WORLD REPUTATION RANKINGS 2019

THE WORLD UNIVERSITY RANKINGS

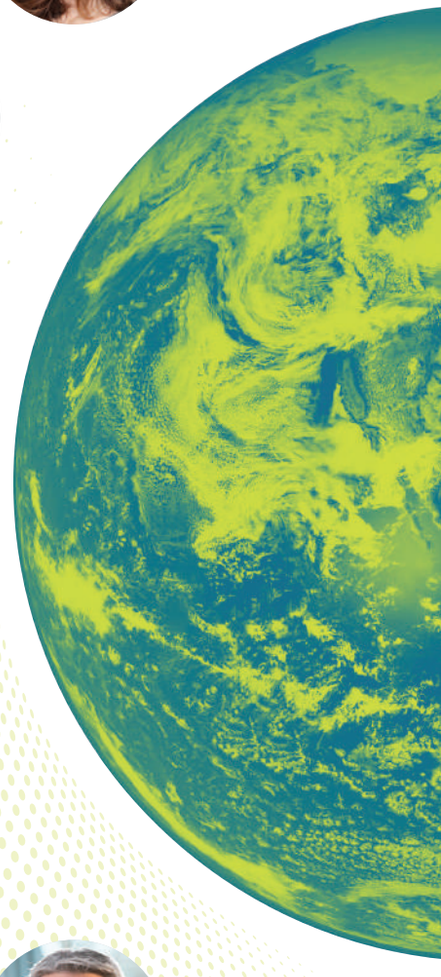
GLOBAL IMPACT

Living in an interconnected world means finding creative solutions to some of the most complex challenges. At McMaster, we foster innovative thinking that improves health and well-being, equity, sustainability and economic growth around the world. Meet some of our global difference-makers.

Clifton van der Linden builds digital technologies that are improving political representation and safeguarding democracy in countries all over the world.

Chelsea Gabel is a Canada Research Chair advancing Indigenous health and well-being through community engagement.

Ravi Selvaganapathy is developing an artificial placenta that will help premature babies breathe.



Erin Reid is changing how workplaces treat people unequally based on their gender.

James Cotton is integrating heat transfer technologies and harnessing the power of communities to create sustainable, efficient energy solutions.

Marisa Young is finding solutions to mental-health challenges that arise from the struggle to balance work demands with family life.

#2 in the world for global impact

Graham Scott is researching the effects of climate change on high-altitude animals, which are usually able to thrive in some of the most punishing environments on Earth.

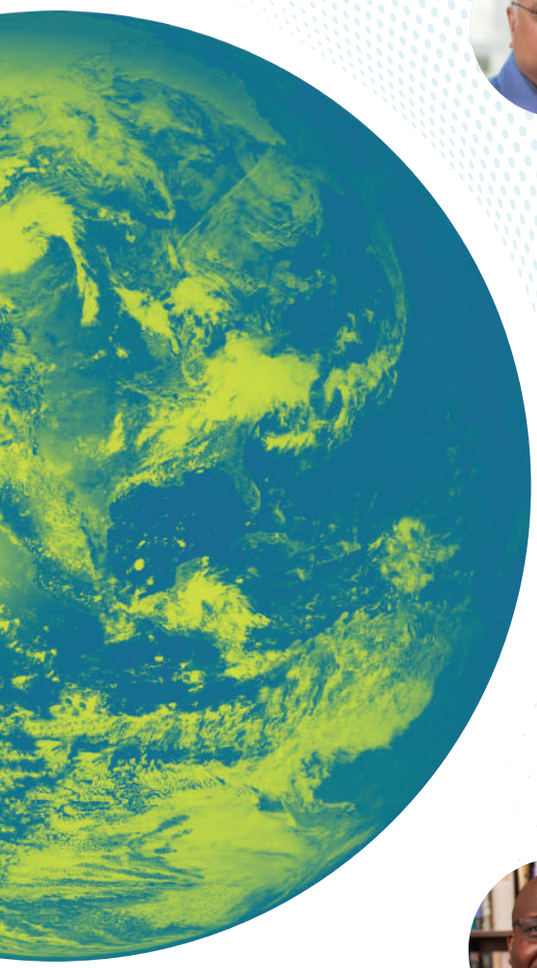
Sara Bannerman is a Canada Research Chair investigating the invasion of individuals' privacy in smart cities.

Canada's most research-intensive university

Benson Honig and **Brent McKnight** are putting their business research skills to use to address the obstacles facing refugees — and their new home communities.

Claudia Emerson is leading the charge to create principles for genetic manipulation that could benefit human health.

Salim Yusuf's large-scale clinical trials and advocacy for global population health have saved millions of lives worldwide.



Stuart Phillips is developing innovative ways for people to build strength.

Sarah Dickson is the head of Water Without Borders and studying the sustainable management of water systems through social and physical lenses.

Pat Chow-Fraser is protecting fragile wetlands from the threat of development.

Bonny Ibhawoh grew up in Nigeria in a time of immense conflict and turmoil. Now he's a leading expert on global truth and reconciliation commissions to address human-rights violations.

Mark Larché is developing vaccines to cure allergies.

Gillian Mulvale is promoting mental-health innovations for youth in remote areas, and for other vulnerable groups.

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Source: Times Higher Education University Impact Rankings 2019; Research Infosource 2018

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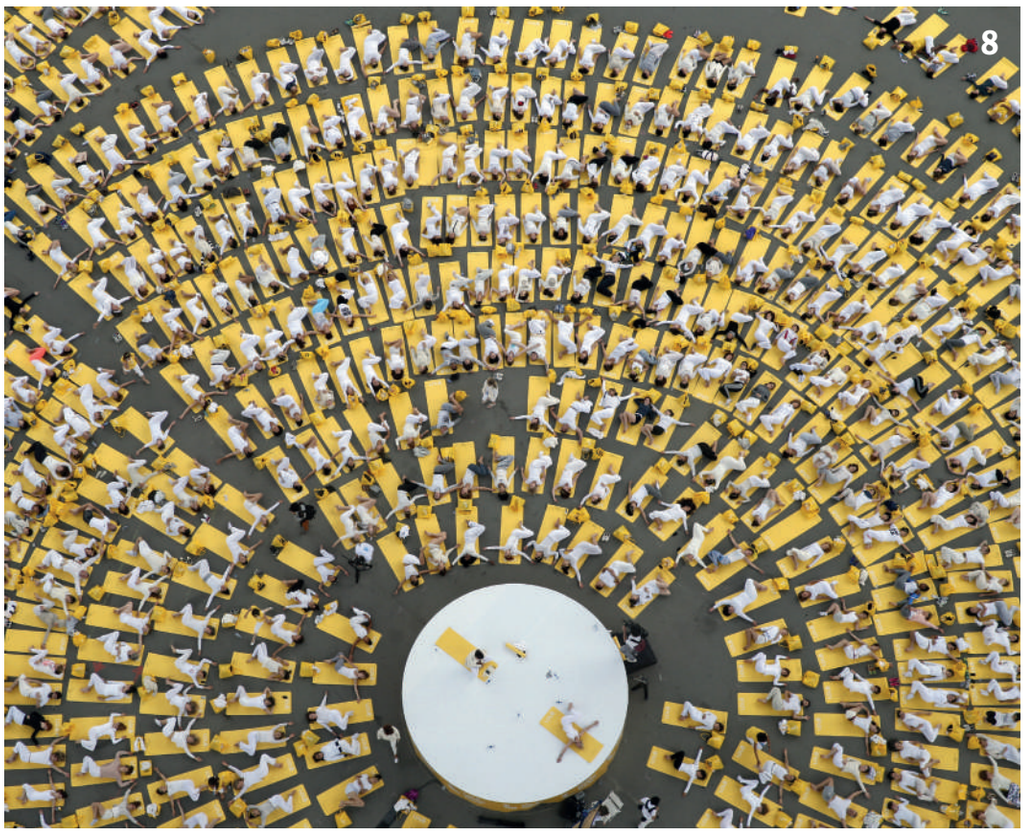
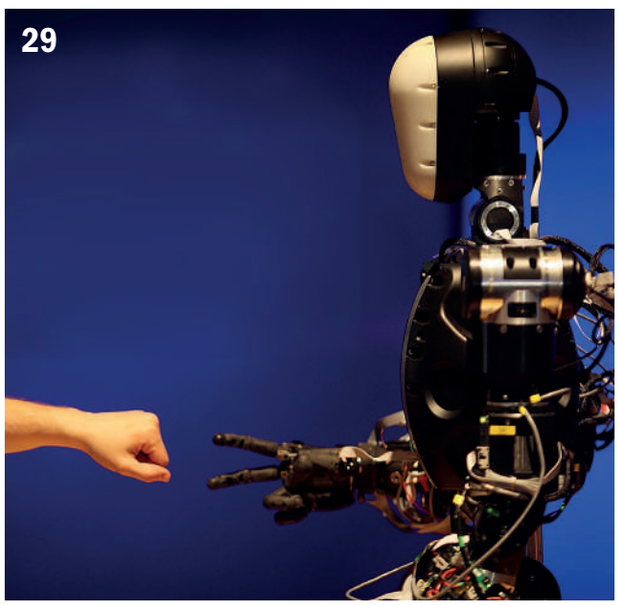
*According to Research Infosource 2018 †Times Higher Education University Impact Rankings 2019

Universities are beginning to see that the reputation of higher education as a whole – and not just individual institutions – must be safeguarded if the sector is to thrive. In these pages, we explore how a good name is made and maintained





COVER: FERNANDO VOLKEN TOGNI

Times Higher Education World University Rankings
Chief knowledge officer, *Times Higher Education*: Phil Baty | Rankings editor: Ellie Bothwell
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To unlock the data behind *THE*'s rankings, and access a range of analytical and benchmarking tools, contact data@timeshighereducation.com

THE WORLD UNIVERSITY RANKINGS REPUTATION

There's more information on our rankings website, www.thewur.com, where you can learn about our full portfolio of global university rankings, including our rankings of teaching excellence and university impact

