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OFFICE OF
**RESEARCH SERVICES, INNOVATION
AND ENTREPRENEURSHIP**

2015-2016 ANNUAL REPORT
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RESEARCH PEOPLE

OFFICE OF RESEARCH SERVICES, INNOVATION AND ENTREPRENEURSHIP (ORSIE) TEAM



- Debbie McKee Demczyk, dean
- Megan Parker, finance and ethics compliance co-ordinator
- Rashmi Gupta, manager, Institutional Research and Planning
- Kyle Paul, research and planning analyst, Institutional Research and Planning
- Samantha Sinclair, research and planning analyst, Institutional Research and Planning
- Joshua Gerrow, junior research analyst, Institutional Research and Planning
- Michelle Cole, manager, Program Development and Quality Assurance
- Shelley Irving, project co-ordinator
- Chris Gillis, manager, Applied Research Business Development
- Dr. Vibha Tyagi, manager, Applied Research Partnerships
- Rebecca Holmes, entrepreneurship co-ordinator
- Jane Hilton, project manager, Grants and Special Projects

RESEARCH CO-ORDINATORS

- Lori Roblin – School of Health & Community Services
- Kelly Ottenbrite – School of Business, IT & Management
- Linda Cheng – School of Media Art & Design
- Greg Moran – School of Skilled Trades, Apprenticeship & Renewable Technology
- Pravin Patel – School of Science & Engineering Technology
- Kevin Griffin – School of Justice & Emergency Services
- Dave Smith – School of Interdisciplinary Studies

RESEARCH ADVISORY COMMITTEE

Debbie McKee Demczyk dean, Office of Research Services, Innovation and Entrepreneurship (ORSIE)

Kevin Baker principal, Whitby campus, School of Skilled Trades, Apprenticeships & Renewable Technology, and Centre for Food

Linda Cheng professor, School of Media, Art & Design

Anna De Grauwe career coach, Career Development

Chris Gillis manager, Applied Research Business Development, ORSIE

Kevin Griffin professor, School of Justice & Emergency Services

Jane Hilton project manager, Grants & Special Projects, ORSIE

Dr. Judeline Innocent executive dean, School of Health & Community Services

Dr. Matthew Jelavic professor, School of Science & Engineering Technology

Barbara MacCheyne chief financial officer, Financial Operations

Greg Moran professor, School of School of Skilled Trades, Apprenticeships & Renewable Technology

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Susan Smikle manager, Insurance & Risk Management

Judith Spring executive dean, School of Business, IT & Management

Susan Todd executive dean, School of Science & Engineering Technology

Dr. Vibha Tyagi manager, Applied Research Partnerships, ORSIE

RESEARCHER PROFILE

GET TO KNOW THE WINNER OF DC'S FACULTY RESEARCH AWARD.



ANDREW MAYNE

Andrew Mayne is a professor in the School of Business, IT & Management at Durham College (DC). Whether engaged in learning or research environments, his passion for technology and collaborative problem-solving motivates students to develop research skills and creative solutions.

With a love for research, Mayne's primary interests include high-performance computing, data science and cognitive computing along with many secondary curiosities. From these areas, he draws examples, energy and enthusiasm to inspire students' imaginations about where their learning can take them. As our society and technological needs continue to evolve, Mayne helps students to develop skills which will allow them to meet and grow with the needs of their communities. With support from DC, his passion for giving back to the community inspires him to help students identify and fulfill clients' needs.

As a full-time faculty member, Mayne takes a high-level problem-solving approach to teaching, driving students to develop creative solutions while staying focused on the client. He is excited to become more actively involved in applied and academic research while teaching mainframe technologies. When asked about future work, Mayne emphasizes that knowledge mobilization will be key to determining how communities can develop more self-sufficient and sustainable solutions.

More simply stated, he likes to put these advanced "toys" into the hands of those who have problems to solve.

As a researcher at DC, Mayne guides students while they navigate the complexities of creating prototypes, proofs of concept and functioning products. Students see what is needed, research, find solutions, and then build potential solutions. Once students are presented with the challenge, they can do almost anything the client needs.

IT'S INCREDIBLE TO WATCH STUDENTS DEVELOP KNOWLEDGE AND EXPERIENCE IN AREAS THAT ARE DIFFICULT TO ADDRESS IN THE CLASSROOM — FROM THE LATEST, GREATEST TECHNOLOGIES DOWN TO CLIENT RELATIONS.

Mayne is currently completing his Masters of Applied Modelling and Quantitative Methods at Trent University, where he is writing a thesis on the use of divide-and-conquer strategies in learned classification models. Mayne enjoys working at DC because of all the research opportunities available to him as well as being able to connect with the community and small businesses that operate within Durham Region.

APPLIED RESEARCH

ORSIE responds to the needs of business, industry and community for practical solutions by matching those needs to faculty expertise, resulting in successful applied research and innovation activities, while at the same time providing students with real-world experiences.

WHITBY FALL RESEARCH SHOWCASE

On November 23, 2015, ORSIE hosted its first Research Showcase at DC's Whitby campus to highlight research projects in the areas of agriculture, craft brewing and energy technology.

