

OPEN MINDS



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HOW XJTLU CAME TO BE**

📡 **BEHIND THE SCENES: THE RISE
OF CHINA'S FILM INDUSTRY**

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2021
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FROM THE EXECUTIVE PRESIDENT

This year, Xi'an Jiaotong-Liverpool University celebrates its 15th anniversary. As we reflect on the past decade and a half – and especially the past year – it's clear how important research and innovation are in shaping the world of tomorrow. In this issue of *Open Minds*, join us as we consider the past, present and future of the world we're living in.

In 2019, when we went to print with the first issue of this magazine, things were very different. In the time since, the whole world has had to learn to adapt to unexpected situations. Like many industries, higher education had to change the way it delivered its services without compromising quality.

Covid-19 taught us many lessons, and showed us at XJTLU just how robust our systems were. As a relatively young university, we pride ourselves on being innovative and flexible, and both of these characteristics helped us when it came time to act fast and migrate classes online with minimal disruption. The technology team came together to keep the learners learning, and did a great job.

What also impressed me was how our researchers came together to try to add their pieces to the puzzle of the pandemic. Read more about the University's research into Covid-19 on **p8**.

This year also marks the 15th anniversary of XJTLU: we officially opened our doors to students in 2006, and have since grown from strength to strength. A bit more about how the University came to be can be found on **p2**.

But this is not a time to dwell on the past – there's too much to look forward to! This year, we'll begin accepting students for our Wisdom Lake Academy of Pharmacy, which has a unique partnership with industry, to usher in XJTLU's 3.0 phase. The academy is well positioned in Suzhou, which aims to cement its

place as the 'Pharma Valley of China'. Read more about how the city is evolving on **p14**.

We also recently partnered with Jiangsu Industrial Technology Research Institute to establish XJTLU-JITRI Academy of Industrial Technology that focuses on supporting postgraduate students in high-tech fields. It is the first of three academies we're launching this year, along with the Academy of Future Education and the Academy of Film and Creative Technology. To top it off, we're going live with our XJTLU Learning Mall, which will allow us to extend our reach beyond the students enrolled here, and enable us to integrate more deeply into the community.

I want to extend a warm thank you to all the experts in this issue who gave us their valuable insights and research, and to the contributors whose hard work gave us yet another great issue.

I hope you enjoy this issue of *Open Minds*.



+ PROFESSOR YOUMIN XI
Executive President of XJTLU
Pro-Vice Chancellor of
University of Liverpool

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CREATING A UNIVERSITY FOR THE FUTURE: HOW XJTLU CAME TO BE



XJTLU's beginning has echoes of the first international collaborations between China and the United Kingdom. **WILL VENN** looks back in history to find the story of XJTLU's establishment.



How does an international joint venture Sino-foreign university come into existence?

One that operates not as an off-shore campus of a UK institution, but as an autonomous university, created within the Chinese system but fully international in outlook?

The story of XJTLU's growth is remarkable enough; from an intake of 164 students in 2006 to a community of more than 18,000 learners within two decades, its success is nothing short of inspirational. But how does a story like this start?

University of Liverpool (UoL) Emeritus Professor Kelvin Everest's *The Story of XJTLU*, published on XJTLU's 10th anniversary, provides a forensic portrait of the origin, one where the wider tapestry of history is woven into XJTLU's conception.

It's a story that dates back to the 1840s and the era of the Qing Dynasty, with the arrival of the first ships from southeast China to Liverpool in the UK. Given its strengths as a trading port, Liverpool grew to have the largest and longest-established Chinese community in all of Europe.

Then when China became a member of the World Trade Organisation (WTO) in 2001, circumstances were ripe for a joint venture university to be established.

That membership provided fresh impetus to the process of 'opening up' and the internationalisation of Chinese universities, an initiative which had begun during Deng Xiaoping's leadership of China in the late 1970s.

As student exchanges and research collaborations with China increased across the UK higher education sector, in 2003 UoL began to seek possible partners for a venture in China. At the same time, the Chinese Ministry of Education published new policies to encourage international higher education institutions to set up joint collaborations.

Enter Professor Michael Fang; an electrical engineering expert who fostered early connections between UoL, where he had a successful career, and the prestigious Xi'an Jiaotong University (XJTU) in China, which he had visited frequently during the 1980s. Professor Fang encouraged Chinese staff to visit Liverpool.

In his book, Emeritus Professor Everest highlights the importance of these early networks, stating: "These strong and deep connections were to have momentous consequences for the University of Liverpool's ambitions to work with China. A vision began to take shape of an initiative that could combine student exchange and research collaboration with a long-term guarantee of numbers."

During 2003, Sir Drummond Bone (UoL Vice Chancellor 2002-2008), together with senior members of the UoL leadership team, made visits to potential university partners in Beijing, Wuhan, and Xi'an, with the initial notion being the establishment of a Liverpool campus in partnership with a Chinese university.

The focus increasingly landed on XJTU, reinforced through Professor Fang's work, and his relationship with Professor Jianhua Wang – a fellow engineering professor who had been appointed Party Secretary at XJTU by the Chinese Ministry of Education in 2003.

The same year saw the release of *The Rules and Regulations Governing Sino-Foreign Joint Running Schools*, providing a clear statement of the type of collaboration that would be encouraged by the Chinese government, establishing a framework of conditions and expectations which greatly helped to shape proposals.

XJTU, which itself had been created when Shanghai-Jiaotong University relocated inland to the ancient city of Xi'an in the mid-1950s, had been independently involved in discussions to create a new branch campus in the city of Suzhou in Jiangsu province.

Suzhou is one of the fastest-growing major cities on Earth, driven by the incredible economic success of Suzhou Industrial Park, home to more than 3,300 foreign companies.