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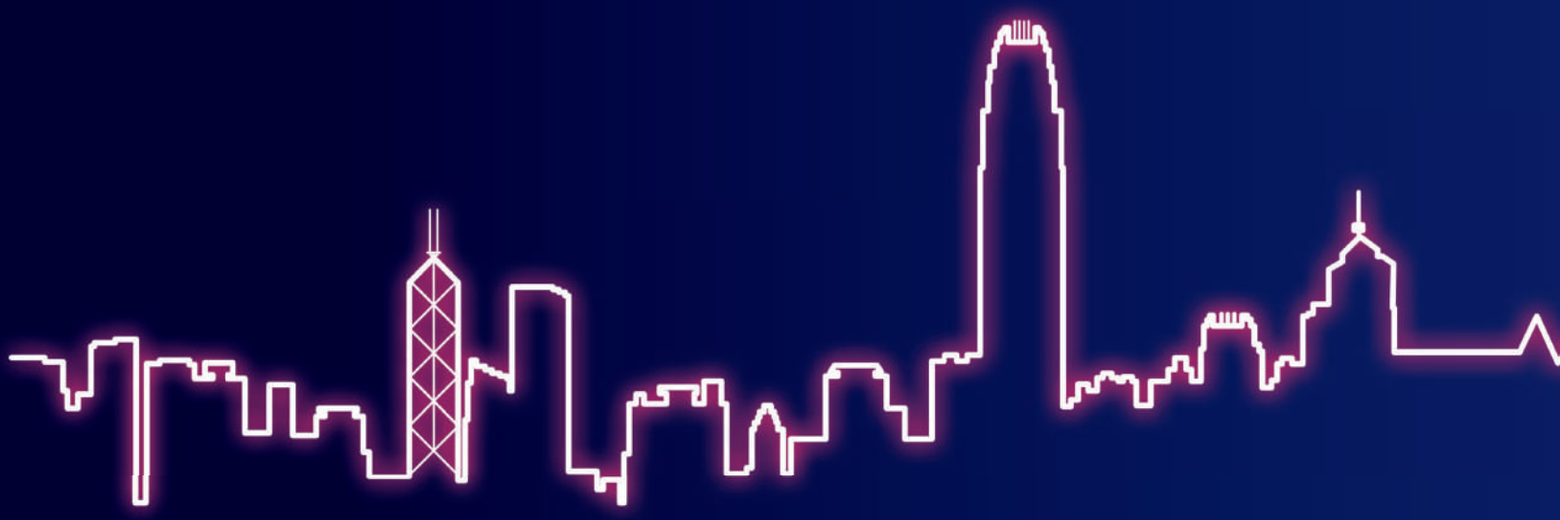

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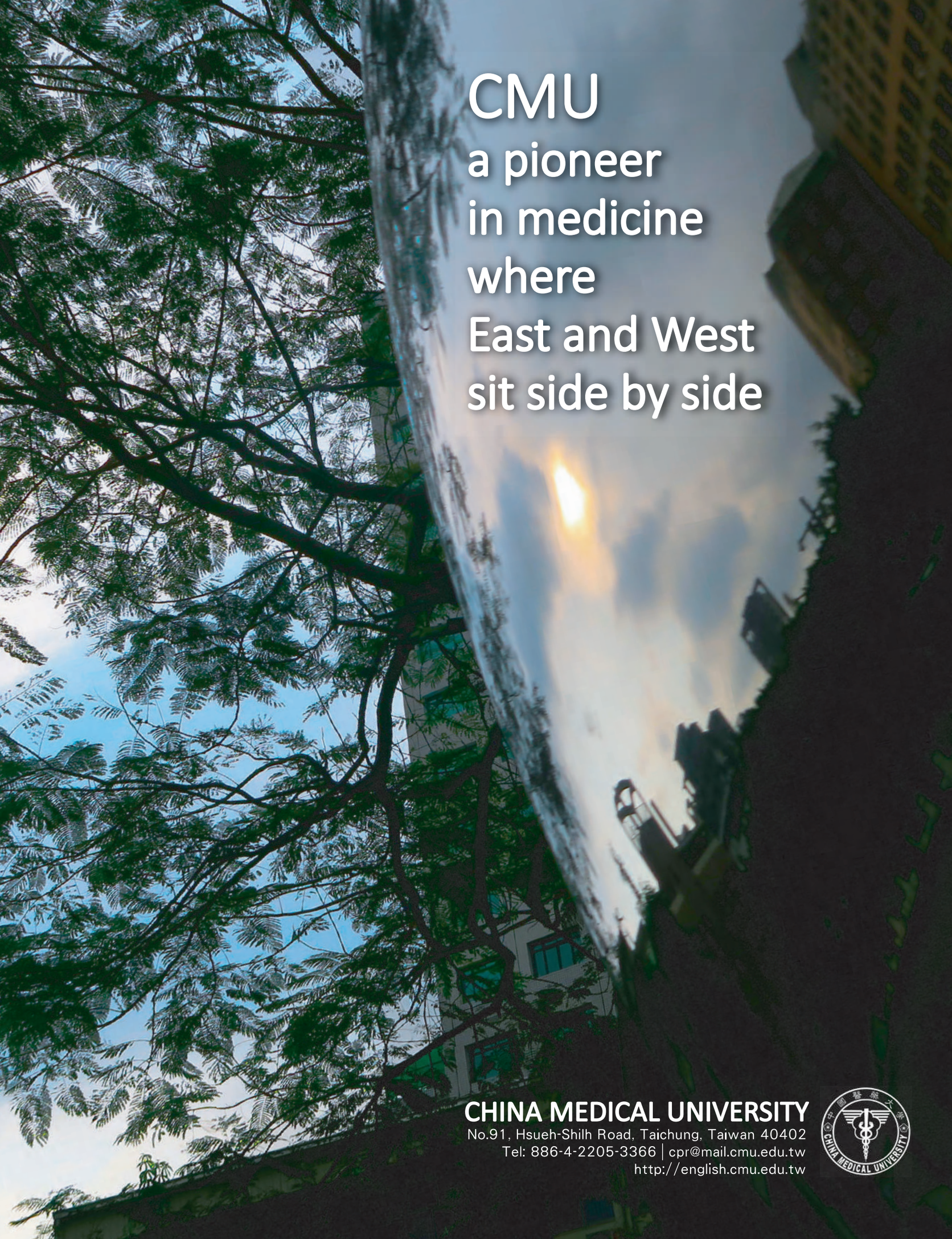

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Sharper tools you can trade on

Our survey offers vital insights to help universities thrive in an ever-changing field, says Phil Baty

To which great global institutions should today's universities look for inspiration as they navigate an uncertain and treacherous future? Plato's Academy? Or perhaps the Mouseion and Great Library of Alexandria? How about the German discount supermarket chain Lidl?

When a UK business school dean wrote an opinion article in *Times Higher Education* earlier this year arguing that universities would do well to look to the retail sector for some strategic guidance, citing Lidl alongside Zara and Next, he was met with howls of outrage on Twitter.

"We should recognise that a non-profit sector that intrinsically exists to provide a social good should not be trivialising its contribution by trying to behave like a high street fashion retailer," said one UK physics professor.

"Is it necessary to say that choosing where to spend three years of your life getting an education is not comparable to choosing where to do a week's shopping, or buy one specific article of clothing? The fact that it is shows the level of absurdity to which we've fallen," added one exasperated commentator.

"I thought this was satire when I first read it," said another. "WTF" was one very succinct comment.

Of course, universities are rather dissimilar to high street retailers to say the least, and students are very much not consumers of education – they must be partners with universities in their own learning and development. But in making his provocative comparison with the high street, the dean had a serious point worth reflecting upon.

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Lidl, Zara and Next, he pointed out, are "thriving among the chaos" of a messy, moribund high street, where many big names have already died. These three are players, he wrote, "delivering value and attracting consumers". They have had very different routes to success, "but all share a strong brand identity, clarity of value proposition…and relentless use of data".

Whether they like it or not, universities are indeed brands, and in a crowded and fiercely competitive market for talent, they need a clear brand identity. In an era of alarming populist attacks on the sector, and some genuine existential threats, universities also need to work hard to forge and articulate a clear value proposition. And, of course, a university cannot truly understand itself and its direction without an awful lot of data.

This might help explain why *THE*'s annual Academic Reputation Survey, which fuels the *THE* World Reputation Rankings and contributes to one-third of the overall score for the flagship *THE* World University Rankings, has become such a vital global resource in higher education.

The 2019 survey attracted 11,554 responses from 135 countries – all senior published scholars who are true experts in their field and are selected at random to be statistically representative of their country (mapped against United Nations data) and of their specialist discipline.

The research not only helps *THE* to create this fascinating annual list of the world's most prestigious university brands, but it also provides hundreds of thousands of detailed data points on the shifting academic perception of thousands of institutions across multiple geographies and disciplines, offering uniquely rich – and increasingly vital – insights. ●

COUNTRIES/REGIONS REPRESENTED

Country/region	Number of institutions in top 100	Top institution	Rank
United States	42	Harvard University	1
United Kingdom	10	University of Cambridge	4
Australia	6	University of Melbourne	=44
China	6	Tsinghua University	14
Germany	5	LMU Munich	43
Japan	5	University of Tokyo	11
Netherlands	5	Delft University of Technology	51–60
Canada	3	University of Toronto	19
France	3	Paris Sciences & Lettres – PSL University	40
Hong Kong	3	University of Hong Kong	=44
South Korea	3	Seoul National University	47
Singapore	2	National University of Singapore	24
Switzerland	2	ETH Zurich – Swiss Federal Institute of Technology Zurich	=20
Belgium	1	KU Leuven	51–60
Brazil	1	University of São Paulo	81–90
Denmark	1	University of Copenhagen	71–80
Russian Federation	1	Lomonosov Moscow State University	38
Sweden	1	Karolinska Institute	61–70
Taiwan	1	National Taiwan University	51–60

Phil Baty
Chief knowledge officer,
Times Higher Education

> "Universities are indeed brands, and need a clear brand identity"

> Senior leaders within institutions are now recognising that marketing and communications activity underpins the successful delivery of institutional key performance indicators

Strong bonds build stron

Having learned the value of protecting reputations individually, universities must begin acting collectively to support higher education, Ellie Bothwell hears

Universities have "always cared about their reputations", and academics have "always cared about people's opinions of their research", says Tania Rhodes-Taylor, vice-principal (external relations) at the University of Sydney.

"You wouldn't have a system where research is peer-reviewed if you didn't care what your peers thought," she says.

However, dramatic changes in the scale of higher education in the past 10 to 15 years – including the growth in the share of young people attending university in many countries and governments' rising expectations about the impact that research should make – mean that effective communication about the work that universities do is more vital than ever, she adds.

