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Introduction

Why we did this project

For many years, universities have been the engine driving change in our society. They perform research projects – alone and in collaboration – the application of which benefit our lives or inspire new avenues of exploration. And they train and nurture the next generation of graduates, who go on to replenish the ranks of academia and beyond.

But in this rapidly-evolving digital age, many are questioning the relevance of that traditional approach. On the education front, there are concerns about the focus of teaching, how lessons are delivered, and whether students are really getting value for money. When it comes to research, universities are struggling to recruit and develop the right talent and adapt to the seismic shifts in the way that research is conceived, conducted and communicated. Funding is a major concern for both universities and funders as they seek to measure the impact universities have on society. In fact, for some time now, critics have claimed that universities are ripe for radical change.

In a bid to deepen understanding of how leaders at research-focused universities are responding to these shifts, Elsevier joined forces with Ipsos MORI, the global market and opinion research specialist. Over the course of 2019, we spoke with institutions and, in 2020, we reviewed the literature. Together, these data sources helped us build a detailed picture of leaders’ roles, responsibilities and priorities, and how they expect them to change in the future.

It’s important to note that the field work for this study was completed prior to the outbreak of the novel coronavirus COVID-19. Where relevant in the main body of the report, we have considered the likely impact of the pandemic on the themes our participants identified.

But despite the fact our surveys were conducted pre-pandemic, many of the questions that COVID-19 has raised, the opportunities it has revealed and, particularly, the challenges it has uncovered, were already top of mind for our participants and feature heavily in their responses. The virus has only increased the urgency for all of us, including those supporting the academic community, to join forces to address them.

What we did

We began by conducting qualitative interviews with 22 leaders at institutions around the globe to gain a deeper understanding of the topics keeping them busy. We followed these up with 187 quantitative interviews, during which we discussed those issues at a granular level. You can find out more about the methodology on page 53.

We focused on three levels of management – all chosen for their institution-wide remit and close relationship to the research enterprise. They are:

- **Heads of the university**: The most senior individuals at the institution; for example, the Presidents, Rectors and Vice Chancellors.
- **Senior executives**: The deputies to the heads of the university, or the most senior person responsible for research; for example, the Vice Presidents, Provosts and Deputy Vice Chancellors.
- **Research services executives**: The people providing support to researchers (in terms of getting grants and tracking compliance) and delivering reports to senior leaders on topics such as research activity and areas of strength; for example, the Directors / Heads of Research Services.

For the purposes of this study, we refer to this group collectively as the university leaders. Their roles and position in the university hierarchy are captured in figure 1 and are explored in more detail in the Appendix on pages 55 to 57.

Once all the interviews had been conducted, we sliced and diced the responses in two key ways: by the roles we’ve just outlined above and by geographic location. We decided to focus on three regions – Asia Pacific (APAC), Europe and North America. We also grouped responses by theme; e.g. priorities and performance and short- and long-term challenges. You can find out what we learned in the Key findings on pages 5 to 8 and in the main body of the report on pages 10 to 52.

What quickly became apparent over the course of this project is that the factors our participants identified as driving change, echo...
the findings of Elsevier’s 2019 report *Research futures: Drivers and scenarios for the next decade*. In both studies, technology is seen as one of the main innovating forces, fuelling change in nearly every aspect of institutional life. And both make it clear that we have reached a tipping point where higher education and the research community at large must adapt if they want to continue thriving in the years to come. In the final section of this report, *Institutional best practice*, we feature advice and feedback from university leaders on key activity areas, drawn from their personal experiences.

No-one can do it alone – particularly now. To prepare effectively for the future, it will be vital for universities, funders and information providers to work together, sharing data, skills and ideas.

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University leaders are operating in an increasingly competitive and complex environment, one in which so much depends on sourcing the right funding, student numbers and talent. At the same time, the pressures they face are changing in nature; never has it been so important for institutions to demonstrate their relevance. While these points are not new, what this study has made clear is the scale at which these challenges are impacting university decision-makers and building tension across core university activities.

Below we’ve listed our main findings. Some were points that university leaders emphasized, some emerged during a detailed analysis of their responses, while others were implicit. We’ve categorized them by theme for ease of reference. This summary provides a snapshot of university leaders’ priorities, thoughts and concerns at the time we interviewed them in 2019 – before the emergence of COVID-19. In the main body of the report, we take a closer look at how the pandemic might impact some of these areas.

Role of the university

Some university leaders are unsure how to respond to challenges from government and wider society. This tension lies at the heart of the university narrative. Their role has always been to act as independent institutions that improve society by expanding knowledge and educating the next generation. Yet critics claim that universities are not delivering the benefits to society they should; for example, some want to see a greater focus on training the workforce of the future. In addition, politicians are becoming increasingly outspoken, criticizing university performance and seeking efficiency improvements. These are pressing challenges that not only call into question institutional autonomy, but crank up the pressure on university leaders as they struggle to find the right mechanisms to demonstrate societal impact.

Funding

For many, funding remains a major headache. As with the majority of the themes we explore in this report, their concerns are closely linked to the other topics keeping them busy, whether that’s technology (funding it and using it to win funding), attracting the right talent and student enrolments, or developing infrastructure. Many, particularly those in Europe and, to a lesser extent, APAC, pointed to the decline in money they receive from government and a freezing of tuition fees. As a result, they must attract more students to increase the amount received from tuition fees (domestically and internationally).

They are operating in a hyper-competitive environment. Higher education institutions are increasingly competing against each other, either for research funding from grant providers, or for students and much-needed tuition fees. Competition can be local (national) and international (either global or within a region). At the same time, there are new education suppliers entering the market, including established tech companies with deep pockets and a clear agenda to train the next generation of employees. Universities are also competing against other institutions – and industry – to recruit the best researchers, who will attract awards and collaborations.

Governments want to see universities build more partnerships with third parties (e.g. non-profits and industry) to increase funding and enhance research capabilities and impact.

However, for many university leaders, working with industry and commercializing research are not priorities. While they recognized that there are opportunities to generate additional income by registering patents, or collaborating with industry, they didn’t see these activities as important and didn’t consider them a strength. This is despite many of them mentioning during the quantitative interviews that they wanted to build closer bonds with corporate partners. One of the challenges is that diversifying the funding mix = an increase in administration with more varied and complex requirements. This comes at a time when demonstrating a return of investment is already problematic and many are finding it difficult to cope with the increasing regulatory burden.
Technology

Technology will prove to be their biggest friend as they move forward into an uncertain future. They highlighted the opportunities it offers to conduct research in new and more efficient ways and demonstrate their value, from impact on society to the sharing of results more widely and openly. It also has the potential to deliver the data and tools they need to streamline processes, improve decision making and monitor performance so that they can provide the compelling metrics so crucial for funding discussions. Importantly, it can support collaboration – within the institution and beyond. They also saw technology as a means to showcase themselves more effectively to the employees and students they so urgently want to attract, and support them in providing the innovative and flexible education that students are now seeking.

But technology brings its own set of challenges. Some admitted that they are struggling to keep up to date with the rapid rate of change in tools, systems and teaching channels – some are still working with outdated information software and analytic tools. There’s also the matter of finding the funds to invest in these developments. And there’s a skills issue; if these systems are to deliver their full potential, it is critical that employees both support and understand them. This skills issue extends beyond their workforce – increasingly, they are under pressure to reshape the teaching agenda so that it delivers graduates ready for today’s tech-driven marketplace.

Developments such as AI have the potential to radically reshape how research and teaching are conducted, but there was some uncertainty about how this will be realized and its impact.

Research and teaching

The production of high-quality research is viewed as a core capability. This was consistent across regions, tiers and levels, though particularly prominent among top-tier institutions (those that appear in the top 100 university global ranking lists). While many expressed confidence in their research capabilities, they were also anxious about maintaining their position. Others were worried about improving their position.

Attracting and retaining top talent across research and teaching is a priority across the different regions we examined. However, institutions in Europe were more critical of their performance in this area than those in APAC and North America.

Due to growing competition for funding, they need to demonstrate research and teaching excellence, as well as societal impact. For many, building the image of their institution was a priority. However, our study participants didn’t consider their impact on society to be so important, despite the fact that funders, policy makers and even the public are becoming increasingly vocal on the topic.

They are very conscious that competition for funding is also increasing the pressure on their researchers to publish. This comes at a time when researchers are juggling evolving student expectations; for example, a desire for innovative teaching methods in place of the traditional lecture-based approach. There are also pressures from industry – particularly the digital sector – to produce graduates armed with market-ready skills.

All believe that improvements to the systems and tools supporting research would help, but the benefits they expect to gain varied, and were influenced by region and their perception of how they are currently performing. Those in APAC were generally confident about their overall infrastructure and believed their facilities were good, in contrast to those in North America and, to some extent, Europe.

Many universities see collaboration as an ingredient of high-performing research, particularly international collaboration. This was true in most regions, apart from North America, where it was not considered a priority and was viewed as a low-performing area. Internal and external collaboration between leaders was considered essential, but challenging due to the competitive environment: collaborators are potentially also competitors (frenemies), particularly as they are competing for a share of the same (increasingly limited) funding pie. All leaders saw networking with internal and external stakeholders and sharing best practice as important for their role.
The following graphics provide a visual breakdown of our key findings by region.

**Asia Pacific (APAC)**

**STRENGTHS**
- They saw having an appropriate **strategic** plan as their top strength, closely followed by their ability to **manage their research funds**.
- They were satisfied with their ability to **communicate and engage with society**, but assigned it less importance than other undertakings.

**PRIORITIES**
- Recruiting and developing the best talent and producing **high-quality research** were top priorities but they were only reasonably satisfied with their performance in these areas.

**KEEPING UP TO DATE**
- *Times Higher Education* was considered the most important channel, followed by **word of mouth** and **university ranking survey data**.
- In terms of social media, **Facebook** was their go-to channel, followed by **WeChat**.

**KEY CHALLENGES**
- The major challenge they identified was **attracting the best students**.
- **Funding** was perceived to be a challenge in the short term, but not in the long term – they expected a **lack of co-operation** to be a future concern.
- **Enhancing their public profile** was another problem area.

**HOW INFORMATION SYSTEMS CAN HELP**
- Recruiting and developing the best talent was the area they felt would benefit most, followed by the ability to produce **high-quality research**.
Europe

STRENGTHS
- Producing high-quality research was seen as a strength. They also viewed it as very important.
- They were satisfied with their strategic plans and felt they were making the most of international collaboration opportunities.

PRIORITIES
- Producing high-quality research was top of their list, closely followed by recruiting and developing the best talent and attracting the best students – the last two were both considered challenge areas.
- They also saw facilities and funding as important ingredients for institutional success.

KEEPING UP TO DATE
- The majority relied on word of mouth (e.g. conversations with colleagues), followed by Times Higher Education.
- On the social media front, they favored Twitter, followed by LinkedIn.

KEY CHALLENGES
- They identified recruiting and developing the best talent and attracting the best students as poor-performing areas. Yet for many, these attributes were seen as crucial to success.

HOW INFORMATION SYSTEMS CAN HELP
- They felt that recruiting and developing the best talent would be the area to benefit most.
- They also saw opportunities to improve the tracking of research outputs.

North America

STRENGTHS
- Producing high-quality research was seen as their greatest strength.
- They also felt confident in their ability to attract the best students and manage research funding.

PRIORITIES
- A key focus was recruiting and developing the best talent, closely followed by producing high-quality research. Research facilities (including the provision of appropriate equipment) was felt to be important too; possibly because it was an area they identified as low-performing.
- Managing funding was another priority item.

KEEPING UP TO DATE
- Word of mouth was considered the most important channel, followed by the Chronicle of Higher Education.
- LinkedIn was the favored social media channel, followed by Twitter.

KEY CHALLENGES
- The most worrisome issue (over the short and long term) was a lack of funding.
- There were also concerns about delivering the right facilities and equipment for students and employees.

HOW INFORMATION SYSTEMS CAN HELP
- They felt that their ability to manage research funding from opportunity to award would benefit the most, followed by benchmarking performance against other institutions.

FIGURE 3: Key findings for the region Europe (all levels). Base: (50)

FIGURE 4: Key findings for the region North America (all levels). Base: (45)
What is Elsevier doing?

All the drivers of change and challenges that our participants identified are closely interlinked and it will be important to strike the right balance between them to secure success.

At the same time, this study shows that university leaders are not only aware of the challenges they face but are working hard to turn them into opportunities. And many feel that enhanced information support systems could help them do so.

While proud of our rich history in publishing, Elsevier has evolved into a data-centric organization, which involves much more than technology; it is about embedding analytics across every aspect of decision-making. We are committed to taking what we learn and working in hand-in-hand with university leaders, researchers and funders to make the world of research more inclusive, collaborative and transparent.

For all of us working in the research and education communities, there is a chance to join forces to ensure universities have the support, systems and data they need to better plan, execute and communicate the impact of their research.

We are delighted that more than 50 percent of our study participants have already agreed to continue the dialogue we've begun and share knowledge and best practice as we work through the next steps together.

We are ready to play our part in increasing the connectivity between every aspect of the research. Finding solutions to the challenges that university leaders face won't be easy. It will involve pooling knowledge and resources to work together. If you would like to find out more about this study and our solutions please contact us at research.intelligence@elsevier.com, or visit us at www.elsevier.com/research-intelligence.
Charting a new course

As economist and previous Harvard University President, Larry Summers, once famously commented: “General Electric looks nothing like it looked in 1975. Harvard, Yale, Princeton, or Stanford look a lot like they looked in 1975.”

After a lengthy period of relative stability, our rapidly changing world is forcing universities and colleges to take a long, hard look at how they do business. They are under pressure from many quarters: students and their parents, corporations, legislators and funders. Increasingly, society at large is looking for some kind of accountability; we want to be reassured that the public money funding research and education is being spent wisely.