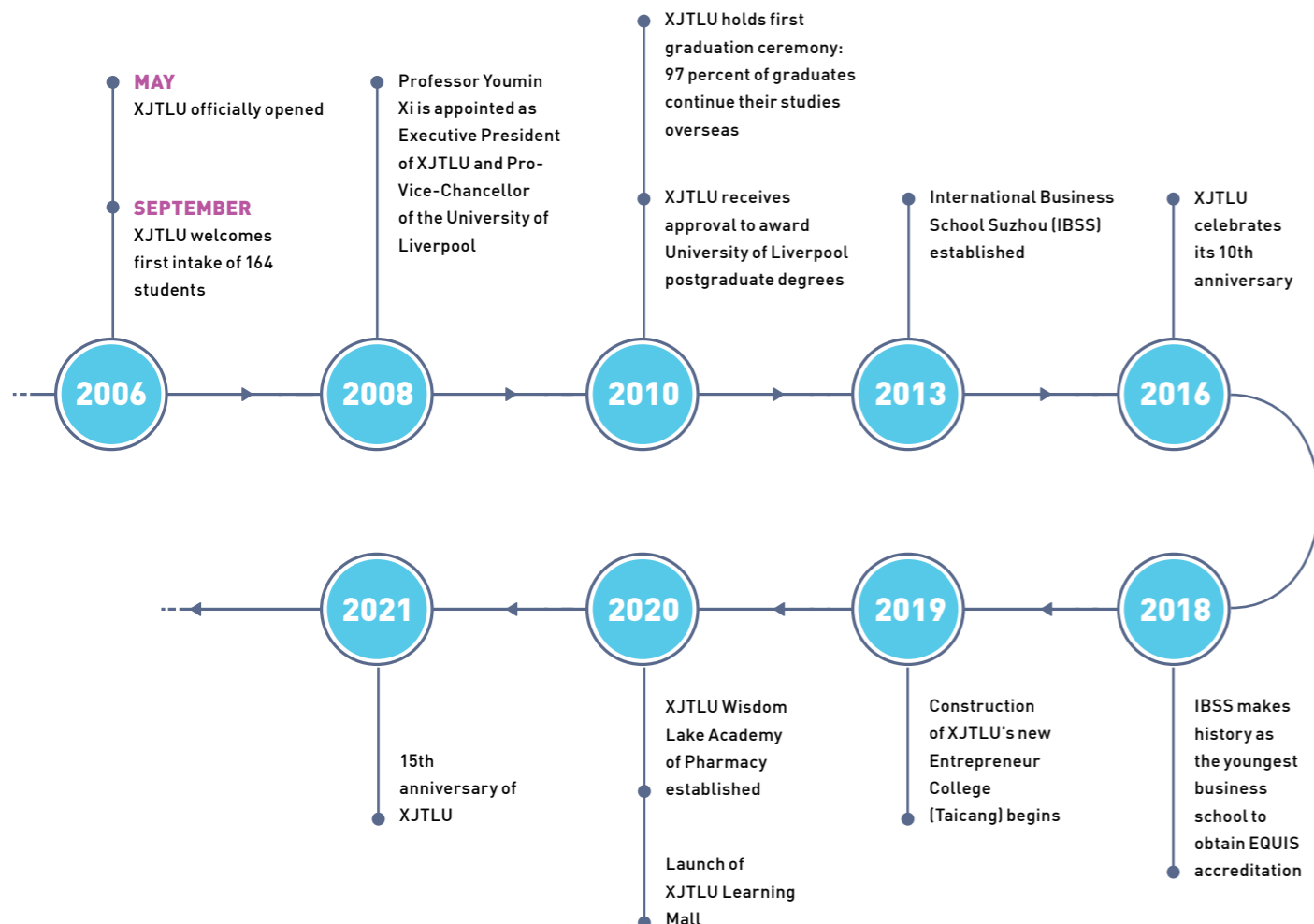
When plans for that branch campus fell through, it was revealed that SIP had made an offer to both universities, for an entirely new university to be created and jointly founded by UoL and XJTU, located in Suzhou.

The pieces were now in place to deliver what would become XJTLU. Permission to set up the joint venture was formally granted in December 2004 and within two years, a new institution had been established.

Emeritus Professor Everest states that XJTLU was established as a: "free-standing entity, not managed from either of the two founding partners but responsible for its own operation...where two distinctive sets of characteristics were drawn in a mutually supporting and enhancing synthesis."

Less than two decades on and XJTLU is an inspiring example of cross-cultural collaboration in action, combining the best elements of Eastern and Western education to provide a unique learning and research environment for students and academics from around the world.

+ AUTHOR **Will Venn**



“ It is incredible to witness and be part of the growth of XJTLU over the past 15 years. Our first graduates and researchers are now amongst the leading lights of their generation. The international education they have received has prepared them to adapt and thrive in their global careers and their success is the best testament to the value of XJTLU. We look forward to an equally productive next 15 years and beyond. ”



PROFESSOR YOUMIN XI
EXECUTIVE PRESIDENT

“ The key to XJTLU's success lies in three aspects: the integration of education philosophies of the East and West, its flat organisational structure that allows more efficient collaboration between academic and administrative units, and XJTLU's strong emphasis on putting students first. ”



PROFESSOR QIULING CHAO
VICE PRESIDENT OF STUDENT AFFAIRS AND INFORMATION



JIKANG ZHANG
CLASS OF 2020
BSC APPLIED MATHEMATICS

“

I think I would have regretted it if I had chosen another university.

The head of XJTLU, Professor Youmin Xi, always said that we need to be global citizens and have the highest end of the horizon in our view. That global vision underpins XJTLU's education and I don't think I would have gotten that elsewhere.

For me, our motto, 'Light and Wings', really had an impact. It taught us to make a stand for what is right and take responsibility for our own actions.

Even outside the classroom, XJTLU's environment made me aware of how to live within an organisation and a society

with different cultures, opinions and challenges.

These experiences turned out to be a huge help after graduation as I entered the workforce and started to build a network in the finance and investment industry. After several internships both in China and London, I recently received an employment offer from HSBC.

In the end, even if we graduated with different grades and final results, each of us has been given a voice to express how we see the world and how we are going to develop ourselves in future.

”

“

Studying at XJTLU gave me a head start in my career in environmental science.

At the time, it was very challenging – coming from Indonesia, I was learning two new cultures simultaneously and studying in a different language. And on top of that, there was all the regular coursework of my degree.

However, these are the very things that benefited my career in the long run.

My time doing projects as an undergraduate taught me to finish what I've started, even when it's complicated or difficult. I still think that way now and it has helped me persevere.

I also learned so much about Chinese language and culture, and that experience has proven really useful in my current work as a Senior Engineer at BMT, especially when connecting with Chinese clients or suppliers.

It's not uncommon for people to underestimate XJTLU, because it's a young university. But that's an advantage, not a problem. It makes XJTLU agile and quick to adapt. They're not afraid to change the way they do things if it means getting a better result.

”



MIA OENOTO
CLASS OF 2017
BSC ENVIRONMENTAL SCIENCE



PROFESSOR ENG GEE LIM
SCHOOL OF ADVANCED TECHNOLOGY
SINCE 2007

“

I came to Xi'an Jiaotong-Liverpool University shortly after its establishment because I thought it would be an adventure to work at such a new university.

During my 14 years here, I've seen a lot of progress – we have new locations, a growing student population, and additional programmes. I don't see these developments as mere changes. They are proof our education concept works.

In my opinion, the biggest impact XJTLU has made is the unique integrative education model we give to the students.

We want to equip them for the future, which means teaching them how to be global citizens.

We don't want students to graduate with just a good score; we provide them with the real-world projects and research experiences that will help them face challenges in industry and society more broadly.

If you are confident and driven, we will give you the wings to fly to wherever you want to go – that is the true meaning of our motto 'Light and Wings'.

”

“

I joined XJTLU because I wanted to continue my research in an English-speaking environment in China.

Research is so important – at its core, it's about solving problems to make the world a better place. That's why XJTLU's enhanced research environment, for both staff and students, caught my eye.

I love that XJTLU is different from other universities. Our students have many opportunities to participate in research projects that interest them, giving them a real competitive advantage

upon graduation.

Their time here also broadens their horizons. All staff have international study or work experience, and I think that's more valuable to the students than the teaching materials we deliver.

At XJTLU, students learn how to learn. Computers can do calculations, so humans need to do something more advanced. We prepare students to solve real problems in the real world.

”



DR CHENG ZHANG
DESIGN SCHOOL
SINCE 2012

“

XJTLU is a research-led international university, which is one of the things that led me to apply in the first place.

After I started working here, I found the environment, facilities, and international mindset very enjoyable. As time went on, I also began to see benefits that weren't as noticeable at the beginning. There's a strong continuing circulation of ideas on all levels, and this

has made my experience here very valuable.

I am constantly surprised that it's often students who give input and insights on new topics and ideas. This inspires me to do research in avenues I haven't yet explored or even considered previously.

”



DR MARCO PELLITTERI
SCHOOL OF HUMANITIES AND
SOCIAL SCIENCES
SINCE 2020

IN THE PANDEMIC, SCIENCE HAS SHOWN THE WAY



In late January of 2020, worries about the spread of a novel coronavirus were increasing. By May of 2021, over 3 million people have died from a worldwide pandemic, with the number continuing to grow.

