Research funding is not enough

Universities need more support for teaching and facility maintenance to stay fit for the future

Philip Hunter

Universities have become a crucial player for the ‘knowledge-based economy’ as both the generators of knowledge that will eventually turn into products, services and economic growth and the training ground for skilled professionals. Yet, this role has also increased governments’ and society’s expectations. “There has been inexorable pressure within universities over the last couple of decades as they have become increasingly professional and directed to generate results of value to governments and society, particularly on the research front,” said Robert Campbell, President of Mount Allison University in Sackville, New Brunswick in Canada. The demand to deliver more publications, patents, graduates and clamour for a higher position on international research indicators has indirectly put a squeeze on budgets both for teaching and maintenance of laboratories and lecture halls, especially in Europe and North America. This pressure has been intensified by a steady rise in student numbers and the financial crisis that forces many European countries to cut back on public spending.

Many universities have responded to the demand for more and better research by reducing funding for activities that do not seem to be related to research efforts. Teaching tends to be the first to be cut according to Campbell, not in a deliberate sacrifice of quality but in a misguided attempt to become more efficient by managing with fewer staff. “We see this inexorable straight line decline in the number of full time faculty in universities, and an increase in student/teacher ratios, and this plays out most dramatically at undergraduate level and especially the first two years, where it is easiest to get those economies of scale,” Campbell said. “The easiest way to increase

productivity is to double the class size, but then your quality declines.” He argued that it was equally short-sighted to cut budgets for building and facilities maintenance whilst increasing class sizes, both of which he described as borrowing from the future and letting down the next generation of students, with research quality ultimately suffering.

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Some organizations in Europe have already pointed out the impending problems of teaching quality and infrastructure maintenance. In February 2011, the European Universities Association (EUA) published a report underlining that universities need both sufficient resources and a long-term planning horizon to invest in future academic and research activities, and to continue fulfilling their role in society [1]. The EUA report also acknowledges that universities would have to pursue alternative income sources to make up for declining state funding. However, such alternative funding, for instance research grants, often does not cater for teaching and maintenance, which has to be paid for out of declining government allocations.

It is, therefore, important that public funding bodies cover building maintenance and teaching, according to Katrien Maes, Chief Policy Officer at the League of European Research Universities. “Universities need to be properly compensated for their research effort, and that

should include overhead costs,” she said. “This is often too low, and the more external research funding there is, the poorer a university becomes if there is not proper provision for overheads.”

The trend towards external research grants that include little or no provision for overheads is not the only factor affecting teaching budgets, according to David Trick, former Assistant Deputy Minister for Postsecondary Education in the Canadian state of Ontario, who now has his own business advising universities and government agencies on higher educational strategy. Another factor is the rising real-term cost of educating each student. “Operating costs per student in Ontario have risen by about 4–5% annually in recent years, mostly due to compensation costs, while revenue per student from tuition and government support typically rises about 2% annually,” said Trick. “Universities have responded to these pressures by increasing undergraduate class sizes and by hiring more part-time instructors to do undergraduate teaching.” This yields considerable bottom-line savings, because, in Ontario, part-time instructors are typically paid C\$6,000–7,000 to teach a one-semester course according to Trick, and a typical full-time professor is paid C\$80,000–150,000 to teach four to five one-semester courses per year.

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The use of part-time instructors also enables universities to pretend that they are maintaining low teacher-to-student ratios, a problem that has been identified in several reports. In one such report, Marney Scully, Assistant-Vice President of Government, Institutional and Community Relations at the University of Toronto in Canada, showed that student-to-staff ratios could vary from 6:1 to 39:1 just by taking different views of the same data [2]. Another study showed that some US universities are manipulating their rankings in the US News & World Report by encouraging staff to avoid taking their vacations during the autumn when the data was collected, to maximize their teacher-to-student ratios [3].

Even without counting part-time instructors, teacher-to-student ratios provide some indication about teaching standards and are therefore useful as a yardstick, according

to Campbell. He is proud of the fact that Mount Allison University has succeeded in holding the ratio at one teacher for 16 students, compared with the Canadian national average of 1:30. However, Campbell conceded that even at Mount Allison the ratio had slipped from the time when he was an undergraduate.

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Similarly, the College of William & Mary in Williamsburg, Vancouver, USA, which has a strong teaching ethos, has been struggling to maintain its healthy teacher-to-student ratio of 1:12, commented Oliver Kerscher, Associate Professor of Biology.