On the education front, back in late 2019, Steven Mintz, a senior advisor to the President of New York’s Hunter College, was already sharing his belief that we’ve reached a stage where “innovation in higher education is not an option. It is essential”. In the same Inside Higher Ed article, he listed eight reasons that institutions must act now, many of which chime with the drivers of change identified in Elsevier’s 2019 report, Research futures: Drivers and scenarios for the next decade. Mintz’s points can be summarized as followed:

- In many parts of the world, students have changed, whether that’s in age, ethnic background or study habits; for example, they might be juggling study with work or caregiving responsibilities.
- Students’ and parents’ priorities have shifted. It’s not enough for graduates to emerge cultured or well-rounded, they want return on investment.
- Expectations have risen sharply about graduation rates, time to degree, the quality of teaching and facilities, and the range of student services.
- The higher education ecosystem has changed. It’s become more competitive, with new players emerging.
- Too often, teaching is outmoded, doesn’t focus on outcomes and is unable to adapt to individual student’s learning needs.
- The college and university financial model is under severe stress. Costs must be trimmed wherever possible and new revenue streams explored, including intellectual property and continuing education.
- The economy is rapidly shifting and the skills expected by employers are changing. Businesses need employees with marketable skills, interdisciplinary education and real-world experience who can work collaboratively.
- Higher education’s promise – to open opportunities in the job market – is proving false for too many students. In the US, around a quarter of those who start at a non-profit four-year private institution and over a third of those who start at a public four-year institution never earn a degree. Two-thirds leave college burdened by debt and too many who do graduate find themselves under-employed.

On the research front, many institutions are exploring ways to maximize the potential of technology in labs, struggling to find the right research talent, facing growing competition for funding, juggling new accountability and engagement requirements. The list goes on.

Since early 2020, there’s a new source of pressure topping that list. The research for this report was conducted prior to COVID-19, but the arrival of the novel coronavirus has only intensified the challenges – and opportunities – our participants raised, from shrinking R&D budgets and student numbers to calls for more societal engagement and flexible learning opportunities. COVID-19 has also accelerated the pace of change; for example, we’ve seen the long-predicted shift toward more virtual teaching take place almost overnight.

At the time of writing, the long-term trajectory of COVID-19 and its full impact on research and education are impossible to predict. However, some are already voicing concerns that a reluctance to miss out on the campus experience may prompt new students to defer their education. And that overseas students – an important income source – may be reluctant to study abroad. On the research front, they predict that sources of government and philanthropic funding might reduce, or even dry up. These shifts could even lead to smaller institutions closing or merging and larger institutions cutting costs, threatening staff numbers. Whatever happens, it is clear that now, more than ever, institutions must be ready and willing to adapt and the decisions they take in the coming months will prove crucial.

How do the university leaders we interviewed view this rapidly changing landscape? In the following pages, we find out. We learn what’s keeping them up at night and what they imagine their institutions will look like a decade from now. And we explore their thoughts on the themes impacting them most – from funding to research, and technology to education – and how these areas have been evolving.

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We asked our study participants to rate the importance of 14 attributes that were identified as key aspects of institutional management during the qualitative interview phase. We then asked participants to rate how well their institution was performing against each of these attributes, on a scale of 0 to 10 (with 0 extremely poor and 10 being excellent).
The helicopter view

In figure 5, we’ve grouped the attributes into themed clusters and mapped them on an x/y axis. We can see that across all levels and geographic locations, research-related attributes, such as collaboration and tracking research output, were considered the most important and many institutions already considered them a strength. However, leveraging commercialization opportunities, such as turning research into profit through patents or working more closely with industry, was not considered a strength and was rated the least important measure of successful performance. This lack of interest in commercialization is surprising for a number of reasons; many participants cited funding as a major concern (see The big themes explored: funding) yet commercialization could provide them with a valuable income stream. It could also help institutions satisfy the growing demand to demonstrate the impact of their research on society and, in the process, boost their public profile – something many participants identified as one of their key challenges (see Challenges in the short and long term).

**FIGURE 5:** How participants rated high-level institution activities in terms of importance and performance (globally, all levels).
Digging deeper: the underlying drivers

For our participants, recruiting and developing the best talent was nominated the most important of the 14 attributes, yet few considered it a strength of their own institution – in fact, when we asked them to rate their performance against the attributes, recruitment was in 10th place. Producing high-quality research was also considered a crucial attribute and was given a similarly high rating in terms of performance. While commercializing opportunities and demonstrating societal impact of research were both rated the least important attributes and the worst performing. Most participants considered that their institution had a strong strategic plan in place.

Base: Overall (187)
Q: Please can you tell me how important/unimportant you consider it to be as a measure of successful performance, using a scale from 0 to 10 where 0 is not important at all and 10 is very important
Q: Thinking now about your own institution, how well do you see it performing on the following criteria? For each of the items please tell me, on a scale from 0 to 10 where 0 is very poor and 10 is excellent, how you would rate your institution

FIGURE 6: How participants rated specific attributes in terms of importance and performance (globally, all levels). Clicking on the figure will open an enlarged version.
Priorities and performance by level

Viewing the same data through the prism of seniority highlights some interesting variations (see figure 7). Heads of the university rated recruitment and development of the best talent the most important attribute: probably because a good team delivers strong results. But in contrast to the research services executives and senior executives, they viewed their performance in this area as relatively strong. Producing high-quality research was also a key focus, but they gave both priority and performance in this area a lower rating than their senior executive or research services executive colleagues. Heads of the university awarded the highest ratings to their ability to put an appropriate strategic plan in place, but they were less confident about attracting students, even though they rated it an important attribute.

Heads viewed international collaboration (projects spanning national borders and partnerships with other institutions) as a critical measure of success, more so than either senior executives or research services executives. The benefits they identified included improved funding, knowledge-sharing and development for students.

Given their focus on the successful production of research, it’s probably no surprise that senior executives equated a steady flow of high-quality research with institutional success and performance was seen as very strong. They also considered recruiting and developing the best talent to be important, but, along with research services executives, gave their performance a comparatively low rating. As research facilitators, their priority is to provide resources to support the research enterprise, and they were moderately confident that they do this well. They assigned commercialization a greater level of importance than the heads of the university did, but still considered it the worst-performing attribute.

For research services executives, producing high-quality research is essential and it’s an area they identified as a key strength. The least important areas for them were being able to benchmark performance against other institutions and commercializing opportunities. This focus on research is likely down to their role in winning and managing research proposals for their institutions.
FIGURE 7: How participants rated specific attributes in terms of importance and performance by level (globally). Clicking on the figure will open an enlarged version.

Base: Heads of University (65), Senior Executives (50), Research Service Executives (72)

Q: Please can you tell me how important/unimportant you consider it to be as a measure of successful performance, using a scale from 0 to 10 where 0 is not important at all and 10 is very important.

Q: Thinking now about your own institution, how well do you see it performing on the following criteria? For each of the items please tell me, on a scale from 0 to 10 where 0 is very poor and 10 is excellent, how you would rate your institution.
Priorities and performance by region

Examining the results at a regional level (see figure 8), reveals an even greater divergence of opinions. For European participants, the production of high-quality research was considered the most important measure of successful performance and they were confident they excelled at it. In contrast, North American and APAC participants considered recruiting and developing the best talent a more important measure, with those in APAC viewing it as a strength. Both European and APAC participants prized international collaboration and considered they were effective at securing partnerships, whereas North Americans scored it their least important area, as well as their poorest-performing.

Participants in APAC and Europe agreed that securing a steady stream of students wasn’t an area in which they performed well, relative to other attributes, but considered it important. North Americans considered it less important but saw it as a strength. The provision of appropriate equipment and/or facilities, e.g. affordable housing for students, was seen by North American participants as very important but a major challenge, while APAC participants considered it a key strength.

Although European participants assigned managing funding the same level of importance as other regions, they awarded themselves a lower performance rating than their counterparts. For APAC participants, managing and sourcing funding was considered a strength, outstripping the performance of the global group.

In general, North American institutions viewed their performance with a more critical eye than other regions; in particular, they viewed facilities, demonstrating societal impact and commercialization as lower-performing areas.
Figure 8: How participants rated specific attributes in terms of importance and performance by region (all levels). Clicking on the figure will open an enlarged version.

Base: Europe (50), APAC (83), North America (45)

Q: Please can you tell me how important or unimportant you consider it to be as a measure of successful performance, using a scale from 0 to 10, where 0 is not important at all, and 10 is very important.

Q: Thinking now about your own institution, how well do you see it performing on the following criteria? For each of the items please tell me, on a scale from 0 to 10 where 0 is very poor and 10 is excellent, how you would rate your institution.

Strategy
(1) Benchmarking performance vs other institutions
(2) Appropriate strategic plan

Research
(1) Tracking research outputs
(2) International collaboration
(3) Recruiting and developing the best talent
(4) Producing high-quality research

Facilities
(1) Providing equipment / facilities

Impact
(1) Communicating and engaging with society
(2) Showcasing research performance and impact
(3) Demonstrating societal impact of research

Comm. Capabilities
(1) Commercializing opportunities
(2) Building partnerships with industry

Education
(1) Attracting the best students
Institutions tomorrow – a lens on the future

Challenges in the short and long term

“Inevitably it’s the short-term challenges that are front of mind, so are the ones that keep you up at night, and there seems to be no end of short-term problems... they can be all kinds of things, from things that are not so nice, or funding shortfalls with a sponsor... The long-term things, it’s harder and harder to find time to think about them...”
Associate Vice President, Research, North America

We asked participants to identify the external challenges they think will affect the reputation and success of their institution, either in the coming months (the short term) or the years that lie ahead (the long term). We then analyzed their answers by region and level of seniority (figures 9 and 10).

Funding was considered a major challenge in the short term, whatever the participant’s role or region. Funding remained a major concern for North American participants over the long term, and they predicted that difficulties around competition and lack of cooperation would become more pressing as time passed. In contrast, APAC participants expected concerns over funding to ease a little in the long term, but thought challenges around attracting more talent would increase.

Whatever the timeframe they were considering, heads of the university tended to focus on high-level issues; for example, funding and attracting more talent.

Senior executives were most likely to mention lack of funding as a challenge in both the short and long term, and viewed attracting talent as a greater challenge over the long term. Their focus tended to be the immediate, daily issues that arise from running research operations; unsurprising given that a number admitted they work with outdated or basic data analytics options; for example, Excel.

For research services executives, lack of funding (in their case, for research activities) was the most prominent challenge, especially in the short term. When considering the longer term, their concerns included level of competition, cooperation opportunities, attracting talent and quality of staff. One particular concern was that while the nature of research is changing, the level of support that universities can give to academics is decreasing. Another was that departments are becoming siloed, impacting alignment.
Top SHORT-TERM challenges

- Lack of funding: 55% (APAC), 50% (Europe), 62% (North America)
- Attract more talent: 29% (APAC), 35% (Europe), 22% (North America)
- Poor public profile: 33% (APAC), 29% (Europe), 11% (North America)
- Level of competition: 19% (APAC), 19% (Europe), 11% (North America)
- Lack of cooperation: 13% (APAC), 20% (Europe), 7% (North America)
- Lack of capacity: 7% (APAC), 12% (Europe), 7% (North America)
- Quality of staff: 20% (APAC), 10% (Europe), 5% (North America)

Top LONG-TERM challenges

- Lack of funding: 34% (APAC), 49% (Europe), 59% (North America)
- Attract more talent: 39% (APAC), 32% (Europe), 27% (North America)
- Poor public profile: 17% (APAC), 14% (Europe), 14% (North America)
- Level of competition: 7% (APAC), 11% (Europe), 20% (North America)
- Lack of cooperation: 31% (APAC), 17% (Europe), 25% (North America)
- Lack of capacity: 15% (APAC), 7% (Europe), 8% (North America)
- Quality of staff: 29% (APAC), 23% (Europe), 11% (North America)

Base: APAC (83), Europe (50), North America (45)
Q: What would you say are the main short- and long-term external challenges in the current research landscape which affect the reputation and success of your institution? (Open-ended questions. Quotes have been coded to quantify the results.)

FIGURE 9: The top short- and long-term external challenges identified by region (all levels).

Top SHORT-TERM challenges

- Heads of the university: 44% (APAC), 63% (Europe), 60% (North America)
- Senior executives: 39% (APAC), 27% (Europe), 26% (North America)
- Research service executives: 30% (APAC), 20% (Europe), 24% (North America)
- Level of competition: 26% (APAC), 11% (Europe), 18% (North America)
- Lack of cooperation: 16% (APAC), 9% (Europe), 17% (North America)
- Lack of capacity: 6% (APAC), 16% (Europe), 17% (North America)
- Quality of staff: 25% (APAC), 14% (Europe), 16% (North America)

Top LONG-TERM challenges

- Heads of the university: 47% (APAC), 49% (Europe), 46% (North America)
- Senior executives: 33% (APAC), 41% (Europe), 27% (North America)
- Research service executives: 29% (APAC), 20% (Europe), 20% (North America)
- Level of competition: 12% (APAC), 16% (Europe), 29% (North America)
- Lack of cooperation: 29% (APAC), 21% (Europe), 22% (North America)
- Lack of capacity: 13% (APAC), 12% (Europe), 8% (North America)
- Quality of staff: 20% (APAC), 20% (Europe), 21% (North America)

Base: Heads of the university (65), senior executives (50), research services executives (72)
Q: What would you say are the main short- and long-term external challenges in the current research landscape which affect the reputation and success of your institution? (Open-ended questions. Quotes have been coded to quantify the results.)

FIGURE 10: The top short- and long-term external challenges by level (all regions).
Thoughts on the decade ahead

Among the university leaders we spoke with, there was a general consensus that the fundamental role of the university – to educate and expand knowledge – is unlikely to change much in the coming 10 years. Since those interviews were conducted in 2019, we have witnessed the rapid spread of COVID-19 around the globe.

At the time of writing this report, the COVID-19 story is far from over and it is clear that the full repercussions of the pandemic won’t be known for some time. However, many in the academic community feel that despite the virus’ devastating impact, the institution’s role to educate and expand knowledge will endure. In fact, writing for the University World News, Ira Harkavy, et al. suggested that higher education has a vital role to play in shaping the post-COVID-19 world, from preserving democracy to educating the medical staff and researchers of the future.6

But while our study participants didn’t expect to see the role of the university change, they did anticipate a transformation in what they deliver and how they deliver it. And they identified technology as a factor that was not only driving change, but helping them and their institutions adapt to those shifts. We explore this further in the section The big themes explored: technology. COVID-19 is accelerating the transformation our interviewees predicted. As Harkavy et al. noted, we are seeing almost unprecedented levels of collaboration and sharing of intelligence in the race to develop vaccines.6 And as touched upon earlier in this report, the virus has spearheaded a dramatic shift to online and remote teaching.

