所有同學都參與進來，我覺得很棒。”長期受過敏性鼻炎折磨的她提到，學習後得知按壓鼻翼兩旁的迎香穴能夠有效改善鼻塞的問題，有助她舒緩症狀，“這門課最大受益就是能學以致用。”

推廣中醫藥　走向世界

隨著粵港澳大灣區建設及“一帶一路”開放合作倡議的實施，澳門中醫藥發展迎來了新的機遇。2017年6月，澳門成為全球六個中醫針灸傳承基地之一，對本地中醫藥發展起了重要推動作用。今年暑假，陳教授應邀到中國藥科大學，以英語為該校及南京其他大學的88名學生開辦國際公開課，講授中醫藥及針灸，“中醫要走向國際化，能使用英語和學術界及病人交流是關鍵之一。”他認為，澳門是中葡文化交融的地方，具有先天的社會、文化及語言優勢，有利把澳門打造成葡語系國家的中醫、中藥、針灸技術交流發展平台，成為中醫藥走向歐盟和世界的一個重要窗戶。”

陳教授和同事們計劃在未來的教學中加入更多元化的內容，除了教授一些傳統的中醫理論和知識外，還會探討現代中醫藥的發展方向和研究，如中醫藥國際化進程以及如何通過中華醫學來尋找新的藥物或治療方法。

Hu joined Prof Chen's summer research team after completing the GE course, serving as a helper in the laboratory, where she experienced cross-disciplinary learning. She says Prof Chen is funny, humorous, and approachable in class, which is completely different from his serious demeanour in the laboratory. She recalls, 'The part the students love the most about the course is when Prof Chen teaches us how to massage the acupuncture points. It would instantly liven up the class, because it means we could try on ourselves.'

When teaching acupuncture, Prof Chen first explains the different acupuncture points and their functions. He then demonstrates the techniques on his body, showing students how to find the correct locations. This is usually followed by an instructional video to enhance students' understanding. He also demonstrates the needles for acupuncture and the moxa sticks for moxibustion, and invites the students to discuss which needles are appropriate for which acupuncture points. A sufferer of allergic rhinitis, Hu has learned from the course that massaging the Yingxiang acupuncture points on both sides of the nose can effectively improve nasal congestion. 'The greatest benefit of attending this course is that you can apply the knowledge in daily life,' she says.

Going Global

China's strategy for developing the Guangdong-Hong Kong-Macao Greater Bay Area and the Belt and Road Initiative spell new opportunities for the development of Chinese medical sciences in Macao. In June 2017, Macao became one of the world's six acupuncture training centres, injecting a fresh impetus in the field. During this summer holiday, Prof Chen was invited by China Pharmaceutical University (CPU) to teach an international open course in TCM and acupuncture in English for 88 students from CPU and other universities in Nanjing. 'For TCM to go global, it is important to be able to communicate with academia and patients in English,' he says. 'Macao is a mix of Chinese and Portuguese cultures, with innate social, cultural, and linguistic advantages. These advantages create favourable conditions for developing Macao into a platform for sharing and developing knowledge about TCM, including acupuncture techniques, among Portuguese-speaking countries. Macao can very well serve as a window through which we promote TCM to the European Union and the rest of the world. '

Prof Chen and his colleagues plan to make the course more diverse. Apart from traditional theories and knowledge of TCM, the course will also incorporate new topics, such as the future and the internationalisation of TCM, and the development of new TCM-based drugs and treatment therapies.

短片：澳大教授開通識課傳授中醫藥知識
Video: UM Professor Teaches GE Course in Traditional Chinese Medicine

對學生的職業生涯負責
法學院稅兵教授

Preparing Students for Future Careers
Faculty of Law Professor Shui Bing

文 Chinese｜林祖兒 Judite Lam　翻譯 Translation｜陳靜 Ruby Chen
圖 Photo｜黃詠豪、部分由受訪者提供 Fernando Wong, with some provided by the interviewee

澳門大學法學院副教授稅兵從事法律教學多年，致力於縮短法學院和法院之間的距離，在課堂上激發學生們的學習熱情，更希望學生離開課堂後能成為法律的守護者。他認為學生除了要學會從問題發掘思考的樂趣外，更重要的是掌握說理的力量。對稅教授來說，對學生的未來職業生涯負責是他的堅持，而正正是這份信念以及在教學上的傑出表現，讓他獲得了2018年澳大卓越教學獎。

Today's law students are tomorrow's guardians of justice. How should the university prepare law students to fulfil their mission upon graduation? This is a question that Shui Bing, a veteran law professor at the University of Macau (UM), has sought to answer throughout his teaching career. Prof Shui believes in using a question-oriented approach to guide students to discover the joy of thinking and the power of logical reasoning. Because of his dedication and outstanding performance, he received the Teaching Excellence Award from UM in 2018.

稅兵教授在教學和研究上勇於創新
Prof Shui Bing dares to innovate in teaching and research

辦公室裡掛著稅兵教授的卓越教學獎狀、與兒子的生活照以及自勉的格言。
The wall of Prof Shui Bing's office displays the certificate of the Teaching Excellence Award, pictures of him with his son, and one of his favorite adages.

離開課堂後更愛法律

稅兵曾當過執業律師和企業高管，創辦過律師事務所，還曾掛職擔任法院副院長，擁有豐富法律實務工作經驗。對於學習法律，他形容是先結婚後戀愛的關係，就是先選了學習法律才明白法律有趣之處。“我是在學習法律的過程中慢慢喜歡上法律。有些人可能會認為學法律枯燥乏味，其實法律是一門有趣的專業，學生在學習時要不斷思考，享受思考，這過程就是一種樂趣。”他在課堂上經常強調：思考的過程比答案的本身更為重要，“我最怕學生缺乏獨立思考，人云亦云。法律問題需要從不同的角度來分析，未必有唯一正確的答案”。

稅教授於2013年來到澳大任教，之前曾任南京大學法學院教授、博士生導師，兼任南京大學—霍普金斯大學中美文化中心教授。他在2012年入選“中華人民共和國教育部新世紀優秀人才支持計劃”，並獲得“江蘇省第三屆十大中青年法學家”等學術獎項。

他經常提醒自己，一定要讓每一個熱愛法律的學生，在走出自己的課堂後更愛法律，“法律從來不是死記硬背，是要明白一些平常沒有注意到的問題，並通過思考去瞭解法律條文背後的精神和原則，從中體會思考的樂趣。教師要幫助學生懂得圍繞理據說話，要做到言之有據，論之有理。”

稅教授年輕時第一次當辯護律師經歷敗訴，讓他汲取很好的教訓。他說：“我事前做足準備，但仍敗訴。我事後檢討時明白到，律師出庭不是去參加辯論賽，不是去法庭上展現你的犀利口才，更重要的

Leaving the Classroom with a Greater Passion for Law

A one-time attorney, corporate senior executive, founder of a law firm, and vice president of a local court, Prof Shui has a wealth of legal experience under his belt. But his romance with law was not love at first sight, but rather, to use his own words, 'love after marriage'. 'It was only after I started studying law that I came to appreciate the fun of it and slowly fell in love with it,' he says. 'Some people think law is a boring subject, but it's not. It can be tremendously fun, as long as you learn to enjoy thinking.' In class, he often stresses that the process of thinking is more important than the answer itself. To him, a cardinal sin in studying law is parroting what others say without thinking independently. 'Legal issues need to be analysed from different angles, and there may not necessarily be only one correct answer,' he says.

Before joining UM in 2013, Prof Shui was a professor in law and doctoral advisor at the Law School of Nanjing University, with a concurrent position as a professor at Nanjing University-Johns Hopkins University Centre. In 2012, he was selected as one of the outstanding university scholars

博士畢業照
A PhD graduation photo

是要掌握說理的力量，尊重庭上的聽眾、對方律師、法官和當事人，用平和的心態陳述觀點，要展示法律人的氣度。”

課堂學習緊貼現實

如何提升學生在澳門法律市場上的競爭力，一直是稅教授思量的課題。作為課程主任的他，除了在課堂上引進創新的方法帶動學生外，更突破常規聯同書院舉辦“書院議庭”，將法律課堂帶到課室外，讓學生實踐所學，真實地感受法庭上雙方答辯和審判的過程。

“書院議庭”的構想源於稅教授的一次課堂調查。新學期伊始，他常常讓同學們在紙條上回答，自己想從這門課程學到甚麼？有位同學曾寫道，希望老師教會他怎樣和別人討論法律問題的時候不會令對方打瞌睡。這觸動他思考如何把課堂學習更緊貼現實，他說：“書院議庭是一次社會仿真的教學改革，讓學生體驗真實世界中的情境，邀請書院的師生作為市民代表，聽取自己闡述法律意見。”

to receive funding under a programme of the Ministry of Education. In 2013, he was named one of the Ten Outstanding Young Jurists in Jiangsu Province.

Prof Shui has a secret ambition—he hopes his students will develop a greater passion for law after completing his courses. To him, law is never about rote learning; it is about experiencing the joy of thinking by paying attention to issues one usually overlooks and understanding the spirit and principles behind a law. ‘As law professors, we must teach the students how to construct compelling arguments to support their views,’ he says.

But as he learned from his first experience acting as a defense attorney, having a silver tongue is not enough. That time, despite thorough preparation, he lost the case. In retrospect, he realised that representing a client in court is not the same as participating in a debate competition. So he often tells his students, ‘You don’t appear in court to show off your silver tongue. You are there to calmly present your arguments in a way that respects the audience, the opposing counsel, the judge, and both litigants.’

Improving Learning Outcomes by Simulating Real-life Scenarios

How to better prepare students for the competitive job market in Macao is an issue constantly on Prof Shui’s mind. As a programme coordinator, he not only adopts innovative teaching methods to liven up his classes, but also organises the College Court with one of the residential colleges at UM in order to extend teaching beyond the classroom.

