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COLLEGES: RESEARCH

Light-up purses and smart lamps evolve from research projects

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The next time you sip fruit-infused water while jogging past a "smart" street lamp and wearing workout gear incorporating "intelligent" textiles, you can thank Canada's community colleges, institutes and polytechnics.

Through partnerships with companies and community organizations, faculty and student researchers at these postsecondary schools play an important role in helping get products and inventions to market while contributing to the country's economic growth.



The recently released 2015 Research Infosource Inc. report on Canada's Top 50 Research Colleges shows they earned a total of \$158-million in research income in fiscal 2014 alone - with some of the highest-ranking schools having a hand in the innovations mentioned above.

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George Brown College in Toronto heads the top 50 research income list, pulling in nearly \$14.23-million last year, more than double its fiscal 2013 total of about \$9.27-million when it was ranked third, according to Research Infosource, a Toronto-based company that tracks research and development data in various sectors.

Rounding up the top 10 schools for 2014 (followed by 2013 totals) are:

- 2. Cégep de Saint-Hyacinthe, Quebec, with nearly \$9.37-million in research income, up from about \$8.94-million.
3. SAIT Polytechnic, Alberta, at just over \$7.20-

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million, up from about \$6.6-million.

4. Cégep de la Gaspésie et des Îles, Quebec, at \$7.09-million, compared to just over \$6.66-million.

5. British Columbia Institute of Technology, at \$7.04-million, from \$15.24-million.

6. Cégep Édouard-Montpetit, Quebec, at nearly \$6.21-million, up from just over \$5.44-million.

7. Cégep de La Pocatière, Quebec, at just over \$5.62-million, from just over \$1.51-million.

8. Red River College, Manitoba, at just over \$5.58-million, from about \$5.82-million.

9. Sheridan College, Ontario, at nearly \$5.5-million, from \$4.27-million.

10. Niagara College, Ontario, at \$5.34-million, from nearly \$4.04-million.

Ron Freedman, chief executive officer of Research Infosource, which has been tracking college data for three years, notes the total 2014 research income earned by the top 50 schools is a 4.7-per-cent increase from the 2013 record total.

"It's a good news-bad news story," Mr. Freedman said in an interview, pointing out that 2014's increase declined sharply from the nearly 39-per-cent growth spurt in 2013 over 2012.

Mr. Freedman couldn't give a precise explanation for the slowed income growth reported for 2014, noting it is more important to look at longer-term trends.

"The trajectory of college research income has been growing very strongly in the last three years or so because of new funding programs put in place by the provincial and federal governments, and the colleges have been quick to take advantage of those programs," Mr. Freedman says.

George Brown, for one, has been "successful in applying for and receiving a number of large grants to structure the work we do," says Robert Luke, vice-president of research and innovation. While helping bring ideas and innovations to fruition, college students are key contributors to Canada's economic future, and many land jobs with the companies they do their research work for, he adds.

The Research Infosource report also shows that year over year:

Income grew in 2014 at 31 of the top 50 colleges;

The number of faculty engaged in research rose by 14.3 per cent;

The number of active research partnerships that colleges engaged in increased by 15.6 per cent.

Following are details about some of the novel products and technologies that the top three research-income schools have worked on with business partners (some companies also work with other postsecondary institutions not mentioned here):

### 1. George Brown College

scientists



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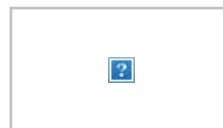
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Its flagship facilities include the Food Innovation and Research Studio, or FIRSt, the Green Building Centre for the development of sustainable building products, and the Advanced Product Development Laboratory, or APD:

- **Infused water:** Inspired by a European tradition to preserve fruit throughout the winter through multistage filtered water, Toronto-based Zpirit's beverage is low in sugar and calories. College researchers helped the company develop the initial product, optimizing its processes and streamlining manufacturing, and later worked on an extension of the line.