The changes that our university leaders predicted for the coming decade varied by level and region. Among heads of the university, many in APAC believed that two key areas will shape their role. The first of these was lifelong learning, which will require developing communication skills suited for a variety of age groups, alongside adopting new methods and tools to deliver education. The other was global networking, which will see international collaboration skills increase in importance. They felt that this would require the President to raise his/her profile internationally and perhaps necessitate the creation of a new global role.

“...Even though, at the moment, research and education is conducted within the campus in Korea, in the future the outbound traffic will increase. That’s why I need to strengthen global expertise.”

President, APAC

Many heads of the university in Europe believed their future focus will be on adapting to digital processes and increasing collaboration with other institutions. They felt technology will enable greater sharing of information between universities.

“It will especially change from paper to a digital process. I [will] have to develop myself...It can also include frequent exchange on forums as part of the university community.”

Vice Chancellor, Europe

Many senior executives identified corporatization as one of the trends most likely to impact their role – and their institutions – over the coming 10 years. This would see universities adopting the operating models of their industry partners, e.g. professionalizing and becoming more hierarchical, with increasingly formal structures. A number mentioned the steps their institutions had already taken to forge closer bonds with industry; these ranged from introducing corporate partnership strategies to establishing corporate engagement centers. We could also see more fundamental changes, including a surge in the creation of business parks and more powerful and independent research offices. For some senior executives, this corporatization is an inevitable and necessary response to the hypercompetitive environment their institutions are already operating in. It is also expected to help produce measurable results, source funding, and build the partnerships they need with industry counterparts.

“Universities have become more corporate in a sense. Far more attention has to be paid to ensuring the profile of the university is high enough that you are getting the attention of potential funders, industry sponsors and so on...I can only see that becoming increasingly important as government funding is not increasing as rapidly as it was.”

Associate Vice President, Research, North America

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Automation was another trend that senior executives felt will shape their role and they saw many benefits. It will help their institutions collect, curate and manage information in a more effective way, providing new insights into how they are performing – particularly in comparison to other universities. It will also simplify the processes and time-consuming tasks that currently interfere with producing high-quality research, create economies of scale across departments, and help them identify new areas for collaboration. But in order for them to reap those rewards, they felt that they will need to upscale skills and deliver a clear message to colleagues about the benefits.

“We are moving towards making the things we do on a routine basis easier for us to do and taking less of our time. So, that frees us up to do more deep analytics and things like predictive analytics and better decision support for our clients across the university.”

Associate Vice Provost for Institutional Research, North America

A large proportion of research services executives identified technology as the factor most likely to trigger change in their roles and they expected that change to be sizeable, with rapid technological developments impacting everything from teaching and research grant application to how research is conducted.

In addition, they felt the type of people recruited for their roles would change; with the focus shifting from candidates with a research background to applicants with managerial and overseer experience.

“The most important skillset is analytical ability. Of course, a communication skill is also important. Most of all, [they must take on] the role of team manager… managing the team, motivating the team members, and developing their potential.”

Research Office, APAC
The big themes explored: funding

What did we learn...

• Many participants face funding difficulties due to a decline in the amount received from government and a freezing of tuition fees. This is particularly a problem in Europe, and in some cases in APAC. As a result, they need to attract more students to increase the amount received from tuition fees (domestically and internationally).

• At the same time, they face an increase in competition from other universities within their regions and from institutions in emerging countries and regions such as China and Africa.

• To make up the funding shortfall, some universities are turning toward industry and business. However, as one participant noted, realistically they will work with anyone willing to give them more money.

• Despite the opportunities to boost funds via commercialization (e.g. patents and seeking possibilities to turn knowledge into profit), it remains a low priority for many. Given their funding restraints, it’s likely we’ll see their interest in commercialization increase.

An overriding concern for all, whatever their role, level, or location, was sustaining, managing and attracting new sources of funding. And the major recession expected in the wake of the global coronavirus pandemic will only exacerbate the grave financial challenges they face.’

Many of the concerns expressed by the heads of the university and senior executives, e.g. lower staff numbers or obsolete research systems, can be traced back to reduced budgets. Managing how money is allocated, and over what period of time, is becoming increasingly essential. As a result, researchers are being encouraged to manage funds with caution.

“Research funding is state and taxpayers’ money, and we hope that every penny can be used where it should be used. Therefore, strict management is required.”
President, APAC

So, what’s changing in funding?

There are a number of factors combining to reshape the old university funding model. COVID-19 is just the latest of these – as we explore below, it is likely to influence what is being funded, along with who provides that money and where it goes. Other factors at play are explored elsewhere in this report. They include rising competition, with new education providers appearing on the scene (see The big themes explored: education and students) and the growing call for accessibility and accountability, which has resulted in new grant requirements (see The big themes explored: research).

New sources

Reduced funding has been an issue for institutions for several years now. While some of the blame can be laid at the door of static, or even shrinking, public budgets there are other factors at play; for example, in the UK, the government has kept tuition fees frozen at the same level for the past three years.4 A number of our APAC participants; for example, university leaders in South Korea and Taiwan, also referred to tuition fee freezes, which in some cases coincided with student number restrictions, preventing them from increasing enrolments to make up the shortfall.

“The ministry of education in Taiwan has many rules and policies to restrict universities and development...For example, we can’t increase our tuition for 10 years already. Our education can’t upgrade because of low income and limited funding and budget from government, compared with China.”

Vice President, APAC

The impact of COVID-19 on enrolment numbers is likely to be weighty. Institutions have been swift in their response to the pandemic, moving rapidly from on-campus education and support to online courses so students can complete this year’s classes. However, there are justifiably concerns around next year’s enrolment figures.5 Given that countries like the US have already witnessed a drop in numbers opting for higher education,6 and the fact that there is increasing competition among universities for those who do, we can expect to see some institutions struggle. Especially those dependent on large numbers of international students.4 In fact, the projected fall in domestic and international student numbers caused by the coronavirus is expected to create global tuition fee shortfalls running into the tens of billions of dollars.5 In addition, industry watchers are suggesting we could see college costs for students “decline tremendously” if education continues to be delivered online.11 A fall in student numbers combined with a drop in tuition fees could prove catastrophic for some institutions, forcing them to join forces with equally impacted universities, or even close.4

Another factor at play is that universities use their research funds to pay researchers. However, during the pandemic, those researchers have been unable to conduct research. As a result, when labs reopen, researchers will have less money to do the research tied to that funding. How governments respond now is critical. There is also likely to be further disruption due to the re-distribution of existing funds to priority areas: in May 2020, the EU pledged €1 billion of Horizon 2020 funding to COVID-19 research, part of a larger global commitment of €7.4 billion.12

However, some academics, such as African Leadership University’s Dean, Gaidi Faraj, have managed to find a silver lining, however small: “It is also a massive opportunity to break out of old habits and create new, impactful, relevant modes of learning that take advantage of technology and this moment.” We consider these opportunities in later sections.

Ongoing concerns over funding have sparked an evolution in the R&D funding mix, with a growing number of industry and philanthropic funders investing in research. A 2019 European Commission study found that “in the face of an ever-increasing global technological race,” the top 2,500 industrial players worldwide increased their R&D investment by 8.9 percent in 2018. There were regional variations; for example, while EU companies accounted for 17 of the top 50 of corporate R&D investors with an increase of 4.7 percent, they were outpaced by their US and Chinese counterparts, who increased their shares by 10.3 percent and 26.7 percent, respectively.15

A portion of this money is making its way into universities through direct industry sponsorship of projects, or academic/industry collaborations, and as Elsevier’s Research Futures report noted, these collaborations are likely to increase in the decade

that figure rises to 3.84. Authors, it rises to 2.74. And when it co-publishes with corporates, publishes papers in isolation, the average field-weighted citation also boosts citations. For example, when the University of Glasgow publishes papers in isolation, the average field-weighted citation impact index is 2.1. When it co-publishes with international co-authors, it rises to 2.74. And when it co-publishes with corporates, that figure rises to 3.84.16

“If we want to be relevant for our students, particularly in the sciences and engineering, we have to build partnerships with industry. Not in the sense that they will tell us what they want us to research, but in the sense that they and our students see the win-win situation of collaborating.”

Rector, Europe

However, a question mark remains over just how much of the money that industry is investing is reaching universities, and how much is being spent on in-house R&D, creating another layer of competition for research-intensive institutions. And some of the research services executives we interviewed, feel that universities have become, in essence, factories producing researchers for companies, particularly in fast-growing fields, such as artificial intelligence (AI).

“I think we can go back to the old days when good research results, free and innovative research can be produced in universities and lead the companies forward. Now we can't compete with multinational companies. We become their training department to produce students to be used by them, and to compete with us.”

Director, APAC

There are other tensions – writing for The Conversation, Professor Lisa Bero, a pharmacologist and researcher in evidence-based health care at University of Sydney, Australia, noted: "The definition of academic freedom boils down to freedom of inquiry, investigation, research, expression and publication (or dissemination).

“Internal industry documents obtained through litigation have revealed many examples of industry sponsors influencing the design and conduct of research, as well as the partial publication of research where only findings favourable to the funder were published.”17

In the same article, she expressed her concern at the low level of institutional oversight of these collaborations, at least in some countries: “A 2018 study found that, among 127 academic institutions in the United States, only one-third required their faculty to submit research consulting agreements for review by the institution.”17

Others have raised questions over intellectual property (IP) – who owns the results of these collaborations? If it’s the companies providing the funds, how easy will it be for institutions that do decide to maximize their commercialization opportunities? And with Bero noting that not all results are shared, what does that mean for combating the reproducibility issues that the research community is facing?18 Or for the move toward open science championed by cOAlition S19 and so many others? (See So, what's changing in research? The rise of open science.) Commenting on her own institution in 2019, Melissa Rethlefsen, Associate Dean at George A. Smathers Libraries, in the US, stated: “Already there is a lot of industry/corporate funding at Utah, and this will grow. The problem is that this funding reduces the impetus to share and be open and reproducible: there is less transparency, and everything is proprietary.”20

Some, however, such as researcher Anima Anandkumar, who works for both the California Institute of Technology in Pasadena and private firm NVIDIA, believe we have entered an era of “unprecedented openness between academia and industry” with “more collaboration, researchers moving back and forth, and people like me with dual roles.” She added: “Now, many companies have an open-publication policy, and that means you’re participating in peer review and embedded in a research community. It’s easy to go back to academia... In fact, industry experience is highly valued.”21

It is likely that COVID-19 will spark a rise in academia/industry partnerships – in part, due to the benefits of increased funding and faster discovery rates we’ve already touched upon. For example, the UK-based Wellcome Trust recently invited corporations to donate to a new funding initiative called COVID-
Zero, which supports research that enables testing, treatment and prevention of the virus. And the arrival of the pandemic has seen corporations that wouldn’t typically fund research, express an interest in doing so; insurance companies have recently revealed plans to support research aimed at restricting the spread of the disease across continents.

On the philanthropic front, the past few years have seen charitable organizations invest more in science than ever before; for example, a 2019 report by the Council for Advancement and Support of Education (CASE) found that charitable gifts and qualified grants from private foundations to US higher education institutions reached $49.60 billion in 2019, the highest level ever reported. In the UK, in 2015-16, annual philanthropic donations to universities exceeded £1 billion for the first time.

The ability of philanthropic foundations to effect real and powerful change is undeniable; the projects they target are often global in nature or focused on developing regions, and they aren’t demanding short-term results. It’s generally accepted that “pay off” could take 20 years or even longer. And they have deep pockets and ambitious goals; for example, the Chan Zuckerberg Initiative has set aside $3 billion to “cure, prevent and manage all disease” by the end of the century.

However, there are fears with both industry and philanthropic funding that it will lead to a much greater focus on applied research; in the case of industry, findings that can be leveraged for profit. And in the case of philanthropists, a narrower focus on moonshot projects; ambitious, ground-breaking endeavors (e.g. the moonshot to find a cure for cancer and now projects focused on vaccines and therapeutic treatments for COVID-19). In both cases there are concerns that financial support for basic or blue-sky research will dwindle as a result. This increased focus on applied science may also prove true for public funding. By the end of April 2020, the US government’s Biomedical Advanced Research and Development Authority (BARDA) had already invested $483 million to scale up small biotech firm Modern’s experimental coronavirus vaccine production, along with hundreds of millions more for other vaccines that have yet to be tested. And in March, Johnson & Johnson (J&J) announced that together with the US government it would devote US$1 billion dollars to advance the coronavirus vaccine it has been working on.

Geopolitical shifts

At the same time, the balance of economic power has been shifting globally – by 2050, China could be the largest global economy by GDP PPP. India is expected to take second place, with the US dropping to third place and Indonesia in fourth. Research influence is also shifting; China is experiencing a steady rise in its already high number of researchers; particularly in proportion to other research-intensive economies, and its student numbers are also increasing.

While the economic fallout from the COVID-19 pandemic could slow China’s momentum, it is likely to be only a temporary setback – the global nature of the virus means other countries are experiencing the same financial challenges. And China is expected to set an ambitious 2035 goal for the percentage of gross domestic product spent on research. It is unclear how different nation states will respond, but in some countries, we could see funding for R&D reduced and projects delayed, with some feeling the pinch more than others. For example, in the US, a major source of income for higher education institutions is endowments, the value of which have plummeted as stock markets have dropped.

* GDP PPP, or GDP at purchasing power parity (PPP) compares the values (in USD) of baskets that contain consumer goods available in all countries (for example, pineapple juice, pencils, etc.). If the basket costs $100 in the US and $200 in the UK, then the purchasing power parity exchange rate is 1:2.29


UNIVERSITY LEADERS: OPPORTUNITIES AND CHALLENGES
Prior to the pandemic, the rising number of Chinese students had very tangible benefits for universities in other parts of the world – in 2018, around 662,100 Chinese students left China to pursue overseas studies, helping to swell student numbers in those countries. That number reflected an 11.74 percent rise on 2017 figures, making China the largest country of origin for international students in the world. COVID-19 will undoubtedly impact international student numbers, but perhaps not in the way we might expect. In a Nature article, Muming Poo, who heads the Institute of Neuroscience in Shanghai, shared his belief that while there will be little impact on the volume of students heading to Europe, we could see a big drop in numbers to the US, largely because of political tensions. News reports on the rising war of words between China and the US over COVID-19 seem to support this point of view. In the same article, Poo also noted: “The need for students to go abroad for graduate school or postdoctoral research is not as high as that just a decade ago, since the quality of many research laboratories in China is now on a par with those in the best research universities in the West.”