書院議庭是稅兵教授的創新嘗試
The College Court is an innovative attempt by Prof Shui Bing

在過去舉辦的三場“書院議庭”當中，學生就多項熱門社會議題進行討論，例如探討Uber在澳門應否合法、如何克服澳門公共工程拖延症、澳門應否實行租金管制，並邀請書院學生和嘉賓在現場充當“市民代表”聆聽控辯雙方的意見。“書院議庭”無疑是一次創新的嘗試，讓學生親身體驗在庭上答辯的氣氛，由於學生面對的是普羅大眾，一些複雜的法律概念和條文，就必須利用生動直白的言語表達出來，提出具有說服力的法律觀點，爭取別人支持。對學生來說，除了培養他們正確的法治思維外，還是走出校園前一次熱身。”

要對學生職業生涯負責

稅教授在教學上不斷追求創新，他透過課堂互動與學生建立溝通的平台，以問題作為導向，鍛煉學生邏輯思維及批判性思考。在研究上，他亦積極鑽研法律的條文細則，努力協助完善法律規章。為了表揚他在教學方面的貢獻，澳大在2018年畢業禮上向他頒授“澳門大學卓越教學獎”。

獲獎後，稅教授坦言心情忐忑，獎項一方面是對他工作的肯定，同時亦為他帶來一點壓力。他認為教學是要對學生未來的職業生涯負責任，首先一定要把專業領域裡面重要的知識紮紮實實地教給學生，“譬如我在講授合同法時，不會隨心所欲只講自己感興趣的內容，而是會講解自己認為最重要的知識，不讓學生在未來的法律實務中感到無所適從。其次是在整個教學過程裡面，要結合本身學科的特點去引導學生。”他認為培養學生的思維能力和批判能力至為重要，整個教學的內容必須貫穿對學生能力的培養。

當律師時的照片
A picture of Prof Shui Bing as an attorney

學生時期在內蒙古田野調查農村土地問題
Investigating farmland problems in a rural area in Inner Mongolia as a student

The idea of the ‘College Court’ was inspired by a classroom survey. At the beginning of each semester, Prof Shui asks students to write down what they hope to learn from the course. One student wrote, ‘I hope to learn how to prevent others from falling asleep when discussing legal questions with them.’ This unexpected answer prompted Prof Shui to explore ways to improve learning outcomes by simulating real-life scenarios. That’s how the idea of the ‘College Court’ was born. It is an innovative attempt to simulate court proceedings to help students put what they learn into practice by role-playing as attorneys or judges.

In the last three ‘College Court’ sessions, students debated hot social issues, such as whether Uber should be legalised in Macao, how to prevent the tendency for public works projects in Macao to fall behind schedule, and whether Macao should institute rent control. Students from the RC and guests were invited to act as Macao residents to listen to the arguments of both sides. ‘The College Court was definitely an innovative attempt that allows law students to experience what it’s like to debate in court, and having lay people as the audience forces them to express complex legal concepts and articles in simple yet vivid language,’ says Prof Shui. ‘They must present compelling arguments to support their views. It helps them to cultivate the right legal perspectives and can serve as a “warm-up exercise” before graduation. ’

Preparing Students for Their Future Careers

Prof Shui continuously pursues innovation in his teaching. He enjoys interacting with students in class and adopts a question-oriented approach to help students improve their logical reasoning and critical thinking skills. In recognition of his outstanding performance in teaching, he received the Teaching Excellence Award at the university’s 2018 congregation.

Prof Shui appreciates the recognition of the award but understands that with recognition comes higher expectations. He believes educators should prepare the students for their future careers by teaching them the most

2013年在內地掛職任法院副院長
In 2013, Prof Shui Bing took up the position as the vice president of a court in mainland China.

税教授描述上課的過程就像是帶著學生走一遍知識的森林，“當老師帶著學生穿越森林後，學生就知道如何面對未來，知道怎麼去分析和去尋找法律關係、法律背後的規則以及怎麼去尋找應對策略。”

深入淺出編寫教材

税教授正在撰寫一本關於澳門民法的教材，幫助學生更有系統和精準地學習澳門法律。他表示：“前期的工作都做好了，之後則需要把收集的資料進行分析、解讀以及編選內容，我想把法律條文、理論學說和司法案例結合起來，用直白易懂的文字表達出來，更切實地服務澳門社會。”

很多人認為法律的任務就是實現正義，税教授認同這想法，但他認為這不是法律價值的全部，“法律是社會正義的底線。除了定紛止爭，法律還可以承擔更多社會功能，例如在促進經濟發展的同時，透過法律去保護環境，守護青山綠水。在這個利益訴求多樣化的時代，法律人肩上的責任是重大的。”

important knowledge in a given discipline. He says, ‘For instance, when I teach contract law, I don’t just talk about things that interest me. I teach students what I think is the most important knowledge to make sure they won’t feel at a loss in their future careers. Secondly, I adjust my teaching methods according to the characteristics of different courses.’ Prof Shui considers critical thinking skills to be of extreme importance, so he designs his courses in such a way as to make sure that training of these skills is present throughout the teaching process.

‘It’s like leading students into a forest of knowledge and then leading them out. After we walk them through it once, they will know how to navigate it by themselves in the future without getting lost. They will know how to analyse and find the patterns behind legal relations and how to develop counter strategies,’ he says.

Developing Textbooks that Explain Complex Concepts in Simple Language

Currently, Prof Shui is writing a textbook on the civil law of Macao, which he hopes will help students learn the laws of Macao in a more systematic and precise manner. He has completed data collection. Next, he will analyse and interpret the data and select some for inclusion in the book. He hopes to produce a book that not only combines legal provisions, theories, and case studies, but also explains complex concepts in plain language so it can better serve the needs of Macao society.

Law is widely perceived as an instrument for resolving disputes and serving justice in society. While Prof Shui agrees with this view, he doesn’t think it completely captures the value of law. He points out that law can fulfill various other social functions, such as promoting economic growth and protecting the environment. Indeed, in a time where there are many interests to serve, legal professionals have a huge responsibility on their shoulders.

法律結合大數據施教

澳門的法學教育，面臨著大灣區融合和人工智能(AI)時代的雙重挑戰。與時並進的稅教授認為隨著人工智能的出現，技術將會促進法律的發展。然而，如同鷹眼的人工智能終究不能替代裁判一樣，數據不能替代思想，邏輯不能替代同理心，法律守護者只能是懂得思考的生命體。他說：“雖然人工智能和大數據有助分析法律的條文和法規，但是利用新技術研究法學數據的同時，學生應以專業問題為導向，體驗思考的樂趣，培養獨立思考的能力。法科學生的眼光、氣度和素養，須在反複思辨中被塑造出來。唯有如此，澳門法學教育才能順應新時代的社會變遷。”

Using Big Data to Aid Teaching

The integration of the Greater Bay Area and the advent of artificial intelligence (AI) present both challenges and opportunities for legal education in Macao. Prof Shui predicts that AI technologies will promote the development of law, but he cautions against over-dependence on these technologies. ‘Just like Hawk-Eye Live cannot replace human umpires, big data and logic cannot replace human thinking and empathy,’ he says. ‘Only thinking beings are qualified to serve as the guardians of justice. AI and big data are indeed useful in analysing legal rules and regulations, so there is nothing wrong with using the latest technologies to study legal data, but at the same time law students must cultivate the ability to think independently with a question-oriented approach. The qualities that are essential for legal professionals, such as the ability to exercise sound judgement and broad-mindedness, can only be cultivated through critical thinking. This is the only way legal education in Macao can meet society’s needs in the new era.’

作為課程主任，提升學生在法律市場上的競爭力，一直是稅兵教授思量的課題。
Prof Shui Bing hopes to better prepare law students for the competitive job market.

短片：卓越教學獎得主稅兵：教學要相長
Video: Teaching Excellence Award Recipient Shui Bing: The Teacher and the Taught Together Create the Teaching

對歷史的看法更深刻，看待今天就更清晰
歷史系特聘教授王笛

Deeper into the Past, Clearer into the Present
Department of History Distinguished Professor Wang Di

文 Chinese｜林祖兒、校園記者夏梓基 Judite Lam, UM Reporter Leo Ha　翻譯 Translation｜陳靜 Ruby Chen
圖 Photo｜張愛華、部分由受訪者提供 Ella Cheong, with some provided by the interviewee

王笛教授潛心研究四川茶館文化多年，收藏不少相關書籍及資料。
A veteran researcher on the teahouse culture in Sichuan province, Prof Wang Di has collected many books on the subject.

英國著名哲學家培根曾說：“讀史使人明智”。自古到今，歷史對一個國家和民族的發展有緊密的聯繫，瞭解歷史的演變，正是吸收前人的指引，避免重蹈覆轍。這些年來，歷史系在不斷地摸索一條提高研究水準，擴大世界學術影響，又為澳門培養人才的合理的課程設置和為澳門繁榮服務的發展方向。澳門大學歷史系特聘教授王笛說：“歷史系學生出路廣闊，歷史系的課程設置，將有助提升學生畢業後在市場上的競爭力。”

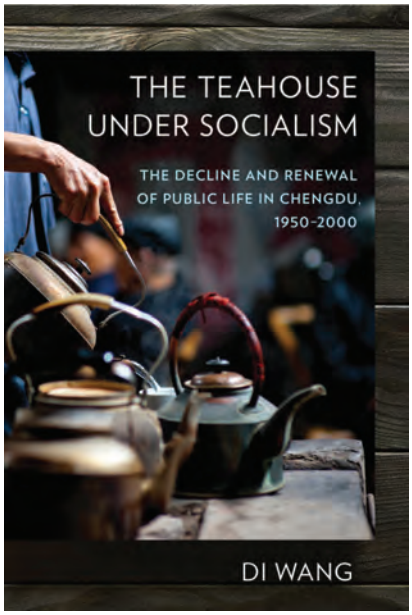
The American poet and writer Maya Angelou once said, ‘You can’t really know where you are going until you know where you have been.’ It is important to understand and learn lessons from the past in order to avoid repeating the same mistakes in the future. This is as true for individuals as it is true for a country. To Department of History Distinguished Professor Wang Di, the relevance of studying history in the modern world is never in question. Indeed, he believes that Macao’s future prosperity depends, at least to some extent, on the quality of education in history. Driven by this belief, Prof Wang and his colleagues from the Department of History have worked tirelessly over the years to develop a quality curriculum that aims to not only improve the students’ competitiveness on the job market, but also enhance the department’s research capacity and international academic influence.