During this dark time, science has lit the way to fight the coronavirus and the disease it causes, Covid-19. **TAMARA KAUP** shares the stories of the scientists at Xi'an Jiaotong-Liverpool University who joined others in this unprecedented effort to protect health and save lives, contributing with research, data models, information sharing, policy advice and public education.



Early days

In January 2020, research by **Dr Xiaowei Jiang** of XJTU's Department of Biological Sciences and Professor David Robertson of MRC-University of Glasgow Centre for Virus Research indicated a close evolutionary relation to a group of bat coronaviruses (*Sarbecovirus*) that gave rise to SARS. "While the results of our preliminary analysis have not yet been peer-reviewed or published, we are sharing as much information as we feel confident providing due to the urgent nature of scientists getting a better understanding of this new coronavirus," Dr Jiang said then.

In response to the World Health Organisation calling the novel coronavirus outbreak a "Public Health Emergency of International Concern" on 30 January 2020, **Dr Ying Chen** of XJTU's Department of Health and Environmental Sciences provided context:

"Confirmed novel coronavirus infections have been found in more than 20 countries or regions outside the Chinese mainland," Dr Chen said in February last year. "As a global community, we need to work together to control this."

Models' predictions

On 10 February 2020, XJTU researchers' data model indicated a soon-to-come rapid decrease in new, confirmed coronavirus cases in the Chinese mainland, a surprising prediction while cases were still going up.

"According to the data we collected, the virus disease pattern shows a classic sigmoid function curve," said **Dr Yi Zou** of XJTU's Department of Health and Environmental Sciences in early February 2020. "The curve looks like a stretched version of the letter 'S.' We appear to be at the top curve of the S, where the top curve indicates the maximum number of cases."

Separately, **Professor Duo Wang** of XJTU's Department of Mathematical Sciences dusted off the model he had used 17 years prior that accurately predicted when the daily newly confirmed SARS cases would drop to zero in 2003.

On 29 February 2020, the model Professor Wang and another professor from Renmin University had slightly modified indicated the number of newly confirmed Covid-19 cases in the Chinese mainland (not including imported cases) outside of Hubei province would drop to zero between 7 and 10 March.

Both models' predictions turned out to be statistically accurate.

Joining the public conversation

In early February 2020, **Dr Stephen Pan** of XJTU's Department of Health and Environmental Sciences called for greater calm in the crisis.

"Excessive fear can lead to harmful stereotypes of entire cities and social groups, as we've already begun to see," he said.

On a positive note, later that month, China enacted a ban on the trade and consumption of wild meat, a move that garnered much support from non-governmental organisations and academic research institutes, as noted by **Dr Emilio Pagani-Núñez** and **Dr Li Li**, both also of XJTU's Department of Health and Environmental Sciences.

"The newly launched wildlife trade ban should be considered a milestone event of public engagement toward good governance," Dr Li said.

In March 2020, **Dr Ying Chen**, also of the same department, said China's multi-faceted approach to controlling the outbreak – case tracking, infection testing, social distancing policies, and rapid deployment of equipment and medics to hotspots – could serve as an example of good practice.



"Social distancing and self-isolation are among the most important factors in controlling the spread of this virus. In China, specifically in Hubei where isolation measures may have been considered strict, that effort has been worthwhile."

Data, research to inform decision-making

Dr Peng Zhao, **Dr Yi Zou**, and **Dr Lei Han** of the Department of Health and Environmental Sciences, along with a scientist from Southern University of Science and Technology, created a website early in the outbreak in China to display coronavirus data and related news for the public and other scientists. They gathered the data from authoritative public sources and made it available so that others could use it in modelling and decision-making. They also posted figures daily from their sigmoid function model to illustrate the virus disease pattern.

"To my knowledge, this was the only such open-access data website for novel coronavirus data in the world at that time," says Professor Johannes Knops, Head of the Department.

Critical care specialist and Department of Biological Sciences PhD student **Dr Lei Zha**'s study published in April 2020 in the *Medical Journal of Australia* indicated that corticosteroids have no clinical benefit for patients with a mild version of the disease.

After analysing flights across 22 countries in six continents between January and April 2020, **Dr Lixian Qian** of the University's International Business School Suzhou, along with researchers at Fudan University, noted that to protect public health, governments and policymakers should look at global mobility holistically – not simply restrict travellers from hotspot areas.

Policymakers are "shutting the front door while leaving the back door open" when they don't consider cross-nation travel from non-hotspot countries, the researchers said.

Throughout the virus's ebb and flow, **Dr Xiaowei Jiang** has continued his research into the genetic ancestry of the coronavirus. In October 2020, commenting on his and his collaborators' study, he noted an urgent need for increased virus sampling.

"The lineage that gave rise to the virus SARS-CoV-2 which caused Covid-19 has been circulating unnoticed in bats for decades," he said.

"This suggests a great deal of viral genetic diversity is not being sampled. Without these samples, we won't know the exact links between SARS, Covid-19 and future outbreaks."

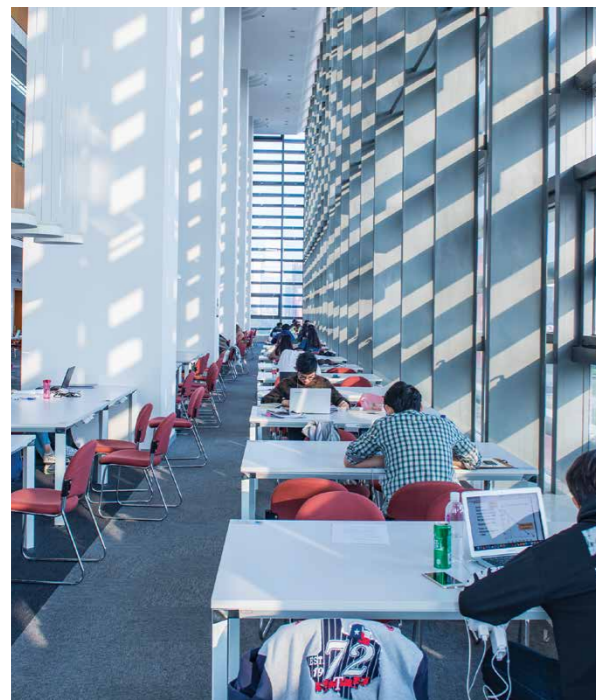
“Crises are often opportunities to foster innovation and make the impossible possible,” said Professor Youmin Xi, Executive President of Xi’an Jiaotong-Liverpool University, in an online letter to the University community on 3 February 2020. His words could not have been more far-sighted.

In just a few weeks after his letter was published, XJTLU made the switch to teaching fully online for the 2020 spring semester. It wasn’t easy. However, by working together, XJTLU staff and students managed a successful online academic semester. Outside of academics, XJTLU also grew its digital presence. A student’s song tribute to medical workers went viral, and some annual events, like the W•E Musicale concert, moved online for the first time.

Before the 2020 autumn semester, with 90 percent of students able to return onsite and the remainder still offsite, XJTLU successfully pivoted again. The University invested in the high-end technology needed to deliver HyFlex, or hybrid flexible-taught modules, to meet the needs of students learning in Suzhou and from around the world.