Over the course of the event, Dr. Ross Stevenson, a professor with the college's School of Science & Engineering Technology (SET), highlighted one of ORSIE's agricultural research projects exploring varieties of okra that can potentially be grown locally. Greg Moran, a professor with the School of Skilled Trades, Apprenticeships & Renewable Technology (START), and Shane Jones, a professor also with SET, discussed their cold-frame technology research designed to extend the growing season for produce. SET professor Dr. Riaz Shah spoke about the pest management research that he is planning with local apple growers and also discussed the research equipment he is using, including a reach-in growth chamber and Potter spray tower.

Professors Lauren Fuentes and Phil Jarvis, also with SET, shared details about their Smart House project at the Whitby campus, while SET professor Dr. Ali Taileb announced a new energy technology project with an industry partner.

With the new research brew line infrastructure in place at the Whitby campus, Chris Gillis, manager, Applied Research Business Development, ORSIE, presented on its capabilities to support craft brewers.

ANNUAL ORSIE RESEARCH DAY

On April 30, 2015, ORSIE hosted its fifth annual Research Day to highlight the college's achievements in applied research and innovation. The day focused on areas of significance to the local and provincial economies and highlighted the agriculture, health care, gaming and wearable technology sectors. Courtney Cole, founder and CEO of ForAHealthyMe Inc. delivered the keynote address in which he discussed the convergence of economics, aging, demographics and the role of technology in the delivery of health care. Diverse breakout sessions were held throughout the morning and research posters were on display. The event also featured a tour of the rapid prototyper located in the Integrated Manufacturing Centre at DC's Oshawa campus.

DC president Don Lovisa remarked, "The work ORSIE has undertaken to drive the research agenda forward in the pursuit of research excellence is something to be shared and celebrated. Research Day gives us an opportunity to do just that."



FACULTY RESEARCH AWARDS



Andrew Mayne, professor,
School of Business IT & Management.



Lauren Fuentes, professor,
School of Science Engineering & Technology.



Kay Corbier, professor,
School of Health & Community Services.

STUDENT RESEARCH AWARDS



Draven Majoor, third-year student,
Electronics Engineering Technology.



Steven Murray, third-year student, Computer
Programmer Analyst, and Kenneth Gardner, third-
year student, Electronics Engineering Technology.



Alfred Massardo, second-year student,
Computer Programmer Analyst.

CANADA'S TOP 50 RESEARCH COLLEGES

For the third consecutive year, DC was ranked among Canada's top 50 research colleges by Research Infosource Inc., a Canadian research and development intelligence company. ORSIE supports applied research that provides students with opportunities to develop their skills and interests, and allows faculty to build their research portfolios. ORSIE also delivers viable solutions to small and medium-sized enterprises and organizations within the community to meet their needs and strengthen their positions in the marketplace. Earlier in the year, industry and student satisfaction surveys were conducted yielding positive results, which affirmed ORSIE's positive impact on organizational outcomes and student learning.

APPLIED RESEARCH — BY THE NUMBERS

RESEARCH PROJECTS

19

2015

23

2016

RESEARCH FACULTY

21

2015

23

2016

STUDENTS

33

2015

53

2016

When comparing 2015 to 2016, DC saw a:

- 21 per cent increase in the number of research projects.
- 10 per cent increase in the number of faculty leading research.
- 61 per cent increase in the number of students participating in research.

Total funding approved for 2016 was \$440,000.

APPLIED RESEARCH PROJECTS

ADVANCING AGRICULTURE, AGRI-BUSINESS AND TOURISM

Designing and constructing cold-frame technology

Research team:

Faculty: Greg Moran, Pravin Patel and Louis Bertrand.

Students: Samander Mirzad and Nathan Mueller.

Funding: Internal Research Fund.

Challenge: This project developed from an idea to explore a method that could be used to extend the growing season for fresh vegetables, enabling them to be harvested in the middle of winter. Investigation was required into cold-frame technology to understand the necessary controls and data collection, and to understand how energy moves in a cold-frame environment.

Solution: The team designed and built an operating cold-frame prototype that was able to gather and store the heat generated during the day to prevent the vegetables from freezing at night. The team gained insights into how energy is captured and how heat moves around in a cold-frame environment. This was accomplished through the collection of data from ambient air, soil and subsoil temperatures and subsequently analyzing the data. As a result, a number of design changes were instigated to improve efficiency and better protect the crop. Yield data was collected but was ultimately impacted by water drainage issues.



Assessing varieties of okra

Partner: Vineland Research Station.

Research team:

Faculty: Dr. Ross Stevenson, Greg Moran and Shane Jones.

Funding: Internal Research Fund.

Challenge: Okra is an increasingly popular vegetable that is typically grown in much warmer climates than that of Ontario. Five varieties of okra were donated by Vineland Research Station with the goal of finding a variety that would thrive in the micro climate of Durham Region.

Solution: The okra seeds were germinated in the greenhouse and a crop of okra was planted in the new fields at the Whitby campus to evaluate how this popular vegetable matures locally.



Evaluating the efficacy of pesticides

Research team:

Faculty: Dr. Riaz Shah.

Students: Jessica Tong, Jiu Lin and Kristen Merrett.