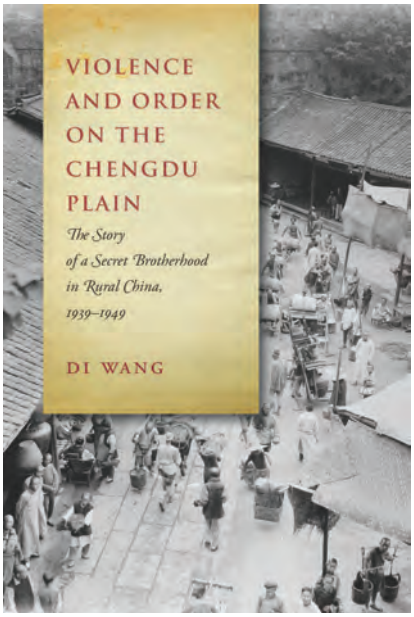
讀歷史的出路

王笛教授認為學習歷史是基本素質的培養，他說：“研究歷史的出路確實跟一些實用性強的學科不同，歷史是人文學科，而且現在日益朝著多學科交叉的方向發展，還涉及到文學、社會學、政治學、人類學、傳播學等。歷史系要求學生要有較強的收集資料、調查、研究和寫作的能力，畢業後無論進入私人公司或者是政府機構，這些基本訓練都非常實用。學歷史除了到各學校做歷史老師外，還可以投身新聞傳播事業，也可以到政府機構去當文化宣傳或文案，到文博機構或公司工作，能發揮的機會很多。”他分享一次難忘的授課經驗時表示，因應澳門逐漸融入大灣區發展，澳門一間博企曾邀請他向高層管理人員講解中國歷史，透過課程讓學員瞭解歷史的淵源，以提高人員對客人的服務素質。

Career Options of History Graduates

According to Prof Wang, history entails training in multiple skills, which gives history graduates more career options. He says, ‘History graduates travel different career paths from pursuers of applied science. History is a branch of the humanities. With an increasing trend towards multi-disciplinary development, history now encompasses knowledge in different branches of the humanities, such as literature, sociology, political science, anthropology, and communication studies. History also demands multiple skills. Students must learn how to collect data, how to investigate, how to conduct research, and how to write reports. These skills will be very useful, whether they choose to work in the government or in the private sector. History graduates have many career options. They can work as history teachers or journalists. They can work in the government, in private companies, or in cultural institutions like museums.’ He cites his own experience to illustrate the great demand for historical knowledge, sometimes from the least expected sources. He was once invited by a casino company in Macao to teach Chinese history to its senior executives, because the company correctly reasoned that employees who understand history will provide better services to customers.





王笛教授的兩本研究新著
Prof Wang Di's two new books

澳大近年成立多個研究中心，包括澳門研究中心、中國歷史文化中心、孔子學院等等，給學生提供了更多的學習歷史的平台，深化學生對中國內地和澳門歷史文化的研究，推動多元人才的培育。歷史系開設的“澳門與中華文明”通識教育課是每一個澳大新生必修。王教授說：“歷史系跟校內的學術研究中心關係密切，中心開設的課程也有不少是由歷史系的教授授課，未來將會合作開辦更多課程，讓學生能從不同角度和方面認識歷史，助他們深入研究。”

與歷史偶遇

王笛教授出生於四川成都，18歲時下鄉到蘇東坡的家鄉眉山勞動，然後在鐵路局的磚瓦廠工作，幹過重體力勞動。因為會畫畫，被調到工會做宣傳工作。即使當時工作環境十分艱苦，但他對知識的渴求從沒有停止過。1978年，正在鐵路局工作的王笛報了高考，他形容當時報考的心情時說：“我當時喜歡畫畫，但考專業藝術的水平還不夠，最後選了跟藝術比較接近的文學研究，因此打算讀中文系。意想不到的是，高考的成績卻是歷史科考得最好，歷史總分是100分，我考到96分，所以順理成章報讀了歷史系。”

In order to create more channels for students to learn history, UM has established several research centres in recent years, including the Centre for Macau Studies, the Centre for Chinese History and Culture, and the Confucius Institute. These centres help deepen students' understanding of the history and cultures of mainland China and Macao so they can grow into well-rounded graduates. The general education course in the civilisation of Macao and China, offered by the Department of History, is a compulsory course for all freshmen. Prof Wang explains that the department maintains a close relationship with academic research centres at UM. Many courses offered by these centres are also taught by professors from the department. 'We plan to collaborate with these centres to launch more courses in the future, in order to help our students understand history from different angles,' he says.

A Serendipitous Encounter with History

Born in Chengdu, Sichuan province, Wang was assigned at age 18 to do manual labour in Meishan, the hometown of the Song dynasty poet Su Dongpo. He was later transferred to a brick factory under the local Railway Bureau. His days of hard physical labour finally came to an end when he was again transferred, this time to a publicity position in the Labour Union, because of his painting skills. The poor working conditions did not dampen his enthusiasm for learning. In 1978, while still working in the Railway Bureau, he applied to the national college entrance examination. He loved painting, but he felt he was not good enough to get admitted to an art academy. So he set his eyes on art's close cousin—literary studies, with the intention of applying to the Chinese department. But as fate would have it, he performed best in the history subject, scoring 96 points out of 100. The rest is, of course, history—he became a history major at Sichuan University.

以優異的成績考進四川大學的王笛專攻中國近現代史，畢業後繼續研究生課程，完成課程後他留校任助教，兩年後被破格升為副教授，當年他31歲，是全國歷史系中最年輕的副教授。1991年，他受美中學術交流委員會青年學者項目邀請，到美國密歇根大學中國研究中心做訪問學者，然後到約翰霍普金斯大學完成博士學位。曾任美國得克薩斯A&M大學歷史系教授，旅美中國歷史學會前會長。2015年至2018年8月出任澳大歷史系主任。

王教授被學界認為是研究中國城市史和新文化史的代表性人物，曾獲得美國城市學會最佳著作獎，擔任英文學術季刊《中國歷史學前沿》（Frontiers of History in China）主編。最新兩部英文著作《袍哥：1940年代的川西鄉村暴力與秩序》及《茶館：成都公共生活的衰落與復興》分別由美國史丹福大學出版社及康乃爾大學出版社出版。兩書為當代中國歷史及微觀史學提供了寶貴的學術貢獻。兩本著作研究大量檔案、社會學調查、官方和民間文獻，對成都平原的秘密組織及當代成都的茶館文化進行全面的闡述。在同一年、同時在西方最權威的大學出版社出版兩部歷史學術專著，屬非常罕見。

茶館是成都人除街頭外最重要的公共場所
The teahouse is the second most important public space in Chengdu, next only to the streets.

王笛教授收藏很多重要歷史文件復印本
Prof Wang Di has collected the photocopies of many important historical records

After completing his bachelor's and master's degrees in the modern history of China at Sichuan University, Wang was hired by his alma mater as a teaching assistant. Two years later, at age 31, he became the youngest history scholar in China to be promoted to associate professor. In 1991, he was invited by the Committee on Scholarly Communication with China to serve as a visiting scholar at the University of Michigan's Kenneth G Lieberthal and Richard H Rogel Center for Chinese Studies and to complete a doctoral degree at The Johns Hopkins University, under a programme for young scholars. Prior to joining UM in 2015, he was a history professor at Texas A&M University and the president of the Chinese Historians in the United States. Between 2015 and August 2018, he served as the head of the Department of History at UM.

Prof Wang is recognised as one of the foremost experts on the urban history in China and new cultural history. He is the recipient of the Best Book (Non-North American) Award for 2005 from the Urban History Association in the United States and a co-editor of the English academic quarterly *Frontiers of History in China*. His two most recent English books, *Violence and Order on the Chengdu Plain: The Story of a Secret Brotherhood in Rural China, 1939-1949*, and *The Teahouse under Socialism: The Decline and Renewal of Public Life in Chengdu, 1950–2000*, were published by Stanford University Press and Cornell University Press, respectively. The books make a valuable contribution to existing literature on China's contemporary history and microhistory. Based on an analysis of a large amount of documents, sociological surveys, and official and unofficial records, the books provide a thorough exploration of a secret society and teahouses in Chengdu. It is very rare for a scholar to have two monographs on history published in the same year by two of the most prestigious university presses in the United States.

成都郊區的一個茶館。牆上還留著文化大革命的痕跡，“毛主席萬歲”的標語清晰可見。

A teahouse in the suburbs of Chengdu. Splashed across the wall in bold letters is the slogan, 'Long live Chairman Mao', a reminder of the Cultural Revolution.

專研平民生活

博學多才的王笛教授熱愛鑽研歷史，特別是研究最普通的平民百姓生活。因為平民百姓的生活更能貼緊現實地呈現當刻的歷史背景和文化。他說：“平民在歷史上佔大多數，我們應該知道他們的思想、活動、情感和經歷，就像我們坐飛機從上往下看，看不到整個地方的細節，若把眼光向下，站在下面，切身處地用平民的眼光去看，你是在人群之中，從下往上看，就能貼緊人們真正的歷史。”

這種以觀察細小的對象為基礎的歷史稱作微觀史，將歷史的研究從宏大敘事轉向微觀敘事，從對重大政治、經濟、文化與社會事件的研究轉向對日常生活、普通人物以及他們的經歷的研究，從對看似微不足道的物件的研究來發現歷史，瞭解歷史。王教授坦言，研究微觀史的過程十分艱辛，歷史往往是由精英來記載的，歷史記錄中很少有對他們的記載，所以查看檔案和資料猶如大海撈針，有時甚至數星期才能找到一份有價值的資料，然後花幾個月去解讀箇中的含義。所以他的《茶館》一書用了整整十年，就一點都不奇怪了。

Focus on Ordinary People

What sets Prof Wang apart from many historians is his focus on ordinary people, as he believes the lives of the masses provide the most faithful representation of society. He says, 'Throughout history, ordinary people have always been in the majority. So we should understand their thoughts, activities, emotions, and experiences. It's like what happens when you look down from a plane—you can't see the details. But if you stand on the ground and look at the world with the eye of an ordinary person, then you can capture authentic history.'

This intensive historical investigation of a well-defined small unit of research is known as the microhistorical approach, which is characterised by a shift from grand narratives to micro-narratives. Instead of studying major political, economic, cultural, and social events, microhistory focuses on ordinary people and their everyday life experiences. Historical truths are discovered and understood through studies of seemingly insignificant objects. According to Prof Wang, microhistorical studies require an arduous journey. The fact that history is written by elites, with scarce records of ordinary people, makes the search for data seem like a literal attempt to find a needle in a haystack. It is not unusual for Prof Wang to spend weeks locating one piece of useful information and another several months to interpret the meaning. It is little wonder, then, that the book *The Teahouse* took him a full decade to complete.

看待今天更清晰

“我們研究歷史一定要仔細分析資料的信息和追查它的來龍去脈。作為歷史學家要謹記的是，任何歷史都帶有主觀性，所以，任何人都不能宣稱他們所寫的歷史是真實的歷史，我們能做的是陳述我們心中所理解的歷史。”對自己熱衷的事情，王教授矢志執著完成，他說：“研究歷史往往就像在過去和現實的時空中切換和交替，對歷史的看法更深刻，看待今天就更清晰。”

A Clearer Perspective on the Present

In Prof Wang’s opinion, it is very important for historians to analyse data and track down their sources. He says, ‘A historian must bear in mind the subjective nature of history. Nobody can declare that the history he wrote is authentic history. The best we can do is present history as we understand it. Studying history is like travelling back and forth between the past and the present. The more you understand history, the more clearly you can see the present.’

麻將與當代中國城市的日常生活是王笛一直關注的研究課題
The role of mahjong in the everyday life of Chinese cities is an ongoing research interest of Prof Wang Di’s.