Student traffic is also flowing in the other direction. China’s rising focus on quality has seen a steady – and growing – number of students from Europe, the US and beyond choose to study at Chinese universities. The country has made it clear that attracting international students and improving its own higher education system is a focus. Moves include establishing seven “Sino-foreign joint venture universities” and the China Scholarship Council has provided scholarship money to ensure tuition costs are “extremely attractive” to international students. In addition, Chinese universities are investing in changes that will make international students feel more at home; for example, hiring English-speaking faculty, teaching courses in English and adapting halls of residences. As a result, prior to the pandemic, some were predicting that China will teach at least 500,000 international students this year (2020). However, whether that figure will continue to grow over the longer term, remains to be seen.

“We aim to attract more foreign students to our university. I think international collaboration is the key to achieving this goal.”

Vice President, APAC

If China and other Asian countries do continue down their current path of becoming increasingly attractive places to conduct research, it is likely that funding and research opportunities will gravitate East. For example, South Korea has been one of the biggest investors in R&D research, as a proportion of gross domestic product (GDP). There is speculation over what a shift in power along these lines might mean for the global research agenda. The volume of China’s research output is already poised to overtake that of the US, and their relentless focus on growth and improvement will see them emerge as a scientific leader in many research fields, such as artificial intelligence (AI). Prior to COVID-19, institutions in other parts of the world had responded by increasing collaboration with their counterparts in China, even though opinion remained divided “about the merits of working with Chinese academic institutions”. As we see in The big themes explored: technology, now, more than ever, cross-border collaborations are seen to be a crucial ingredient in tackling the global challenges we face. However, it is unclear to what extent China will be included in these projects amid rising international tensions, despite the fact that many see China/US collaborations as critical right now.
The big themes explored: research

What did we learn...

- The issue of how researchers work is directly affected by the funding constraints and shifts we’ve explored in the previous section.

- University leaders are very aware that due to competition for funding, and the need to demonstrate productivity and impact, researchers have to “publish or perish”.

- Alongside pressure to publish, researchers are juggling evolving student expectations; for example, a desire for innovative teaching methods in place of the traditional lecture-based approach. We examine these in “The big themes explored” sections on technology and education and students.

As we saw in the section Institutions today – priorities and performance, university leaders identified research as the most critical factor contributing to an institution’s success, particularly producing high-quality research, and recruiting and developing the best talent.

Most of our study participants were satisfied with their current performance in research, but were concerned about maintaining that performance level due to factors such as national research assessments and pressures on their researchers, e.g. the need to publish – and publish well, evolving student demands, and the rise of accountability. Increased competition for funding was also a major concern.

“For every £1 of research [we do], 80p is generated by funding, 20 percent is being funded by the university. If it went further down it wouldn’t be sustainable.”

Director of Research Strategy, Europe

To understand how institutions are progressing toward their performance goals, we cross-referenced their responses to two questions – one focused on the quality of research produced by their institution, and the other on their strategic plan (see figure 11). We also examined other attributes to identify characteristics associated with the segments featured in the chart below.
We divided the results into four groups:

- **Developed quadrant:** 34 percent of participants scored their institution 8, 9 or 10 for both attributes (i.e., they felt that they produced high-quality research and had an appropriate strategic plan). When we examined associated attributes for this segment, we saw that its high level of performance was linked to a strong international outlook, particularly in **Europe**.

- **Fighting quadrant:** 17 percent of participants scored their institution 8, 9 or 10 for “having an appropriate strategic plan” but 7 or under for production of high-quality research. They are striving to improve, as evidenced by their high plan-related scores. This segment was the smallest and equally distributed across regions. It was more likely to highly rate its ability to attract students. It was also more likely to feel that the ideal information system would have the greatest impact on their ability to attract and develop the best talent.

- **Complacent quadrant:** Conversely, 21 percent of participants scored their institution 8, 9 or 10 for “producing high-quality research” but 7 or under for “having an appropriate strategic plan”. When asked which area would improve most with an ideal information system, they indicated the ability to “benchmark performance against other institutions”.

- **Lagging quadrant:** 27 percent of participants awarded the quality of their institution’s research outputs, and the appropriateness of their strategic plan, a score lower than 7. These participants were more likely to be from **APAC**. They gave their ability to attract quality students a high rating, which suggests that their institutions have a strong education focus.
So, what’s changing in research?

The daily life of the researcher is transforming; for example, who funds their work, the grant conditions they must satisfy, the type of projects being prioritized and how “success” is measured. Technology is also playing a major role, changing everything from how they conduct and communicate research to how they collaborate. We look at this in more detail in the section The big themes explored: technology.

The COVID-19 pandemic is accelerating some of the changes already underway. It is fuelling an existing desire for greater transparency and driving an increase in collaborations. Researchers are also sharing preliminary results at unprecedented rates, embracing the type of early sharing that physicists have practised for some time.

Pressure to publish

It’s inevitable that these shifts will impact the quality – and volume – of researchers’ outputs, in both positive and not so welcome ways. For example, a study of Dutch university professors found that “those lucky enough to have become full professors – supposedly the light at the end of the tunnel for struggling junior scholars – spend just 17 per cent of their time on their own research.” The study established that teaching, research supervision and management and organizational tasks received the lion’s share of attention. It also found that “associate and assistant professors fare little better carving out research time for themselves.”

“We have a lack of faculty, so they end up teaching more and doing less research. That is a major challenge we have right now.”

Vice Provost for Research Support, North America

For institutions, this causes uncertainty and many of the university leaders who took part in this study flagged it as an area of concern. In particular, senior executives and research services executives (who tend to work more closely with academics) mentioned the pressure on their researchers to publish a steady stream of high-impact articles.

Ironically, some of that pressure to publish stems from the institutions themselves. In order to secure funding, it is vital that they employ researchers with experience, networks, and, importantly, a strong publishing history. But, as the pressure on funding increases, especially government funding, competition grows stronger, making permanent research positions harder to come by. And as we are living and working longer than ever before, senior researchers are staying longer in their posts, reducing the number of vacancies even more. Some predict that as technology becomes more sophisticated, it will take on more of the repetitive tasks involved in laboratory experiments, potentially resulting in a further reduction in researcher jobs – and even greater competition for those that remain.

As a result, temporary contracts are common, which can prove a vicious circle, as researchers on short-term contracts often struggle to demonstrate the ability and skills that would help them secure a permanent role – and funding. At least one study has found that the impact of job uncertainty on non-permanent institution staff members is extensive, promoting feelings of “anxiety, demotivation, and mistrust”. An increasing number of researchers are now turning to industry for the security they seek, and in many cases industry is, in turn, actively seeking to recruit researchers (and other university staff) with in high-demand skills.

“We have a difficult time competing in the labor market for highly-skilled data analysts, and people who work in data warehousing. It’s hard to keep them in a public organization because they have such high outside opportunities.”

Senior Vice President for Strategy and Policy, North America

The perception of the university leaders participating in this study was that this “publish or perish” spiral will only escalate in the decade ahead as competition for funding and permanent research positions increases. These rapidly shifting sands have left some of our participants unsure which channels their researchers should use to publish their results.

What do researchers think?

73 percent of those we surveyed for Elsevier’s Research futures study, felt that pressure to publish is likely, or very likely, to increase in their field over the coming 10 years, mainly driven by funding organizations, research administrators and potential employers.1

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41 Matthews, D. If you love research, academia may not be for you. Times Higher Education. 08 November 2018. [https://www.timeshighereducation.com/blog/if-you-love-research-academia-may-not-be-you](https://www.timeshighereducation.com/blog/if-you-love-research-academia-may-not-be-you)

“There is an increasing complexity in the publishing options and they don’t align well with promotion and tenure and funders’ expectations. This means a lot more confusion for researchers and teams.”

Director of Research Data Management, North America

Adding to the researcher’s burden is that many believe we will also see an increase in the number of outputs per researcher in coming years. This will be driven, in part, by the increasing number of channels offering researchers the opportunity to publish each element of the research process separately (e.g. methodology, data, findings and discussion), sometimes even before the project is complete. This not only helps researchers showcase the work they’ve done but increases the transparency of the research process, an important step toward aiding the reproducibility of science.

More publications will mean an increased workload for researchers, who must not only prepare the extra papers and attempt to get them noticed, but keep up-to-date with the findings of their peers. This can be particularly challenging in fast-moving fields.

Impact and accountability measures

If there is to be a successful move away from using publication history, particularly citations, to measure a researcher’s performance, new metrics will be required. Work is already underway; for example, as far back as 2012, the Declaration on Research Assessment (DORA) was launched to “recognize the need to improve the ways in which the outputs of scholarly research are evaluated.” More recently, Elsevier established the International Center for the Study of Research (ICSR), which aims to “cultivate the thoughtful use of metrics and indicators in research evaluation and to promote evaluation best practices.”

Open science is helping to fuel a new generation of measures: alternative metrics or “altmetrics” are being used to consider the attention an article has received; for example, mentions on social media, news outlets and blogs. Downloads, clinical citations, policy citations and reference manager bookmarks are also used to calculate how a researcher, article or journal is performing. The challenge is that neither alternative or citation-based metrics capture whether the attention received was positive or negative – work on developing an indicator that can measure sentiment is ongoing. Open science is not only enabling new measures, it’s creating a need for them; for example, ratings for reproducibility or recognition for publishing open access have been suggested. Some would also like to see metrics introduced that provide researchers with an incentive to perform activities that benefit science, but for which they currently receive no credit; for example, the publication of negative results.

There is also a very strong drive for measures of societal impact. Many feel that the outcomes of research funded by taxpayers’ money should benefit those taxpayers in some way, and that everyone should be able to freely access the results.

“There we consider that this is part of our mission, our university does not operate as a closed vessel; our research activities are also intended to correspond to societal values and to irrigate society.”

Senior Vice President, Europe

Increasingly, funders require applicants to explain how their projects will be beneficial to society, and often they want to see evidence that proposals support the United Nations’ Sustainable Development Goals (SDGs). These 17 SDGs, which the UN describes as an urgent call for action by all countries to work in global partnership, are becoming increasingly embedded in the research community – a number of A&I databases now offer the opportunity to filter on SDG-associated research and, since 2019, the Times Higher Education Impact Rankings have assessed universities against the SDGs.

“All our research outputs are built around UN Sustainable Development Goals…They are very much bound to local community and environment as well as bigger issues…being part of the community is important.”

Dean of School for Business and Society, Europe

Many funders also want findings to be made openly available in some form – sometimes on the open research platforms they’ve built themselves (for example, Gates Open Research and Wellcome Open Research). And they want results explained in a way that will allow people without a scientific or academic background to understand them, and even engage with them.

For researchers, this means changing how they communicate results and interact with readers. And they will likely look to their institutions to provide the training and support they need. Taking

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43 DORA website. [https://sfdora.org/](https://sfdora.org/)

44 International Center for the Study of Research (ICSR) website. [https://www.elsevier.com/icsr](https://www.elsevier.com/icsr)

these steps could prove beneficial to institutions; some studies indicate that “scientists’ participation in public communication, particularly social media, may increase scientific impact”.46 In addition, it offers an opportunity to highlight the university’s research skill and attract more talent to the university. And it can help to create a positive feedback loop, in which universities demonstrating the positive impact they have on society, create further buy-in and support from society. However, some are concerned that along with the rise in philanthropic and industry funding, this shift in thinking could prove problematical for blue-sky research and serendipitous discoveries.

“I fear the threat to curiosity-led research by some of the trends in research funding. People are forced to think of the importance of their research which can mean we are in danger of forgetting that the greatest discoveries that affect mankind can happen by accident. The more we force people into being accountable the less time they have for anything else.”

Head of Research Evaluation & Impact, Europe

Another factor fuelling increasing calls for public engagement is the rise in global challenges with the potential to transform the way we all live; for example, climate change and, more recently, the rapid spread of the novel coronavirus, COVID-19. Many feel it’s important that the public understand the work that researchers are undertaking to combat these challenges and have the opportunity to contribute to finding solutions.

As we can see in figures 7 and 8, many of our participants did not consider demonstrating the impact of research on society one of the most important measures driving successful performance. However, the urgency to find solutions to the economic and health issues raised by COVID-19 may have changed the views of some. Among those who identified it as important, the reasons for doing so varied. Some saw it as a moral responsibility.

“That’s the ultimate goal. The reason why we graduate students is so that we have a positive impact on society and we keep on growing as a global community.”

Director of Institutional Research, North America

Some viewed it as evidence that they were making a difference in the world and were moving their research beyond theory. For others, it demonstrated that funders are getting value for money and could help them secure future awards.

“Our funding is done through governments and it’s tax money, so we need to show them what we’re doing with the investment in our research. It’s also important for recruitment of talent.”

Vice Provost for Research Support, North America

What do researchers think?

79 percent of those we surveyed for Elsevier’s Research futures study, agreed it is desirable that the majority of research they conduct 10 years from now has an impact on society. Only 51 percent believed that it will.

For institutions, keeping track of publications and their impact – however that impact is measured – is a challenge. Research information databases, such as Scopus and Web of Science, are helping institutions form a picture of the research being performed. But a knock-on effect of tracking performance is that university leaders, particularly research services executives, are not always able to offer the same level of researcher support they once could.

“…because [of] the volume of research, the number of researchers that we now have on the campus, we’ve moved away from providing very hands-on editorial support to more broad base support, providing researchers with tools, access to information easily…[we] try to make them a little bit more independent.”

Director, North America

A growing number of countries are introducing performance-based research funding systems (PRFSs), to measure and benchmark the impact of research institutions, including their wider societal impact. These PRFSs determine, among other things, how much state-level research funding an institution receives, yet some are concerned at what they feel is a “one-size fits all” approach.47

New research analytics tools such as SciVal, Dimensions, Pure and Symplectic are helping institutions and funders track, analyze and report on some of the activities vital to these rankings. These platforms are also starting to incorporate new research outputs, e.g. patents and policy documents, to improve the measurement of societal impact. It’s expected that this partnership between the research community and information analytics providers will continue to grow.