Funding: Internal Research Fund.

Challenge: Two-spotted spider mites (*Tetranychus urticae*) cause damage to all major vegetable and fruit crops, as well as many ornamental plants. Natural predators of the spider mite are present in the natural ecosystem or intentionally released to control the pests. Research was needed to determine how effective the Class 11 pesticides were against spider mites and whether the spray impacts the natural predators.

Solution: Spider mites were released on leaf discs either before or after applying the pesticide spray. Directly applied insecticidal soaps and garlic/chilli extract was found to be the most effective way of killing the mites. However, only Malathion and garlic/chilli extract were effective when applied as spray deposits (mites released after spray).



ENABLING TECHNOLOGIES OF THE FUTURE

Investigating a new paradigm in heating

Industry partner: DynaCurrent Technologies Inc.

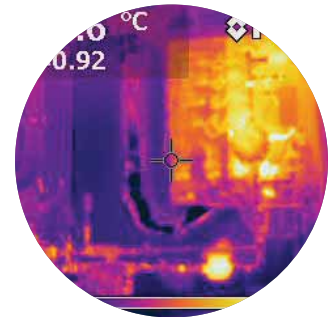
Research team:

Faculty: Dr. Ali Taileb and Atul Tyagi.

Funding: Natural Research Council's Industrial Research Assistance Program.

Challenge: DynaCurrent Technologies developed an innovative way to heat homes more efficiently, and significantly reduce the carbon foot print of the traditional gas furnace, by using multiple sources of electricity. The company required validation in a residential house to demonstrate the performance of the technology needed to gain market acceptance for their innovation.

Solution: The DynaCurrent technology was installed in one of the learning lab houses located at the Whitby campus, and evaluation was run over the heating season to compare the new technology versus natural gas and electric furnace heating. Results demonstrated that the technology was more efficient, virtually eliminated the carbon foot print of traditional home furnaces, and eliminated the hazard of carbon monoxide.



Promoting a lab-tracking system

Industry partner: Lab Improvements.

Research team:

Faculty: Anna Augusto Rodrigues.

Students: Tinamarie Singh, Phil McCabe and Sarah Headley.

Funding: Natural Research Council's Industrial Research Assistance Program.

Challenge: Start-up company Lab Improvements developed a better way to track blood samples used in labs but needed expertise to market this innovation.

Solution: Through an applied learning opportunity, a promotional video was produced by the research team. With the video complete, Lab Improvements founder Alex Bushell was able to launch his product into the U.S. market.



Creating a web portal

Industry partners: William and Robert Biggar.

Research team:

Faculty: Linda Cheng

Students: 17 from DC's Web Development program.

Funding: in-class project.

Challenge: Two entrepreneurs with FastStart, an entrepreneurial training partnership aimed at university and college students, founded a company called Ideal Compass and needed a front-end web portal for their travel agent application.

Solution: The college's Web Development students were briefed on the project requirements and then created a solution. At the end of their project, the submissions were judged by the partners and a winner was selected.

Developing wearable technology

Research team:

Faculty: Rick Tidman.

Students: Matthew Farlymn, Ian Frazao, Yvonne Henderson, Cynthia O Irhuegbae, Rebecca Landry, Austin Martin, Zackary Matzke, Scott Moxley, Taylor Somann and Jill Whittick.

Funding: Internal Research Fund.

Challenge: To build bio-monitoring sensors and electronic circuits into a portable device that a person can wear to measure their vital signs such as heart rate, body temperature and perspiration. Incorporation of vital signs into an app was needed to record the data from the wearable device including alarm settings with the ability to remotely transmit abnormal results.

Solution: The team started by researching wearable technologies, identifying components as well as hardware and software requirements. This was followed by the designing and building of prototypes, which were then tested, and apps created that could record and monitor vital signs.



Integrating tele-health and digital health solutions

Industry partner: ForaHealthyMe Inc.

Research team:

Faculty: Stephen Forbes and Andrew Mayne.

Students: Peter Dwight-Kassabian, Ryan Rozema, William Villeneuve, Lisa Macklem, Daniel Ciancone and Jackson Teather.

Funding: Natural Sciences and Engineering Research Council of Canada.

Challenge: The company needed assistance with integrating telehealth and digital health into a decision-support platform. They also required a tool to empower patients to better manage their chronic conditions at home while allowing the hospital to continue to monitor and provide support.

Solution: The research team designed and developed the architectural framework to implement a video conferencing application into the existing platform. The end result offers a solution to help health care institutions improve quality of care, reduce patient readmissions and enable patients to better manage their conditions where they live.



Unmanned aerial vehicles for precision agriculture

Industry partner: Woodleigh Farms.

Research team:

Faculty: Amit Maraj.

Students: Michael Longauer and Shaun Lloyd.

Funding: Natural Sciences and Engineering Research Council of Canada.

Challenge: The company's unmanned aerial vehicle (UAV), which was used to inspect crops, was challenged to incorporate and process Normalized Difference Vegetative Index (NDVI) images into various farm software programs.

Solution: The research team developed middleware that can process the data from the UAV and integrate high-resolution NDVI images into a variety of databases. This provided the company with a competitive edge in crop scouting and imaging services.