短片：王笛教授暢談學習歷史的樂趣
Video: Prof Wang Di Discusses the Joy of Learning History

美麗的眼睛與善良的心
幼教專家劉乃華教授

An Eye for Beauty and a Kind Heart
Childhood Education Expert Prof Liu Naihua

文 Chinese｜黃首豪、校園記者李佳穎 Saohou Wong, UM Reporter Winnie Li　翻譯 Translation｜陳靜 Ruby Chen
圖 Photo｜黃首豪 Saohou Wong

影響小孩成長的人除了父母，便是學校的老師。在台灣當過幼稚園園長、教育集團教育總監，從事幼兒教育及研究工作30年的澳門大學教育學院助理教授劉乃華一直以“老師最需要美麗的眼睛與善良的心”這個理念來教育學生，她說：“身為人師，時刻要謹記老師的使命感，尊重每一個生命，愛護每一個孩子，把愛的種子留在小孩的身上。”

Apart from parents, teachers are probably the most important influence on a child's growth. Liu Naihua, an assistant professor from the University of Macau's Faculty of Education, has 30 years of experience in childhood education and research. She believes that what early childhood teachers need the most are an eye for beauty and a kind heart. She says, 'As teachers, we must always remember our mission—we must respect every life, love every child, and sow the seed of love in the hearts of the children.'

劉乃華教授是一位充滿正能量的老師
Prof Liu Naihua is a teacher who radiates positive energy

視學生如自己的孩子

劉乃華教授多年來一直堅持在教育路上的原因很簡單：“一是興趣使然，二是使命感。我喜歡聽孩子們的童言童語，看孩子們純真的笑容，欣賞他們的善良體貼，在這個紛繁複雜的世界裡，唯有在兒童的天地裡才能感受那份自然與自在。”

Treating Students as Her Own Children

Over the years, Prof Liu has encountered her fair share of career challenges and setbacks, but the thought of leaving the profession has never crossed her mind. Why? She says, ‘two reasons—interest and a sense of mission. I love to hear children talk and see their innocent smiles. I’m touched by their goodness and thoughtfulness. In this complicated world, you can only experience this kind of pure innocence when you are with children.’

Some UM students praise Prof Liu for always smiling and radiating a positive energy, to which she replies, ‘Love, respect, and caring are what every life needs the most. I want to give all three to my students. So I cherish every moment with them, and I try my best to listen and understand their thoughts.’

Appreciating Every Child’s Uniqueness

As an early childhood education teacher, Prof Liu cherishes the trust of her students, and she feels a great sense of satisfaction when students share their innermost thoughts with her. ‘I often tell them, forgive those who have hurt you, because that’s the greatest release. Be grateful to those who have helped you, because then you will be blessed. What early childhood education teachers need the most are an eye for beauty and a kind heart. We must appreciate every child’s uniqueness, and patiently wait for them to grow,’ she says.

實踐學習區角教學的課室按照不同學習領域規劃學習區角
Classrooms that adopt the Learning Corner Approach are divided into different sections to serve different educational purposes

學習區角教學的教具均由老師精心設計
The teaching aids in the learning corners are all carefully designed by the teachers

曾有澳大學生稱讚劉教授“永遠笑容滿面，充滿正能量”，她說：“每一個生命最需要的三個元素是愛、尊重與關懷，我只是把這三個元素結合在一起給予學生。所以我很珍惜和學生相處的時間，試著傾聽並理解他們的想法。”

欣賞每一位幼兒的獨特性

作為幼教老師的老師，劉教授表示：“我非常珍惜學生與我之間的這份信任，他們的分享給我帶來很大的喜悅。我常常對他們說，原諒傷害我們的人，就是最大的釋放；感恩幫助我們的人，才能獲得祝福。幼教老師最需要美麗的眼睛與善良的心，欣賞每一位幼兒的獨特性，耐心等候他們的茁壯成長。”

劉教授還經常提醒學生進入職場後不要隨波逐流，時刻謹記作為老師的使命感，尊重每一個生命，愛護每一個孩子，把愛的種子留在小孩身上。她認為老師不只是一份工作，而是影響小孩一生的“靈魂工程師”，每當想到這份使命感都會感動落淚。

談及幼兒教育多年來的變化，劉教授表示：“昔日的幼兒教育，著重小朋友的知識學習及技能訓練。現今趨勢則著重老師如何引導孩子主動發現，動手操作的學習態度，培育幼兒的思辨能力，解決問題的能力及對環境的適應力。因此，我們幼兒教育專業的研究方向也必須與時俱進。”

Prof Liu often reminds her students not to follow the crowd after entering the job market; rather, they should always remember an educator's mission, which is respecting every life, loving every child, and sowing the seed of love in the hearts of the children. She believes that teaching is more than just a job; the teacher is an engineer of the human soul and may have a lifelong influence on children.

Commenting on the changes in early childhood education over the years, she says, 'In the past, early childhood education focused on knowledge acquisition and skill training, while today, the tendency is for teachers to guide students to discover on their own, to practice with their hands, and to develop critical thinking skills, problem-solving skills, and adaptability to new environment. Therefore, research in early childhood education must also reflect this change.'

Studying the Learning Corner Approach

In Prof Liu's opinion, most kindergartens today rely excessively on textbooks. As a consequence, teachers tend to be constrained by textbooks and their curriculum design skills are impaired. To change this situation, five years ago, she started working with a kindergarten in Macao to open a research centre, where they intentionally depart from traditional teaching methods by reducing the number of textbooks and phasing out written exams. This approach is known as the 'Learning Corner Approach'. Specifically, they devote each learning corner to a different educational function and adopt a multidisciplinary integration approach to cater to children's interests and satisfy their propensity to touch objects around them with their hands, guiding them to discover and learn through games.

In this Learning Corner Approach, teachers use different kinds of music in place of instructions to signal a change of activities and the desired behaviour expected from the children. Each learning corner serves a different educational function. There are art and craft corner, science

劉乃華教授常提醒學生謹記老師的使命感
Prof Liu Naihua often reminds students to remember the mission of an educator

劉乃華教授經常到幼稚園觀察小朋友的學習情況
Prof Liu Naihua often visits the kindergarten to observe how children learn

研究學習區角教學模式

劉教授認為，現時的幼稚園大多數對教科書過度依賴，容易受到教科書的限制，也會弱化幼兒教師設計課程的能力。因此，她在五年前與澳門一間幼稚園合作開設研究基地，致力突破傳統的教學方式，降低教科書的使用量，並逐漸取消筆試。該研究項目叫“學習區角教學模式”，以課程統整方式，讓他們在不同的學習區域接觸不同領域的知識，尊重幼兒的興趣及滿足他們操作的樂趣，透過遊戲引導幼兒去發現與學習。

在學習區域內，老師會運用不同的音樂代替指令，使小孩知道活動的轉換及相應的行為模式。老師按照不同的功能劃分區角，包括：美勞區、科學區、語文區、益智區、積木區、裝扮區等。小孩可以自由選擇老師精心設計的實體教具進行學習，而老師可以使用多元的方式評估小朋友的學習能力。近幾年為求幼兒評量更客觀化，劉教授與科技產業共同研發幼兒學習區評量系統，運用科技記錄幼兒的學習力，讓老師及家長更理解幼兒的能力及興趣。學習區角教學模式讓小朋友學習變得更加主動、自主，她發現這幾年幼兒的思考力、解決問題能力與判斷力、觀察力等都大大的提升。

corner, Chinese corner, intellectual development corner, toy block corner, and so on. Children can freely choose from the physical teaching aids carefully designed by the teachers, and teachers can assess the children's learning ability with a multifaceted approach. To ensure a more objective assessment, Prof Liu developed an evaluation system in collaboration with the industry. The system uses a high-tech device to record the children's learning process in order to help teachers and parents better understand children's learning abilities and interests. According to Prof Liu, the Learning Corner Approach helps students become self-driven learners. She has noticed a great improvement in the reasoning skills, problem-solving skills, judgment, and observational skills in the children who have benefited from this approach.

小孩自由選擇操作的教具
Children freely choose the teaching aids they like

馮嘉寶校友
UM alumna Fong Ka Pou

教學相長，良性循環

劉教授坦言推行這項研究項目一點也不輕鬆，因為要把台灣帶來的學習區角教學模式本地化，調整教學策略。從課室區域劃分到教具櫃的設計都要深入考量，儘管得到該校校長與幼稚園主任的支持，仍有部分老師抱著半信半疑或拒絕的心態。她說：“當初推行學習區角教學，很多老師都沒有概念，也不理解如何實行。我就把當時大三學生上的環境規劃課程重新調整，用了一個學期訓練我的學生如何實踐學習區角教學，然後讓這班大學生分組到幼稚園各級示範，讓幼稚園老師瞭解操作技巧。”

學習區角教學實行第一年，劉教授與她的學生以及幼稚園老師共同調整教學環境、教學內容及元素。她回憶道：“第二年我帶另一班受過學習區角教學的大學生到幼稚園，示範如何把教具與學習主題及環境作連結，讓幼稚園老師更熟悉學習區角教學的技巧。如今我的學生會到該幼稚園實習，跟那邊老師學習區角教學的操作技巧，形成良性循環。”

在聖瑪大肋納學校任教、2017年學前教育專業畢業的馮嘉寶表示：“劉老師推行的學習區角教學可以讓小朋友在教具中探索學習，啟發他們的想像力及創造力。另外，又可以讓幼兒動手操作，發展小手

The Teacher and the Taught Together Create the Learning

Prof Liu says it is not easy to promote the Learning Corner Approach, which originated from Taiwan, because of the need to adjust the teaching strategies to suit local circumstances. Meticulous planning is required in the process, from the division of the classroom to the design of the teaching aid cabinet. While she had the support of the school principal and the head of the kindergarten, some kindergarten teachers were dubious and reluctant to try this new approach. She says, 'When I tried to promote this Learning Corner Approach, many teachers had no idea what it was, much less how to implement it. So I adjusted the environmental planning course for third-year undergraduates, and spent one semester teaching my students how to implement this approach, and then I divided them into groups and assigned the different groups to the different grades in the kindergarten to demonstrate to teachers there how to use this approach.'

In the first year of implementing the Learning Corner Approach, Prof Liu worked with her students and kindergarten teachers to adjust the teaching environment and content. She recalls, 'In the second year, I took some of my students who had learned the approach to the kindergarten to demonstrate how to use teaching aids in a way that suits the environment and the subject of learning, to help teachers there become more familiar with this approach. And now, my students would do internships in the kindergarten to learn the approach from teachers there. This way, a virtuous cycle is created. '

Fong Ka Pou, a Class of 2017 graduate with a degree in pre-school education, now works as a teacher in St Mary Magdalene School (Escola de Santa Madalena). She says, 'The Learning Corner Approach advocated by Prof Liu can help children learn with teaching aids, thereby stimulating their imagination and creativity. It also caters to the children's innate tendency to use their hands to interact with the world. In the process, children get to exercise the muscles in their hands and experience the joy of learning at the same time.'