The climate in which universities operate has shifted, too, altered by movements such as #MeToo and Extinction Rebellion, the rise of populism in many parts of the world and the prominence of social media, increasing the likelihood that universities will find themselves

REUTERS

g brands

swept up in controversies.

At the same time, a rising number of universities in the UK, the US and Australia now have a marketing and communications expert on their senior leadership team – a move suggesting that reputation management has climbed to the top of the agenda for many higher education institutions.

Rachel Sandison is one such example: she became the first member of the University of Glasgow's external relations team to join its senior leadership earlier this year.

"Marketing is strategy, and I do think senior leaders within institutions are now recognising that marketing and communications activity underpins the successful delivery of institutional key performance indicators. As a result, external relations practitioners are more in demand than ever before and more frequently have a much deserved (and needed) seat at the top table," says Sandison, who is now vice-principal of external relations at Glasgow.

She adds that although she is "still perhaps a rarity within the sector, I'm buoyed by the fact that I'm not the first vice-principal in this sphere, and I'm confident that I won't be the last…This is exciting both for the profession and the sector as a whole."

Sandison believes that "reputation has always been a significant driver of university success, but it has definitely grown in importance as competition sector-wide has intensified for global talent".

> "Reputation has always been a significant driver of university success, but it has definitely grown in importance as competition sector-wide has intensified for global talent"

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"More emphasis than perhaps ever before is being placed on brand, distinctiveness and quality in support of reputation management," she says.

"Metricising the impact of activity remains challenging, but I love the fact that it means universities are recognising the importance of building relationships with our stakeholders to better understand their needs and, as a result, are becoming more adept at storytelling. Insight and digital innovation are driving exciting new initiatives and creating conversations with audiences in a way that wasn't possible a number of years ago."

> "My institution is 110 years old and that brand has been building that entire time, yet its prestige can change in a negative way in a heartbeat"

Steve Moore, senior vice-president and chief marketing/communications officer at the University of Arizona, agrees that "reputation, or brand management, has been of increasing importance in higher education for some time".

In the US, the title of "chief marketing officer" was previously used only in private companies, but it began to be employed in universities about 10 years ago and "today the title is commonplace in higher education", he says.

"Universities are becoming more aware of the value of their brand, attitudinally and commercially. As in private industry, the value will be a driver in terms of recruitment, fundraising and sponsored research," he adds.

Joe Gow, chancellor of the University of Wisconsin-La Crosse, says reputation management is "vitally important…particularly in an era where people have access to so much information".

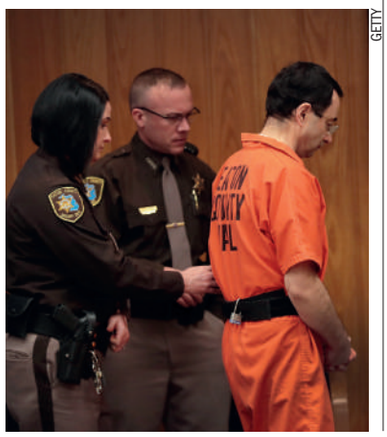
Although a university cannot "build a reputation…overnight" – "my institution is 110 years old and that brand has been building that entire time" – its prestige can change "in a negative way in a heartbeat", Gow says.

"Unfortunately the way social media are today…tends to [favour] a more sceptical, negative mindset. And so when bad things happen, there's a mechanism to communicate those quickly and broadly."

The US university sector has certainly not been short of scandals in recent months. US government investigators have charged dozens of parents, sports coaches, testing officials and private admissions counsellors after it emerged that parents had paid millions of dollars in bribes to win their children admission to elite universities through falsified sports and academic credentials.

Meanwhile, several institutions have drawn criticism for their responses to complaints of sexual assault – not least Michigan State University, whose president and subsequent interim president both resigned over the handling of the scandal involving former gymnastics physician Larry Nassar, who was convicted of several counts of sexual assault of minors.

However, Gow says a distinction should be made between research conducted at universities and incidents involving specific members of staff.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"Some very bad things have happened at institutions of higher education yet they don't involve the entire institution," he says.

For example, while Pennsylvania State University, where Gow studied, might never "fully get past" the scandal involving retired football coach Jerry Sandusky (pictured below), who was convicted of rape and child sexual abuse, "one would like to think that people are still respecting the academic quality of what happens at my alma mater".

Wisconsin-La Crosse was caught in its own controversy last year after Gow invited porn star-turned-sex educator Nina Hartley to speak on campus. The university system president claimed in a letter that the event "puts all of our funding at risk" given the potential pushback from politicians opposed to pornography.

But Gow suggests that the board's focus on the institution's reputation was perhaps misguided.

"Our enrolment numbers for the fall are looking very good, so that [incident] did not appear to turn anybody off. I think that students still want a place where the faculty and staff and, hopefully, the administration have full academic freedom and use that widely and in a way that advances knowledge," he says.

"That still seems to matter at a time when more and more of the conversation is about 'will I get the job skills I need to have a good career?' They're both important, and hopefully we strike the right balance."

But broader questions about the value of universities demand not only that institutions manage their own reputation, but also that they tend the reputation of the sector as a whole.

"In these times of polarised politics and anti-expert sentiment, I think it's incredibly important that the sector works collaboratively to promote the global impact of universities and our wider societal benefit," says Glasgow's Sandison.

As examples of important initiatives, she cites Universities UK's MadeAtUni campaign, which illustrates the impact that UK universities have on the wider public and communities, and Universities Scotland and partners collaborating on #ScotlandIsNow branding to encourage tourists, businesses and

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students to head to Scotland. But, she says, such activities should be combined with universities "engaging at a local level with our communities and fostering meaningful relationships with civic and corporate partners".

"I don't believe that the aims of the sector and that of an individual institution are mutually exclusive in this regard; in fact, they're interdependent, and universities ought to be focused on protecting and enhancing the reputation of both," she says.

Jenny Dixon, deputy vice-chancellor of strategic engagement at the University of Auckland, says "it is not so much a case of needing to protect sector reputation versus institutional reputation that is the issue".

"Rather, the sector is caught in a tension between the residual context of economic liberalism that has promoted inter-institutional competition on the one hand, and, on the other, the contemporary academic reality that it is often cross-institutional and even international research collaborations, for example, that bring about the best new advances in knowledge," she says.

"Individual institutional reputations are enhanced by even greater collaborations, hence the engagement of universities in international networks and strategic partnerships with peer institutions. As this happens, so both the sector as a whole, and individual institutions within it, are better protected."

Arizona's Moore believes that major educational issues such as attainment that cut across many universities "can generally be addressed more effectively together".

In his case, Arizona State University, Northern Arizona University and the University of Arizona work in tandem with the office of the Arizona board of regents – the governing body of the state's public university system.

"Our ability to impact the state's students who will be seeking an advanced degree will have a direct impact on the economy of the state and all constituents within the state. This is just one example, but one where the stakes are very high for the state of Arizona," Moore explains.

Meanwhile, back in the UK, the #WeAreInternational campaign has helped to counter negative media coverage and political statements about immigration in the country and to celebrate the importance of diverse international student and staff communities in universities. It was established by the University of Sheffield and its students' union in 2013 and is now supported by more than 160 universities and organisations across the country.

"The great strength of the #WeAreInternational campaign is that it has a coalition of supporters from students to business, and is backed by institutions ranging from Oxford and Cambridge to new universities, private providers and specialist institutions right across the UK," says Ruth Arnold, formerly director of public affairs at Sheffield and chair of the campaign's national advisory group.

"These supporters adapt the campaign to their own needs, but the voice of students and staff and the contribution they make is at the heart of all messages, which are more credible as a result."

Sydney's Rhodes-Taylor agrees that the diversity of the higher education sector in many countries is one of its main strengths and says the sector as a whole must now "tell our story in such a way that people realise we are actually a hugely varied and differentiated sector and that we deliver all sorts of things".

However, she adds that she is heartened by the fact that people working in external relations in UK and Australian universities are generally "very collegiate and very collaborative", sharing information "all the time" and supporting each other more broadly.

"One of the things that people coming in from industry find fascinating but delightful is how willing we are to share with each other information that in an industry context would be fiercely protected… So I think we're actually better at [working together] than we give ourselves credit for," she says.

> "Supporters adapt the campaign to their own needs, but the voice of students and staff and the contribution they make is at the heart of all messages"