ENHANCING SCHOLARLY TEACHING AND LEARNING

Improving the clinical experience

Research team:

Faculty: Fabiola Longo, DC, and Dr. Jennifer Abbas Dick, University of Ontario Institute of Technology (UOIT).

Funding: Internal Research Fund.

Challenge: While clinical teachers are an integral part of a student's practicum experience in the Nursing - Collaborative Bachelor of Science in Nursing (BSCN) (HONS) program offered jointly by DC and UOIT, there has been little research to determine their needs and the resources that would increase the quality of a student's clinical experience.

Solution: Through a survey format with closed- and open-ended questions, data was analyzed to identify common themes of how clinical instructors define their roles, what resources they utilize, and the challenges they face in performing their roles. Understanding the perspective of the clinical instructors in connection with their experiences will enable the program to continue to develop and enhance resources to support these instructors in their role.



ePortfolios and employers

Research team:

Chris Hinton, director, Centre for Academic and Faculty Enrichment (C.A.F.E.);
Jacqueline Towell, curriculum specialist, C.A.F.E.; Judith Amesbury,
research co-ordinator, C.A.F.E.



Funding: Higher Education Quality Council of Ontario.

Challenge: ePortfolios were previously researched as a tool to facilitate assessment of Essential Employability Skills (EES) and in this fourth phase of the study, the researchers investigated how ePortfolios were useful in the hiring process and the type of skills for which employers are looking.

Solution: A survey was created and disseminated to 5,000 employers with a goal to gather data on their actual experience with ePortfolios and potential use of ePortfolios in the hiring process. Employer expectations around the demonstration of EES within an ePortfolio were also investigated.

CULTIVATING HEALTHY LIVES AND RESILIENT COMMUNITIES

Co-production: a literature review and environmental scan

Community partner: Social Services department, Region of Durham.

Research team:

Faculty: Randy Uyenaka.

Students: Janina-Mae Adduru, Marie Bushie, Alison Mitchell and Chloe Ouellette.



Funding: Ontario Human Capital Research and Innovation Fund.

Challenge: Social innovation is transforming the delivery of public services on all levels. In some parts of the world, co-production is emerging as a new and innovative service delivery approach. Little was known in Ontario as to how service providers and recipients can work together equally and reciprocally to make use of each other's experiences and knowledge in order to co-design and deliver services.

Solution: The research team conducted an extensive literature review and environmental scan of companies currently delivering co-production, and found that when this model is implemented, marginalized and vulnerable citizens have increased confidence and critical thinking skills, which lead to improved mental health and the development of peer support networks.

RESEARCH ETHICS

All research within the auspices of Durham College (DC) that involves human participants must be reviewed and approved by the college's Research Ethics Board (REB) to ensure the research is conducted in a way that is ethically responsible and in accordance with relevant standards and guidelines.

In 2015-2016, the REB reviewed 23 DC research applications, of which 20 were approved and three withdrawn. As in previous years, the majority of applications were focused on research related to education (16). Six were health-related and one was course-based. Slightly over half of the applications (12) originated from DC researchers and 11 applications were submitted by external researchers.

The majority of research undertaken by the researchers was unfunded (14) and the remainder was funded by a number of other organizations, including the Natural Sciences and Engineering Research Council of Canada; Internal Research Fund; Registered Practical Nursing Association of Ontario; Ministry of Advanced Education and Skills Development; and Higher Education Quality Council of Ontario, to name a few.

Over the course of the year, the REB received 25 completion reports, eight requests for renewals, and three research application amendments.

REB MEMBERS

- Kay Corbier (chair), School of Health & Community Services (HCS)
- Jordanne Christie, Centre for Academic and Faculty Enrichment
- Fabiola Longo, HCS
- Alexandra Penn, School of Interdisciplinary Studies (IS)
- Dave Roger, Human Resources
- Virginia Harwood, School of Justice & Emergency Services
- Terri Korkush, community member
- Dr. Lynne Kennette, IS
- Megan Parker, finance and ethics compliance co-ordinator, ORSIE

The REB adopted the Multi-site Research Ethics Review Application Form as the standard document for all those who are conducting research studies at more than one college. The form and process were developed by Ontario's Heads of Applied Research, Research Ethics Subcommittee and adopted by all colleges across Ontario. The multi-site form allows researchers to complete one ethics review form when considering a study at multiple colleges.

The REB continues to work with colleagues at UOIT to streamline the process for ethics review between their respective institutions and to develop a reciprocal agreement for reviewing REB applications.

PROFESSIONAL DEVELOPMENT

Jordanne Christie, educational developer/sessional instructor, Centre for Academic and Faculty

Enrichment, DC and UOIT Faculty of Education, attended the Canadian Association of Research Ethics Boards conference held in May 2015 in Vancouver, B.C. The theme was Big Data, Small World, and sessions included privacy in research, responsible conduct of research and Tri-Council updates.

REB members attended the Heads of Applied Research Research Ethics Subcommittee's sixth annual Professional Development Day held at George Brown College. Sessions included REB accountability, course-based research and an overview of REBs in Ontario.

POLICY

The Ethical Conduct of Research Involving Humans Policy and Procedure were reviewed and approved in May 2016.