There has also been a rise in the number of ranking services to help students – and funders – understand and compare institutions, either regionally or globally. These include the various Times Higher Education World University Rankings, the Financial Times (FT) MBA Rankings, Quacquarelli Symonds (QS), Shanghai China national university rankings, and the Maclean’s University Rankings Canada. Securing a good position in these rankings has become an added pressure for institutions. With competition for students and talent accelerating and a growing drive for accountability, the dependency on services to rank, categorize and order universities is only likely to increase over the next decade.1

“The money that our university receives [from the government] has been reduced. But I have to stimulate research and reform the university. That’s hard work…if we don’t stimulate research, we’ll move down in the ranking and won’t make money.”

Executive Vice President for Research, APAC

The rise of open science

The term open science appears frequently in this report. That’s not surprising, given its growing influence on all aspects of the research cycle. But while open science is enabling change, it is also benefitting from shifts elsewhere in the research landscape. For example, technology is fuelling new platforms that openly host research outputs, from preprints to data and code. And society’s growing interest in accountability, means funders want to ensure the results they’ve funded can be freely accessed by others. We touch upon these synergies throughout The big themes explored… sections. Inevitably, the arrival of COVID-19 is also impacting the adoption of open science, as we explore below.

Scholars have yet to agree on a definition of open science, but it is generally used to describe new, more transparent ways of working, sharing and collaborating, often drawing on technology, that allow everyone to access, participate in and benefit from science. It is a broad church, encompassing elements such as open access (OA) publishing, open data, open peer review, citizen science, open citations, and much more. For some, an important component of open science is that research is not only freely available, but is shared as early as possible. For FOSTER Plus, a two-year, EU-funded project designed to drive open science, it’s more than that – it’s about “a systemic change to the way science and research is done.”48

The concept of open science has widespread support. For many, it offers one of the most promising paths to solving the global challenges that society faces. Among researchers, the desire for transparency is growing, driven, in part, by the role it can play in tackling perceived reproducibility issues in science. It also offers them the opportunity to access – and build upon – the data, software and code developed by others. Importantly, many researchers believe that publishing open access will improve the reach and visibility of their own work. As we’ve seen, for state and philanthropic funders, the open sharing of research they’ve funded helps them demonstrate that money is being spent wisely. Increasingly funders are not only mandating that research articles be made openly available (via OA publishing), but data and software too.

But there are still many hurdles on the path to open science, some of which were raised by the university leaders we interviewed. For example, though funders may favor open access, for researchers keen to secure funding and career progression, publishing in established journals recognized by their research communities is important – and at this moment in time, these are often subscription titles, or hybrid; publishing both OA and subscription articles. Some of our study participants found this situation far from ideal.

“We are not against [open access], but what is not good for us is the mixed system…I would like either completely open access or completely subscriptions.”

Vice Rector for Research and Innovation, Europe

There were also concerns about the quality of some of the open access publications on the market; university leaders pointed to the number of sub-standard or predatory titles.

“…open access sites are basically unreliable. It is a very important issue for any researcher how reliable open access becomes…”

President and Managing Director, APAC

In addition, prepping data and other research elements so that they can be found and reused by others eats into researchers’ limited research time. And even if they want to invest that time, will others want to reproduce their work? Many journal editors are focused on high-impact articles and replicated studies tend to garner few citations. This is also true of the negative research results that researchers are increasingly being encouraged to share. In addition, some don’t have access to the funds to cover the costs of publishing gold OA. Add into the mix concerns over the impact of early sharing on intellectual property, and a lack of agreement among states and funders over a preferred OA model, and it seems that the road to open science could remain a somewhat bumpy one.

However, recent developments look likely to accelerate open science and OA adoption.

In late 2018, a group of national research funding organizations announced the launch of cOAlition S to accelerate open access uptake. Its current goal – outlined in Plan S – is to ensure that by 2021, “…all scholarly publications on the results from research funded by public or private grants provided by national, regional and international research councils and funding bodies, must be published in Open Access Journals, on Open Access Platforms, or made immediately available through Open Access Repositories without embargo.” Any new funders joining the movement are asked to implement Plan S policies within a year. While researchers and publishers, initially responded with caution, for others, “if implemented carefully, it could be a rare opportunity to bring whole-scale change and benefit society through increased open access to publicly funded research.”

Another potential game-changer for open science is the COVID-19 pandemic. In fact, in Elsevier’s 2019 Research futures report, we mapped out the steps that would signal our vivid imagining of an open science future - Brave open world - was coming true: state and philanthropic organizations uniting to fund and respond to a pandemic was among them. COVID-19 has already driven unprecedented levels of data sharing on an international scale, from information on the spread of the disease to designs for face shields and ventilators. Many publishers have also made all research on COVID-19 openly and freely available. As countries strive to bring the crisis under control, many see open science as not just desirable, but essential. For example, for the OECD, open science has the power to “remove obstacles to the free flow of research data and ideas, and thus accelerate the pace of research critical to combating the disease.”

Changing skill requirements

Another added pressure for researchers is the growing requirement to continue their learning, beyond the boundaries of their own speciality. For many, it is an essential ingredient for success. This could mean developing knowledge about other disciplines and drawing on their methods – interdisciplinary research – or collaborating with colleagues in other fields – multidisciplinary research.

“[The] shift towards interdisciplinary research. That creates the need for a cultural transformation within the university about how we approach research. Being able to do that successfully is imperative for our survival.”

Executive Director. Office of Sponsored Research Programmes, North America

Many believe that interdisciplinary and multidisciplinary science are the most promising avenues for solving some of the complex and global challenges we are grappling with today. Both types of research are on the rise, fuelled by technological advances, such as social media and other networking tools, which help researchers to access “new perspectives and ideas”. And, increasingly, governments and funding bodies require researchers to demonstrate an interdisciplinary approach; in particular, a focus on mission-driven projects that will bring economic or societal benefits.

“We have a relatively small institution in terms of the number of faculty but a high degree of interdisciplinary collaboration that occurs. This makes us capable of attracting funding from a wide variety of sources and [we are] able to translate that into things that ultimately matter to sponsors.”

Senior Associate Vice President, North America

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Mastering data science skills is also likely to increase in importance as the volume of data generated by developments such as the Internet of Things (see The big themes explored: technology) continues to rise. For some, it will be important to learn programming; for example, astronomers today are likely to be online “digitally scheduling observations, running them remotely on a telescope in the desert, and downloading the results for analysis.” For others, becoming more data literate and understanding how data can benefit their field will be key. Some believe that the coming decade will see the focus of researchers potentially shift. Managing Director of Elsevier’s SSRN, Gregory J. Gordon, has observed: “There might be more specialization in research: people who are extremely good in doing experiments and creating data sets, but are not as strong at writing papers and vice versa.”

Those data skills won’t just be required while conducting research but will even determine what the next project should be. It is likely that hypothesis development will increasingly rely on hard evidence, not ideas. In fact, researchers are likely to be among those constantly upskilling as part of the life-long learning phenomenon we discuss in The big themes explored: education and students.

56 Murphy, T. Why data-driven science is more than just a buzzword. The Conversation. 10 May 2017. https://theconversation.com/why-data-driven-science-is-more-than-just-a-buzzword-76949
The big themes explored: technology

What did we learn...

- Participants feel technology will help them open up opportunities for collaboration, both within their university and with others, as well as making universities more efficient. Having access to more and better data will give them the knowledge necessary to make effective decisions.

- For research services executives, technology allows them to reduce the effort they invest in time-consuming tasks, such as completing grant proposal forms or filling in HR information for their line reports. It helps them be more efficient in their workflow.

- However, technology could also present institutions with a challenge. To work effectively, technology requires buy-in from all who use it or those in senior posts won’t receive the quality and accurate data they need to make informed decisions. In addition, technology often moves so quickly that institutions struggle to keep up.

Rapid advances in technology are proving a transformative force. They now impact every aspect of our daily lives and the work of institutions is no exception. As we’ve seen in the previous sections, technology enables open science, and empowers new metrics and ways for institutions to understand and showcase their performance. It will also transform how learning is delivered and the skills that students require as we discover in the section The big themes explored: education and students. In fact, technology is driving change in all the themes we explore in this report. And for our study participants, it has the potential to deliver both solutions and challenges for their institutions. For those in senior positions, it has been creating collaboration opportunities and institution-wide efficiencies. For the wider university team working in administration and academia, technology has been streamlining workflows, limiting time-consuming tasks.

“I was really enamoured with an equivalent tool for looking at research connectivity. You could sort of scrape databases to look at what is going on in research, and then you could use the tool to search and understand where synergies might lie amongst organizations or individual researchers, and look for synergies there.”

Director, North America

To build a clearer picture of how technology can best help them, we asked study participants to imagine a scenario in which they had at their disposal the best possible information systems supporting research, and then identify which of their institutions’ capabilities would improve the most – they could choose up to a maximum of three capabilities from a list of 14 (see figure 12). Recruiting and developing the best talent was their most popular choice (32 percent), with the ability to produce high-quality research in second place (23 percent).

“All of research needs to be completed by best talent. From idea, execution, and submission, the talent will affect and influence each step and result.”

Director of Research and Development, APAC
If we break down the results by region, we see strong variations. While participants in APAC and Europe agreed that talent would improve the most (44 percent and 26 percent, respectively), North Americans chose the ability to manage research funding from opportunity to award (31 percent). For them, recruiting and developing the best talent sat in third place (23 percent).

A much higher percentage of North Americans (27 percent), thought that benchmarking against other institutions would improve compared to peers in APAC (10 percent) and Europe (15 percent). While 32 percent of APAC participants thought producing high-quality research would improve, compared to only 9 percent in Europe and 18 percent in North America.

<table>
<thead>
<tr>
<th>Area of Activity</th>
<th>Global</th>
<th>Europe</th>
<th>APAC</th>
<th>North America</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recruit and develop the best talent</td>
<td>32%</td>
<td>44%</td>
<td>26%</td>
<td>23%</td>
</tr>
<tr>
<td>Produce high-quality research</td>
<td>23%</td>
<td>32%</td>
<td>9%</td>
<td>18%</td>
</tr>
<tr>
<td>Manage research funding from opportunity to award</td>
<td>19%</td>
<td>8%</td>
<td>20%</td>
<td>31%</td>
</tr>
<tr>
<td>Benchmark performance against other institutions</td>
<td>18%</td>
<td>10%</td>
<td>15%</td>
<td>27%</td>
</tr>
<tr>
<td>Find opportunities for international collaboration</td>
<td>17%</td>
<td>24%</td>
<td>11%</td>
<td>6%</td>
</tr>
<tr>
<td>Track research outputs</td>
<td>16%</td>
<td>10%</td>
<td>9%</td>
<td>15%</td>
</tr>
<tr>
<td>Attract the best students</td>
<td>12%</td>
<td>20%</td>
<td>6%</td>
<td>7%</td>
</tr>
<tr>
<td>Showcase your institution’s research performance</td>
<td>12%</td>
<td>9%</td>
<td>7%</td>
<td>14%</td>
</tr>
<tr>
<td>Demonstrate and quantify the societal impact of research</td>
<td>11%</td>
<td>11%</td>
<td>7%</td>
<td>16%</td>
</tr>
<tr>
<td>Build partnerships with industry and/or commercial organizations</td>
<td>9%</td>
<td>8%</td>
<td>5%</td>
<td>13%</td>
</tr>
<tr>
<td>Design an appropriate strategic plan</td>
<td>8%</td>
<td>7%</td>
<td>11%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Base: Overall (187), APAC (83), Europe (50), North America (45)
Q: Imagine a scenario in which you have at your disposal the best possible information systems supporting research to satisfy your needs. Which of your capabilities, if any, do you consider would improve the most under this scenario? I’d like you to please tell me up to three you feel would be most improved at your institution.

**FIGURE 12:** The areas of activity that participants felt would improve most if they had the ideal information system (globally, all levels).
So, what’s changing in technology?

Support for collaboration

One of the benefits of technology identified by our study participants is the role it plays in enabling collaboration. Often, this was within their own institution.

“...the thing that keeps me up at night is finding ways to drive collaborations between the different schools and colleges.”

Director, North America

But many also mentioned collaboration with other institutions (both domestically and internationally), with industry, and even with the public (citizen science). They also referenced collaborations spanning disciplines (multidisciplinary and interdisciplinary research).

“...Department of Education, the government is important. Good contact with the surrounding society, schools, and universities, hospitals, industry; we have a lot of collaborations, a good network to have.”

Vice Chancellor, Europe

International collaborations have long been considered the future of research.57 And for many, like Mukhisa Kituyi, the Secretary-General of the United Nations Conference on Trade and Development, the COVID-19 pandemic “is underscoring the critical role of international collaboration on the frontiers of science and technology.”58 However, at the same time, Kituyi (and others) fear that the virus is dissolving previous bonds and creating tensions that will “undermine international collaboration in scientific and health research at a time when we need it most.”59 This seems to be borne out by early data, which suggests that since the beginning of the outbreak, research teams have involved fewer countries.59

Whatever the future of international collaboration, as with all forms of research partnerships, it brings challenges, from finding the right people to work with, to agreeing scope, logistics and intellectual property rights. But collaborations, whatever their remit, also deliver many advantages, and for some fields of research they are a necessity; for example, projects in particle physics often require huge, expensive infrastructure that no single country could afford on its own.60

Many see diversity of funds, skills, and knowledge as key benefits of these collaborations. They can prove particularly beneficial for developing or less research-intensive economies, providing funding, equipment, or expertise they can’t access alone. And studies have shown that collaboration can boost the impact of the research produced, which represents better value for money for funders.61

The growth of collaboration is fuelled, for a large part, by new technology which powers tools from web annotation services to collaborative writing tools. As Vincent Larivière, Canada Research Chair on the Transformations of Scholarly Communication at Université de Montréal, noted in a 2018 article: “I have international collaborators I’ve never met…someone can just send an email to share ideas and data, and we can write a paper without ever having to meet each other in person.”60

Technology – and open science – also make it easier to share large volumes of data and other critical research information online, while meeting software makes it possible to host virtual get-togethers for team members around the globe.