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Reputation Rank 2019	Reputation Rank 2018	Position in World University Rankings 2019	Institution	Country/region	Research reputation	Teaching reputation	Overall score
1	1	6	Harvard University	United States	100.0	100.0	100.0
2	2	4	Massachusetts Institute of Technology	United States	88.4	77.8	85.4
3	3	3	Stanford University	United States	78.8	73.7	77.3
4	4	2	University of Cambridge	United Kingdom	70.5	76.6	72.3
5	5	1	University of Oxford	United Kingdom	69.8	75.1	71.3
6	6	15	University of California, Berkeley	United States	60.0	49.7	57.0
7	7	7	Princeton University	United States	37.3	38.1	37.5
8	8	8	Yale University	United States	36.6	37.2	36.7
9	=9	17	University of California, Los Angeles	United States	29.4	25.1	28.1
10	=9	10	University of Chicago	United States	28.5	21.7	26.6
11	13	42	University of Tokyo	Japan	26.0	24.4	25.6
12	11	5	California Institute of Technology	United States	26.3	22.2	25.2
13	12	16	Columbia University	United States	26.0	23.0	25.1
14	14	22	Tsinghua University	China	19.3	22.1	20.1
15	15	20	University of Michigan	United States	21.4	16.5	20.0
16	21	=12	Johns Hopkins University	United States	18.3	15.6	17.5
=17	17	31	Peking University	China	16.2	19.9	17.3
=17	=18	14	University College London	United Kingdom	18.0	15.7	17.3
19	=22	21	University of Toronto	Canada	17.6	15.2	17.0
=20	=22	11	ETH Zurich – Swiss Federal Institute of Technology Zurich	Switzerland	17.7	14.4	16.8
=20	16	=12	University of Pennsylvania	United States	17.5	15.2	16.8
22	=18	19	Cornell University	United States	16.9	15.8	16.6
23	20	9	Imperial College London	United Kingdom	16.1	15.6	16.0
24	24	23	National University of Singapore	Singapore	14.6	16.6	15.2
25	25	26	London School of Economics and Political Science	United Kingdom	15.0	12.9	14.4
26	26	27	New York University	United States	15.4	11.6	14.3
27	27	65	Kyoto University	Japan	14.1	13.3	13.9
28	28	28	University of Washington	United States	11.7	9.5	11.1
29	29	18	Duke University	United States	11.4	10.0	11.0
30	31	30	University of California, San Diego	United States	10.7	6.6	9.5
=31	30	24	Carnegie Mellon University	United States	9.8	8.1	9.3
=31	36	39	University of Texas at Austin	United States	10.0	7.6	9.3
33	37	25	Northwestern University	United States	9.8	7.8	9.2
=34	35	29	University of Edinburgh	United Kingdom	8.7	9.3	8.9
=34	32	50	University of Illinois at Urbana-Champaign	United States	9.3	7.8	8.9
36	=33	43	University of Wisconsin-Madison	United States	9.1	7.8	8.7
37	38	37	University of British Columbia	Canada	8.6	8.2	8.5
38	=33	=199	Lomonosov Moscow State University	Russian Federation	6.9	10.4	7.9
39	41	=44	McGill University	Canada	7.7	8.3	7.8
40	39	41	Paris Sciences & Lettres – PSL University	France	6.8	8.7	7.3
41	42	38	King's College London	United Kingdom	7.4	6.8	7.2
42	=44	NR	University of California, San Francisco	United States	7.9	5.2	7.1
43	49	=32	LMU Munich	Germany	7.2	6.2	6.9
=44	=44	34	Georgia Institute of Technology	United States	6.8	5.5	6.5
=44	40	36	University of Hong Kong	Hong Kong	6.4	6.9	6.5
=44	=47	=32	University of Melbourne	Australia	6.7	6.2	6.5
47	46	63	Seoul National University	South Korea	6.1	6.8	6.3
=48	=47	=59	University of California, Davis	United States	6.2	6.2	6.2
=48	43	35	École Polytechnique Federale de Lausanne	Switzerland	6.2	6.2	6.2
50	51–60	56	University of North Carolina at Chapel Hill	United States	6.8	4.6	6.1

Reputation Rank 2019	Reputation Rank 2018	Position in World University Rankings 2019	Institution	Country/region
51–60	51–60	58	Delft University of Technology	Netherlands
	51–60	47	Heidelberg University	Germany
	51–60	48	KU Leuven	Belgium
	51–60	57	University of Manchester	United Kingdom
	51–60	=71	University of Minnesota	United States
	51–60	51	Nanyang Technological University	Singapore
	51–60	170	National Taiwan University	Taiwan
	50	81	Pennsylvania State University	United States
	51–60	73	Sorbonne University	France
	61–70	=44	Technical University of Munich	Germany
61–70	61–70	62	University of Amsterdam	Netherlands
	61–70	67	Humboldt University of Berlin	Germany
	61–70	40	Karolinska Institute	Sweden
	71–80	68	Leiden University	Netherlands
	71–80	=82	University of Maryland, College Park	United States
	61–70	=93	Michigan State University	United States
	61–70	=71	Ohio State University	United States
	61–70	66	University of Southern California	United States
	71–80	=59	University of Sydney	Australia
	81–90	251–300	Tohoku University	Japan
71–80	61–70	49	Australian National University	Australia
	71–80	53	Brown University	United States
	91–100	=116	University of Copenhagen	Denmark
	81–90	104	Fudan University	China
	81–90	=146	Indiana University	United States
	71–80	102	Korea Advanced Institute of Science and Technology (KAIST)	South Korea
	81–90	251–300	Osaka University	Japan
	51–60	64	Purdue University	United States
	81–90	=93	University of Science and Technology of China	China
	81–90	189	Shanghai Jiao Tong University	China
	81–90	54	Washington University in St Louis	United States
81–90	NR	=159	University of Arizona	United States
	91–100	=74	Boston University	United States
	61–70	52	University of California, Santa Barbara	United States
	81–90	104	Free University of Berlin	Germany
	61–70	41	Hong Kong University of Science and Technology	Hong Kong
	91–100	=176	Rutgers, the State University of New Jersey	United States
	NR	251–300	University of São Paulo	Brazil
	71–80	=82	Sungkyunkwan University (SKKU)	South Korea
	71–80	251–300	Tokyo Institute of Technology	Japan
	71–80	101	Zhejiang University	China
91–100	71–80	53	Chinese University of Hong Kong	Hong Kong
	NR	=114	Durham University	United Kingdom
	91–100	108	École Polytechnique	France
	NR	=156	University of Florida	United States
	NR	=84	Monash University	Australia
	NR	69	University of Queensland	Australia
	NR	=96	UNSW Sydney	Australia
	81–90	=74	Utrecht University	Netherlands
	91–100	=59	Wageningen University & Research	Netherlands
	81–90	=79	University of Warwick	United Kingdom

NR = not ranked

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Disciplinary divisions

Australia is one of the stand-out performers in the latest edition of the *Times Higher Education* World Reputation Rankings, doubling its representation compared with last year. And these charts outline how some of the country's best-known institutions are now gaining recognition across a broad range of subjects.

The "radar" graphs (below) show for each Australian university the share of its votes in the Reputation Rankings that come from six subject areas, in 2015 and in 2019.

For most of Australia's top universities, an increasing proportion of the votes in the ranking are coming from academics in business and economics and engineering and technology. Social sciences also seem to be rising in stature relative to other fields at the Australian National University and the universities of Sydney and Queensland.

However, the growing share of reputation votes in certain subjects appears to be at the expense of the arts and humanities proportion for some of the universities.

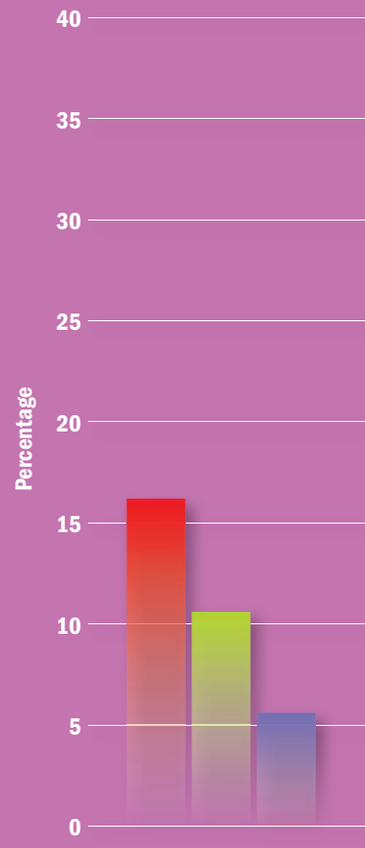
Meanwhile, the bar graphs on subject area and world region show how the scholars voting in each area of the globe are split among different fields.

In the Asia-Pacific, for instance, almost 40 per cent work in engineering and technology areas – far higher than the share in North America and Europe – and the arts, humanities and social sciences form a relatively small proportion of those voting.

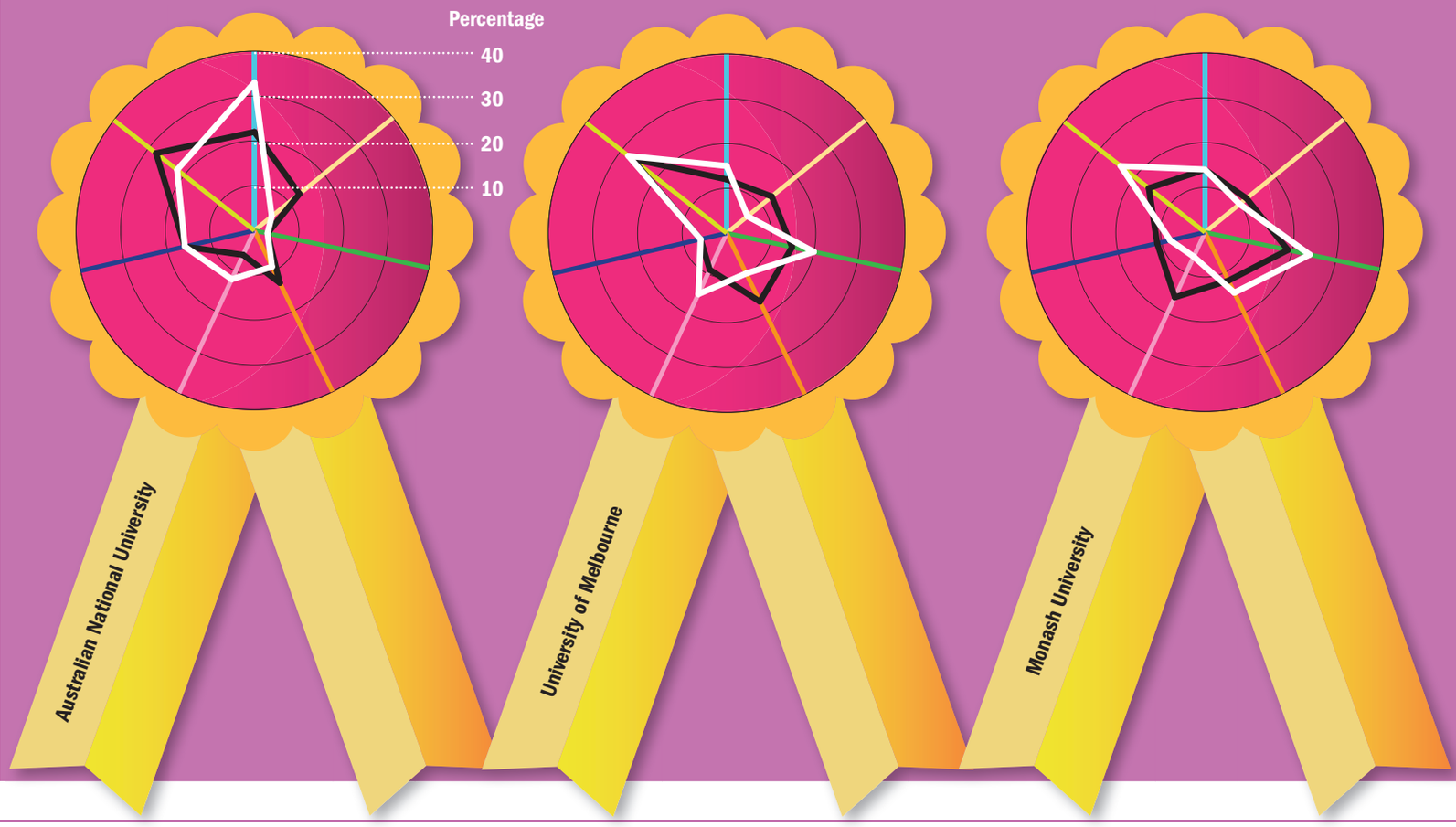
Those casting votes in Europe are more likely to be working in the arts and humanities than their peers in the other regions, while the social sciences form a similar share of voters in Europe and North America.