小孩自覺收拾教具
Children put the teaching aids back at the end of the class

肌肉，又可以快樂地學習。”

馮嘉寶指，從劉教授身上學到的教具製作、問題引導、學習區角環境規劃及佈置等技巧，都可以運用在現時的教學上。

學生更主動思考和學習

在培正幼稚園任教、2009年教育碩士學位課程（課程與教學專業）畢業的梁定剛認為，劉教授的學習區角教學非常適合小朋友的發展需要，她說：“現今小朋友可以說是萬千寵愛在一身，被父母過度溺愛，導致生活自理能力不足。但劉教授帶來的學習區角教學可以讓小朋友主動思考和學習。”

推行學習區角教學的幼稚園成立至今，經歷了傳統教學法、大單元教學法、主題教學法等教學模式。學習區角教學模式推行已邁入第五年，得到老師與家長的支持。幼稚園主任劉玉玲很欣賞這種教學方式，她說：“實施學習區角學習之後，看到小朋友變得有紀律，專注能力也增強，家長也會好奇我們用甚麼方法讓小朋友成長。”

劉教授對自己推行的教學模式非常有信心，“孩子在這種教學模式下能更好的展現出學習能力。目前我還在努力把學習區角教學讓課程、教學、評量更緊密的連結，增進幼兒各項能力的提升，希望未來可以把這個教學模式推廣到全澳的幼稚園。”

幼稚園主任劉玉玲
Lau Iok Leng, head of a local kindergarten

Fong Ka Pou notes that the skills she has learned from Prof Liu, including skills in developing teaching aids, guiding the learning process with questions, and designing and decorating the learning corners, can all be applied to her current job.

Students More Motivated to Think and Learn

Leong Teng Kong, a Class of 2009 graduate of the master's degree programme in education (curriculum and instruction), now works as a teacher in Pui Ching Middle School. He is convinced that Prof Liu's Learning Corner Approach perfectly suits the children's developmental needs. He says, 'Today's children are spoiled by everyone in the family. And the sad result is that many of them don't know how to take care of themselves in daily life. Prof Liu's Learning Corner Approach can make children feel more motivated to think and learn.'

The kindergarten that has adopted the Learning Corner Approach has experimented with different modes of teaching, including the traditional teaching method, the unit teaching method, and the thematic teaching method. Introduced five years ago, the Learning Corner Approach has won favour with kindergarten teachers and parents alike. Lau Iok Leng, the head of the kindergarten, is a fan of this approach, saying, 'Since we implemented the approach, we have noticed a great improvement in the children's self-discipline and concentration, so much so that some parents have asked us with curiosity, what did you do to make my kid grow so fast?'

Prof Liu is very confident about the Learning Corner Approach. She says, 'This approach taps into the children's learning ability. I am working to improve this approach to make curriculum, teaching, and assessment more closely linked, so I can help children improve their various skills. I hope to promote this teaching approach to all kindergartens in Macao.'

梁定剛（右）與恩師劉乃華教授
A photo of UM alumnus Lao Teng Kong (right) and Prof Liu Naihua

短片：澳大教授與幼稚園推動區角教學　強調師生互動建創造力
Video: UM Professor Works with Kindergarten to Adopt a Learning Corner Approach

歷史性的時刻：內地和澳門數學教育正“揚帆出海”

An Historic Moment: Mathematical Education Methods from the Mainland and Macao Spread Overseas

撰文 Chinese｜孫旭花 Sun Xuhua　翻譯 Translation｜陳靜 Ruby Chen

英國廣播公司新聞網頁
BBC's webpage

時事熱點: 中國基礎教育正“揚帆出海”

近年，全球的媒體興趣和普通民眾都對中國數學教育投以廣泛關注。2015年8月，由英國廣播公司策劃拍攝的紀錄片《中國式教育—我們的孩子足夠堅強嗎》也曾引發中西方教育界熱議。紀錄片測試顯示，由中方教師教授的學生在數學、中文、科學三科完勝由英方教師教授的學生，印證了中式教育的成功，這讓英國社會對中國教育刮目相看。

Hot News: Chinese Textbooks for Basic Education Launched Overseas

In recent years, there has been growing international interest in mathematical education in China, both on the part of the media and ordinary people. The BBC documentary, *Are Our Kids Tough Enough? Chinese School,* has sparked widespread interest and discussions both in China and in the West. According to the documentary, students taught by Chinese teachers left their British-taught counterparts in the dust when they were tested in maths, Chinese, and science. This seemed to point to an obvious fact, of which the British society had to sit up and take notice — that Chinese education is far more successful than it has been given credit for.

作者孫旭花為澳門大學教育學院助理教授，數學教育方向。2008年加入澳大。是《螺旋變式—中國內地數學課程與教學之邏輯》的作者，任第23屆國際小學數學教育 “數學整數教學” 專題國際統籌委員會主席。

Dr Sun Xuhua, an assistant professor in the Faculty of Education, University of Macau, is a specialist in mathematical education. She joined UM in 2008, and is the author of Spiral Variation: A Hidden Theory to Interpret the Logic to Design Chinese Mathematics Curriculum and Instruction in Mainland China *(the book is in Chinese). She was the president of the international coordinating committee for the ICMI Study 23: Primary Mathematics Study on Whole Numbers.*

《紐約時報》2017年8月5日報導，英國的學校正計劃從中國引入一套名為《真實上海數學》（Real Shanghai Mathematics）的教材，從2018年1月起，英國的老師可以在日常的數學教學中使用這套教材(上海一至六年級數學教材英文版，包括課本、課本練習冊和教學參考書，共計36個品種)，媒體隨之沸騰，中國日報網、參考消息網、中國新聞網、濟南日報的標題：為提高數學成績英國採用中國教科書；中國數學教材將現身英國課堂！西方教育向東看！英國小學生將捧起中國課本；上海教材“走紅”英國，教改不只是“西天取經”，英國教育部將在逾八千所小學的數學科採用中式教學方法等標題消息，引發了社會的廣泛關注和討論。

的確，英國引進中國數學教材引發了國際效應，美國、阿聯酋、肯亞和馬來西亞等很多國家也在積極地與中國方面接觸。中國中小學教材第一次成系統、大規模進入歐美發達國家的國民教育體系，確實顯示中國基礎教育正“揚帆出海”。

英國廣播公司2018年1月31日報導稱，特雷莎·梅政府宣佈，在未來兩年內繼續派遣200名英

國際數學委員會主席Prof. Shigefumi Mori（菲爾茲獲獎者）代表國際數學委員會致辭

Prof Shigefumi Mori, president of the International Mathematical Union (IMU) and recipient of the Fields Medal,gives a speech on behalf of the IMU

An article entitled, ‘Britain Turns to Chinese Textbooks to Improve Its Math Scores’, which appeared in the 5 August 2017 edition of the *New York Times*, mentioned that British schools plan to introduce *Real Shanghai Mathematics*, a series of 36 textbooks translated directly from Chinese into English. ‘Starting in January, teachers in England will have the option of using *Real Shanghai Mathematics*,’ said the article.

The article caused quite a stir in the Chinese media. Splashed across the front pages of various newspapers were headlines proudly announcing the news: ‘Britain Turns to Chinese Textbooks to Improve Its Maths Scores: Chinese Textbooks to Show Up in British Schools’, ‘Looking to the East for Solution in Education—British Primary Schools to Adopt Chinese Textbooks’, ‘Textbooks from Shanghai All the Rage in Britain’, ‘Role Reversal—End of the West’s Leadership Role in Education Reform’, and ‘British Ministry of Education to Adopt Chinese Maths Textbooks in Over 8,000 Primary Schools’.

Actually, this fervour for Chinese textbooks has spilled over into many other countries, including the United States, the United Arab Emirates, Kenya, and Malaysia. Representatives from each of these countries have approached China to express the intention of introducing Chinese textbooks into schools. It is the first time that advanced countries like the UK and the US have used Chinese textbooks for primary and secondary schools in such a systematic and large-scale manner. It shows that the quality of basic education in China has gained increasing recognition from the international community.

On 31 January 2018, the BBC announced the Theresa May administration’s plan to send 200 maths teachers to China over the next two years to learn from their Chinese counterparts. A *New York Times* article commented, ‘Britain’s shift to the East is a turnaround for a country that has some of the world’s elite universities.’

中英教育班測試成績 Average Test Results of Chinese- and British-taught Classes		
中式教育實驗班成績 Average test results of a Chinese-taught class		英式教育實驗班成績 Average test results of a British-taught class
67.74	數學 Maths	54.84
46.88	中文 Chinese	36.46
58.33	科學 Science	50.00
注：學生是英國小學生，實驗時間為4周 Note: The students are primary school students from the UK. The experiment lasted four weeks.		

中英教育班測試成績
Average test results of a Chinese-taught class and a British-taught class

國數學老師來華交流學習。《紐約時報》評論稱："對於擁有世界一流大學的英國來說，轉而求助於東方是一種非常大的改變。"

澳門數學教育：初露頭角

歷史上，四百年前利瑪竇來到澳門。利瑪竇和徐光啟翻譯了《幾何原本》，第一次把西方數學引入中國數學教育系統，在中國數學教學歷史上，寫下東西文化交流輝煌的一筆。然而葡萄牙統治下的澳門基礎教育成績平平。回歸後，國際評比(PISA)數學成績節節升高，特別是由2009年數學由第15位升為2015年中國澳門15歲學生之數學素養得分544分，排名全球第三，從15名一躍躍入第三名，成為兩岸四地進步最快的地區，迅速騰飛並引起國際社會的關注。

"一個歷史性的時刻"：第23屆國際小學數學教育"數學整數教學"專題國際會議2014年1月在第23屆柏林國際數學教育研究委員會ICMI STUDY 23國際代表會議（IPC meeting）上，決定第23屆國際小學數學教育"數學整數教學"專題研討會將在澳門大學舉辦。

國際數學教育研究委員會（ICMI）成立於1908年，是國際公認的世界數學教育權威機構，旨在提高全球從小學到大學的數學教學質量，在世界範圍內加強教育研究者，教育政策制定者，數學教育家和數學教師間的交流和合作，促進數學教育理論和實踐的均衡發展。自上世紀80年代中期，已經舉辦了22屆專題研究，每屆研究側重於數學教育的突出問題研究。該會議是享譽海內外的最高級別小學數學教育權威會議，世界各地爭相承辦。

Macao: A Rising Star in Maths Education

Over 400 years ago, Matteo Ricci arrived in Macao, where he later translated *Euclid's Elements* into Chinese in collaboration with the Chinese mathematician Xu Guangqi. This was a brilliant chapter in the history of Sino-Western cultural exchange, as it was the first time a Western maths textbook was introduced into China. But under Portuguese rule, basic education in Macao was nothing to write home about. After Macao's return to the motherland, scores on the PISA (Programme for International Student Assessment) test began to increase steadily. Most notably, Macao's international ranking in the maths subject jumped from No 15 in 2009 to No 3 in 2015, when 15-year-old students from Macao scored 544 points on the PISA test, the third highest score among all examinees in the world. This made Macao the fastest-improving city among the cross-strait four regions in maths education, and quickly attracted attention from the international community.