What do researchers think?

84 percent of those we surveyed for Elsevier’s Research futures study, said they want to see more projects conducted across international boundaries 10 years from now. A slightly higher proportion, 86 percent, wanted to conduct research projects with colleagues in other countries, although only 64 percent expected the majority of projects in their field to be international in the future.1

Both technology and open science are also supporting citizen science. Also known as crowd science, civic science or networked science, it describes any scientific research conducted by amateur scientists, e.g. counting butterfly populations or using computing power to analyze data, as well as indirect activities such as crowdfunding.

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UNIVERSITY LEADERS: OPPORTUNITIES AND CHALLENGES

38
More data, innovative tools, new opportunities

Big data*, machine learning and artificial intelligence are important technology trends changing the way that researchers and institutions operate. For researchers, they provide the opportunity to understand topics in new and unprecedented ways. Tools already in development can, among other things, sort and analyze data, provide personalized and predictive services, support peer review, identify plagiarism and predict and evaluate research impact. Analysis software is tackling the data-intensive tasks common to many research fields, giving researchers more time to focus on other aspects of their work, including those growing in importance, such as public engagement.

At the same time, the Internet of Things** network is helping to improve the quantity and quality of data and is having a positive impact in many fields. The interconnectivity of lab devices means researchers can track and record data in real time, so that they can check experiments and adjust them, if needed. Other developments such as the rise of 3D printers, mean there’s the potential to create laboratory parts at a reduced cost – important when funding is already tight. “Scientists are now creating innovative designs for lab equipment that can be sold online and printed out affordably.”

For university leaders, many of these developments have the power to inform strategic plans, drive funding, help them showcase performance and enhance the institution profile. As we’ve seen in So, what’s changing in research? | Changing skill requirements, technological advances are requiring researchers to become more data-savvy, and this is true for university leaders too – many of our study participants acknowledged that alongside introducing improved support systems, they will need to enhance their own information skills... In fact, they recognized that new systems would mean change for the whole campus.

“...data management/data curation is going to be very important for future research lines and that needs to feed into the way in which we do things, and the way in which we record things and store the data and so on and so forth in order to develop.”

Vice Principal (Research and Innovation), Europe

A number also mentioned the fact that technological developments have reduced the effort they invest in time-consuming tasks; for example, in the case of research services executives, it has reduced the time spent completing grant proposal forms or filling in HR information for their line reports.

But for university leaders to maximize the opportunities that technology offers, it will be important to provide proper training for all relevant employees. And highlighting the dangers of the familiar “garbage in, garbage out” problem will also be key to ensuring they receive the accurate data they need to make informed decisions. Another challenge, particularly in times of constrained funding, is keeping up with the rapid pace at which technology develops.

“...science and technology are developing too fast, compared to when I studied. The developing rhythm is too fast and the developing cycle is too short now.”

Vice Chairman, APAC

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* The term big data is used in a variety of ways. Often it describes large and complex data sets that are challenging to handle with everyday software, but it can also be used to describe the deeper insights the data can deliver.

** The Internet of Things is seen as the network of connected objects that “are able to collect and exchange data using embedded sensors.”


The big themes explored: education and students

What did we learn...

• Students and the future of their education remain a priority issue for university leaders. Tuition fees have become a more important source of funding due to the reduction in government and philanthropic investment. Students are a potential source of future academics and donors / role-model alumni for the university, so ensuring they enjoy research and succeed in their careers is important.

• As tuition fees remain static, universities must source a greater number of students in order to increase the amount of funding they can receive from them. However, the introduction of tuition fees, or the raising of them in some cases, has also led to students expecting more from their university experience.

• As a result, universities must explore new ways of educating their cohorts beyond the “traditional” methods.

• Technology could help to make a difference here, supporting innovative forms of teaching, and a move beyond undergraduate degrees to lifelong learning.

As we discovered in the section The big themes explored: funding, tuition fees have become an increasingly important source of income for many institutions. This has seen competition for student enrolments soar to an all-time high. And once students have signed on the dotted line, the (high) tuition costs that many face mean there is a much sharper focus on outcomes; not only do they want to graduate with good grades and a memorable and meaningful student experience (a particular challenge now that COVID-19 is curbing campus activities), they also want to be workforce-ready.

The pandemic has added to the growing pressure on institutions to ensure that they are teaching the kind of useful skills that will help students find work in today’s rapidly evolving marketplace – at the time of writing, the virus is forcing them to deliver those skills remotely. Add all these elements into the mix and it’s clear that institutions – and researchers – must find new and innovative ways to educate the students passing through their doors.

“As an institution, two-thirds of our income is teaching, and so the fundamental piece that underpins our success is the approach we’ve taken to manage that teaching aspect.”

Director of Engagement and Partnerships, Europe

So, what’s changing for education and students?

Flexible learning and a skills-based approach

A Pearson study into the skills that employers will require by 2030, found that education systems will need to “support better understanding, teaching practice, and assessment of the granular skills that will be in greater demand [by 2030],” and that educational institutions will need to provide support to educators as they teach those new skills. It added: “This could require
significant retooling of teacher education or faculty incentives.” Importantly, it found that institutions will need to swiftly adapt to changing job market needs and offer accelerated and flexible learning pathways.46

A 2018 Studyportals study into the future of global higher education reported similar findings. It indicated that “the continued shift in the demographic, technological, and economic contexts will encourage institutions to experiment and innovate with new models of blended, online or lifelong learning”.47 Both studies echo many of the points that researchers and industry experts raised in Elsevier’s Research futures report.1

“[It’s important to] ensure academic integrity and financial viability. That involves overseeing the curriculum to ensure we are offering our students the best experiences for success.”

President, North America

The appearance of COVID-19 has only intensified the need for flexible learning. Many believe that personalized learning will be a key theme in the coming years.48 Instead of a one-size-fits-all approach, tuition is likely to become student-led, allowing them to select courses that are tailored to their knowledge, interests and the speed with which they want to learn. Sarah Pritchard, Dean of Libraries, at Northwestern University in the US, believes that we’ll see increasingly “boutique” or specialized courses designed to “promote experiential learning or multi-institutional exchanges so you can have different experiences.”49

Already, universities are using artificial intelligence (AI) algorithms to offer more personalized learning options, and some believe that AI has the potential to make courses available to more people than ever before.50 We’ve already seen technology used to increase access to education with developments such as Massive Open Online Courses (MOOCs) – needing only an internet connection, they have the power to help education reach the masses. But while MOOCs initially experienced phenomenal growth, more recently the number of users has declined. Some blame this drop on the number of users has declined.51

Importantly, it found that institutions will need to swiftly adapt to changing job market needs and offer accelerated and flexible learning pathways.46

Prior to the arrival of COVID-19, there were already predictions that university-run online-only degrees and courses would increase in availability and uptake. Some felt that it was “only a matter of time” before virtual learning transformed higher education, potentially making some traditional institutions like the University of Oxford redundant unless they kept pace.46 While others predicted the most likely outcome was “blended learning”, with students picking and choosing how many online courses and how many on-campus courses they took each semester or term.49 Some institutions had already taken the first steps on the path to virtual learning; for example, in 2017, the UK’s Coventry University announced that in partnership with FutureLearn, it would be providing 50 entirely online postgraduate degrees over the next five years.50

Unsurprisingly, COVID-19 has rapidly accelerated the adoption of virtual learning. According to Bert van der Zwaan, former rector of Utrecht University in the Netherlands: “The pandemic is speeding up changes in a tremendous way.”51 Early in the pandemic’s progress, governments decided to shut down education institutions in a bid to stem infections, forcing lecturers to deliver course content – and even conduct exams – online. At this stage, the long-term impact of COVID-19 adjustments are difficult to predict, but some view the virus as “yet another type of disruption likely to accelerate the radical transformation of higher education.”51 The virus has forced universities to confront long-standing challenges, and at least some of the resulting changes are likely to be permanent; for example, the “new normal”51 may see education institutions continue to deliver large portions of their content remotely, even when/if the threat of contagion has died down.

What do researchers think?

36 percent of those we surveyed for Elsevier’s Research futures study, thought students will be educated on campus 10 years from now, while 27 percent believed education will largely take place remotely. Life and social scientists were more likely to think remote education will be prevalent – 40 percent and 32 percent, respectively.51

31 Witze, A. Universities will never be the same after the coronavirus crisis. Nature. 01 June 2020. https://www.nature.com/articles/d41586-020-01318-x
An important way in which universities can provide the skills the job market is seeking, is by opening courses to students of every age and level of experience. “Lifelong learning” or “renewable learning” offers people the opportunity to retrain as their old jobs are lost to technology, an evolving economy, or even COVID-19. It means they can also regularly refresh skills to see them through a longer working life. As a UK government report notes: “Those entering the labour market now can expect to work longer and may need to change careers more frequently. Economic security will not come from having a job for life but from having the ability to maintain and renew the right skills through lifelong learning.”72

COVID-19 may drive a growth in the uptake of lifelong learning at universities, with those left unemployed by the pandemic-driven recession retraining to find work. Equally, would-be students may struggle to find the funds to pay educational fees – even if the move to online teaching sees those fees “decline tremendously”.11

Another trend is accelerated learning: for example, condensing a three-year course into two. Institutions in the UK, US and Australia already offer fast-track undergraduate degrees, though the model used and the tuition fees charged vary. The goal is to make it easier for students to afford degrees and also open up the market to a new raft of learners who don’t want to commit to several years on campus. However, where accelerated learning is available, uptake remains relatively low.

Libraries are among the institution departments responding to the call to enhance the student experience. For example, in the US, Texas campus libraries have been adding study rooms, booths and exercise machines,73 and the remodelled library at University of California, Berkeley, features modern meeting spaces and nap pods – food and drink are also welcome.74 Many institution libraries around the globe have also been offering a variety of training workshops and support sessions for students. But the success of many of these initiatives depends on students returning to campus, and how soon that will be possible, remains unclear.

With rising unemployment and some industries under threat from COVID-19, the ability of universities to rapidly adapt to changing job market needs has probably never been more crucial. As Steven Mintz noted in the Inside Higher Ed piece we highlight in Charting a new course, employers want people with real-world experience and marketable skills.1 And increasingly, those skills are data- or technology-related. This has resulted in calls for universities to move away from their traditional role of nurturing knowledge and intellectual curiosity in their students, and focus instead on preparing students for today’s competitive workplace.

An analysis of 95 million US online job postings over a period of three years found rapid growth in the number of companies (across all industries), seeking digital skills, alongside expertise in fields like artificial intelligence, the Internet of Things, cloud solutions, machine learning, and fintech (financial technology). In addition, the demand for more “traditional” digital skills continues to escalate, e.g. handling document management systems.21

However, there are some that believe knowledge and curiosity will remain vital skills for graduates, however the job market evolves. The Pearson study into employment in 2030 found that, in the US, knowledge and skills will be equally in demand, while in the UK, there will be a slight bias toward skills, but not by a wide margin.14

“[A long-term challenge is] developing teaching programmes that will bring students to us, without dropping our academic levels.”

Rector, Europe

Rising competition

Some companies are already taking on the mantle of education provider to develop the workforce skills they seek. Increasingly, higher education institutions are competing against both the private sector and non-traditional education providers. Big players include LinkedIn Learning (formerly Lynda.com), which offers online video courses taught by industry experts in software, creative and business skills, and the Chinese Changingedu.com – a platform that enables students to find tutors. Other big names in the EdTech* field include Udacity, Age of Learning, iTutorGroup and Pluralsight.74

* EdTech (education or educational technology) is a broad term that embraces everything from using computers to teach in schools to the “submission of homework online, entire online degree platforms, informal mobile learning applications, gamification or virtual reality techniques”.77

10 Vedrenne-Cloquet, B. What is EdTech and why is it such a big opportunity? Hot Topics. https://www.hottopics.ht/14731/what-is-edtech-and-why-is-it-important/
Established tech giants like Google, Apple and Alibaba have also stepped in to offer training in areas such as computer and data science, either alone or in partnership with institutions, and EdTech has proved an attractive proposition for super-wealthy philanthropists like the Bill & Melinda Gates Foundation. In fact, in 2019, global investment in learning technology companies reached an all-time high of more than $18.66 billion, according to analysis firm MetaAr. It noted: “To put this in perspective, investments in 2018 and 2019 combined far outstrip the total combined investments made to all edtech companies for the entire twenty-year period between 1998 and 2017.”

The transformative power of EdTech

The potential of technology to disrupt education is seen as enormous, and for many, it is artificial intelligence (AI) that will play a pivotal role. For example, Georgia State University and Arizona State University in the US are using AI algorithms to predict student marks and indicate when interventions are required to help students succeed. Some claim it is only a matter of time before traditional educators are competing for positions with AI: “A growing database of information harvested from online courses – clickstreams, eye-tracking and even emotion-detection – could make AI lecturers a common feature in the near future.”

Writing for the World Economic Forum website, University professors Mark Dodgson and David Gann outlined their vision that “AI is a new scientific infrastructure for research and learning that universities will need to embrace and lead, otherwise they will become increasingly irrelevant and eventually redundant.”

In the article, the pair explore how AI, and technology in general has “flipped the classroom, forcing universities to think about where we can add real value – such as personalised tuition, and more time with hands-on research, rather than traditional lectures.” They believe that AI will improve the quality of education and provide students with an immersive experience, through developments such as augmented reality and virtual reality, that will parallel or even exceed the physical learning environment.

Virtual reality (VR) allows people to learn and practice in a simulated environment and along with augmented reality, it is likely to become a useful educational tool for institutions. The key strength of both channels is that they can bring knowledge to life by making it visual and applicable. They have proved particularly popular teaching aids in the health and medical sciences, helping students experience medical procedures in a safe (and now, crucially, remote) environment. And their use is growing; for example, the company Discovery Education has already reached millions of students with its virtual field trips. These have included “aerospace (a virtual behind-the-scenes tour of the Johnson Space Center), health (a VR-powered look at the science behind opioid addiction), technology (a multi-part series on agtech) and more.”

In fact, some feel that virtual reality could one day replace online classes, as instead of “data being fed to your brain in the most boring way possible...[it] gives students opportunities to raise their hands, ask questions in an organic way and generally feel more directly invested.”