+ AUTHOR **Tamara Kaup**

+ PHOTOS **Shutterstock**



10

factor by which XJTLU’s online education platform needed to be expanded before spring semester 2020

3

number of weeks in which to complete that expansion

0

number of days the expansion was late

6,000
-
8,000

number of XJTLU students who could access the platform simultaneously

15

number of technical staff answering instructors’ online teaching technical support questions in spring 2020

900+

number of instructors teaching online in spring 2020

95

percent of modules online by start of the 2020 spring semester

14k+

number of students learning online in spring 2020 semester

1M+

number of times XJTLU student’s musical tribute to healthcare workers viewed on Sina Weibo online

8

number of provinces from which students performed in first online W•E Musicale concert

38

percent of graduating class of 2020 receiving first-class honours

500k

amount of RMB invested in technology to support HyFlex teaching for the 2020 autumn semester



Xi’an Jiaotong-Liverpool University’s summer, language and short courses are designed for global students who wish to learn more about China in the way that suits their needs, whether online or onsite at our beautiful Suzhou campus.

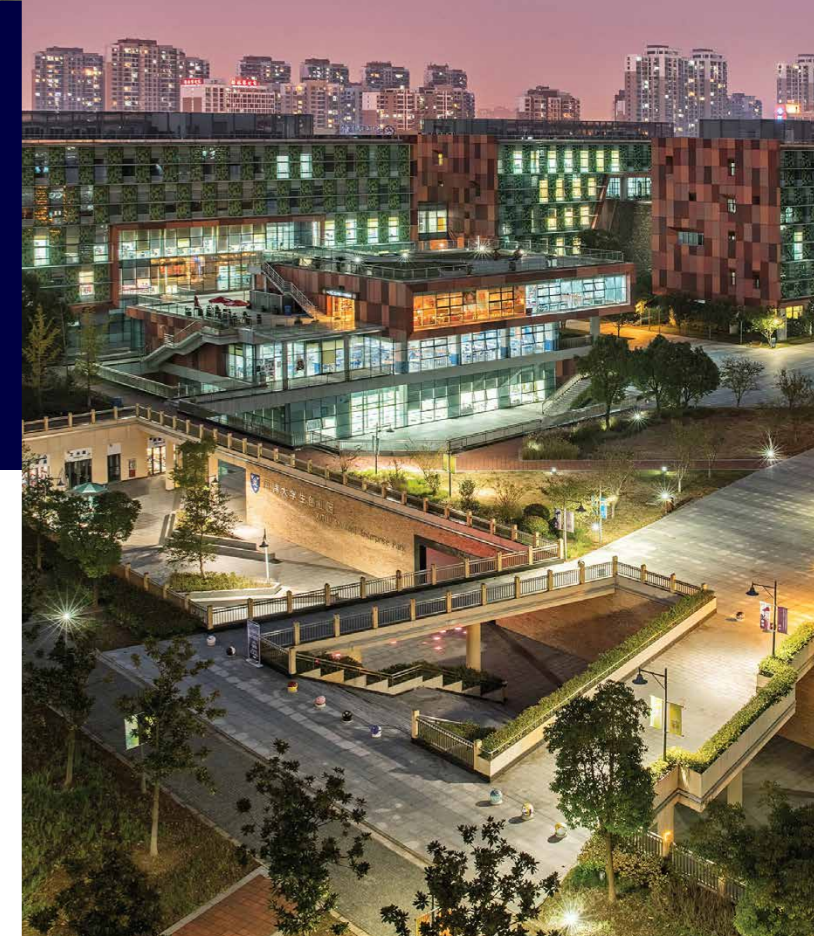
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SUZHOU'S TRANSFORMATION INTO THE 'PHARMA VALLEY OF CHINA'



Suzhou, long known for attracting tourists to its picturesque gardens, now has its sights on enticing heavy hitters and up-and-comers in the biomedical field. **CHLOE BYRNE** and **WEI ZHANG** explore why the region is recognised as a strategic biopharma hub, and where it's going from here.



“The newcomers are usually more innovative and they bring new products, technologies and practices to the existing competition, while the established companies are more experienced in clinical trials and commercialisation of research findings,” she says.

Professor Mu Wang, Executive Dean of XJTLU Wisdom Lake Academy of Pharmacy, which was established last year, agrees. He says the robust industrial ecosystem vital to the growth of the Valley will rely on companies supporting each other with shared resources and expertise.

“Pharmaceutical analysis centres or lab facilities are expensive to build. By sharing resources, newcomers can have a running start,” he says.

“Established companies, who are inclined to be profit-driven, can also do joint research with innovation-focused start-ups.”

Among the most notable tenants of the more than 3,000 biotechnological and pharmaceutical companies already residing in Suzhou are Abogen Biosciences and Advaccine Biopharmaceuticals, two local pioneers of coronavirus vaccines. The former developed China’s first mRNA-based Covid-19 vaccine and the latter developed China’s first DNA-based Covid-19 vaccine. Both candidates are currently in clinical trials.

The speed with which these companies have taken action underscores the strategic importance of this industry and its supporting infrastructure.

The ancient city of Suzhou in Jiangsu province, famed for its millennia-aged gardens and winding canals, seems from the outside an unlikely host to the burgeoning pharmaceutical innovation boom currently taking place.

Yet the city’s pursuit of the perfect balance of industry foundations, research capacity and societal support means Suzhou is fast becoming a magnet for biomedical companies. The vibrant ecosystem, unveiled with the construction of the Suzhou BioBAY 15 years ago, is now striking a harmonious juxtaposition between old and new, the established big names alongside exciting newcomers, utilising cutting-edge research and reinforced financial support.

The BioBAY, located in Suzhou Industrial Park, is home to more than 430 businesses and almost 15,000 professionals in the biomedical industry. Among the residents are not only pre-eminent players like Innovent Biologics, CStone Pharmaceuticals, Ascentage Pharma and BeiGene, but also high-flying start-ups like Gracell Biotechnologies and Basecare Medical.

Suzhou has set its sights on becoming the Pharma Valley of China by 2030, aiming to grow the number of biomedical companies in the city to 10,000 and hit 1 trillion RMB (US \$155 billion) in revenue from the industry.

In 2019, Suzhou’s biomedical industry,

with a gross output of 172.8 billion RMB and a year-on-year growth rate of 24.9 percent, was put on the list outlining 66 strategic emerging-industry clusters released by China’s National Development and Reform Commission.

Running start

With local government support, the industrial ecosystem is focusing on a circular system of providing resources and infrastructure to attract valuable tenants, which in turn will provide opportunities for employment and collaboration.

Dr Yu Song, Director of the XIPU Institution, XJTLU’s research think tank, says attracting both established firms and newcomers to Suzhou’s Pharma Valley will be critical to the city’s ambitions of building a healthy industrial ecosystem for the biomedical sector.



University-industry collaboration

Another future driver for this exciting industrial hub in Suzhou will be the XJTLU Wisdom Lake Academy of Pharmacy, which welcomes its first cohort of students in autumn 2021.

Professor Wang says XJTLU could be the link to bring all the elements of the Valley together, taking inspiration from Boston’s successful model of fostering industry growth through its proximity to renowned universities.

Kendall Square, located in the Boston metropolitan area, is an international innovation centre for biotech and life science. The biomedical cluster is propelled by the synergies of leading universities and biopharma companies in the area, including education and research incubators like Massachusetts Institute of Technology and the Broad Institute of MIT and Harvard, and giant firms like Bayer, Johnson & Johnson Innovation, and Pfizer.

This clustering is also taking shape in Suzhou. XJTLU is only two kilometres away from BioBAY, which will spur collaboration and innovation for the industry.

“With the Academy, we have a concrete foundation of research credentials, so high-level talent training is one way we can contribute to growing the Pharma Valley,” Professor Wang says.