A Historic Moment: ICMI Study 23: Primary Mathematics Study on Whole Numbers

It was decided at the 23rd meeting of the International Program Committee of the International Commission on Mathematical Instruction (ICMI), held in January 2014, that the ICMI Study 23: Primary Mathematics Study on Whole Numbers, would be held at UM.

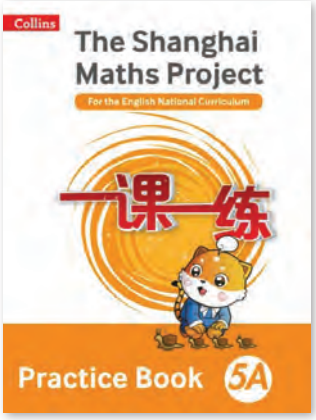
Founded in 1908, the ICMI is an internationally recognised authority on maths education. It aims to improve the quality of maths education worldwide at all levels (from primary education to university education); to increase communication and collaboration among educators, researchers, policy makers, and maths teachers from around the world; and to promote a balanced development of the theory and practice of contemporary maths education. So far, it has held 22 international conferences, with each conference focused on a specific pressing issue in maths education. The conference is considered the most authoritative conference in the field of primary school maths education and enjoys great renown both at home and abroad. Each year, various countries compete to host it.

Maths Education: The Foundation of Science and Technology and Human Civilisation

Why, you might wonder, would the UK and other advanced Western countries want to introduce the Chinese way of teaching maths? Because the results of some international tests in recent years indicate that British students lag behind their Shanghai counterparts by three years in terms of maths proficiency, and statistics show that this lacklustre performance in maths education is costing the UK approximately 20 billion pounds a year, accounting for 1.3 per cent of the country's GPD. In fact, China's rise as the world's second largest economy and its rapid progress in science and technology in the past few decades would not have been possible without the support of excellent maths education, for maths is the foundation of all

數學教育：科技與社會文明的基礎

讀者不禁要問，為甚麼英國乃至西方基礎教育需要借鑒中國數學教學模式呢？有調查資料顯示，落後的數學水準導致英國每年損失約200億英鎊，佔英國GDP的1.3%。近年來的一些國際測試還顯示：同等年紀的英國學生，其數學水準落後上海學生3年）。事實上，近幾十年來中國迅速地發展成為世界第二經濟體，科技發展十分迅速，其中與其數學教育有力的支持是分不開，因為數學是理工農商的學習基礎，數學教育的品質直接影響科技發展的水準。廣義而言，基礎教育（數學教育）變成媒體關注的一個重要的一個焦點，背後原因最主要是數學教育成為經濟和科技發展一個最重要的基礎，也是國家實力的一個重要的指標，在一定程度上反映了經濟的國際競爭力！



英國引進的上海數學教材
The maths textbook Britain introduced from Shanghai

內地和澳門數學教育的機遇和挑戰

眾所周知，大學排名引發了社會對高等教育的關注，基礎教育的類似排名，也引發了全球的基礎教育的關注。在2009年和2012年的PISA測試中，上海學生獲得冠軍，這一結果在當時震驚了包括英國在內的全球教育界。

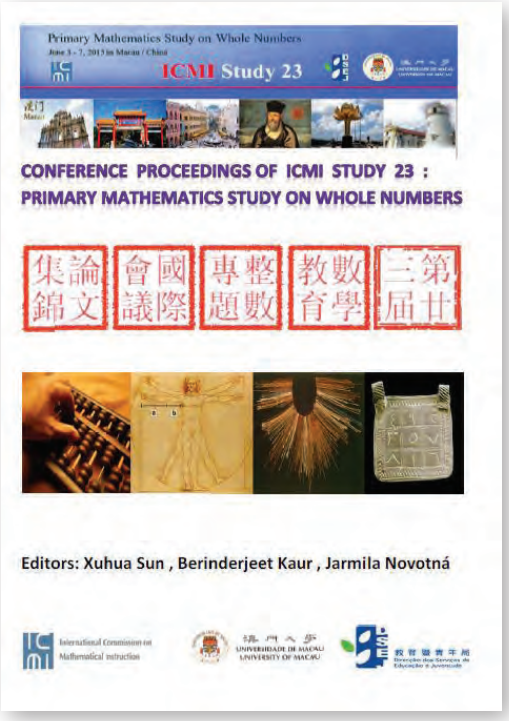
近20年來，澳門基礎教育有所提高部分原因是，借鑒了內地的優良實踐（譬如澳門內師計劃）。相反，很多內地專家認為這個結果是理所當然的，既沒有總結自己的經驗，盲目追隨英美國家的課程方向。2015年，中國四個省市參加PISA測試，結果變成了第十位。大大的跌宕，這也說明一個重要的問題：如果不保持清醒頭腦，知己知彼，還是危機四伏。澳門數學教育剛剛起步，筆者期望它一個美好的明天。

science subjects and the quality of maths education determines the quality of scientific and technological developments. There are many reasons why basic education, especially maths education, has become a focus of media attention. But the most important reason is that maths education has become not only the cornerstone of a country's growth in economy, science, and technology, but also a key measure of national power and, to some extent, the global competitiveness of a country's economy.

Opportunities and Challenges Faced by Mainland China and Macao in Maths Education

World university rankings have increasingly trained the spotlight on higher education. This is also true of rankings in basic education. Take the PISA tests in 2009 and 2012 for example. In both tests, the top-scoring student was from Shanghai, a fact that sent shock waves across education circles around the world.

There has been some improvement in the quality of basic education in Macao over the past 20 years, partly because Macao has adopted some good practices from mainland China. Unfortunately, many experts in mainland China took the good result for granted. They brushed aside their own experience and success, and blindly followed the lead of the UK and the US. It was not long before they paid the price. In 2015, four Chinese provinces and municipalities participated in the PISA test and ended up at the tenth place. This sobering drop from the top spot served as a wake-up call and taught Chinese educators the importance of knowing their strengths. Maths education in Macao is still in its infancy. I look forward to the day when it will blossom into the pride of Macao residents.



第23屆國際小學數學教育“數學整數教學”專題研討會在澳門大學舉辦
ICMI Study 23: Primary Mathematics Study on Whole Numbers was held at UM.

網絡遊戲及澳門居民的網遊沉溺

Online Gaming and Addiction in Macao

撰文 English｜胡文詩、梁建熙 Anise Wu & Karlas Leong　翻譯 Translation｜陳靜 Ruby Chen

你喜歡網絡遊戲（網遊）嗎？網遊是全世界最受歡迎的網絡活動之一，特別深受年輕人的喜愛。據估計，中國2017年網遊玩家的人數為4.42億，較2011年上升了36.4%。隨著網遊及其相關產業的盛行，網遊也不再只是一種娛樂方式。競技遊戲就是一個很好的例子。2022年亞運會已將競技遊戲列為官方體育項目。有些地方甚至為這種新型的體育運動開設了專門的課程和教學機構，例如香港的電子競技學院和台灣僑光科技大學的電子競技培訓中心。

人們為甚麼喜歡玩網遊？雖然電競及其他相關產業蓬勃發展，但我們早前進行的在線問卷調查顯示，中國人玩網遊的最普遍原因依然是“娛樂”。“抗壓”和“逃避現實”則位居第二和第三。的確，網遊不僅好玩，而且讓玩家從心理上暫時忘卻了日常生活的煩惱和問題。但是這種效果只是暫時的，而且如果將其作為應對現實生活的唯一方法，會對玩家的健康造成威脅。我們的問卷調查提供了實證，網遊玩家中，越是將玩網遊作為逃避現實的工具，越是容易患上網遊障礙症（IGD），其實就是一種行為成癮。美國精神醫學學會（APA）在2013年《精神疾病診斷與統計手冊第五版》中將這種障礙症歸入有待進一步研究的臨床症狀。所以，有必要認真審視網遊的潛在心理危害。特別是，誰更容易患上IGD?　IGD對我們的健康有甚麼威脅？如何才能改變現狀？為了尋找這些問題的答案，我們的研究團隊通過電話問卷調查訪問了1,000名澳門居民。

Do you enjoy online gaming? Gaming is one of the most popular online activities in the world, especially among young people. It is estimated that there were 442 million online gamers in China in 2017, an increase of 36.4 per cent when compared to 2011. With such rapid growth in popularity, gaming is no longer mere entertainment. Competitive gaming is a good example; gaming has been included as an officially-recognised sport in the 2022 Asian Games. Specific courses, programmes, and even educational institutions have been established for this new type of sport, such as the eSports Academy in Hong Kong and eSports training center in Overseas Chinese University, Taiwan.

Why do people play online games? Despite the flourishing of eSports and other associated businesses, our earlier online survey shows that the most common reason for Chinese people to engage in online gaming is still 'recreation'. 'Coping with stress' and 'escaping from reality' are the second and third reasons commonly reported. Indeed, online gaming not only brings fun to gamers but also keeps them psychologically away from daily hassles and problems. This effect, however, can only be temporary and will impose a potential threat to an individual's well-being if gaming is taken as the sole solution for real-life problems. Our survey provides empirical evidence that people with higher general and escape motives for online gaming are more vulnerable to Internet Gaming Disorder (IGD), which is generally regarded as a specific type of behavioural addiction. The American Psychiatric Association (APA) has classified this disorder as a clinical condition for further study in the fifth edition of *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)* in 2013. Therefore, a careful look at the potential psychological harm of gaming is warranted. In particular, who is more susceptible to IGD? How is IGD threatening to our well-being? And what can we do to improve the situation? Our research team has interviewed 1000 Macao residents via a telephone survey in order to provide insights for these questions.

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The author Anise M S Wu is currently a professor of psychology at the University of Macau. Her main research interest is individual and public health, with focus on addictive behaviours (including gambling, gaming, internet use, excessive spending, and substance use), organ donation, volunteerism, and the well-being of older adults.

作者梁建熙於2017年取得澳門大學心理學學士學位，現時為胡文詩教授擔當研究助理，並積極為日後學術生涯發展作準備。

The author Karlas K H Leong received his bachelor's degree in psychology from the University of Macau in 2017. He is now a research assistant for Prof Wu Man Sze and is actively preparing himself for his future academic career.