VR also offers the opportunity to bridge the geographic divide, bringing students together in one location, wherever they are based in the world.

* Virtual reality is used to describe a believable, interactive 3D computer-created world that you can immerse yourself in by donning equipment, typically a headset and potentially sensory gloves.
** Augmented reality is the combination of real and virtual worlds, e.g. the layering of digitally-generated information on top of a genuine image.


In the case of AR, students can experience scientific experiments, such as chemical reactions, that would be difficult to conduct safely in the real world. By displaying virtual elements over real objects, AR also makes it possible to visualize concepts, such as airflow or magnetic fields, or events. And it has been found to benefit learning outcomes; for example, studies have discovered it improves long-term memory retention of information, enhances students’ lab skills and increases student motivation and collaboration.

However, the costs of AR and VR devices remain high and that has held back wide adoption rates to date. In addition, both require high-performance supporting technology.

For many of our study participants, getting buy-in for all the shifts in teaching methods we’ve explored in this section was a key consideration.

“...students are wanting and demanding to learn in different ways...but we sometimes have a mismatch between faculty prerogative and student learning styles. How do you keep an ageing senior faculty current with a generation of new learners who want to learn on their phone or by podcast or by their own exploration, through some broad parameters?”

Associate Vice President, North America

With technology set to transform how education is delivered so radically, and the rise in alternative education channels, where does that leave traditional institutions and their lecturers? For UK policy adviser Daniel Korski, the growth of EdTech offers them the opportunity to leverage their greatest advantage over computers—the ability to deliver knowledge via human contact.

For University of Strathclyde lecturer, Mark Haw, it’s essential that institutions, lecturers and students urgently band together to “identify and share what is really important about being taught by an actual human.” He added: “In my university’s recent teaching awards, student voters created YouTube videos explaining how their favorite lecturers had really made a difference to them. That’s not a bad place to start.”

During the interviews we conducted for this study, participants shared the steps they have taken to improve institutional performance. We have grouped together the points they raised by theme, and drawn on additional sources, where appropriate. This section also features information on how university leaders keep up to date; the channels they consult and the organizations they join.

**Developing a strategy**

This was seen as the first step toward improving institutional performance. Most participants agreed that a strong direction from leadership on vision and strategy is critical. Recommendations included:

- **Start with a clear mission and an understanding of the institution’s values and guiding principles.** Together, these will guide daily activities. The mission should reflect the institution’s core purpose. Most of our participants saw academic freedom and autonomy as expected values.

- **Identify the key actions required to achieve the mission.** Many agreed that determining the right path can be time consuming and often has considerable resource implications.

- **Evaluate past performance. Identify strengths and weaknesses, as well as threats and opportunities.** Developing the plan provides an opportunity to make strategic decisions on research focus, e.g. where to invest and divest. Most felt that institutions should focus on the subject areas they are strong in. Some highlighted the importance of identifying and amplifying the points that make the university unique.

  “Our strategic plan for the last dozen years has been to invest in hiring interdisciplinary faculty who are research active. We hire them in areas that are between disciplines. Specifically underexploited areas where we can define our research that is distinctive from other institutions. The faculty tend to be very entrepreneurial.”
  Director of Research Development and Strategic Projects, North America

- **Plan for the long term.** The strategic plans of most study participants’ institutions focus on a period of 10 years or more, providing a valuable road map for direction and decision making.

  “We have established a strategic plan in 2009 until 2020, we see the effectiveness…it has allowed us to recognize our strengths and not to go back on subjects where we have no competence...knowing our points of strength has allowed us to invest in other areas that we have identified.”
  Vice President, Europe

- **Identify and track appropriate metrics.** Often a challenging process, but critical for attaining the institution’s strategic goals. Bibliometrics reflect the research environment several years ago, so it’s important to look for lead indicators. Participants recommended identifying someone who will manage and monitor progress.

- **Make the process of developing the strategy participative.** For example, by holding workshops, consultations and feedback sessions with staff.

  “It is less of a top-down strategy but more of a bottom-up approach.”
  Chancellor, Europe

- **Make the plans available to staff online and provide a feedback loop.** Some institutions found it helpful to give the strategy a name or a tagline. The most effective plans were considered to be those with buy-in from staff.

  “…there has been a unified strategy vision. The faculty are responding, which is really exciting.”
  Assistant Vice Chancellor Academic Affairs Research, North America

**Institutional best practice**
• Involve external partners (funders and industry) and local communities.
Participants felt this improved the strategy’s relevance.

• Build in flexibility.
Very prescriptive, detailed strategies were considered to hold back academic creativity.

• Establish a strategy cycle so that the plan is revisited on a regular basis.
This not only offers the opportunity to review progress against targets, but to check for continued relevancy and adjust, if necessary.

Nurturing the right culture

Despite the hierarchical nature of most institutions, universities have a strong tradition of collaborative decision-making. In recent years, this has been challenged by the move toward a more corporate structure and the introduction of executive roles. For example, participants at some of the larger universities in this study felt that their institutions were in danger of becoming overly bureaucratic, creating siloes, which could inhibit creativity and interdisciplinarity. However, for most, nurturing a supportive, open and collaborative culture remained a priority.

“The leadership style is one of listening and leading by example and problem solving... my style is collegial, not formal. I prefer when there are problems to get the parties involved together and try to work out a reasonable solution.”
Associate Vice President, Research, North America

Other areas of advice and feedback included:

• Break down barriers between colleges to encourage horizontal communications.
Information should also flow freely between the colleges and other areas of the institution, including support functions, so departments can benefit from each other’s unique skills.

“[What has helped us be successful is] good collaboration with other offices like financial services, facilities management and the university.”
Vice Principal (Research and Innovation), North America

• Maximize the synergy between education and research.
In a study of social science departments, Bennich-Björkman observed that innovative research departments had academic staff that were engaged in both teaching and research. While Georgetown University Provost, Robert Groves, fears that any separation of instruction from research, could result in a failure “to prepare our students for their own original inquiries so necessary to their long-term success.” The university leaders taking part in this study also saw the value of strengthening education/research bonds.

• Prioritize diversity and inclusion.
Study participants felt that diversity in the workplace creates a more inclusive environment, making it easier to attract talent. It also ensures that the research produced reflects multiple perspectives.

“...trying to recruit a diverse pool of folks always adds to the strength of everything we're doing.”
Director of Research Development Office, North America

• Provide modern equipment and buildings.
This not only helps to attract the best teaching staff and researchers, but is a strong draw for students too.

“Investment in research infrastructure, which also includes facilities and equipment, has been a tremendous help.”
Associate Director, North America

• Promote professional development at all levels, including research support roles.
This may include providing talent plans, or using external resources, such as Vitae’s Researcher Development Framework. Other options include creating networks for research-specific purposes at national or international level, creating university cross-disciplinary networks, or offering courses in teaching and leadership.

“Our university made a series of talent plans with funding support on international collaboration. Every level from top to bottom promotes it actively. Currently we have built collaboration with the UK, the US, as well as the Belt and Road countries on long term talents exchange.”
Vice Chancellor, APAC

Benchmarking performance

For most study participants, understanding how their institution is performing in relation to competitors, was a critical ingredient of decision making. This performance tracking tends to focus on research and spans the entire workflow from funding opportunities, success rates and publication outputs, to quality indicators (including citations) and technology transfer.

“As researchers who can produce good results have to be allocated funds appropriately. As a result of that, they will raise their motivation and produce excellent results.”

Senior Executive Vice President for Research, APAC

Many also closely monitor comparative data of graduation rates, retention rates and overall performance in the lecture theatres.

“I think that everybody wants to know the context of their environment. You can look at your institution but if you don’t know how it compares to others and what the best practices are...[then you don’t know] how you fit into the larger picture.”

Director of Institutional Research, North America

Some institutions have invested in balanced scorecards or dashboards that are accessible to all staff. But generating these insights has a price tag – money needs to be invested in the right technology and staff need sufficient time to compare data. External evaluations; for example, the various university rankings, have become a fact of life. However, for mission and value-led organisations, they can be problematic – the principles they are guided by aren’t always included in those rankings’ evaluations.

“We...benchmark our performance; we are very interested in finding out where the areas are to improve, and to understand how to maximize the efforts in order to improve.”

Vice Rector, Europe

Below are the key recommendations we gleaned from our participants.

• Provide management training to young scholars.

For example, some participants have introduced mentorship programs that complement the informal nurturing of talent, or encourage mobility among younger researchers, in particular.

“We offer educational programmes for different professions and we are very good at setting up the learning goals...what kind of deep knowledge and long-term skills would you need.”

President, APAC

• Allocate responsibility for monitoring and managing metrics.

A growing number of universities are creating administrative roles devoted to this task, with the goal of easing the burden on researchers, while others have devolved responsibility completely to the researchers. Some of our participants favored central support, while others felt it was important to have local representation.

“[We have] an impact team who support academics to find evidence and to record information...A library team who work closely with academics to make sure we are capturing every single output as soon as possible. We also recently invested in the Pure system from Elsevier.”

Associate Director, Research Planning Office, APAC

• Create a set of peer institutions for comparison purposes.

The institutions on these lists are usually similar in ranking status, size and demographics. Study participants typically first measured the performance of their institution’s departments against national performance levels; for example, funding for internal medicine at their institution versus internal medicine funding across the country. They then looked further afield at regional and global levels.

• Network with colleagues at institutions with higher performance levels.

Many have built relationships with peers at institutions that have already reached the level they aspire to, so they can better understand their position and drivers of success.

Building the university brand

Impressive research and education results have long been seen as essential components of a university’s brand. Over the past few years, a third element has taken on an increasingly important role in that mix – societal impact. For many of our study participants, consistency was seen as the key to building brand, and, in turn, their institution’s reputation. This included consistency in performance across key areas, driven by a shared vision and mission. But also consistency in the messaging they delivered. When it comes to the latter, maximizing the various brand-building pathways that universities have at their disposal was a challenge for many. Increasingly, institutions are following the lead of the private sector and creating dedicated marketing...
students, these ambassadors can help to build enrolments.

“We have a dedicated international service, and it’s mainly focusing on the student and teaching aspect of the university. We have a lot of in-country teams that support the university in getting the message out.”

Head of Research Services, Europe

Driving research quality

There are many factors that contribute to successful research. Size of the team can be important, although this may vary depending on discipline – according to Heinze et al., creative research teams tend to consist of six to eight researchers,91 while Kenna and Berche favor medium-sized groups.92 Creating teams that reflect diversity and complementary knowledge and skills was also a priority for our participants. Their other recommendations included:

- **Avoid a fully top-down approach.**
  While a comprehensive research program with defined research goals and timelines can help to drive success, some felt that leaving it to management to set the research roadmap was counterproductive, stifling innovation. Successful departments tended to be those in which the academics had the freedom to establish their research agenda. This is supported by the findings of Heinze et al., who discovered that empowering teams to define their own focused research questions boosted creativity.91

“Our success...is due to singular actions on handful of professors who work and/or collaborate with colleagues abroad. And from these connections derive larger cooperations with the university.”

Chancellor, Europe

- **Ensure the research infrastructure is technically sound and social.**
  Many felt it was important to support interaction between groups e.g. provide shared spaces. For some of our participants, this interaction included the transfer of knowledge from researchers to students.

  “We have high-quality researchers and faculty who take the time to go in a lab and train students. The students themselves are high quality and passionate about research. The faculty are passionate about research and that leads to great research and discoveries here.”

  Associate Vice President for Research Partnerships,


Establishing partnerships with industry

Many of our study participants felt that improving relationships with industry will be key to their future success. This may be down to funding pressures and the need to find new sources or the fact that governments are growing increasingly vocal in their support for these partnerships. In addition, recent studies have shown that research groups with close industrial links tend to have a positive publication record and attract more funding. Our participants have also found these partnerships can offer educational and networking opportunities for students, boosting their future job opportunities. We examine the pros and cons of these relationships further in ‘So, what’s changing in funding?’ | New sources.

“We are very active in getting industry involved in education. It does not simply mean that people from the industry come to our university for work. We have made considerable efforts to develop new educational programs, providing educational opportunities through industry-academia collaborations.”

President, APAC

For most of our university leaders, these relationships are a growing focus and they had best practice tips to share:

- **Dedicate resources to identifying partnership opportunities.** Several institutions involved in this study have developed new roles, and even departments, dedicated to this area.

  “We just created a corporate engagement centre. We hired some exceptional talent in that space to build new relationships and foster new ones.”

  Director of Research Development, North America

- **Exploit existing synergies.** For example, promote skills that align with the industries already operating in the area, or identify and approach companies that share the same subject specialism. Many mentioned the importance of thinking on a national and international scale.

  “[Focus on] industry-friendly research: For example, we are funded by LG Display and Samsung SDS to educate postgraduate students, and then some talented students can be employed by those companies. In addition, our university conducts the research that companies need.”

Growing international collaboration

There is increasing recognition that conducting research across international boundaries brings many benefits, from a greater funding pot to higher impact results. We consider the value of these collaborations in ‘So, what’s changing in technology?’ | Support for collaboration.

Many of our participants saw the value of growing their international outreach and have already been taking steps to improve performance in this area.

“Science research shouldn’t be limited to national borders, especially in social science. People are more interested in what is going on in the global context. Through international collaboration I can get a better view and new ideas.”

Vice Rector, Europe
We’ve captured some of their key recommendations below.

- **Establish a team or department with international collaboration as its focus.**
  At some of our university leaders’ institutions, international partnerships stem from the individual actions of lecturers and professors. But many have been adopting a more centralized approach and creating dedicated roles.

  “We have management people on the executive with those areas in their job title. [For example] there is a Pro Vice Chancellor for Partnership and Region.”
  - Deputy Vice Chancellor, Europe

- **Consider merging international departments with commercial teams.**
  This can provide a stronger bedrock upon which to build collaborations with industry and academic partners, both internationally and locally.

- **Create networks for research-specific purposes at an international level.**
  For example, institutions can identify partners aligned with their areas of excellence or involved in pioneering research, then invite leading scientists to give lectures and visit the institution’s laboratories.

- **Initiate formal exchanges of students on an annual basis.**
  This helps to build closer ties to overseas institutions and can also boost international student enrolments.