“The model of XJTLU Wisdom Lake Academy of Pharmacy is the first of its kind in China’s biomedical sector, and the successful execution could set XJTLU apart as an example of partnership between universities and industry.

“Since China drew up guidelines to promote the integration between education and industry in 2017, people have been talking about a collaboration with business, a collaboration with the government and a collaboration with universities, but no one has yet really put this in place.

“I hope that our experiment will come to fruition in a few years when the first cohort of industry-ready students graduates.”

Professor Song thinks the government-industry-university ecosystem model will set a precedent for future similar endeavours.

“Universities such as XJTLU will play a crucial role in cultivating a conducive environment for future biomedical innovation,” she says.

+ AUTHORS **Chloe Byrne, Wei Zhang**

+ PHOTOS **Shutterstock**



+ **DR YU SONG**
Director of the XIPU Institution



+ **PROFESSOR MU WANG**
Executive Dean of XJTLU Wisdom Lake Academy of Pharmacy

BEHIND THE SCENES: THE RISE OF CHINA'S FILM INDUSTRY



In the decades since the release of China's first film, *Dingjun Mountain* in 1905, the Chinese film industry has seen remarkable growth, with China becoming home to the world's largest box office in 2020. Join us as we take a journey through the history of Chinese film and find out what's next for this booming industry.

A short history of Chinese film

Among the thousands of films produced in China to date, a few stand out as milestones that helped Chinese film reach a wider global audience and join the competitive international market.

The first Chinese film to break into the international mainstream was *Song of the Fisherman* (1934), a silent film exploring the struggles of a poor family of fishermen forced to sing on the streets to survive. Following its huge success domestically, the film went on to become the first to win an award in an international festival at the 1935 Moscow Film Festival.

Nearly 60 years later, director Kaige Chen's masterpiece *Farewell My Concubine* made waves internationally in 1993. The historical drama, which follows the lives of two Peking opera actors against the backdrop of a politically turbulent period in China's history, became the first Chinese film to take home the Palme d'Or – the highest prize awarded – at the renowned Cannes Film Festival.

Coinciding with China's rapid economic growth and increasing global influence, the turn of the century saw the first Chinese film awarded Best Foreign Language Film at the Academy Awards. *Crouching Tiger, Hidden Dragon*, directed by Ang Lee, was a huge commercial success, giving audiences around the world the chance to see a *wuxia* film – a widely-popular genre of Chinese fiction focused on martial arts in ancient times.

Chinese science-fiction film *The Wandering Earth* is the most recent film to enjoy significant success on the global stage. Garnering both commercial and critical acclaim worldwide following its release in 2019, the film was described by *The Hollywood Reporter* as “China's first full-scale interstellar spectacular”, highlighting China's move into the internationally competitive film industry with state-of-the-art special effects and technology.

From the shadows

While the first Chinese film was produced only 115 years ago, the country's role in the history of moving pictures goes back much further.

Centuries before films were captured and projected on screen, entertainers in China were enthralled audiences with shadow plays. Chinese shadow puppetry, which was inscribed on the UNESCO Representative List of Intangible Cultural Heritage of Humanity in 2011, is considered one of the precursors to modern cinema, and a major influence in the development of the Chinese film industry.

Produced on a translucent screen with hand-operated figures and voices and singing mostly from the puppeteers, Chinese shadow puppetry is a form of theatre with a history dating back to the Western Han era (202 BC-8 AD). The puppets themselves are drawn on leather or paper, often featuring bright colours and intricate designs.

According to Dr Hui Miao from XJTLU's Department of Media and Communication, the pre-cinema Chinese shadow puppetry tradition provided opportunities for experimenting with light, sound and storytelling techniques.

“This was the beginning of Chinese cinema and demonstrates Chinese audiences' historical appetite for visual storytelling that goes back hundreds of years,” she says.

Home to a multi-billion-dollar industry

According to data from China Film Distribution and Screening Association, China's film market has experienced rapid growth over the past decade. China's box office revenues rose from

10.172 billion RMB in 2010 to 64.266 billion RMB in 2019. In the same period, the number of movie-goers in China has seen a fivefold increase, from 281 million in 2010 to 1.727 billion in 2019.

In line with audience demand, both output and revenue in the domestic film industry has surged. Box office takings for domestic films grew from 5.734 billion RMB in 2010 to 41.175 billion RMB in 2019 while the number of films produced in China nearly doubled.

By 2019 – the year before the global pandemic put much of the world's film industry into deep decline – 47 of the 88 films that grossed more than 100 million RMB at the Chinese box office were made domestically.

While much of the international film market is still struggling today due to the pandemic shuttering movie theatres in previously robust markets, China became the world's fastest recovering film market thanks to epidemic prevention and control measures that allowed the country's cinemas to reopen in low-risk areas from mid-July last year.

For the first time, 2020 saw China's film market surpass North America to become the world's largest with a record 20.417 billion RMB (\$3.129 billion) in earnings, as the North American film market hit a 40-year low.

	2009	2019
CHINESE BOX OFFICE	6.206 billion RMB	64.266 billion RMB
NUMBER OF MOVIE-GOERS	180 million	1.727 billion
NUMBER OF CINEMAS	1,687	11,453

An audience with diverse tastes

The large portion of Chinese people who make up the worldwide film market is due, in some part, to Chinese viewers' desire for varied content. In addition to major Hollywood blockbusters like those from the Marvel Cinematic Universe and Fast and Furious franchises, as well as China's own domestic productions, the Chinese audience also has an appetite for films exploring different cultures.

From India's *Dangal* to Thailand's *Bad Genius*, foreign films have increasingly captured the attention of domestic moviegoers. *Dangal* still holds a place in the top 50 biggest box office hits in China, earning nearly 1.3 billion RMB since its release five years ago. Meanwhile Spanish thrillers like *Contratiempo* (*The Invisible Guest*) and Japanese animation films like *Your Name* have also enjoyed a healthy performance in the Chinese film market.

Dr Cheng-Hung Lo of XJTLU's School of Film and TV Arts says that while Chinese audiences make up a large and important part of the international film market, mainland Chinese films still

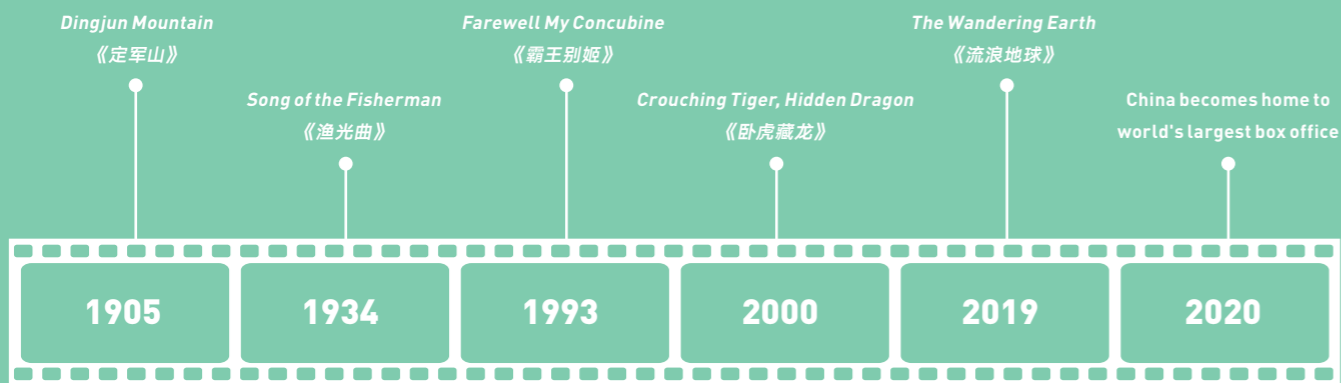
struggle to attract foreign interest.