IGD的定義

雖然網遊日益盛行，對相關成癮行為及其影響的認知依然相對有限，因此是否應將IGD定義為一種心理疾病？在這一點上依然存在較大的爭議。APA傾向於將其定義為一種非物質相關的障礙症（亦稱為行為成癮，賭博障礙症是另一個例子），但尚需更多的實證才能下定論。世界衛生組織最近在《國際疾病分類標準第11版》中將網遊障礙症定義為數字遊戲（或電子遊戲）的行為模式，其特徵是“對遊戲日益喪失控制力，將遊戲置於優先於其他興趣和日常活動的位置，在出現負面後果時行為依然持續或者升級”。

這個定義與APA在《精神疾病診斷與統計手冊第五版》中列出的IGD的九種診斷症狀基本吻合（1）沉迷網遊，（2）戒斷症狀，（3）出現耐受性，（4）反覆不成功的嘗試減少或戒掉網遊，（5）對以往的興趣愛好/娛樂失去興趣，（6）知道存在心理問題依然繼續沉迷，（7）將參與網遊的行為隱瞞他人，（8）通過網遊調節情緒，（9）網遊導致對人際關係的負面影響或者機遇的喪失。沉迷遊戲者通常都會反映有這些症狀，因此研究人員可以通過這些症狀來對成癮行為作出判斷。

Defining IGD

Despite the fact that online gaming has greatly increased in popularity, the knowledge regarding its associated addiction and influence is relatively limited, and hence the controversy of defining IGD a mental illness remains heated. The APA tends to classify it as a type of Non-Substance-Related Disorder (also called behavioural addiction, with gambling disorder as another example) but is calling for more empirical evidence before making the final decision. The World Health Organisation has recently defined Gaming Disorder, in the draft *11th Revision of the International Classification of Diseases (ICD-11)*, as a behavioural pattern of digital-gaming (or video-gaming) that is 'characterised by impaired control over gaming, increasing priority given to gaming over other activities to the extent that gaming takes precedence over other interests and daily activities, and continuation or escalation of gaming despite the occurrence of negative consequences'. This definition is somehow consistent with nine diagnostic symptoms of IGD listed in the DSM-5 by the APA: (i) preoccupation with online gaming; (ii) withdrawal symptoms; (iii) tolerance development; (iv) repeated failure to reduce or quit online gaming; (v) loss of interest in previous hobbies/entertainment; (vi) continued involvement despite knowledge of psychosocial problems; (vii) deception about online gaming involvement; (viii) mood modification via online gaming; and (xi) risking relationships or opportunities. These symptoms are commonly reported by gaming addicts and thus can be used by researchers, including those in our research team, to screen probable problem gamers.

社會人口因素：年齡和性別

甚麼性別和年齡段的人群更容易患上IGD？37份系統性的橫向比較研究顯示，IGD在不同年齡段的人群中的患病率存在很大差異（介乎0.7%和27.5%之間）。由於玩網遊的人群中年輕人居多，現有的文獻報告大多是關注中學生、青少年，而甚少關注其他年齡段的群體。我們的電話問卷調查是首次嘗試通過中國人口中具代表性的成年人樣本來分析IGD的患病率。數據顯示，澳門的成年中國籍居民中約有2%的人患有IGD。在過去一年有過網遊經驗的人當中，患病率為4.3%，與一些青少年樣本中估計的患病率大致相當。因此，網遊玩家中，成年人與青少年患IGD的風險是相當的，因此對於成年人也應採取適當的干預措施。此外，通常認為男性比女性更容易患IGD，但是，我們自中國成年人所收集的數據並未顯示有顯著的性別差異。

心理因素：心理疾病和自我力量

我們的問卷調查發現，抑鬱和焦慮等心理疾病與患IGD的風險呈正相關。我們無法驗證兩者之間的因果關係，但是懷疑兩者之間會形成惡性循環，即心理疾病可能會導致網遊玩家過分沉迷，而患有IGD的人士也可能過著不健康的生活方式（例如嚴重的睡眠不足、精神疲勞以及社交孤立等等），從而加重心理疾病。除了風險因素之外，我們的調查也發現了一些保護因素。我們發現，心理韌性（即從逆境當中復原的能力）較強、人生有目標的人出現IGD的症狀也較少。按照正向心理學理論的解釋，這些正面的心理特質可以保護成年網遊玩家出現生理社會問題，包括IGD。

Sociodemographic Factors: Age and Sex

What sex or age group is more susceptible to IGD? A systematic review of 37 cross-sectional studies found a large variation of IGD prevalence across populations (0.7% to 27.5%). Since online gaming involvement is relatively higher among young people, it is no surprise to find that the spotlight of the existing literature went to middle school students or adolescent gamers rather than other age groups. Our telephone survey is the first attempt to examine the prevalence of IGD with a representative adult sample in a Chinese community. Based on the survey data, the estimated prevalence was about 2.0 per cent among adult Chinese residents in Macao. Among those who had online gaming experience in the past year, the prevalence was 4.3 per cent, which is comparable to the prevalence estimated among some adolescent gamer samples. Therefore, adult gamers are as vulnerable as adolescent gamers to IGD and thus adequate intervention attention should also be allocated to adult gamers. In addition, men are generally expected to be more susceptible to this disorder than women. Our data, however, did not demonstrate a very big gender difference among our Chinese adults.

Psychological Factors: Psychological Distress and Ego Strength

Our survey found that psychological distress such as depression and anxiety were positively associated with IGD. We cannot test their causal relationship but speculate a vicious loop: high psychological distress may predispose online gamers to excessive gaming, while IGD gamers may also have a problematic lifestyle (eg, sleeping deprivation, mental strain, and social isolation) which results in more distress. In addition to risk factors, our survey data also identified protective factors and found that Macao gamers with higher levels of psychological resilience (ie, capability to rebound from adverse situations) and purpose in life (ie, perception of a meaningful life) reported fewer symptoms of IGD. As suggested by positive psychology theories, these positive psychological attributes may protect adult gamers from developing psychosocial problems, including IGD.

公眾健康威脅

由於不同年齡段的兩性網遊玩家人數日益增加，過度沉迷網遊成為公眾健康的一大威脅。所以有必要提升公眾對網遊成癮行為及相關問題的認識。未來預防IGD的計劃可以著重增強個人的心理韌性，幫他們找到人生的目的，學會積極應對各種心理問題。澳門未來也應投放適當的資源用於該領域的研究和干預。“負責任博彩”會否成為預防IGD的一個有效策略？我們期待實證結果為我們提供答案。

A Public Health Threat

Given the increasing online gaming involvement of both genders and across age groups, excessive and problematic gaming is a public health threat to our society. Public awareness of such type of addiction and associated problems should be promoted. Future prevention programmes for IGD could work on increasing individuals' psychological resilience and help them to find their purpose in life. Active coping of psychological distress should also be considered in those programmes. In Macao, further resources should also be allocated to research and intervention programmes. Will 'responsible gaming' be an effective strategy for IGD prevention? We look forward to empirical findings to give us the answer.

量子計算的歷史與前景

History and Perspective of Quantum Computation

撰文 Chinese & English｜殷灝 Ian Hou

2016年8月，中國第一顆也是世界上第一顆量子衛星“墨子號”升空。2017年6月，世界上第一個地空量子信息實驗：一對相距1,200公里的光子的量子糾纏，通過墨子號實現。2011年加拿大D-Wave公司以一千萬美元出售了世界第一套量子計算機。2013年，谷歌成立了量子人工智能實驗室。2017年，IBM實現了50個量子比特的雲計算機。在過去的十年裡，量子信息和量子計算這兩個名詞不斷地出現在人們的視野裡，那它們到底指的是甚麼呢？我們以後是不是就不用現在的電腦，而要改用量子電腦了呢？

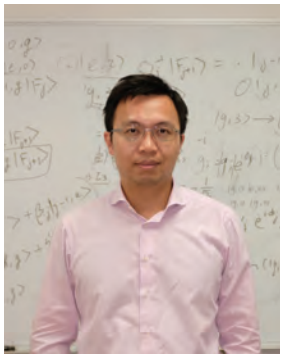
In August 2016, China's first, and also the world's first, quantum communication satellite 'MoZi' was launched. In June 2017, the world's first experiment on quantum information across the earth and space – the separation of a pair of entangled photons over 1200km – was realised through the satellite. The first quantum computer was sold by the Canadian company D-Wave at a price tag of USD10 million in 2011. Google established its quantum AI lab in 2013. IBM made a 50 quantum-bit cloud computer in 2017. Over the past decade, the topics of quantum information and quantum computation have appeared constantly in media; but what do they really mean? Would we stop using the current computers and switch to quantum computers in the future?

概率算法和平行計算

故事要從上世紀講起。1947年晶體管和50年代集成電路發明後，計算機的計算能力大增，科學家開始利用新增的計算能力來處理人力基本處理不了的問題，例如將一個大數因子化，通過特殊函數的計算將訊息加密等。為了減低計算複雜度，提高計算速度，將原來需要幾天計算時間的程式壓縮到幾分鐘內完成，科學家在70年代提出了一種“概率算法”來增加程式的平行併發度。

Probabilistic Algorithm and Parallel Computing

To answer these questions, we have to begin our story in the last century. With the invention of the transistor in 1947 and the integrated circuit in the 1950s, the power of computers greatly increased. Computer scientists made use of the newly acquired power to solve problems that are beyond the calculation capacity of humans, such as factoring large integers or encrypting messages by scrambling some special functions. To reduce computation complexity and thus elevate the computing speed in these tasks, the scientists proposed what they called 'probabilistic algorithms' to compress the computing time from days to minutes by increasing the parallel concurrence in the algorithms.



作者殷灝是澳門大學應用物理及材料工程研究所的副教授。他在澳大建立了低溫量子計算實驗室，來進行超導電路上量子光學與量子信息處理的研究。中科院理論物理研究所的科研經歷讓他對天文物理亦產生興趣，並在澳大任教一門關於宇宙奧秘的通識課。

The author is an associate professor of the Institute of Applied Physics and Materials Engineering, University of Macau. He has established the cryogenic quantum computation laboratory and conducted research studies on quantum optics and quantum information processing using superconducting circuits. Through his research experience at the Institute of Theoretical Physics of the Chinese Academy of Sciences, he has developed an interest in astrophysics, and currently teaches a general education course on the mysteries of the universe.