  “Our international department collects information about overseas programs effectively. We have a full-time teacher within the department and some English speaking staff to contact abroad.”
  - Vice President, APAC

- **Make international cooperation an element of research performance measurement.**

**Demonstrating impact on society**

Although university leaders rated their ability to highlight and explain the societal impact of their research as poor, most recognized that it’s growing in importance and have been seeking ways to improve. These include the steps highlighted in *Building the university brand* in this section. We also look at the topic in greater detail in *So, what’s changing in research? | Impact and accountability measures*. Other recommendations from our participants included:

- **Build societal impact into the strategic plan.**
  Embedding the agreed approach into the plan will ensure it remains a key focus and is not overlooked.

- **Establish a dedicated team.**
  This may involve establishing new roles or expanding the responsibilities of existing roles. The team’s remit should be to communicate with the public about the research the institution is conducting and what it might mean for society at large.

  “We have a very successful Heroes campaign with posters on the Underground promoting our key academics with links through to websites.”
  - Head of Research Planning, Europe

- **Leverage alumni networks.**
  They are often very knowledgeable about the institution and its role and can help to promote the university brand. With guidance and supporting materials, they can become advocates, highlighting the university’s performance in its core academic areas.

- **Identify opportunities for students and faculty to become active in the local community.**
  This can help improve community understanding about how the university and its work is benefitting them.

  “Part of our mission, since the university was founded, was to have an impact on the society around us. It’s two-pronged: on the one hand it’s that a large number of our students volunteer, as part of their studies, in the community; the other is that we try to share as much of our research as we can... with the industry and society around us, in order that we benefit the local society and help them, whether it’s in medical research or technology.”
  - Rector, Latin America
Keeping up to date

“The most important channel is to talk to peers. So, appearances at conferences, conventions, and major international meetings are important.”

Vice President (Research and Development), APAC

We asked the university leaders taking part in this study to name three to four external sources they favor for keeping track of higher education developments. They named a variety of channels—we’ve captured the most common below.

- **Word of mouth and networking:** This was mentioned more frequently by senior executives and research services executives (38 percent and 40 percent, respectively) than heads of the university (27 percent)—although all three groups mentioned it most often. There were also regional variations: while 51 percent of participants in Europe and 44 percent in North America identified it as important; in APAC that figure fell to 24 percent. Various national and regional associations were also mentioned as key sources of knowledge, particularly in North America; for example, the National Organization of Research Development Professionals (NORDP), National Institutes of Health (NIH) and the National Science Foundation (NSF) (11 percent, 9 percent and 9 percent, respectively).

- **The Times Higher Education (THE)** was also mentioned often, and was most likely to be used by participants in APAC (33 percent), followed by Europe (24 percent) and North America (22 percent)—although it’s unclear whether they were referring to THE, the university rankings, or THE, the magazine.

- **University rankings were consulted**, especially when assessing competitiveness. This was particularly true for participants in Europe (17 percent) and APAC (29 percent). Interestingly, North American participants didn’t mention university rankings as one of their favored options.

- **Online social media was used**, but not on the same scale as other sources. When participants were prompted to think about social media platforms, LinkedIn, Facebook and Twitter were mentioned most by each management level. If we look at the responses by region, Twitter and LinkedIn were the most popular options in Europe (34 percent and 28 percent, respectively) and North America (32 percent and 34 percent, respectively). In APAC, Facebook (28 percent) was the most popular social media channel, followed by the Chinese social media site WeChat (20 percent).

- **University leaders**: Opportunites and Challenges

“I often turn to associations who disseminate information on research and opportunities available for faculty, such as the IIE – Institute of International Education. Also, governmental sources like the Department of State.”

Associate Vice Provost for Global Engagement, North America

In terms of networking, many heads of the university discussed strategic issues, such as funding or strategic investment, with both internal and external colleagues. The internal personnel they consulted include:

- Research services
- Academic leaders, such as departmental chairs
- Departments including budget, legal, and general affairs services, as well as finance partners.

When it comes to solving problems, (for example, those we explore in Challenges in the short and long term), heads of the university in Europe mentioned word of mouth as their favored channel—elsewhere greater emphasis was placed on sources. Networking with key stakeholders was seen as crucial. Social media was used mostly to support this and to support communications.

Many senior executives favored their own teams for networking and collaboration, but opportunities to consult with peers at conferences and events were also valued.

“I don’t tend to collaborate with others because most of your peers are competitors.”

Vice Provost for Research, North America

While the methods used to source information were not radically different from those at the top of the institution, their content focus was much more research-specific. Information sources were considered useful when they supported the research strategy, particularly around funding and collaboration. Databases such as Scopus and Web of Science were used to track, compare and improve research performance. In terms of social media, it was mentioned less frequently than other sources, although many in APAC relied on it.

“LinkedIn is used for looking at what other institutions that are similar to us are doing...I do keep abreast of Twitter, looking for companies or opportunities that are out there...All just looking for opportunities for our researchers.”

Assistant Vice President of Research and Innovation, North America
For research services executives, most networking and collaboration took place with internal stakeholders. They leveraged information sources to help them improve the support they offer colleagues and provide greater insight into the research areas that they or their institutions focus on.

Nearly all participants saw the main value of organization membership as the opportunity to network with peers. The type of organization and their motivation for joining tended to vary by region and specialism.

Most heads of the university were members of several organizations. They tended to join groups linked to their research background. However, some were also members of higher education bodies, often regionally based.

Senior executives were a member of at least one organization and tended to focus on those offering opportunities to further their knowledge on areas of research focus, establish collaborations, or pool resources (particularly important as funding becomes more competitive).

For research services executives, upskilling was a key motivation for joining an organization, as was finding a best practice resource to tap into; for example, the National Organization of Research Development Professionals (NORDP).

“In smaller institutions or less research-intensive universities you might be only one of very few research administrators. You have nobody to ask questions of so that is the reason we are in it [ARMA International], it's the only place you can talk to people.”

Head of Research Services, Europe
Methodology

Approach

The research was split into two phases. The first was qualitative and exploratory to help us better understand the needs and priorities of leaders. It helped us determine which metrics should be measured in the second phase, which was quantitative and measured opinion. The fieldwork was conducted in 2019 and was completed toward the end of the year.

Sample

The study was conducted by Ipsos MORI in partnership with Elsevier. Ipsos MORI sourced the majority of university leaders approached for the study with Elsevier supplying additional names. Quotas were set on country and region to ensure we spoke with a cross-section of leaders across geographies and gained a broad variety of opinions.

All data was collected from leaders via phone interviews. Qualitative interviews took 1 hour, quantitative interviews took, on average, 42 minutes.

Responses were analyzed as a whole and also by region (North America, Europe and APAC) and level: the levels used are listed below (see the appendix for information on their roles and responsibilities).

- Level 1 – Head of the university
- Level 2 – Senior executive
- Level 3 – Research services executive

Note: Deans and heads of department were not included in the study as the focus was on management with an institution-wide remit.

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<th>Phase 1: Qualitative interviews (n=22)</th>
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<th>Phase 2: Qualitative interviews (n=187)</th>
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The table below contains a list of the countries in which the participating institutions are based, along with their regions.
Acknowledgements

Study participants

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Appendix: The university leaders who participated in this study

As outlined in the introduction to this report, for the purposes of this study we decided to focus on three key layers of management, all chosen because they share an institution-wide remit – together we refer to them as the university leaders. While their job titles and responsibilities often vary per region, these management layers share a number of common features, which are captured in the tables below:

## Heads of the university

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<tr>
<th>Roles</th>
<th>President, Rector, Vice Chancellor – the most senior individuals within the institution.</th>
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<tbody>
<tr>
<td>Responsibilities</td>
<td>They provide the <strong>overall vision and strategy.</strong> Building a strong reputation for research and education is also a key focus. According to our participants, building that reputation often involves <strong>managerial and operational duties.</strong></td>
</tr>
<tr>
<td>Challenges</td>
<td>The issues they face tend to be high-level; for example, funding, attracting more talent and improving a poor public profile. We explore these further in the section <strong>Challenges in the short and long term.</strong></td>
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### Key metrics

In order to deliver on strategy, they prioritize:

- **Recruitment and development of the best talent.** Getting the right team in place means they can produce the best work. They considered their performance in this area as relatively strong.
- **Producing high-quality research.** They were confident in their institution’s ability to achieve this and in its ability to manage research.
- **Having an appropriate strategic plan.** They were most confident about this.
- **Attracting students.** This was also viewed as important but they considered their performance in this area as weak.
- **Collaboration.** This was seen as a critical driver of future success, not just partnerships with other institutions but projects spanning national borders. Benefits identified included improved funding, knowledge-sharing and development for students.

The least important areas for this group were **commercializing opportunities and demonstrating the societal impact of research.**
“I am responsible for the university as a whole. For the quality and for the profiling, the strategies.... I am responsible for research, education, and all the academic questions.”
Vice Chancellor, Europe

### Senior executives

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<tr>
<td><strong>Responsibilities</strong></td>
<td>They act as advisors and lead on the <strong>design and execution of the institution-wide research strategy</strong>. Core responsibilities are around planning the <strong>research life-cycle</strong>, with a particular emphasis on establishing a fruitful <strong>network of partnerships</strong> that can translate into a robust pipeline of grant proposals.</td>
</tr>
<tr>
<td><strong>Challenges</strong></td>
<td>This group tends to be more focused on the immediate, daily problems of <strong>running research operations</strong>, but this is complicated by <strong>outdated and outmoded data analytics</strong> options; for example, some still use Excel. The regulatory burden placed on universities also falls on their shoulders. The <strong>availability of funding</strong> was identified as their standout challenge, as was attracting more talent. We explore these issues further in the section <strong>Challenges in the short and long term</strong>.</td>
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<tr>
<td><strong>Key metrics</strong></td>
<td>Not surprisingly, given their focus on research and the successful production of it, our participants equated a steady flow of <strong>high quality research</strong> with institutional success and performance in this area was seen as very strong. They also viewed <strong>recruiting and developing the best talent</strong> as important, but felt they were underperforming in this area. As research facilitators, their priority is to provide resources to support the research enterprise, and they were moderately confident they are doing this well.</td>
</tr>
</tbody>
</table>

“I am responsible for research and regional revitalization. My main work includes improving research skills and abilities across the university, invigorating research activities to produce excellent results, and raising the money needed to achieve these goals.”
Trustee and Vice President, APAC
Research services executives

Roles
Director or Head of Research Services – the people running the research office.

Responsibilities
More so than any other level, they support the research process. This includes managing funding submissions, seeking new funding opportunities (domestically and globally), helping to manage awards and assisting researchers at each stage of the research cycle.

Challenges
Participants identified a lack of funding for research activities as the most prominent challenge, especially in the short-term, as was attracting more talent and building a public profile. In the long-term, they saw a greater range of challenges, including level of competition, cooperation opportunities, talent and quality of staff. One particular concern was that the nature of research is changing yet the level of support that universities can give to academics is decreasing. Another was that departments are becoming siloed, impacting alignment. We explore these issues further in the section Challenges in the short and long term.

Key metrics
Recruiting and developing the best talent was seen as the most important measure of a university’s success. However, research services executives believed their own institutions have been performing poorly at this. Producing high quality research is essential for this group, and it’s an area they viewed as a strength. The least important areas for them were being able to benchmark performance against other institutions and commercializing opportunities. This focus on talent over research could be down to their role in winning research proposals for their institutions and managing them. Interestingly though, they viewed performance in this area as relatively weak.

“We spend most of our time searching out new funding opportunities and identifying faculty members who may or may not be interested in and eligible for applying for said funding opportunities.”

Director of Research Development, North America

<table>
<thead>
<tr>
<th></th>
<th>Heads of university</th>
<th>Senior executives</th>
<th>Research services executives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>39%</td>
<td>35%</td>
<td>42%</td>
</tr>
<tr>
<td>Education</td>
<td>27%</td>
<td>26%</td>
<td>27%</td>
</tr>
<tr>
<td>Operational management</td>
<td>26%</td>
<td>25%</td>
<td>35%</td>
</tr>
<tr>
<td>General responsibilities from being institutional head</td>
<td>25%</td>
<td>24%</td>
<td>28%</td>
</tr>
<tr>
<td>Planning</td>
<td>24%</td>
<td>28%</td>
<td>24%</td>
</tr>
<tr>
<td>Partnership working</td>
<td>32%</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>Proposals</td>
<td>30%</td>
<td>24%</td>
<td>30%</td>
</tr>
<tr>
<td>Research facilitation</td>
<td>23%</td>
<td>23%</td>
<td>23%</td>
</tr>
</tbody>
</table>

FIGURE 13: The top five responsibilities per role identified by our participants.

Base: Heads of university (65), senior executives (50), research service executives (72).
Q: Please can you tell me how important/unimportant you consider it to be as a measure of successful performance, using a scale from 0 to 10 where 0 is not important at all and 10 is very important.

Q: Thinking now about your own institution, how well do you see it performing on the following criteria? For each of the items please tell me, on a scale from 0 to 10 where 0 is very poor and 10 is excellent, how you would rate your institution.

**FIGURE 6:** How participants rated specific attributes in terms of importance and performance (globally, all levels).
FIGURE 7: How participants rated specific attributes in terms of importance and performance by level (globally).

Q: Please can you tell me how important/unimportant you consider it to be as a measure of successful performance, using a scale from 0 to 10 where 0 is not important at all and 10 is very important.

Q: Thinking now about your own institution, how well do you see it performing on the following criteria? For each of the items please tell me, on a scale from 0 to 10 where 0 is very poor and 10 is excellent, how you would rate your institution.

**Strategy**
(1) Benchmarking performance vs other institutions
(2) Appropriate strategic plan

**Funding**
(1) Managing research funding

**Research**
(1) Tracking research outputs
(2) International collaboration
(3) Recruiting and developing the best talent
(4) Producing high-quality research

**Facilities**
(1) Providing equipment / facilities

**Impact**
(1) Communicating and engaging with society
(2) Showcasing research performance and impact
(3) Demonstrating societal impact of research

**Comm. Capabilities**
(1) Commercializing opportunities
(2) Building partnerships with industry

**Education**
(1) Attracting the best students
FIGURE 8: How participants rated specific attributes in terms of importance and performance by region (all levels).