There are only a few notable exceptions, such as Yimou Zhang's *Hero*, which was released in 2002 and earned US\$50 million in overseas box offices and the forementioned *Crouching Tiger, Hidden Dragon*, which remains the highest-earning foreign film in the US, and the only one to crack \$100 million USD.

“Their success is attributed to the successful export of Chinese culture and history through martial arts fiction and marks an important step to the overseas market for China. Yet after the initial popularity of martial arts films in the early-2000s, Chinese films experienced a long-term trough period,” says Dr Lo.

“The lack of success for Chinese films in the international market is often ascribed to cultural differences and scripts that don't have relatable themes for foreign audiences.

“Many films that enjoyed enormous domestic box-office success didn't live up to expectations overseas.”



Cutting-edge special effects

More recently it seems Chinese films are again finding a place in international cinemas. A turning point was the release of the forementioned *The Wandering Earth* in 2019, which brought in the highest international box office revenue in five years at 38 million RMB.

Dr Lo believes the science fiction film won over audiences overseas due to its extensive special effects, and signals a new era of Chinese films in the international market.

“It takes a lot of resources to create a credible reality in science fiction films and *The Wandering Earth* executed this very well,” he says.

“For this reason, I think it is a landmark in the development of Chinese films. In addition to meeting international industrial production standards, the film’s success lies in its theme of unity and commonality – a community with a shared future for mankind.

“*The Wandering Earth* has a story that audiences around the world can relate to.”

While universal themes and relatable experiences are one of the most crucial aspects of gaining a worldwide audience, high production quality and innovative techniques are a big part of modern filmmaking – and this is where China could come into its own, according to Dr Ming Xu from the School of Advanced Technology at XJTU.

“In the past 25 years, computer graphics technology has become more accessible, and is now widely applied in films – from adding effects to save the cost of film shooting, to producing full feature-length films entirely in computer-generated imagery,” he says.

Fellow School of Advanced Technology researcher, Dr Hai-Ning Liang, agrees, stating that innovative technology, such as virtual reality, will be a gamechanger in the film industry.

“One of the most exciting technologies to influence the future of cinema is virtual reality,” he says.

“VR is already used in the film industry to navigate within computer-generated scenes. For example, in *The Lion King* (2019), the directors used it to examine the scenes in first-person perspective.

“Augmented reality is another technology tool that can be used in film making. It can help plan film sets, allowing designers to use 3D models to create a range of scenarios before settling on the final one.”

While these technologies are helping filmmakers already, Dr Liang says producing a full-length VR film is still full of technical and narrative challenges.

“In highly interactive VR films, the filmmaker might choose to lead the viewer to focus on specific areas by blurring the peripheral scenes. But this might feel constraining to the viewer, as they are unable to see everything,” he says.

“At the same time, without any constraints the viewer might decide to focus on things that are not relevant to the story the filmmaker wants to portray, and thus miss another part of the experience.”

Dr Liang’s research group is investigating how to best direct a viewer’s attention in the virtual environment, to give the audience a well-designed interaction and an enjoyable experience.

Given China’s impressive track record of technology development, providing international audiences with technically advanced and immersive film experiences could be the key to continued success in the global film market, building on the country’s long and colourful history of visual storytelling.

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AI AND HIGHER EDUCATION: TOWARDS CUSTOMISED LEARNING



When we hear the term “artificial intelligence”, most of us envisage robots taking over increasingly complex human tasks. But AI can complement and work with people, transforming all industries. **KE TANG** and **KEYU LU** explore how AI has evolved over time and its impact on higher education.

Few technologies in recent memory have simultaneously sparked both such bright-eyed optimism and grim pessimism as artificial intelligence. However, with its myriad applications and benefits, it's fast becoming a part of life for everyone.

In China, AI is seeing rapid growth. According to the *Report of Artificial Intelligence Development in China (2020)*, there are 389,571 domestic patent applications for AI innovations, the largest number in any country in the world.

Although most people have a vague idea of what artificial intelligence is, with terms like "smart robots", "machine learning" and "neural networks" making headlines daily, you may still be hard-pressed to find someone who could tell you exactly what it is. That's because, despite being such a ubiquitous concept, there is no specific definition that encompasses every aspect of what it can do, according to Dr Qiufeng Wang, Head of the Department of Intelligent Science at Xi'an Jiaotong-Liverpool University's School of Advanced Technology.

"We can define what falls under the umbrella of AI, but it is difficult to define exactly what AI itself is," he says.

"The field has been rapidly evolving since it emerged in the first half of the 20th Century, and some scientists divide its development into three stages of increasing complexity: computational intelligence (solving a statistical objective using computation), perceptive intelligence (the ability to recognise objects such as a cat or a face) and cognitive intelligence (to recognise and understand using common sense knowledge).

"The ultimate goal is to develop cognitive AI that can perform tasks with the same reasoning and problem-solving abilities as humans."

Smart assistant

One of the hottest developments, which emerged in 2012, has been deep learning, whereby advances in algorithms allow machines to learn based on huge amounts of data. In the past, machines needed human guidance and supervision to learn correctly. Now, the evolution of machine learning has resulted in an unsupervised system of learning, called representation learning.

Representation learning can distil information more efficiently because AI is able to learn the characteristics of useful data automatically through algorithms, rather than having to rely on human intervention to outline specific features. One of the most well-known examples of AI that learned in this way is AlphaGo, developed by DeepMind Technologies. The system learned to play the game Go through a process called reinforcement learning, which is often used in representation learning. AlphaGo's victory over a human player in the game Go in October 2015 was a big moment for machine learning because the game's high variability was thought too complex to be learned by a machine.

While ground-breaking AI like AlphaGo grabs headlines, more pedestrian AI technology is already making everyday life easier for a variety of industries, including higher education.

Professor Kaizhu Huang, Associate Dean of Research at XJTLU's School of Advanced Technology, says one of the most beneficial applications of AI in higher education is that of student support.

"AI can be a great help in terms of real-time feedback and academic writing," says Professor Huang. "For example, using smart handwriting recognition, it's possible to check and mark handwritten quizzes in real-time, and provide immediate feedback to students."

Another powerful tool to accelerate academic writing is natural language processing (NLP). After learning about the writing in an enormous number of journals and its recurrent patterns, an NLP-modelled software can recognise when an author's language doesn't follow academic style. Students can then change their writing so that it follows the expected conventions.

Pattern recognition, such as that used in NLP, is a fundamental element of AI. It is a cognitive technology that matches information stored in a database with incoming data.

From speech recognition widely used in online translators to helping financial corporations with data recognition related to trends in the markets, pattern recognition-equipped systems are proving beneficial in various aspects of life.

In recent years, pattern recognition applications have been growing in reliability and popularity.

"The education field now has a high demand for pattern recognition applications. XJTLU has focused on understanding various pieces of information such as images, video, text and audio and performing pattern applications. Currently, XJTLU is ahead in this technology both theoretically and practically," Dr Huang says.

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+ PHOTOS **Shutterstock**



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TECHNOLOGIES CHANGING HIGHER ED

+ By **Na Li**

NEXT-GENERATION DIGITAL LEARNING ENVIRONMENTS

Cutting-edge technologies can support a flexible and innovative online learning environment, especially for higher education. These environments aim to improve a variety of aspects of online education, but the most exciting is enabling more collaboration. "Students can have more opportunities to collaborate with each other through group activities and peer review activities," says Roland Sherwood, Head of XJTLU's Centre for Educational Technology.

