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THE VANCOUVER SUN

Universities form a vital part of the knowledge economy: They're a cornerstone of this crucial sector as they train the next generation of professionals

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Technology industries and top-tier research institutes are traditionally considered the base of any knowledge economy, but universities can also stake a claim because of the immense influence they wield over these sectors.

Economist Jock Finlayson at the Business Council of B.C. says these institutions are cornerstones for the knowledge sector because of their role in training the next generation of skilled professionals and generating new technology and ideas through research.

Mario Pinto, vice-president of research at Simon Fraser University, said the economic impact of universities is traditionally measured by calculating the value of spin-of companies and intellectual property that is generated by university research, and the revenue they generate for their institutions.

However, Pinto believes this is not the only way to measure a university's impact on society, nor is it the best way.

"Skills are much more fundamental if you look at their contribution to the knowledge economy," he adds. "The way I view it, [it is] the training of personnel that is the currency [of universities]."

Pinto says a university's graduate programs create economic impacts both by contributing new technology and original ideas and by churning out skilled people.

For example, Pinto notes that SFU is the headquarters for a federally funded network of research centres called the Mathematics of Information Technology and Complex Systems, which is engaged in studying practical uses for complex equations.

In another instance, Pinto says that the university's Centre for Research in Immigration studies issues of multiculturalism, and turns out graduates who are sensitive to the needs of a diverse society, which is critical for B.C.'s increasingly multi-racial makeup.

"To me, that's the knowledge-based economy," Pinto says. "We're training the next generation with the most up-to-date knowledge, [and giving them] the skills-sets that allows them to not only apply knowledge but also the principles they've learned for problem solving and how to trouble-shoot.

"That is the most valuable role of universities."

THE SCHOOLS

British Columbia's half-dozen universities are substantial enterprises within the provincial economy, with budgets totalling more than \$2 billion in 2005-06 and employment rolls that top 18,800 people.

The Ministry of Advanced Education also reports that these schools house 69,300 provincially funded student positions.

The University of British Columbia -- the province's largest comprehensive school, complete with medical school and top-flight research institutes such as the Michael Smith Foundation for Health Research -- has almost 35,000 undergraduate students and a budget of more than \$1 billion.

IMAGES



Peter Battilioni, Vancouver Sun
 Mario Pinto, vice-president of research, says in his lab at SFU, "Skills are much more fundamental if you look at their contribution to the knowledge economy ... The way I view it, [it is] the training of personnel that is the currency [of universities]."



Ward Perrin, Vancouver Sun
 Ramakrishna Bhat works with a concentration solution in Mario Pinto's research lab at Simon Fraser University, an institution with a \$306.2-million budget and more than 26,500 students.

Simon Fraser University, with 23,480 undergraduates and a budget of \$306 million, is the second largest comprehensive school, followed by the University of Victoria, which has 15,920 undergraduate students and a budget of \$240 million.

Other institutions have unique mandates, such as Victoria-based Royal Roads University, which focuses on mid-career professional training. It has more graduate students, numbering just over 2,000, than undergraduates.

The University of Northern British Columbia in Prince George had just 3,570 undergraduates at the end of its 2005 school year, however the school sees its mandate to deliver education to the whole of northern B.C.

Thompson Rivers University in Kamloops, formerly University College of the Cariboo, was recently designated as B.C.'s sixth full-fledged university, which delivers courses over a large area that stretches as far north as Williams Lake.

The Ministry of Advanced Education also gave Thompson Rivers University responsibility for administering the distance education courses of the former B.C. Open University.

"We've got a very strong foundation to build on," says Don Avison, president of the University Presidents' Council of B.C., a lobby group formed to represent the interests of B.C.'s key universities.

"The province has a very strong university system, though I would argue that for quite some time it was smaller in size than it needed to be to continue developing people at levels that will be required in the knowledge-based environment we expect the 21st century to be."

The B.C. Progress Board, set up to advise the provincial government on public policy issues, produced a report in 2002 that found post-secondary institutions' lack of growth was beginning to strain the education system, with more eligible students knocking on their doors for increasingly scarce seats.

UBC president Martha Piper, who chaired the Progress Board committee that looked at B.C.'s education system, says the provincial government responded to its warning with a plan to add 25,000 new spaces, half to universities, by 2010.

Initiatives have included establishing a new regional campus of SFU at Surrey's Central City, and turning the University College of the Cariboo into a satellite school of UBC, emulating California's state university system.

"If we look out [toward 2010] as those seats are created, we believe [they] will go a long way toward addressing accessibility," Piper says.

RESEARCH

The ideas that come out of B.C.'s universities are also fuel for the knowledge economy. The schools are supported heavily in this regard by government, with programs such as the Canada Research Chairs initiative, Social Sciences and Humanities Research Council, Natural Sciences and Engineering Research Council, and B.C.'s Leading Edge endowment fund.

The provincial Ministry of Advanced Education keeps tabs on the amount of research funds B.C. institutions receive. In 2002-03, they got \$472 million -- \$229.3 million from federal sources, \$84.3 million from the province and \$158 million from private industry.

Innovation, Piper adds, is simply "people with novel ideas." And in that respect, B.C.'s four major research universities, UBC SFU, UVic and UNBC, "punch above our weight" when it comes to generating new knowledge.

Piper would rank UBC and SFU within the top 10 of all universities in North America when it comes to turning research into commercialized technology.

UBC research helped spawn companies such as anti-blindness drug maker QLT Inc., and Angiotech Pharmaceuticals Inc., the creator of drug coatings for artery-opening heart stents.