ENTREPRENEURSHIP

Over the last decade, the government has promoted research and development at post-secondary institutions. More recently, the focus has expanded to include entrepreneurship as a government priority. Higher education institutions play a significant role in developing and promoting entrepreneurship and Durham College (DC) is no exception.



THE VIBE

FastStart is an entrepreneurial training partnership aimed at college and university students. It is designed to provide young, potential entrepreneurs with opportunities to acquire entrepreneurship knowledge and develop practical skills by offering progressive programs, tools and resources to connect students with industry leaders and mentors to help them succeed. In addition to gaining a better understanding of entrepreneurship, students gain both business and planning skills to convert their ideas into endeavours and launch successful businesses.

The DC campus space dedicated to fostering entrepreneurship activity is named The VIBE, which is an acronym for the service delivery model that stands for Vision, Inspire, Build, and Elevate. FastStart's goal is to first create a Vision of entrepreneurship, and Inspire through participation in events and competitions that build knowledge and help develop entrepreneurial skills. With the development of a solid business idea,

FastStart then assists students to Build their business, and Elevate them through specialized supports and access to funding.

Over the summer period, the FastStart team hired five students, two of whom were entrepreneurs, to work in The VIBE. To kick off the summer, a "meet and greet" was hosted in this specially designed space for DC Summer Accelerator participants and their fellow entrepreneurs. Throughout the summer, students regularly dropped into The VIBE for help testing their ideas and turning them into businesses. In July, a peer-to-peer program was also started with the two student entrepreneur-employees.

The Whitby Public Library also demonstrated the Makerbot 3D printer in The VIBE to acquaint staff and students with the additive manufacturing process of making three-dimensional solid objects from a digital file.

ACCELERATOR PROGRAMS

In winter 2015, FastStart introduced the Why Not Me? workshop series which included five specialized sessions designed to help students hone their entrepreneurial skills. In addition to these workshops, FastStart offered several other seminars and two investor fairs. This was complemented with an intensive, innovative start-up program developed in partnership with the Spark Centre, an organization that works co-operatively with local entrepreneurs and organizations to cultivate and support a strong entrepreneurship culture within Durham Region and Northumberland County, called the DC Summer Accelerator. The goal of the program was to help students and graduates take their innovative ideas or business ventures to market faster while using the professional services of an experienced support team. By the end of the application deadline, 25 applications had been received and 10 successful candidates were offered seats in The Loft at the Spark Centre. In addition to attending numerous workshops and seminars, students were matched with lead advisors and then took part in two pitch competitions. At the end of the summer program, Ideal Compass, owned by Robert and

William Biggar, won a \$1,000 cash prize for achieving the top score in DC's Summer Accelerator program.

Riding on the success of the Summer Accelerator program, a DC Fall Accelerator program was launched and received a total of nine applications with two successful candidates being offered an opportunity to put their entrepreneurial ideas on the fast track to success during their fall academic studies.

After evaluating the previous Accelerator events, a decision was made to offer two streams, a Traditional (in-house at DC) program and a Technology-driven (Spark Centre) program.

Another DC Winter Accelerator program was launched in early 2016 with 25 applications received and after an interview process, all 25 were accepted into the program.

As the recipient of \$5,000 in seed funding from the DC Accelerator program, Jeremy Coulis immersed himself in the start-up world, and in August 2015, officially incorporated his company, Agile Fat Guy Spirits.



EVENTS



With the beginning of the new academic year, September saw the FastStart team attend as many program orientations as possible and set up booths at four orientation events to promote their entrepreneurial programs and services. Other events included:

- Hosting question-and-answer sessions, in conjunction with Spark Centre and the Business Advisory Centre Durham.
- Organizing a Tech Meets Main Street event in conjunction with Centennial College.
- Partnering with UOIT's Brilliant Entrepreneurship non-academic program that resulted in a promotional booth at UOIT's homecoming; a speaking engagement with Bruce Croxon, founder of Lavalife and of CBC's Dragons' Den fame; plus a regular Monday Mashup networking session held at both Shagwells on the Ridge and E.P. Taylor's, pubs located at DC's Oshawa campus.
- Hosting four events, two in partnership with Business Advisory Centre Durham, Spark Centre and Brilliant UOIT, during Global Entrepreneurship Week as part of the regional celebration, Do It in Durham.
- Co-hosting Green FastStart Christmas with the DC Green Team and, in keeping with the sustainability theme, donating the proceeds to the DC-UOIT Campus Holiday Food Drive.
- Launching an inaugural Craft Beer and Entrepreneurship event at the W. Galen Weston Centre for Food, located at DC's Whitby campus.
- On March 2, 2016, as the academic year wrapped up, CBC's popular Dragons' Den television show held auditions on campus for student, employee and community entrepreneurs to pitch their business ideas and concepts. Aspiring entrepreneurs had 15 minutes or less to impress the producers and move on in the process for a chance to secure a financial investment that could help turn their dreams into a reality.
- On March 4, 2016, DC joined the Business Advisory Centre Northumberland, to celebrate the official launch of the E3 Youth Entrepreneurship Program at St. Mary's Catholic Secondary School in Cobourg, Ont.