要理解這類基於概率的算法與普通算法的不同，我們可以考慮一個特定的例子：譬如找出14的因數。除去1和14本身，要分解14，最笨的算法就是從2開始到13，一個一個試著去整除14，如果能整除餘0，那這個數就是14的其中一個因數。計算機很擅長一個一個去試，由此我們可以很快算出2和7兩個因數，而這種依靠蠻力的算法程式也很容易編寫。不過我們可以馬上想像到使用蠻力的代價是這方法只對100,000或1,000,000以內的整數有用，對再大的數字譬如14位的整數，似乎就有點無力了，因為要試做整除的數字太多，計算速度一下就降低了。

平行計算在這時變成了拯救者。假如我們用兩台計算機去分解14，一個從2試到4，一個從5試到7，那計算時間就馬上縮短為原有的一半。換句話說，如果計算機的處理器能集成N個計算核心，計算複雜度會簡化為原來的N分之一，但是這種簡化還是不足以對付太大的整數，效率不高。但是，我們若能隨機抽選因數去嘗試整除，那麼從概率上來說找到真正因數的效率會大大提高。譬如2到7之間有2，3，4，5，6，7六個數，如果不按順序試整除14，而是隨機抽樣，有可能我們第一個抽到就是7、第二個抽到的就是2，那麼我們根本不需要嘗試3，4，5，6就已經找到了所有14的因數，這就是所謂的“概率算法”。

In order to appreciate the difference of probabilistic algorithms from regular algorithms we can consider a specific example: for example, to find the factors of 14. Besides the trivial factors 1 and 14, the stupidest way to solve the problem is to try dividing 14 by the numbers 2 up to 7 one-by-one. If it is divisible with a remainder of 0, then we can determine the relevant number is a factor. Computers are good at trying one-by-one. Hence, it's easy to figure out that 2 and 7 are the only two factors for 14 and these brute-force methods are also easy to program. However, we would soon realise that the brute-force methods are useful to deal with integers within 100,000 or 1,000,000 given a powerful computer. If we are to deal with an integer with, say, 14 digits, we are going to hit a brick wall since the number of integers we need try dividing is simply too many.

Parallel computing is our saviour. Suppose we use two computers to try factoring 14, one trying the factors from 2 to 4 and the other 5 to 7; then the computing time is instantaneously reduced to half the original. In other words, if the processing unit of a computer can integrate N computing cores, the computing time complexity would be reduced to 1/N. Nonetheless, this type of simplification is still not efficient enough for factoring a very large integer.

Yet, if we are allowed to try factoring randomly, the efficiency of successfully finding a factor would be greatly improved, probabilistically speaking. For instance, we have six numbers 2, 3, 4, 5, 6, 7 between 2 and 7. If we do the division of 14 not sequentially but by picking randomly the candidate factors from these six numbers, it's likely that the first one we pick is 7 and the second one 2. In that case, we don't even need to try 3, 4, 5, and 6 before we have found all factors of 14. This is the motivation behind the so-called 'probabilistic algorithms.'

量子計算的優點

受到平行計算和概率算法的啟發，1980年代Deutsch和姚期智等計算科學家利用了量子力學對物理世界的理解，即一個系統可以同時存在於兩個或更多狀態所組成的疊加態上，發明了量子圖靈機的數學模型。也就是說，假設2到7之間每個數字都能表示為一個物理狀態的話，我們只需要一個量子系統就能組成它們的疊加態，並平行地試驗哪一個是14的因數，而不需要增加計算機的數量。同時，由於在這個疊加態內每個表示數字的物理狀態都依附於一個概率，這些概率的數值會通過量子算法的施行，併發地增大或減小，最後概率接近1的物理態反映的就是14的真因數。所以量子計算的優點是既省卻了計算所需空間量，又縮短了計算複雜性的時間長。1995年，貝爾實驗室的Shor就第一次提出了基於量子計算模型的大數因子化算法。不過量子計算在那個時候仍然是紙上談兵。

到了2000年以後，Girvin、Martinis、Tsai等物理學家們通過超導材料的約瑟夫森效應成功試驗出一個稱為超導量子比特的系統，從此量子計算所需的疊加態就能可控地在一個固態電路上生成。2012年Martinis小組就在四個超導量子比特組成的超導電路下，實現了執行Shor算法的整數15因子化。

The Merits of Quantum Computing

Inspired by the concepts of parallel computing and probabilistic algorithms, Deutsch, C C Yao, and other computer scientists employed the world view of quantum mechanics – a system can retain a superposition state to simultaneously coexist on two different physical settings – in 1980's to have invented the mathematical model of quantum Turing machines. In other words, supposing every integer between 2 and 7 can be represented as a physical state, we then only need one quantum system to form their superposition state and try out the factors in parallel without increasing the number of computing cores.

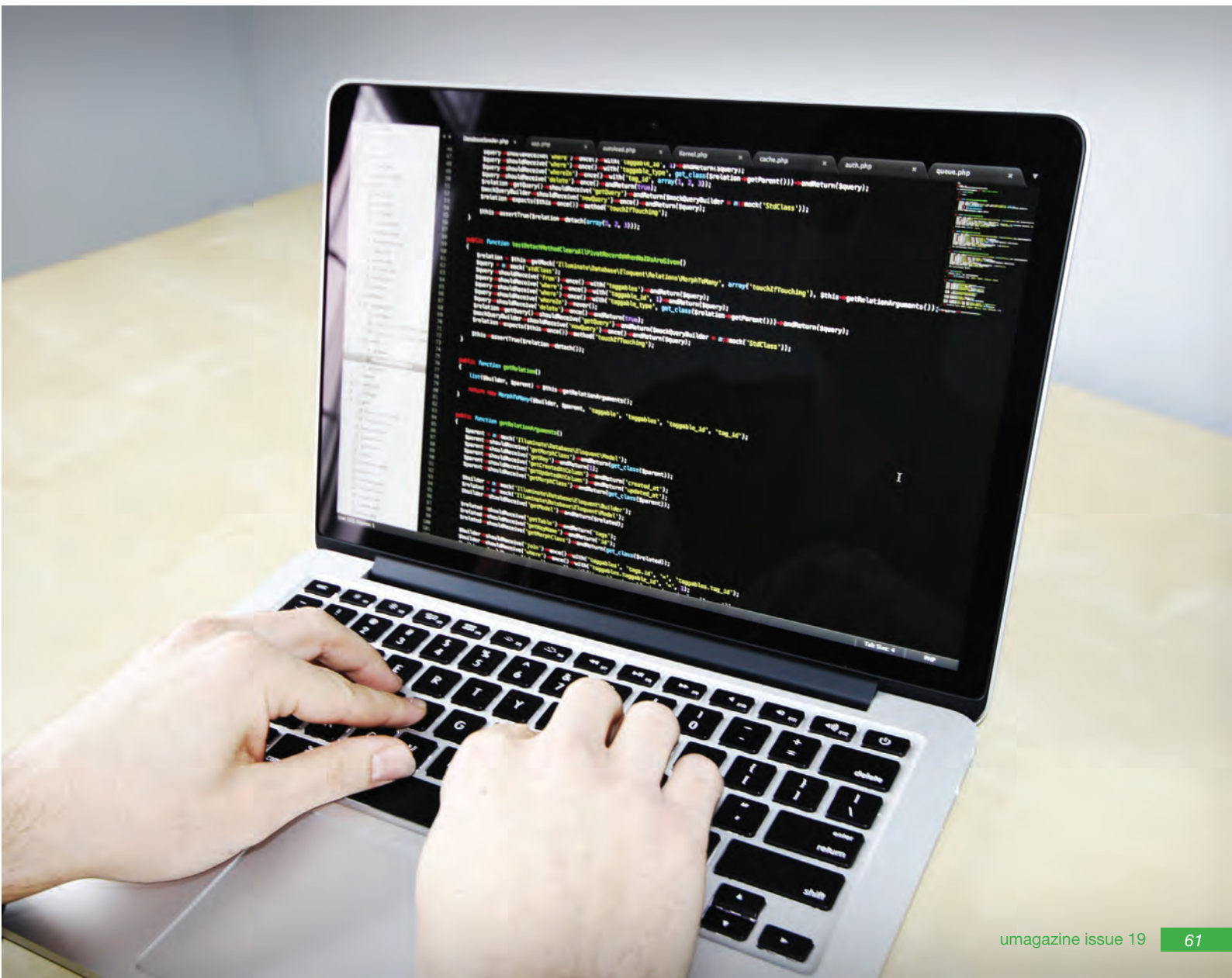
Meanwhile, since there is a probability associated with each state of integer out of the collective superposition state, these probabilities would increase or decrease concurrently through the execution of quantum algorithms. The probabilities associated with the real factors of 14 would gradually approach 1 in consequence. Therefore, the advantage of quantum computation is that it reduces the consumption of memory space while alleviating the computing time in temporal complexity. Shor of Bell Laboratory proposed just such a probabilistic integer-factoring algorithm geared specifically for quantum computer in 1995. But so far quantum computation still rests on paper.

After the year 2000, quantum physicists including Girvin, Martinis, and Tsai successfully fabricated what they called superconducting quantum-bit (or qubit) systems by carefully manipulating the Josephson effects on superconducting materials. Thereafter, the superposition state necessary for quantum computation can be generated in a solid-state circuit in a controllable fashion. The Martinis group has implemented Shor's algorithm to factor the integer 15 using a superconducting circuit comprising four qubits.

It seems then the making of the quantum computer has already succeeded and we can make a head start on commercialising them. But in reality, there is a long road ahead before one can buy a personal quantum computer. The two most imminent problems are: (i) the effective data storage time in a qubit is not sufficiently long, being only on the scale of microseconds; and (ii) the scaling mechanism to share data across qubits has not yet existed. The latter is also the reason why we can only factor a small integer like 15 so far. Therefore, one of the current research directions in our research group at UM is to make use the properties of solitons on superconducting circuits to prolong the effective storage time, thus solving the first problem.

這樣看來，量子計算機似乎已經試驗成功了。但是事實上，量子計算要從實驗室走到大家家裡這段路還很長。這其中最迫急的兩個問題是：一、超導量子比特的有效儲存時間不長，在微秒量級；二、量子比特與量子比特之間的數據共享還沒有有效的擴展機制。這也是為甚麼我們現在只能因子化15的原因。所以，我們研究小組當下在澳大開展的工作之一就是利用孤立子的特性來延長有效存儲時間，解決第一個問題。不過，就算上述兩個問題得以解決，量子計算的使命還沒有完成，因為現在我們只是利用了量子力學的原理改進了傳統計算機概念裡因子化和搜索等算法。量子力學的特殊性能否突破原有圖靈機的框架，讓一些原本大家以為不可用計算機計算的問題變得可計算呢？這還是一個未知之數。

But even if the two aforementioned problems are completely solved, does that mean that the mission to conquer quantum computation is accomplished? Not quite. Because up to now we are only using the principles of quantum mechanics to improve the algorithms for factoring, searching, etc. within the conceptual framework of conventional computers. Is it possible to employ the postulates of quantum mechanics to exceed the given structure of Turing machines, making some tasks originally incomputable computable? About this, we do not yet know the answer.



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ISSN 2077-2491

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