SFU vice-president Pinto adds that researchers at his institution have been responsible for launching technologies such as the television violence-screening device known as the V-chip, as well as companies such as VSM MedTech Ltd., creator of the brain-scanning magnetoencephalograph.

"If you look at the number of spin-off companies formed and technologies transferred [to commercial use] from university research, it's quite impressive," Piper says.

However, she adds that for all that B.C. universities do contribute, society as a whole could help them do more.

Statistics Canada found that in 2004, Canada spent almost \$25 billion on research and development, or 1.9 per cent of the country's gross domestic product.

Piper says that is an improvement over previous years, but is still a far cry from the amount other nations put into developing the capacity of their economies to be innovative. She notes that Singapore aims to spend three per cent of its GDP on research and development.

Other nations outspend Canada on basic research and development, figures compiled by the Organization for Economic Co-operation and Development show. Tiny Iceland, in 2002, spent 3.04 per cent on its country's research and development. In the same year, the United States poured 2.82 per cent of its enormous economic output on research; and Sweden has been in the range of 4.25 per cent in recent years.

Piper adds that while federal and provincial governments have ramped up their research spending, her biggest fear is that "over the next decade, governments will back off, [thinking that] the research agenda is finished . . . and we're far from finished."

Pinto says B.C. is at a disadvantage in attracting the brightest graduate students, the passionate young researchers who will drive the high-level innovation of the future. He says B.C. has not provided basic per-student grants to graduate student spaces at universities since 1991. Ontario and Alberta, however, do provide such funding to graduate-level studies, and have increased those amounts in their recent provincial budgets.

"B.C. does extremely well," Pinto says. "That's because of some of the policies brought in [during the 1980s] by Pat McGeer, who was minister of science and technology.

"But we could slip very easily. What it really comes down to is having the correct talent. That's the currency."

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B.C.'S UNIVERSITY SECTOR AT A GLANCE:

6 universities

69,308 students

\$2.15 billion in total budgets for 2005-06

\$472 million in federal and provincial research grants received in 2002-03

Source: B.C. Ministry of Advanced Education, Vancouver Sun

UNIVERSITY OF BRITISH COLUMBIA

Budget 2004: \$1.13 billion

Total staff: 11,225

Faculty: 4,019

Student population 2004-05: 34,454 undergraduate;

7,878 graduate

Canada research chairs: 119

Key research institutes: 72, including:

- Liu Institute for the Study of Global Issues
- Tri-University Meson Facility (TRIUMF)
- Michael Smith Laboratories

Research grants 2003-04: \$349.6 million

SIMON FRASER UNIVERSITY

Budget 2005-2006: \$306.2 million

Total staff: 1,091

Faculty: 759

Student population 1004-05: 23,480 undergraduate; 3,190 graduate

Canada Research Chairs: 31

Other key research chairs: 4

Key research institutes: 53, including:

- Criminology Research Centre
- Behavioural Ecology Research Group
- Mathematics of Information Technology and Complex Systems (**MITACS**)

Research grants (annually): \$50 million

UNIVERSITY OF VICTORIA

Budget 2005-06: \$240 million

Total staff: 3,927 employees

Faculty: 2,001

Student population 2004-05: 15,920 undergraduate; 2,400 graduate

Canada Research Chairs: 30

Other key research chairs: 6

Key research institutes: 18, including:

- Centre for Addictions Research BC
- Centre for Earth and Ocean Research
- Institute for Integrated Energy Systems

Research grants 2003-04: \$59.1 million

Big innovation: UVic is the lead Canadian university developing the \$300-million Neptune project, an underwater observatory network across the ocean floor from Oregon to Vancouver Island.

UNIVERSITY OF NORTHERN BRITISH COLUMBIA

Budget for 2005-06: \$52.4 million

Total staff: 628

Faculty: 308

Student population 2004-05: 3,570 undergraduate; 410 graduate

Canada Research Chairs: 8

Other key research chairs: 4

Key research institutes: 9 including:

- B.C. Rural and Remote Health Research Institute
- Natural Resources and Environmental Studies Institute
- Centre for Environmental Disturbance Assessment Research

Research grants 2004-05: \$10 million

THOMPSON RIVERS UNIVERSITY

Budget 2005-06: \$88.2 million

Total staff: 1,566

Faculty: 623

Student population 2004-05: Academic 5,801; career, vocational and other 8,320

Canada research chairs: 3, with options for 2 more

Other key research chairs: 4 (proposals submitted for 2)

Key research institutes: 9 including:

- Centre for the Study of Canada
- Centre for Early Education and Development Studies
- Centre for Ecosystem and Community Ecology

Illustration:

- Photo: Peter Battistoni, Vancouver Sun / Mario Pinto, vice-president of research, says in his lab at SFU, 'Skills are much more fundamental if you look at their contribution to the knowledge economy ... The way I view it, [it is] the training of personnel that is the currency [of universities].'
- Photo: Ward Perrin, Vancouver Sun / Ramakrishna Bhat works with a concentration solution in Mario Pinto's research lab at Simon Fraser University, an institution with a \$306.2-million budget and more than 26,500 students.
- Colour Photo: (University of British Columbia.)
- Colour Photo: (Simon Fraser University.)
- Colour Photo: Brian Sprout, Special to the Vancouver Sun / Students work in the paleontology lab at the UBC Okanagan campus. It's estimated that the new institutions have an economic impact worth in excess of \$468 million.
- Colour Photo: (University of Northern British Columbia.)

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