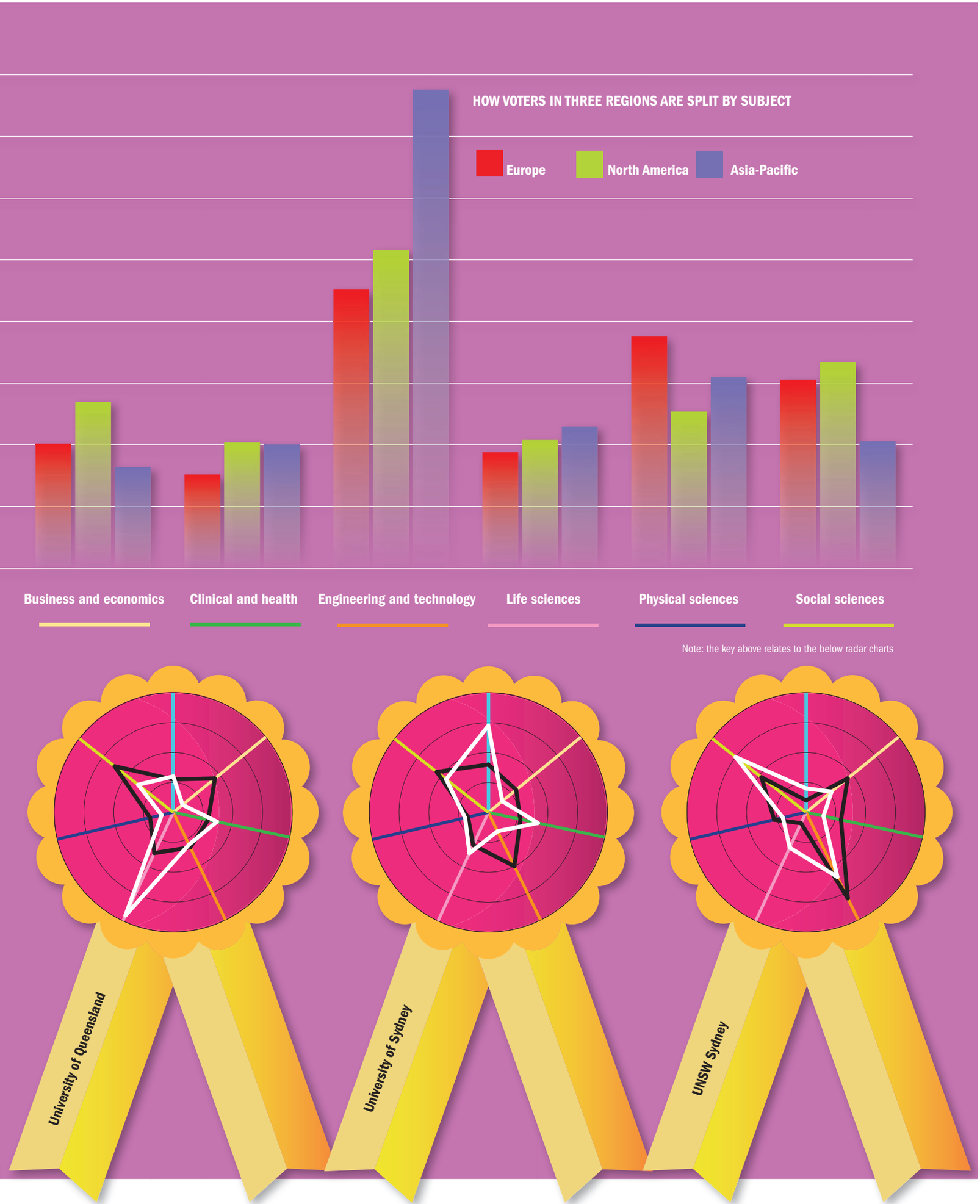
Life sciences and clinical subjects have relatively similar shares in all three regions, while the physical sciences are more likely to be the discipline for voters in Europe compared with the Asia-Pacific and North America.

Simon Baker



STRONG POINTS: VOTE BREAKDOWN BY SUBJECT FOR AUSTRALIA'S UNIVERSITIES




HOW VOTERS IN THREE REGIONS ARE SPLIT BY SUBJECT
Europe
North America
Asia-Pacific
Business and economics
Clinical and health
Engineering and technology
Life sciences
Physical sciences
Social sciences
Note: the key above relates to the below radar charts
University of Queensland
University of Sydney
UNSW Sydney

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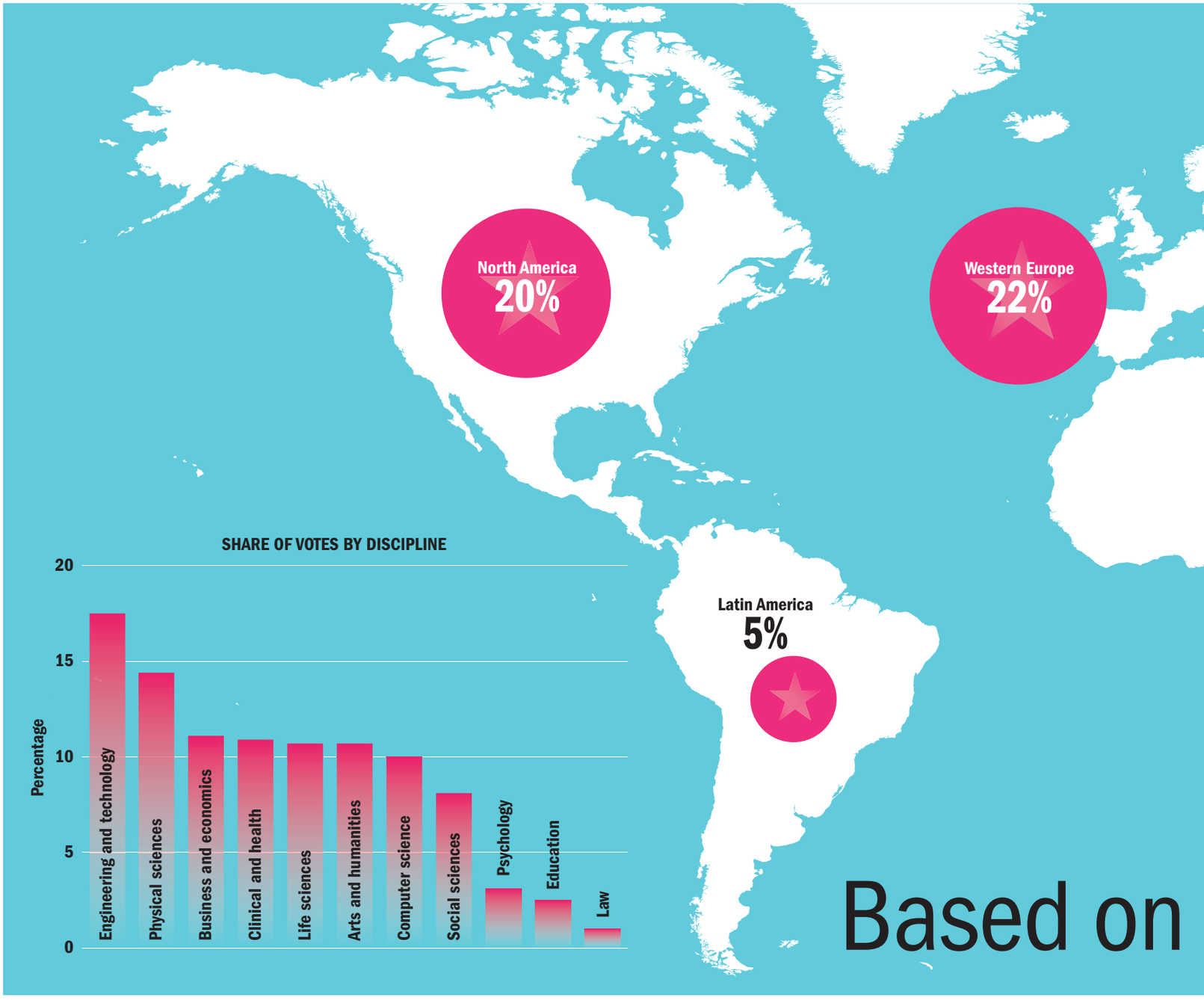


Based on

Our Academic Reputation Survey forms the foundation for these rankings, meani

The *Times Higher Education* World Reputation Rankings are created using the world's largest invitation-only academic opinion survey – a unique piece of research.

The Academic Reputation Survey, available in 16 languages, uses United Nations data as a guide to ensure that the response coverage is as representative of world scholarship as possible. It is also evenly spread across academic disciplines.