ONLINE DISTANCE LEARNING

Online learning became the top 2020 educational technology trend overnight because of the rapid spread of Covid-19 and closure of campuses. This led to a rising demand for platforms that could support online education and provide a flexible learning environment that allows for digital learning tools and components that adhere to common education quality standards.

VIDEO-ASSISTED LEARNING

Thanks to the rapid development of networking technologies such as 5G, videos are now a common feature of online distance education. Well-structured videos, especially those using animations and interactive components, enrich learning and teaching by making content easier to understand.

VIRTUAL REALITY, AUGMENTED REALITY AND EXTENDED REALITY

These technologies integrate the real world with virtual environments through computer graphics and wearables. They enhance the view of a real image, providing a constructed reality that can create an opportunity for students to experience real-world problems in a low-risk environment.

LEARNING ANALYTICS

This involves the measurement, collection, analysis and reporting of data about students' learning behaviours. With analytics, students can better understand their own study progress and learning outcome achievements, and teachers can reflect on and adjust their teaching based on engagement trends and usage preferences.



+ **NA LI**
Senior Educational Technologist at the Centre for Educational Technology

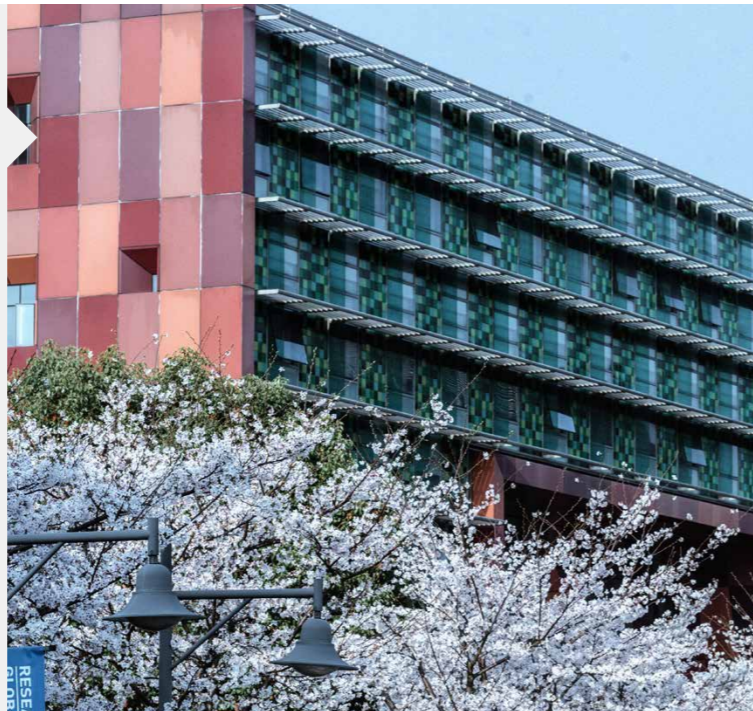
MAJOR DEVELOPMENTS AT XJTU



XJTU RANKED IN 5 THE WORLD SUBJECT RANKINGS 2021

In October 2020, *Times Higher Education* (THE) announced Xi'an Jiaotong-Liverpool University was ranked in five of the 11 THE World Subject Rankings 2021. XJTU ranked in the 201–250 band in Computer Science and Social Science, 251–300 band in Engineering, 401–500 band in Business and Economics and 501–600 band in Physical Sciences.

In addition to joining the world subject rankings, XJTU was ranked 112th in THE's Emerging Economies Rankings 2021 on 9 March 2021. This is the first time XJTU has appeared in this ranking.



IBSS ACHIEVES TRIPLE CROWN ACCREDITATION

International Business School Suzhou (IBSS) at XJTU has officially received joint accreditation from the Association of MBAs (AMBA) and the Business Graduates Association (BGA), two of the world's leading authorities on business education. Upon receiving AMBA&BGA accreditation, IBSS is now one of just 103 business schools worldwide to achieve the prestigious Triple Crown accreditation. It is also the youngest business school to have obtained the accreditation.



XJTU LAUNCHES JITRI ACADEMY

In April, XJTU launched the XJTU-JITRI Academy of Industrial Technology, jointly established with Jiangsu Industrial Technology Research Institute. The Academy will offer masters and PhD programmes aimed to develop professionals with industry and innovation skills who can work across disciplines to lead modern industries, and will develop a dual-supervisor mechanism for postgraduates, with supervisors from both XJTU and JITRI or industries who are recognised by the XJTU Graduate School.



NEW ACADEMY OF PHARMACY LAUNCHED

XJTU launched its new Wisdom Lake Academy of Pharmacy on 11 November 2020. This is in line with Suzhou's local government strategy to establish the city as the "Pharma Valley of China" within the next 10 years. In addition to the support of local government, the Academy is bolstered by its connection to the University of Liverpool, who has an internationally leading pharmacology institution.



LEARNING MALL GOES LIVE

The XJTU Learning Mall has officially gone live to the public. While students and staff have had access since November 2020, from May this year, the platform is open to anyone seeking online learning. For more information, visit learningmall.cn

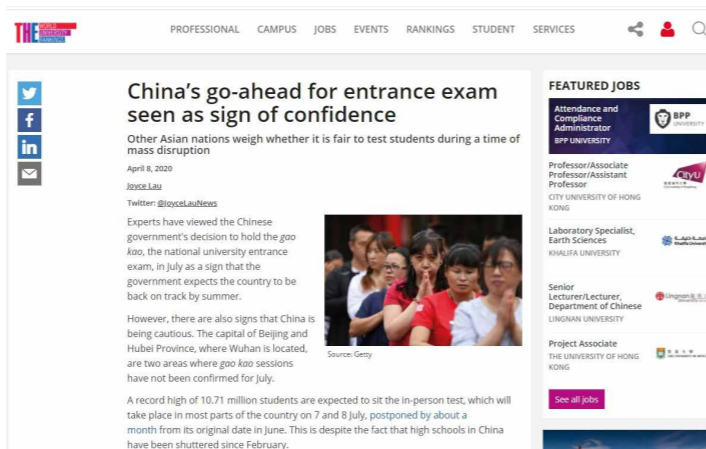


TWO NEWEST ACADEMIES UNVEILED

In May, XJTU launched its two newest academies – the Academy of Future Education, focusing on training the educators of tomorrow, and the Academy of Film and Creative Technology, incorporating XJTU's schools and centres offering training in multimedia. Both academies will be accepting students in the autumn semester of 2021.

CHINA'S GO-AHEAD FOR ENTRANCE EXAM SEEN AS SIGN OF CONFIDENCE

Dr Ceren Ergenc of the Department of China Studies at XJTLU was sought for comment by *Times Higher Education* to discuss the gaokao – China's university entrance exam – being offered during the pandemic. Dr Ergenc said: "The public has an expectation that in-person education will resume soon. If that happens, it will be an important sign of life going back to normal, but it will also be a test of whether the pandemic is completely under control domestically in China."



Original article published in Times Higher Education on 8 April 2020.

AS LABS MOVE TO REOPEN, SAFETY WORRIES ABOUND

Dr Minyan Wang of XJTLU's Department of Biological Sciences was quoted in a *Science* news story about how the Covid-19 pandemic upended scientific research around the world when laboratories and field experiments had to be shut down. Dr Wang shared her own experience of her laboratory being closed temporarily and the potential impact such closures could have on her PhD students.