Overall, during the 2015-2016 reporting period, it was evident that FastStart thrived on campus having hosted a total of 68 events and seminars that drew 1,065 student participants and 109 youth from the broader community. This is in addition to the 39 events and conferences that FastStart attended, creating program awareness to 8,389 youth. As part of DC's business plan commitment, student satisfaction with entrepreneurial learning was surveyed. Overall the results were positive and the feedback is being incorporated by DC to ensure continuous quality improvement.

INSTITUTIONAL RESEARCH AND PLANNING

The Institutional Research and Planning (IRP) team at Durham College (DC) had a productive year. The team accomplished their goals and objectives, often under very tight timelines. Throughout 2015-2016, this team undertook many new requests in addition to the regular work of providing administration and faculty with consistent and accurate data to facilitate planning and decision-making.

PERFORMANCE METRICS

Quantitative performance

- 1,651 Student Feedback Questionnaire reports: 875 faculty members, 34,459 student responses.
- Key Performance Indicators report cards for:
 - 127 programs.
 - 18 service areas.
 - 12 leadership team members.
 - One Continuing Education program.
- 49 environmental scans to support decisions on new program development.
- 12 program information packages and presentations for program review and renewal.
- 23 student affairs reports.
- 38 ad hoc projects.

Qualitative performance

IRP collaborates with a number of stakeholders to provide data that supports planning, reporting or other strategic partnership initiatives. The following reports and presentations are of particular note:

PRESENTATION/REPORT	STAKEHOLDER
DC-UOIT Pathways	DC Board of Governors
First Generation, Aboriginal student data analysis	Ministry of Advanced Education and Skills Development
Unpacking the data – competitive application and enrolment analysis	Strategic Enrolment Management, DC
New program recommendations – analysis to support development of five-year program review and renewal roster	Academic Leadership Team, DC
Development of the Program Health Matrix 2.0 Model	Vice-President, Academic, DC
Assessing impact of high school Math, Physics and Chemistry grades on the success of students in first year of the Chemical Engineering Technology program	School of Science and Engineering Technology, DC
Development of interactive reports to support post-secondary conversion of dual-credit students to Durham College	School-College-Work Initiative, DC
Vietnam skills for employment project – labour market research Barbados leadership development – data and quality assurance	International Education office, DC
Preparatory programs at Durham College: assessing effectiveness	2015 Canadian Institutional Research and Planning Association (CIRPA) Conference

In 2015-2016, IRP finalized the Ontario Council on Articulation and Transfer-funded study, *Credit Where Credit is Due: Understanding the Credit Transfer Experience at Ontario Colleges*. DC led this study involving the collaboration of 22 colleges in Ontario. The results were presented at the 2016 CIRPA conference in Halifax where institutional research professionals came together to learn best practices, exchange information and ideas, and network with colleagues.

The purpose of this research study was to understand why some students do not apply for credit transfer and for those who do, to better understand their credit transfer experiences. The study explored patterns of student mobility, student expectations of credit transfer, prevalent credit transfer practices and procedures, and institutional challenges. The goal of the study was to produce a comprehensive report that identified best practices in order to improve the credit transfer process for students at Ontario colleges.

The research team used data from the Ontario College Application Service and included a survey of the students across the 22 colleges who were eligible for credit transfer prior to enrolling in a post-secondary program in September 2014. Students were invited to complete an anonymous, online survey and were offered the opportunity to participate in a group discussion. Findings from the survey were analyzed and the quantitative data was further enriched with student focus groups conducted onsite at most of the 22 participating colleges. Phone interviews were also conducted with the registrars or designates at each of the participating colleges.

[See further details and the results of the research study.](#)

SURVEYS: DEVELOPMENT, ANALYSIS AND REPORTING

IRP supported the following projects for strategic planning and decision-making through survey development, administration and reporting:

1. **Alumni engagement:** collaborated with the Office of Development and Alumni Affairs to explore alumni's connections to DC and understand their expectations.
2. **Applied research stakeholder assessments:** evaluated applied research and entrepreneurship participant satisfaction in support of a 2015-2016 DC Business Plan commitment.
3. **Board effectiveness:** evaluated and reported on the DC Board of Governors' self-assessment and provided information to support a board action plan.
4. **Degree development:** developed stakeholder surveys and reported results to explore the proposed Honours Bachelor of Health Care Technology Management degree program with relevant employers, current students and graduates of the Biomedical Engineering Technology program.
5. **Student outreach:** worked with DC's Student Academic Learning Services to identify students in Accounting and Mathematics courses who required academic support.

PROGRAM DEVELOPMENT AND QUALITY ASSURANCE

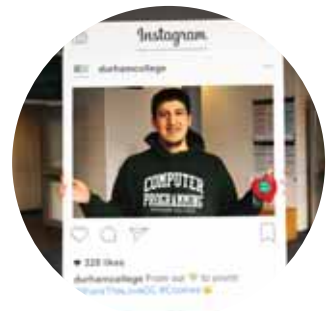
NEW PROGRAM ACHIEVEMENTS

- Developed a five-year roster for new program development.
- Facilitated an external focus group for a Massage Therapy program and a Mechanical Technician – Elevating Devices program.
- New programs approved:
 - Computer Foundations certificate program.
 - Office Administration – Real Estate diploma program.
- Site visit by three Postsecondary Education Quality Assessment Board auditors for the assessment of the proposed Honours Bachelor of Health Care Technology Management degree program.
- Board approved three program suspensions: Journalism - Print and Broadcast, Golf Facilities Operations Management, and Welding Techniques.