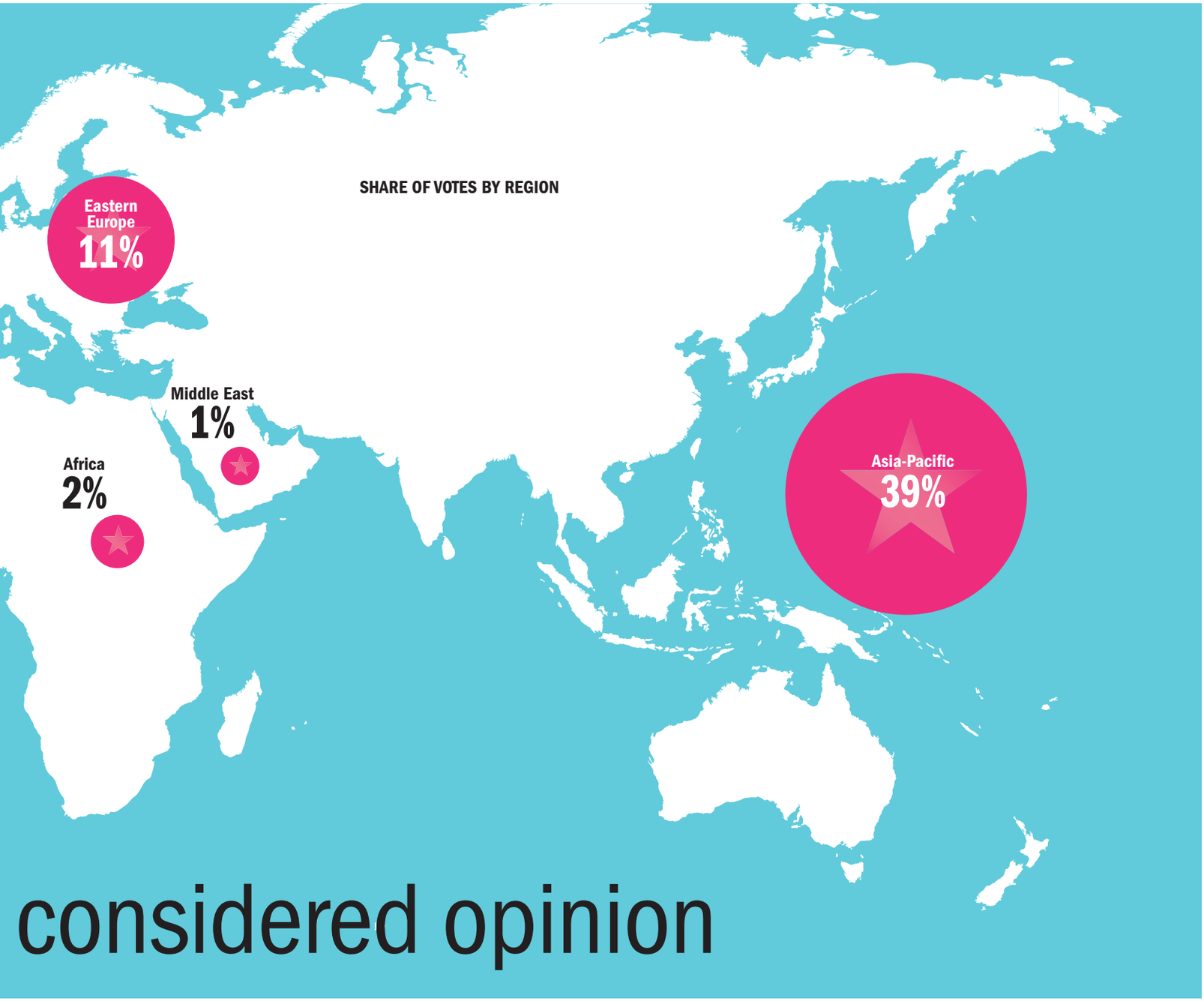
The questionnaire, which is administered on behalf of *THE* by Elsevier, targets only experienced, published scholars, who offer their views on excellence in research and teaching within their disciplines and at institutions with which they are familiar.

The 2019 rankings are based on a survey carried out between November 2018 and February 2019, which received a total of 11,554 responses from 135 countries.

The best represented subject was engineering and technology (accounting for 17.5 per cent of responses), followed by physical sciences (14.4 per cent). Also well represented were business and economics (11.1 per cent), clinical and health (10.9 per cent), life sciences (10.7 per cent), arts and humanities (10.7 per cent) and computer science (10 per cent). The rest of the responses came from social sciences (8.1 per cent), psychology (3.1 per cent), education (2.5 per cent) and law (1 per cent).

However, to better reflect the opinion of scholars from a wide range of disciplines and to make direct comparisons with last year's ranking, *THE*'s data team weighted the responses based on the share of votes in each subject from last year's survey. These were as follows: physical sciences (14.6 per cent), clinical and health (14.5 per cent), life sciences (13.4 per cent), business and economics (13.1 per cent), engineering (12.7 per cent), arts and humanities (12.5 per cent), social sciences (8.9 per cent), computer science (4.2 per cent), education (2.6 per cent), psychology (2.6 per cent), law (0.9 per cent).

We have also maintained a fair distribution of survey responses across the regions. A total of 39 per cent of responses hail from the Asia-Pacific region. The rest of the responses break down as follows: western Europe accounted for 22 per cent, North America for 20 per cent, eastern Europe for



considered opinion

ng that they are built on the insights of a representative sample of global experts

11 per cent, Latin America for 5 per cent, Africa for 2 per cent and the Middle East for 1 per cent. Where countries were over- or under-represented, *THE*'s data team weighted the responses to more closely reflect the actual geographical distribution of scholars, based on UN data.

In the survey, scholars are questioned at the level of their specific subject discipline. They are not asked to create a ranking themselves or to list a large range of institutions; they only name at most 15 universities that they believe are the best in each category (research and teaching), based on their own experience.

The survey data will be used alongside 11 objective indicators to help create the *THE* World University Rankings 2020, which will be unveiled in September 2019.

The reputation table ranks institutions according to an overall measure of their esteem that combines data on their reputation for research and teaching.

The two scores are combined at a ratio of 2:1, giving more weight to research because our expert advisers have suggested that there is greater confidence in respondents' ability to make accurate judgements about research quality.

The scores are based on the number of times that an institution is cited by respondents as being the best in their field. The number one institution, Harvard University, was the one selected most often. The scores for all other institutions in the table are expressed as a percentage of Harvard's, which is set at 100.

For example, the University of Oxford received 71.3 per cent of the number of nominations that Harvard gained, giving it a score of 71.3 against Harvard's 100. This scoring system, which differs from that used in the *THE* World University Rankings, is intended to give a clearer and more meaningful perspective on the reputation data in isolation.

The top 100 universities by reputation are listed, but *THE* has decided to rank only the top 50 because the differentials between institutions after that point become narrow. The institutions that make up the second half of the table are listed in groups of 10, in alphabetical order, although the number in each group may vary owing to some institutions at the thresholds having the same scores. ●

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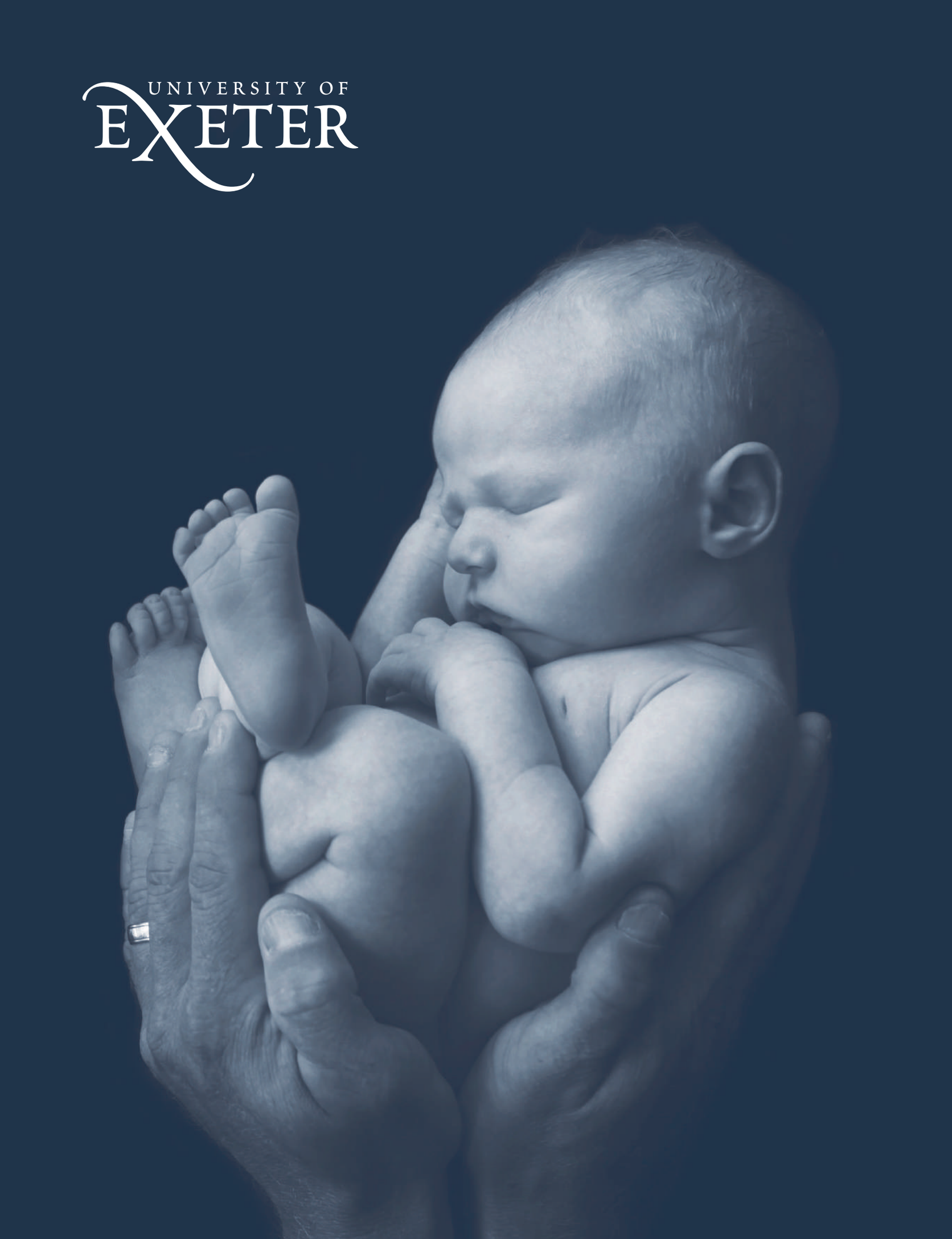

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Nail it in the digital age

> You can't acquire tacit knowledge from reading a book or listening to a lecture. You can't even ask an expert for it

Manu Kapur discusses how universities can craft human-centred learning that sets them apart in today's world

How do we prepare our students for the work of the future? Are our current models of developing expertise adequate, and if not, what should we do differently?

Since joining ETH Zurich almost three years ago, I have frequently been asked these questions at major summits on talent development and the future of work.

On questions such as these, everyone has an opinion. As a consequence, many replies are little more than recitations of buzzwords and faddish concepts. My goal here is not to offer another such opinion. Instead, I want to bring the science of human learning into answering these questions.

The sciences of learning have a long history of research on the nature and development of expertise. Let us start with the obvious. It is common knowledge that experts know a great deal about their domain. It is also common knowledge that experts have highly organised knowledge structures that allow them to see things that novices do not see and to act efficiently and effectively.