"For example, due to lack of funds, as we are a public university, a hiring freeze for tenure eligible faculty has been instated and it is not even entirely clear if retiring faculty will be replaced right away," he said. So-called non-tenure eligible temporary staff are being hired as a stopgap measure, but Kerscher commented that they are often less effective teachers. The college is also, as with many others, coping with increased undergraduate intake, set to rise by 200 over the next four years.

While Maes commented that there can be too much emphasis on the link between teaching and research as some staff are better at one and some at the other, there is a growing belief that the two are inextricably linked, or at least should be, according to Jan Petter Myklebust, Assistant Director in the Department of Research

Management at the University of Bergen in Norway. From the perspective of undergraduates, the earlier they get exposure to all aspects of a research career the better, he argued. "Young people should be made responsible at the earliest date possible in their career," he said. The training should not just cover experimental work but also include writing research articles and the increasingly time-consuming business of applying for grants. "Such practice helps them think through the planning of their own research," said Myklebust. It is important that researchers also derive benefit from closer involvement in teaching, which some universities achieve by using undergraduates within research projects. "William & Mary is unusual in that we do most of our research with undergraduate students and about 60% of our 100 or so graduating biology and neuroscience students each year had some sort of research experience beyond the classroom or teaching lab," commented Kerscher.

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The Charité University Hospital in Berlin, Germany, also focuses on linking research and teaching to provide graduates with the right skills from the beginning. "If medical education fails to convey scientific skills to medical students, only a few of them will be prepared for a scientific career and, more importantly, only a few will be able to understand the resulting evidence and practice evidence-based medicine," commented Claudia Spies, the Charité's Dean of Educational Affairs. "This increases translational barriers between basic research, clinical research and clinical practice. To remedy this situation, we believe that teaching and research should not be separate entities." Spies went on to argue that teaching itself should become a subject of research. "More research should be performed on teaching and more teaching should be provided on research and research methods. This is currently not the case. In fact, granting agencies consider research on educational matters not as real, or at least not as fundable research," she said.

The Charité has taken the view, much like Myklebust at the University of Bergen, that students need all round training in all aspects of research. "Students must be trained to understand and evaluate research results and plan and execute research projects," explained Spies, adding that teaching scientific thinking and writing were essential. Students therefore spend less time in lecture halls with traditional teaching. "The Charité has introduced and continues to improve an innovative integrated medical curriculum that started in 2010/11," Spies said. "One main feature of this curriculum is that fewer lectures are offered. Instead, opportunities for small group work are increased, such as problem-based learning moderated in groups of eight students, bedside teaching with groups of four students, and seminars with groups of 20 students."

However, universities need more funding. Building and maintenance of their infrastructure should go hand in hand with teaching, according to Campbell, who reckoned that academic institutions should be spending about 4% of their budget on maintaining their facilities. Few, however, were actually spending at that level; Mount Allison has now enacted budgetary rules that require moving closer to that 4% target year by year. Yet, more investment in buildings and facilities could come at the expense of teaching budgets, according to Trick. "In Ontario, and under many other jurisdictions, many public infrastructure investments from the 1950s, 1960s and 1970s are not being adequately maintained, including many university buildings," he said. "University boards of governors are attempting to finance these building renewal costs, even though there is no adequate source of revenue to do so. Every dollar that is taken from general revenues for this purpose might otherwise have been used for teaching or general operations."

William & Mary, in fact, decided that investing in new buildings was the best way to ensure its future. "We've recently put in the neighborhood of a quarter billion dollars into academic infrastructure," said Dennis Manos, William and Mary's Vice Provost for Research. This has been spent on buildings started or completed since 2005, financed from a mixture of fund-raising

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activities and the Virginia state. "We've invested US\$65 million in our Integrated Science Center, which holds chemistry, psychology and biology," Manos added. "We're on the cusp of spending US\$86 million for the third phase of the Integrated Science Center. At the same time, we've also built new student housing. William & Mary is very attentive to infrastructure, and if other universities are not, that's regrettable and they'll pay for it later."

Of course, not all universities are in the position to spend such sums on buildings. As Trick pointed out, most of them ultimately depend on their primary funding sources, usually through governments, and should be lobbying them to take an enlightened view on maintaining both teaching standards and facilities. "We should be clear that universities are responding to incentives that are created by governments, either directly or through buffer bodies," Trick explained. "If governments believe that the balance between research and teaching is inappropriate, they must change the incentives." Just changing the incentives for universities is not enough; if governments want to preserve and improve universities as a major component of their knowledge-based economies, they need to invest more money and not just for cutting-edge research.

CONFLICT OF INTEREST

The author declares that he has no conflict of interest.

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