QUALITY ASSURANCE MILESTONES

- Submitted the 18-month Program Quality Assurance Process Audit Follow-up report on the 10 recommendations for improvement and action plan which received approval by the Ontario College Quality Assurance Service Management Board.
- Engaged the Academic Leadership Team and prepared a tool to help DC academic schools determine their programs' levels of preparedness for the 2017-2018 College Quality Assurance Audit Process.
- Administration of Key Performance Indicators student satisfaction survey:
 - 21 faculty, 31 student leaders and 22 staff received training to administer the surveys.
 - 259 in-class surveys were delivered in total across the Oshawa and Whitby campuses and the Pickering Learning Site.
- Program review and renewal:
 - Facilitated nine student focus groups with 71 students.
 - Facilitated four external focus groups.
 - Informed the process redesign for the Annual Program Review Task Force.
- Program Change policy and procedure approved and implemented.



FACULTY PUBLICATIONS

Chorney, D., Munro-Gilbert, P., & Coffey, S. (2015). Intraprofessional Education: Experiences of PN & BScN Students Learning Together. ICERI2015 Proceedings, p. 2237.

Munro-Gilbert, P., Chorney, D., & Coffey, S. (2016). Innovating to break down intraprofessional barriers in nursing education. *CARE*, 30(1), 6-7.

Kennette, L. N., & Redd, B. (2015) Instructor presence helps bridge the gap between online and on-campus learning. *College Quarterly*, 18(4). <http://collegequarterly.ca/2015-vol18-num04-fall/index.html>

Larsen, B., Snow, R., **Williams-Bell, M.**, Aisbett, B. (2015) Simulated firefighting task performance and physiology under very hot conditions. *Frontiers in Physiology*, 6, 322.

Williams-Bell, F.M., Kapralos, B., Hogue, A., Murphy, B.M., & Weckman, E.J. (2015) Use of serious games and virtual simulations in the fire service: a review. *Fire Technology*, 51(3), 553 – 584, DOI: 10.1007/s10694-014-0398-1

Taileb, A., & Dekkiche, H. (2015). Infrared imaging as a means of analyzing and improving energy efficiency of building envelopes: The case of a LEED gold building. *Procedia Engineering*, 118, 639–646. doi:10.1016/j.proeng.2015.08.497

Percival, J., DiGiuseppe, M., Goodman, B., LeSage, A., **Longo, F., de la Rocha, A.,** Hinch, R., Sanchez, O., Samis, J. **Rodrigues, A., Raby, P.** (2016). Exploring factors facilitating and hindering college-university program completion. *International Journal of Educational Management*, 30(1), 20-42. <http://dx.doi.org/10.1108/IJEM-04-2014-0051>

Percival, J., Goodman, B., LeSage, A., **Longo, F.,** DiGiuseppe, M., **De La Rocha, A.,** Samis, J, Hinch, R., Sanchez, O. (2015). Exploring Student and Advisor Experiences in a College-University Pathway: A Study of the Bachelor of Commerce Pathway. *Canadian*

Journal of Higher Education, 45(4), P. 400-422. Retrieved from <http://ojs.library.ubc.ca/index.php/cjhe>

Chiriac, V. & Rusu, O. (2015). Overcoming Communication Stereotypes Through Innovative Educational Technology Tools. In Popa, D. M. & Iftimie, N-M (Coordinators), *The Relationship Identity-Otherness And Socio-Cultural Stereotypes*. National symposium, with International Participation, Centrul de Limbi Moderne Aplicative si Comunicare "Linguatek", Colectivul de Limbi Straine, din cadrul Departamentului de Pregatire a Personalului Didactic al Universitatii Tehnice "Gheorghe Asachi", Linguatek Centre for Communication and Applied Modern Languages of "Gheorghe Asachi" Technical University, Iasi, Romania.

Dougherty, K. (2015). Factors that Influence College Faculty to Adopt Digital Technologies in Their Practice. *Higher Education in Transformation Conference*, Dublin, Ireland, 2015, pp.307-318.

Dougherty, K. (2015). Faculty Attitudes and Factors affecting Faculty Attitudes toward Adoption of Digital Technologies. In S. Carliner, C. Fulford & N. Ostashewski (Eds.), *Proceedings of EdMedia: World Conference on Educational Media and Technology 2015* (pp. 1403-1413). Association for the Advancement of Computing in Education (AACE).

Kennette, L. N. & Hanzuk, W. (2014, April). Digesting the information acquired through professional development and/or colleagues: One bite at a time. *Catalyst*, 35(2), 6.