Therefore, as the argument often goes, if you are training novices to become experts, you need to give them a lot of knowledge and help them structure it in a highly efficient and organised network. It's pretty simple, isn't it?

Except it isn't. One of the major problems is that not all knowledge is explicit, and therefore it cannot always be easily given. There is a substantial amount of knowledge that is tacit.


ALAMY

Explicit knowledge is knowledge that can be externalised, represented, codified and communicated. Laws, principles, theorems, formalisms are examples of explicit knowledge. You can acquire it from reading books, listening to lectures, talking to experts and so on.

Tacit knowledge cannot be externalised, let alone codified or communicated. There are often times when an expert intuits, makes a judgement call, acts spontaneously, and all this without being able to explain how he or she thought of or did that thing. You can't acquire such knowledge from reading a book or listening to a lecture. You can't even ask an expert for it; and if you did, you might simply get a shrug of the shoulders and the candid response: "I don't know, I can't explain it."

In fact, research on expertise suggests that experts have not only a large body of explicit knowledge but also a vast reservoir of highly nuanced, situational, tacit

Manu Kapur
Professor of learning sciences, ETH Zurich

knowledge. Expertise is a function of how experts are able to leverage both explicit and tacit knowledge to solve problems. It is a tight coupling between the explicit and the tacit that works the magic.

Now what does this have to do with education?

For most of our modern history, schooling has tended to be organised around the transmission of explicit knowledge. Massive amounts of content are packed into slide after slide, lecture after lecture. The goal is to "give" the novice all the foundation knowledge and skills. There is nothing wrong with that, but it also results in "death by PowerPoint".

Higher education is no different, with the result that students learn large amounts of content and pass all sorts of tests and exams yet are unable to transfer that knowledge to real-world applications or work. An engineering student can master highly advanced mathematics but find it difficult to apply that to solve engineering problems in practice. A medical student can cram in prodigious amounts of knowledge about anatomy yet find it difficult to recall shortly after the final exam, let alone use it for diagnoses during clinical practice. You get the idea. Unsurprisingly, decades of research on human cognition and learning consistently show that such transfer is not only hard but rare.

To be clear: explicit domain knowledge is important; novices need to be taught, and experts must teach them. The problem is that we are teaching them in ways that tend to exclude tacit knowledge, largely because explicit knowledge is mostly decontextualised from the actual disciplinary contexts in which it will be used.

Allow me to illustrate this problem of decoupling with a thought experiment.

Imagine a carpenter with a new apprentice. Suppose the carpenter first makes the apprentice learn a lot of mathematics. After all, a good carpenter must be good with numbers, measurement and geometry. Then the novice is made to learn a lot of physics. A good carpenter must also have a good understanding of forces and equilibria. The list goes on. Perhaps a good carpenter must also be able to pass tests on this knowledge, even if the tests have nothing to do with carpentry. And only then is the apprentice allowed to touch a saw, to pick up a piece of timber and to engage in the actual practice of carpentry.

Of course, the carpenter is more likely to take the apprentice to the shed and engage in the authentic practices of carpentry. All knowledge and skills – explicit and tacit – that need to be learned are situated in the actual practice of carpentry.

It should be clear by now that if the primary focus of education remains on explicit knowledge, then it will hinder the optimal development of expertise. If, however, teaching can couple the explicit with the tacit, it will positively influence the development of expertise. In turn, this will also increase the likelihood of transfer to authentic practice.

Enter technology and artificial intelligence. Another question people often ask is, "Will AI replace teachers in schools and universities?"

My response is simple. To the extent that our teaching is organised around explicit knowledge, knowledge that can be represented and codified, teachers will be replaced. Machines can deal with codified knowledge rather easily.

In contrast, it will be much harder for machines to deal with tacit knowledge. Therefore, the more we design learning to couple the explicit with the tacit, in ways that are consistent with the science of human learning, the lower the chance that teachers will be replaced.

Paradoxically, advances in technology and AI may give us no choice but to focus on what makes us more human. Instead of viewing this as a threat, I see it as an opportunity. ●

> "If the primary focus of education remains on explicit knowledge, then it will hinder the optimal development of expertise"

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EMRI researcher, Professor Rob Newton admits the idea of cancer patients undertaking exercise as a critical component of supportive care was revolutionary, but it's now well established, and targeted exercise is recommended for all cancer types and stages – even when undergoing challenging treatments. Exercise as medicine is one of a growing list of world-class research specialisations at Edith Cowan University.

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A bright outlook

Strategic initiatives and extensive expansion at UC San Diego build on the creative spirit of the university's illustrious past, says Pradeep Khosla

Pradeep K. Khosla
Chancellor,
University of California, San Diego

The creative energy of California in the mid-20th century not only gave birth to a new medium of entertainment, but also attracted a slew of engineers and scientists to the state. In San Diego, researchers such as Jonas Salk (pictured inset) – who created one of the first successful polio vaccines – opened the Salk Institute, and the Scripps Research Institute (established in 1924) was coming into its own with the addition of Harvard biochemist A. Baird Hastings in 1959, followed by colleagues in immunology, biochemistry and microbiology shortly after. At the same time, the Scripps Institution of Oceanography (established in 1910) was petitioning the University of California's board of regents to add programmes in engineering and physics to fulfil convergent needs for its oceanographers.

This critical mass of biological and physical scientific thought forged the University of California, San Diego (UC San Diego) in 1960 and laid the foundation for exponential success in a variety of medical, biological, engineering, oceanographic and climate research and innovations.

ALAMY

Today, UC San Diego is recognised as one of the top public research universities in the US and is number one in the *Times Higher Education* table of the world's best "Golden Age" universities – institutions that were founded in the aftermath of the Second World War (between 1945 and 1967). While its founding vision has served the institution exceptionally well, at age 60, the university is at a critical point in its history.

An extensive planning exercise undertaken in 2014 yielded UC San Diego's first-ever strategic plan. Shortly after, the university embarked on an ambitious 10-year, $2 billion (£1.6 billion) fundraising campaign to support strategic initiatives. As of May 2019, we've raised 92 per cent of the goal within 70 per cent of the time.

We thought boldly to identify and implement the unprecedented solutions that are necessary to ensure our continued level of excellence and to advance our knowledge in order to address pressing global challenges. Through the planning process, five goals were solidified: enhance the student experience; cultivate a diverse and inclusive university community; nurture and support a collaborative and interdisciplinary research culture; support and promote just and sustainable forms of economic development, shared prosperity, and social and cultural enrichment regionally and globally; and create an agile, sustainable and supportive infrastructure by ensuring a dedication to service, people and financial stewardship.

An analysis of our academic and research strengths, faculty and campus leaders also identified four main research themes: understanding and protecting the planet; enriching human life and society; exploring the basis of human knowledge, learning and creativity; and understanding cultures and addressing disparities

> "We thought boldly to identify and implement the unprecedented solutions necessary to address global challenges"

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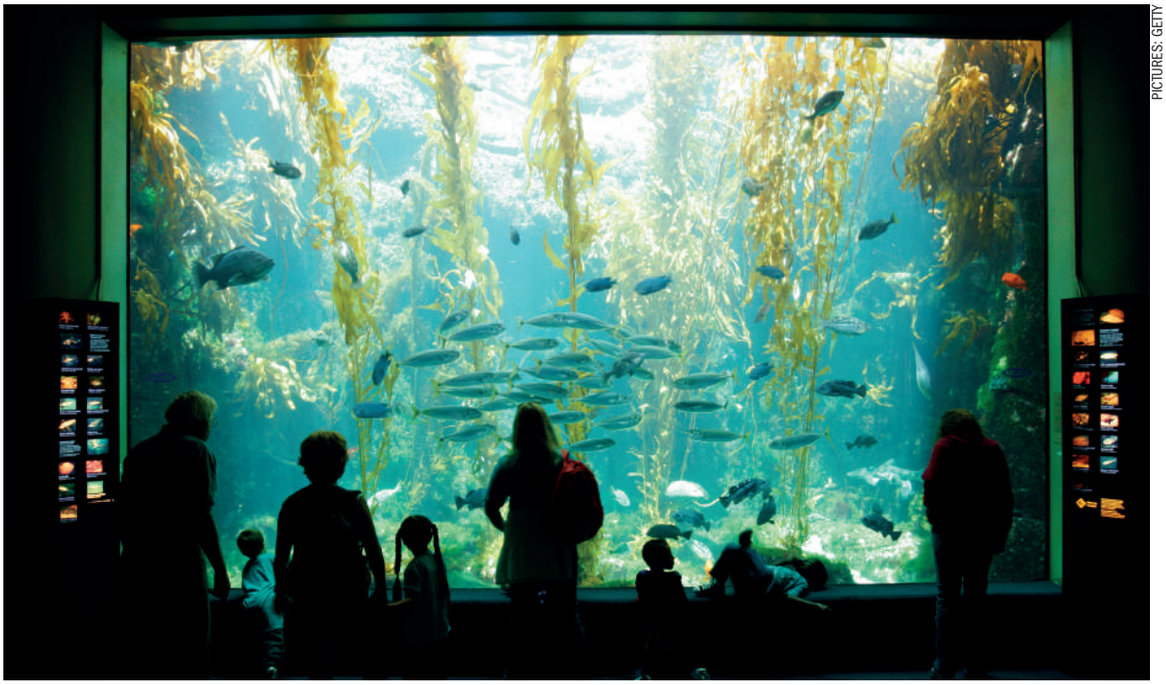


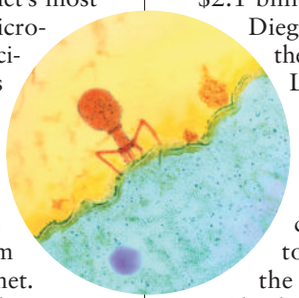
PICTURES: GETTY

> “An intellectual and cultural transformation is under way that is re-energising the student experience”

in society. These four areas of focus are where UC San Diego has deep and broad expertise and are rich with possibility for creation and innovation, education and training.

We hired more cross-discipline faculty; built new thinktanks, research centres and institutes; and expanded industry partnerships locally, nationally and internationally.