Original article published in Science on 15 May 2020.

AFTER NEW CORONAVIRUS OUTBREAKS, CHINA IMPOSES WUHAN-STYLE LOCKDOWN

Public health researcher at XJTLU, Dr Chen Ying was interviewed by *The New York Times* for an article about lockdowns in China. He said that officials were reacting forcefully in the northwest in response to new outbreaks because the experience in Wuhan had demonstrated the importance of early, stringent action.



Original article published in The New York Times on 21 May 2020.

WHAT HAVE WE LEARNED AND HOW WILL HIGHER EDUCATION CHANGE POST COVID-19?

University World News sought comment from Professor Youmin Xi, Executive President of XJTLU, in an article about the impact of the pandemic on the higher education industry internationally. Professor Xi said: "I am very positive because international cooperation and the globalised world needs international education. But universities need to reshape their learning and teaching and refine the future university after the pandemic because people will look at things in a different way and universities will need to change."



Original article published in University World News on 26 June 2020.

NEW RESEARCH COULD HELP SPEED UP THE DETECTION OF SEPSIS

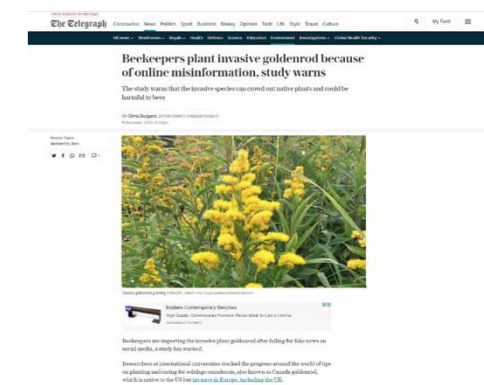
A new study could lead to a faster and more accurate way to detect sepsis, according to an article in *Healthcare Global*. XJTLU Department of Chemistry's Professor Christopher Gwenin, one of the researchers behind the discovery, said: "A method like this reduces run time as well as the cost of the device."



Original article published in Healthcare Global on 3 September 2020.

BEEKEEPERS PLANT INVASIVE GOLDENROD BECAUSE OF ONLINE MISINFORMATION, STUDY WARNS

The Telegraph reported on a study by an international group of researchers, including Professor Johannes Knops, Head of XJTLU's Department of Health and Environmental Sciences, that illustrated how the spread of misinformation online can lead to biological invasion. The researchers looked at the case of *Solidago canadensis*, also known as Canada goldenrod, which is native to the United States but invasive in other parts of the world. According to the study, beekeepers are importing the invasive goldenrod plant after falling for fake news on social media about the scientifically unsupported health benefits of goldenrod honey.



Original article published in The Telegraph on 19 November 2020.

+ COMPILED BY Yunji Tao

AROUND CAMPUS



^ A team of 11 students rebuilt the University block by block... in Minecraft, that is.



< XJTLU's fifth W•E Musicale concert went online for the first time, bringing music into the homes of staff and students at a time when no one could visit the campus. The concert is typically held in the Wave Pavilion on South Campus.

∨ XJTLUers got creative during lockdown with a competition to recreate world-famous paintings. Here, Xinran Sun does her version of Frida Kahlo's *Self Portrait, Dedicated to Dr Eloesser*.



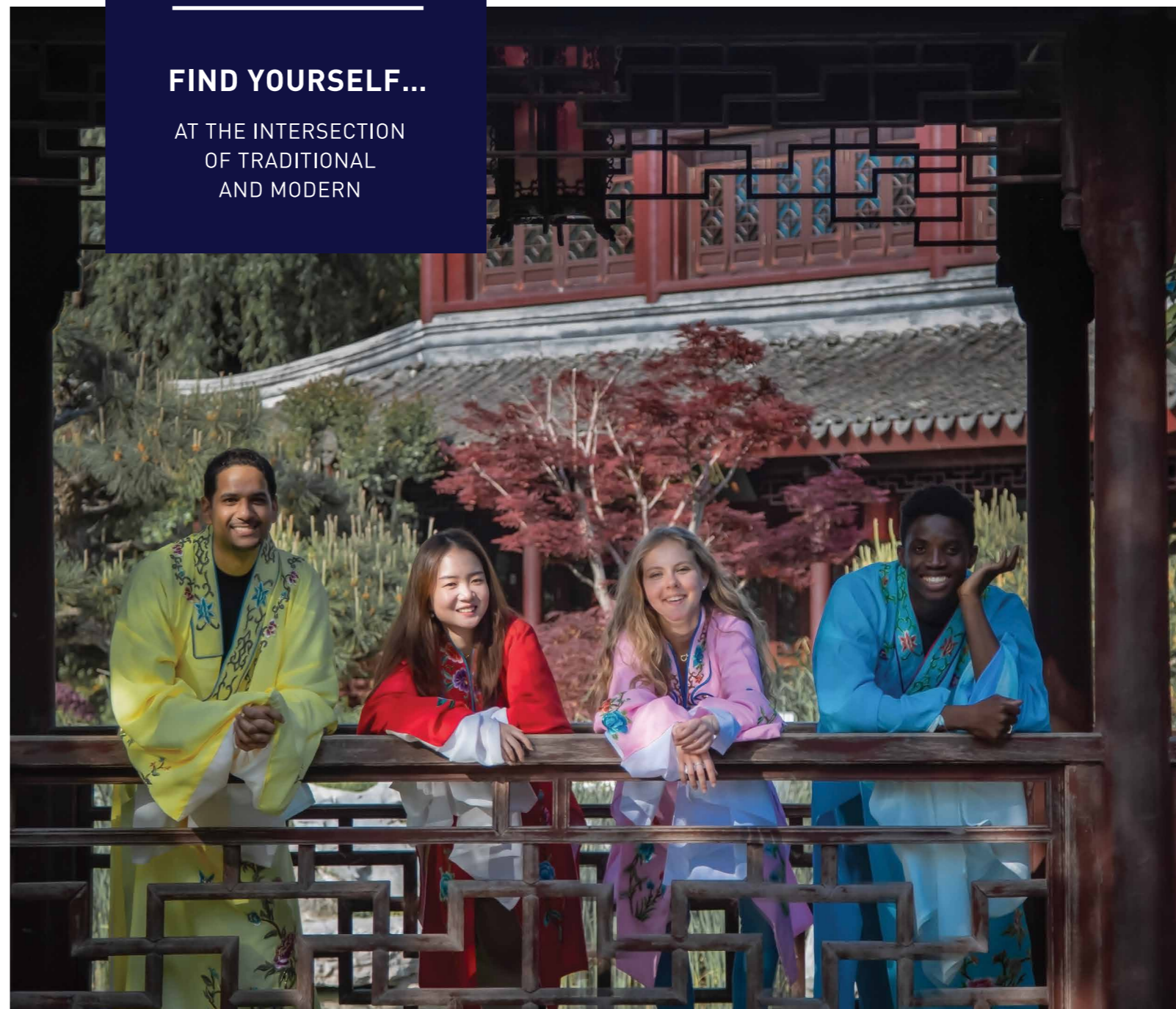
< Student ambassador Mutia Hanifah was honoured to give a graduation speech to her classmates at XJTLU – even though she was more than 4,000 kilometres away in her hometown of Bogor, Indonesia.

^ Nearly 300 students from XJTLU Entrepreneur College (Taicang) successfully completed their first Professional Development Programme summer school.

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