Kennette, L. N. & Hanzuk, W. (2014) Advice for implementing best practices from professional development sessions: One bite at a time. *Transformative Dialogues: Teaching and Learning Journal*, 7(1), 1-3. <http://www.kpu.ca/td/past-issues/7-1>

FACULTY PUBLISHED ABSTRACTS:

Williams-Bell, F.M., Glover, C., Cammisa, B., & Holmes, M.W.R. (2015) Evaluating muscle activity of the lower extremity in minor hockey referees and linesmen during elite level Midget AAA hockey games. *Applied Physiology, Nutrition, Metabolism*, 40, S68.

O'Neill, C., Buren, T., **Williams-Bell, F.M.**, (2015) Holmes, M., & Dogra, S. Metabolic demands and measured heart rate in the modified Canadian Aerobic

Fitness Test. *Applied Physiology, Nutrition, Metabolism*, 40, S49.

Williams-Bell, F.M., (2015) Passmore, S.R., McLellan, T.M., & Murphy, B.A. Is cognitive function impaired while working in a climate chamber at 30°C in firefighters? *Medicine and Science in Sports and Exercise*, 47(5) Supplement 1, S812.

FACULTY PRESENTATIONS:

Corbier, K. The Experience of Simulation and Perception of Preparedness of Developmental Service Worker Students to Practice in Field Placement.

- Presentation: Ministry of Training, Colleges and Universities' Policy Research Symposium, November 2015, Toronto.
- Presentation: Developmental Services Human Resource Strategy Forum, February 2016, Toronto.

Coffey, S., Chorney, D. Munro-Gilbert, P. IntraProfessional Education: Experiences of PN & BScN Students Learning Together.

- Poster presentation: 4th International Conference on Nursing & Healthcare. September 2015, San Francisco.
- Presentation: CAPNE 2015 (Canadian Association of Practical Nurse Educators) October 2015, Toronto.
- Poster presentation: ICERI 2015 November 2015, Seville, Spain.

Kennette, L. N. (2016) Using the Jumpstart Model for lesson planning and delivery. [Poster] Annual National Institute on the Teaching of Psychology, St. Pete Beach, FL, January 2016.

Kennette, L. N., Lin, P. S., & Van Havermaet, L. R. (2015). Student feedback tools. [Roundtable discussion] Annual convention of the Midwestern Psychological Association, Chicago, IL, May 2015.

Kennette, L. N., Redd, B. R., Van Havermaet, L. R., & Lin, P. S. (2014). Active learning: Ideas from the trenches. [Roundtable discussion] Annual convention of the Midwestern Psychological Association, Chicago, IL, May 2014.

Lin, P. S., Van Havermaet, L. R., Redd, B. R., & **Kennette, L. N.**, (2014). Technology in teaching: Integrating media resources with the classroom experience. [Roundtable discussion] Annual convention of the Midwestern Psychological Association, Chicago, IL, May 2014.

Cole, M. Development of Durham College's Program Repository and Database project, Curriculum Developers Affiliate Group (CDAG) Conference, London Ontario, November 2015.

LOOKING AHEAD

ORSIE plays an increasingly important role within the strategic mandate of Durham College (DC) and the broader context of the province's goal to help the current and future workforce adapt to the demands of a technology-driven knowledge economy.

In keeping with The Premier's Highly Skilled Workforce Expert Panel final report, released in June 2016, ORSIE will continue to support experiential learning opportunities through expanded community partnerships and applied research projects. ORSIE has a long history of establishing partnerships, communication and collaboration that are key foundational aspects of local economic development.

Our research capabilities will grow using dedicated research infrastructure to support agricultural research (growth chambers), manufacturing and engineering research (rapid prototyper) and craft beer and beverage research (brew line). We are actively seeking new partnerships with institutions and businesses, connecting them with faculty expertise and student ingenuity. We will expand technical assistance on projects that require innovative solutions, such as producing and testing prototypes, evaluating new technologies and developing new or improved products or processes for start-ups and small and medium-sized enterprises.

Together with faculty we will develop strategies to recognize industry research and innovation in the classroom and expand hands-on research opportunities for students. ORSIE is committed to supporting capstone projects and course-based research with a goal to integrate research into the curriculum where students can apply their classroom learning to real-life projects and scenarios.

DC's Institutional Research and Planning (IRP) team excels as an information and analytical resource for evidence-based decision-making at the institutional and program level to ensure quality, accountability and continuous improvement. Access to timely, reliable and comprehensive labour market information has been identified by many stakeholders as requiring urgent attention, in addition to regularly updated data and refined forecasts to be useful. To that end, ORSIE has partnered with the Durham Workforce Authority and the Social Services department of the Region of Durham on the Local Employment Planning Council pilot that is working towards understanding and strengthening local capacity to plan for future local labour market needs, challenges and solutions.

To thrive in today's economy it is necessary to have resilience, creativity and entrepreneurial skills. FastStart will engage the entrepreneurial spirit of our students and provide support through invaluable connections and advice, as well as access to best practices and experiences that make entrepreneurship so rewarding. It will serve as a catalyst for those just beginning their entrepreneurial experience and support start-ups by delivering value through initiatives like DC's accelerator programs.

As DC celebrates its 50th anniversary in 2017, the college community will take the opportunity to reflect on how far we have come and where we are headed next. It is also a time to celebrate our successes and thank the community for its support of ORSIE.



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