Our efforts to develop more convergent (cross-disciplinary) opportunities are paying off. The Halıcıoğlu Institute for Data Sciences is developing new methods and infrastructure in the emerging field of data science to help all disciplines solve the planet's most critical issues. The Microbiome and Microbial Sciences Initiative is creating enabling technology to understand and control the complex microbial communities that underpin processes on scales from our bodies to our planet. And the first phage therapy centre in North America, the Center for Innovative Phage Applications and Therapeutics, is bringing innovative research and clinical practice to the field of medicine. These are just three examples of the many new centres and institutes being established at UC San Diego.



We then turned our attention to smarter growth. Undergraduate applications have nearly doubled since 2012. In response, enrolment has grown by 34 per cent in the same period. Meeting this growth requires not only more investment in faculty, advising and student services, but also the creation of more academic infrastructure and housing. With input from both campus and community, we updated our Long-Term Development Plan and gained approval from the UC regents. Today, construction has started on three new living and learning complexes that will add 4,250 new beds to campus inside vibrant mixed-use “neighbourhoods” incorporating residential, academic, administrative, public, and retail and dining spaces.

The neighbourhoods are scheduled to open in the same year as a $2.1 billion extension of San Diego's light-rail system, the UC San Diego Blue Line, linking our La Jolla campus with our medical campus in Hillcrest, our new innovation hub under construction in downtown San Diego and the US/Mexico border. Also located downtown, we are in the planning stages of a sister attraction to the Scripps Institution's Birch Aquarium.

Later this year, we break ground on two more projects to expand collaborative lab, classroom and faculty space. Other planned construction includes a new gateway centre, two more living and learning neighbourhoods, and extensive improvements to public space and campus mobility. By 2035, we will have built 27.8 million gross square feet of academic, research, housing and public-serving facilities and added 15,000 beds, allowing us to offer a four-year housing guarantee to undergraduates and graduates at 20 per cent below market prices.

Between 2012 and 2017, UC San Diego invested $2 billion to create the La Jolla Medical Center, which included significant upgrades to campus infrastructure. With the opening of the Altman Clinical & Translational Research Institute, the Jacobs Medical Center and the Koman Family Outpatient Pavilion, UC San Diego Health now offers the best clinical care and translational medicine in one location. We will soon invest another $2 billion in our Hillcrest Medical Campus.

Beyond the new buildings, an intellectual and cultural transformation is under way that is re-energising the student experience, sparking breakthrough research and innovation, and providing world-class patient care.

With $1.2 billion in annual sponsored research and a growing portfolio of regional, national and global partnerships, the Nature Index ranked UC San Diego seventh in the world for scientific impact. While I'm extremely proud of our success in expanding research impact, there's one ranking that speaks to our collective efforts as educators. *Washington Monthly* ranked UC San Diego first in the US for contributions to social mobility, research and public service. This speaks to our very vision to be the nation's leading student-centred, research-focused, service-oriented public university. ●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Dizzying effect of spin

The desire to attract good publicity causes universities to oversell their achievements, damaging public trust in science, says Peter Weingart

Peter Weingart
Professor of sociology,
Bielefeld University

> Social media has emerged as an accelerant, firing scientists' urge to aggrandise their egos with the promise of likes and, as a result, visibility

In February, the German tabloid *Bild-Zeitung* announced a "world sensation" – the discovery of a blood test for breast cancer. The jubilation subsided quickly when it was revealed that the announcement was part of a PR campaign for a start-up spawned by the University of Heidelberg that was to market the new test.

Criticism was launched against the gynaecological clinic and the start-up for not having gone through the usual academic process of peer review and publication in a scientific journal before going public. The media discovered more unsavoury details: the press conference had been engineered by a PR company at the price of €80,000 (£70,000), while the investor behind the start-up turned out to be a businessman who had previously been convicted of bribery and who had close ties to a former editor of *Bild-Zeitung*. A legal investigation has opened, and the university management fears that it could cost the institution its place in Germany's excellence initiative, which is up for review this summer.

The case is an extreme one, yet it is not unique. On the contrary, such events are on an upward trend across the whole system. Related incidents include: the growing number of retractions in scientific journals reflecting hasty publication of results not sufficiently tested; the surge in research fraud committed by scientists and – in response – an increasing number of commissions or agencies for scientific integrity. If that is not evidence enough, one can point to the number of PR personnel in German universities, which is estimated to have increased tenfold within the past 15 years or so. I expect that the figure is similar for UK and US universities.

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Several interrelated, mutually reinforcing factors are responsible for this development. Most fundamental is the regime of public management that has subjected universities to global comparison and competition. Some consequences of this are beneficial; some are unintended and detrimental.

A condition of this regime is comparability, which has spawned the creation of performance indicators. Governments of all industrialised nations and even some developing countries are building and justifying their science policies on the promise of delivering innovation that will enhance economic and social well-being. This promise involves all national science systems in the global and unrelenting race for innovation.

Over a relatively short period of three to four decades, these shifts have initiated far-reaching organisational and behavioural changes among universities and their academic staff. The most significant organisational move has been the professionalisation of university management, which nowadays acts very much like the management of private companies. That means that their strategies are dictated by the logic of politics and the media – they are focused on securing political support through attracting public attention. The obsession with attracting attention seduces university management into advertising and, eventually, overstating their achievements, not only putting their institutional credibility at risk but also potentially damaging public trust in science.

The lure of performance indicators as measures of comparison and popularity has taken hold in sizeable sections of the academic community and has eroded the values that shaped its communication behaviour. If the relevant audience for any scholar in 1970 was the community of disciplinary peers, their successors in 2019 look for the attention of the general public.

Government science policies incentivise this attitude with their rhetoric of "outreach", "engagement" and the "democratic obligation of accountability". Social media has emerged as an accelerant, firing scientists' urge to aggrandise their egos with the promise of followers and likes and, as a result, visibility.

Has this development harmed trust in science? Polls in the European Union and the US reveal fairly stable levels of trust but also some ominous signs: trust generally declines as political polarisation rises, while concerns are growing about the commercial funding of research in universities and the impact that this has on objectivity. Evidently, the public has a clear preference for "disinterested" over "interested" communication.

The complexity of this development, of which I have highlighted only the negative aspects, does not leave hope for reversal. But university presidents and scientists alike could take a serious look at the growing evidence that propaganda-style PR is hurting rather than promoting their own image, that of their institutions and trust in science more broadly.

The obvious solution is to separate PR and marketing departments from press offices, which are obligated to provide balanced information, and to implement strict controls on the veracity of factual claims before they are communicated to the public. Governments should learn to distinguish between propaganda and factual information when advancing science communication. Trust in science can be (re)gained only if a commitment to honest and truthful communication is effectively demonstrated. ●

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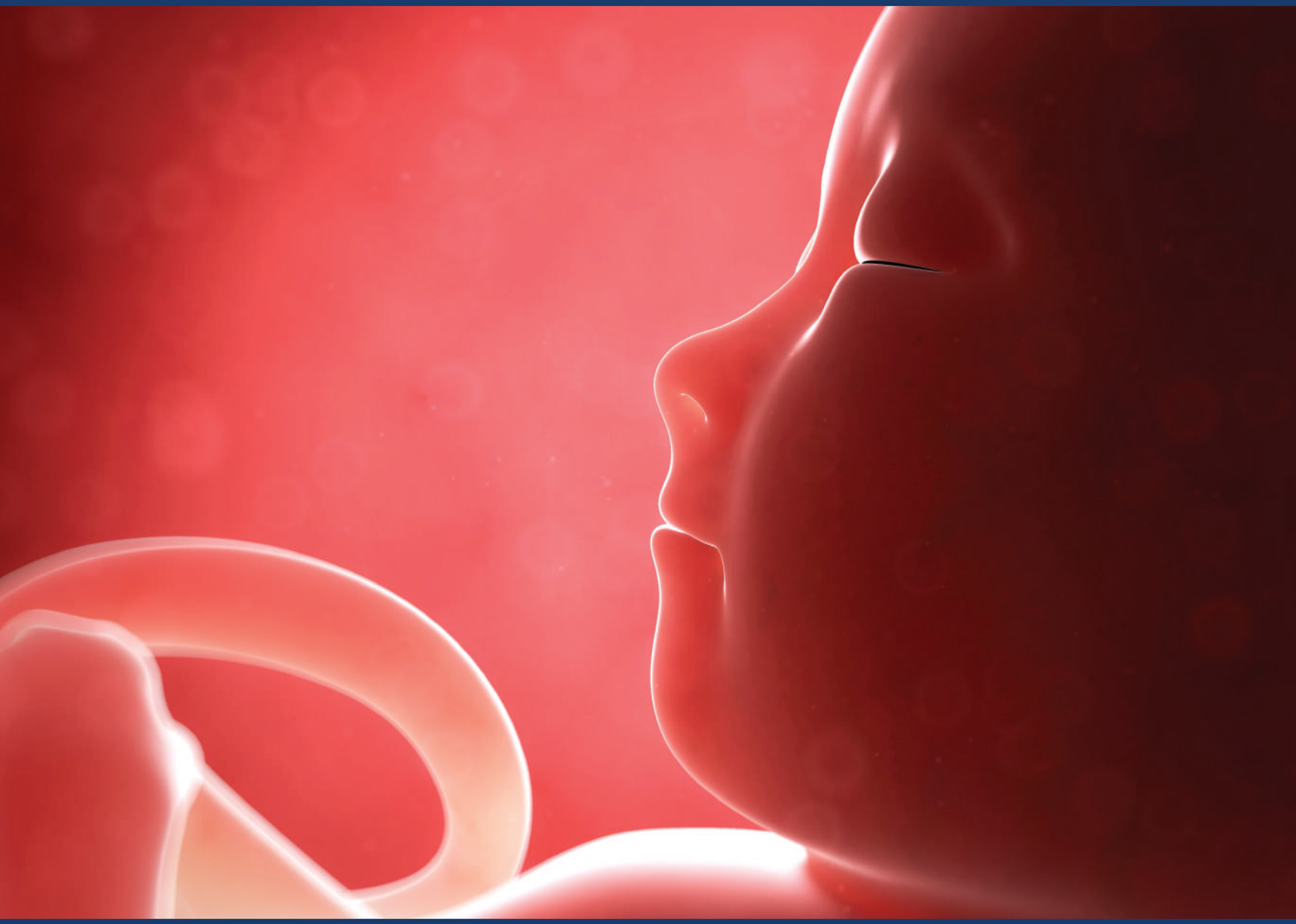

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