- **Smart street lamps:** Clear Blue Technologies of Toronto has combined clean energy with cloud software technology to wirelessly deliver off-grid power to street lights, traffic cameras, mobile signage and other devices. George Brown researchers worked on the prototype for the solar and wind hybrid controller, a beta version of its off-grid controller technology, and in the early days provided Clear Blue with space on campus. Since the launch of its product last year, Clear Blue has grown to 13 full-time employees, including two George Brown graduates, and has customers in Canada, the United States, Germany, United Arab Emirates and Australia.

- **Apartment/condo door air filter:** George Brown researchers helped with prototype refinement, fabrication and market research for Door Filter (the brainchild of Ontario businessman Andrew Borden), a lightweight, retrofit filter system for apartments and condos that attaches to the bottom of the door, and helps prevent pests, dust and other allergens, as well as noise and light, from entering the unit.

## 2. Cégep de Saint-Hyacinthe

Noted for its partnership with the non-profit CTT Group, a technology transfer centre that specializes in the research, development and testing of technical textiles, advanced textile-based materials and geosynthetics:

- **Intelligent textiles** (mainly used for heating, monitoring or as sensors, with elements such as electronic or chemical components, LEDs, chips and thermistors, or temperature sensitive resistors, embedded right into fabric): Student researchers have worked on intelligent textiles with applications in the military, and industries including sports and leisure (sensors in fitness clothing that are close to the skin to measure heart rate, as well as heated insoles) and fashion (handbags with integrated lighting technology so you can easily find what you're looking for inside).

- **3-D textile technology:** CTT Group's 3-D Preform Development & Design Unit develops new technologies to improve the production of preforms (preliminary moulds) for the manufacturing of composite materials – using technological platforms such as 3-D weaving looms (special looms that create thicker fabrics so there is no need for layering materials) and industrial robots. Saint-Hyacinthe researchers, in conjunction with CTT Group, have worked with airplane partners, including Bombardier and Bell Helicopter, to help develop and manufacture preforms for airplane components.

## 3. SAIT Polytechnic

Its Applied Research and Innovation Services, or ARIS, was created more than a decade ago and is home to four research areas: Environmental technologies, sports and wellness engineering technologies, the RFID Application Development Lab and the Green Building Technology Access Centre:

- **Electronic livestock identification tags** ("cow earrings"): Researchers with the RFID lab designed, developed and tested ultra-high frequency (UHF) cow ear radio-frequency identification tags (with funding provided by the Alberta Livestock and Meat Agency). Hundreds of tags can be read in seconds, eliminating the need to put cattle in a squeeze chute, allowing

ranchers to keep track of their animals and food producers to trace the origin of beef sources. In another tag project, GEM Services worked with SAIT researchers to develop a patent-pending UHF-RFID mat tag for use in the oil-and-gas, transmission-line and pipeline industries – to locate pickup-truck-sized matting products used to create temporary access roads and work platforms that are buried under mud.

- **High-performance sleds** for sliding sports (bobsleigh, skeleton and luge): Own the Podium's Top Secret project funded the development of made-in-Canada skeleton sleds, after years of using second-hand sleds and models available to other countries. Over five years, ARIS researchers developed a number of prototypes that led to the high-performance sleds custom-designed for use by skeleton athletes John Fairbairn and Eric Neilson at the 2014 Sochi Olympics. SAIT's current relationship with the non-profit Winter Sport Institute (WinSport) includes working on design and fabrication enhancements of its fleet of wheel-based summer bobsleighs.

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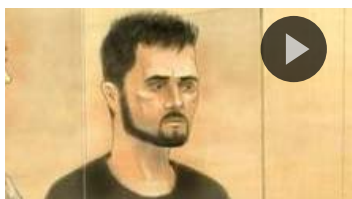
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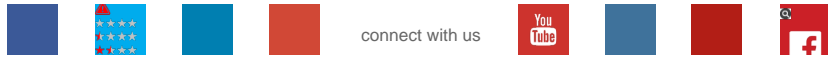


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