Spring 2013

ResearchFanshawe Magazine Issue 8

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Recommended Citation
Makaran, John; McIntosh, Leslie; Bonnett, Tina; and Douglas, Dan, "ResearchFanshawe Magazine Issue 8" (2013). ResearchFanshawe Magazine. 2.
http://first.fanshawec.ca/researchfanshawemag/2

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Students and the Research Experience

How research and innovation enable learning
Q&A
A few minutes with... Dr. John Makaran
Industrial Research Chair

Newflash
Record number of partners...Connections grant...Research recognized at Fanshawe

SEQUEL
New feature tells the story after the story

Innovation Ahead
Students in research

Through Doors
One student’s journey down career path

MyPath
Opportunity + collaboration = great success

ECL by Prof. Tina Bonnett
Research at core of new ECL degree program

A Valuable Tool
Research a teaching tool in learning to learn

Eyes on Research
Opening eyes to the world

Innovation Opportunity
Innovation means game on

On My Mind by Dan Douglas
Research and student engagement

Next by Leslie McIntosh
College research is all about students, grads

Cover: Industrial Research Chair Dr. John Makaran (right) examines data with student researcher Jonathan Dayus. Dayus is working on development of a small, solar-powered utility vehicle, a research project in which Makaran is a co-investigator.
Q. What is your role as Industrial Research Chair?
A. I see the role of Industrial Research Chair as being the face of the College to local industry. I try to identify opportunities where the College and local industry can work together on projects. I also facilitate industry-college collaborations for the Faculty of Technology. Another part of my job is to document a value stream for incoming projects, a “recipe” for the process that will be followed once a project comes into the College. I also do my own research.

Q. What types of projects are done at CSEE?
A. CSEE conducts research into sustainability and renewable energy. The focus is on incremental innovation and commercialization, rather than revolutionary disruption. It may involve products, processes or services – any sort of work where there is a degree of uncertainty and where there is a value proposition for the company.

Q. And in the Faculty of Technology?
A. We do a number of different types of projects: prescriptive projects, where the outcome is known, for example, building a prototype; and projects where the outcome is known but the way to achieve it isn’t, e.g., benchmarking, testing, designing new ways of manufacturing products, new products, and so on. Then there are projects where the outcome is unknown and there is a high degree of uncertainty. A company may come to us with an idea and a broad, general objective, say, to design “x”, but there is no clear path, and, in the end, the idea may not be feasible at all.

Q. What is the process for working with industry?
A. The company contacts me directly or through the Applied Research and Innovation (ARI) office. I like to meet face-to-face with industry clients so we can discuss their needs. Based on the needs, we assess whether Fanshawe can help with this type of project. Then I identify the school where the required expertise resides and talk with them to determine whether it has the capacity to take on the project.

Q. Why is it important to have an organized process in place?
A. We want our research activities to be deliberate and efficient. We do not want to do things on an ad hoc basis. Projects performed in an ad hoc manner or without a true understanding of the project constraints are doomed at the onset. We want a positive experience for all project stakeholders and participants.

Q. Are there other considerations?
A. The idea of scope is very important in working with industry partners, and I stress, these are partnerships. Project details and timing must be realistic and feasible within the capacity of the College. Also, in cases where external funding is required, ARI may have to find government funding and assist the company with an application, if that company is eligible and the project fits with funding program.

Q. Who actually does the research?
A. Usually a PI is assigned and the research team could include other faculty and staff and students. I provide oversight and liaise with other College areas that might be involved, e.g., facilities, health and safety, purchasing, etc. The partner will be very much involved with the research. We don’t just accept a project, then go away. Students are involved as often as possible.

Q. What is the most important work clients should do upfront?
A. I encourage people to do patent or benchmarking surveys to determine if their proposed product or service already exists in the marketplace. Check the American, Canadian and European patent databases (most are online, free and searchable) to see if it exists. If it doesn’t, go to peer-reviewed journals to see if the concept has been conceived or proven. If you pass through all those gates, it is worth drafting a scope document.

Q. What is the benefit of applied research?
A. Why applied research is done at Fanshawe College is sometimes the most overlooked aspect of this. Students are the most important part of this activity. It’s about training highly qualified personnel in technologies in use in the marketplace. So when, hopefully, students have done the projects with companies, they will be hired by those companies. That has actually happened in several cases to date.

Q. What is the future of applied research at Fanshawe College, in your view?
A. I see the future of applied research at the College as very bright indeed. With small to medium enterprises comprising an ever larger portion of the employment market, I anticipate that the research activities of the College can only increase as we perform a very important role for these industry stakeholders; that is, the solving of existing problems as well as the commercialization of new products and processes.

Dr. John Makaran, PEng, is an electromechanical engineer who spent 16 years in industry before joining Fanshawe College. He has worked on the application of theoretical principles to large electrical systems at 3M and served as a senior electronics designer at Husky Injection Molding. As an electronics engineer at Siemens, Makaran worked on motor and motor drive design, power electronics and EMC. He also has a strong background in project management with both Canadian and international project teams. Prior to the IRC position, he was Chair of the School of Applied Science & Technology.
Congratulations to Principal Investigator (PI) Prof. Martin Volkening and the School of Applied Science & Technology (AST) for obtaining a 2012/13 Connections grant from the Ontario Centres of Excellence (OCE). A total of six projects involving four London-area companies were submitted last fall, and all six were funded. Funding for one energy conservation-related project was provided by the Ontario Power Authority. The award amount is $13,500 and goes toward facilitation of the projects.

Connections is an annual competition that funds short-term, applied research projects with businesses, executed by student teams and led by a PI and a company representative. This year’s projects include:

- sound testing for new and existing products (Centennial Windows and Advanced Converting Technologies Inc.);
- plant waste heat recovery and innovations in poultry product production (Cargill Ltd.),
- pest control (Advanced Converting Technologies Inc.);
- and design/prototype creation of a test stand with Albert’s Generator Services.

Interestingly, the noise measurement equipment to be utilized in these projects was originally funded by the College & Community Innovation Program’s Applied Research Tools & Instruments fund (CCI-ARTI) for the Centre for Sustainable Energy & Environments (CSEE). CCI-ARTI is administered by the Natural Sciences and Engineering Research Council of Canada (NSERC) and helps colleges build capacity to do applied research and meet regional industry needs.

Prof. Margot Sippel, co-recipient of Fanshawe College’s first federal external research grant, has been named a Professor Emeritus. Sippel recently retired after more than 30 years in the School of Human Services.

The distinction was conferred by Fanshawe President Dr. Howard Rundle at last fall’s graduation. Along with co-investigator Prof. Anne Hill, Sippel embarked on a program of research that examined how technology could be used for knowledge-building and for helping learners with disabilities.

That work resulted in the College’s first application to the Canada Foundation for Innovation (CFI), which funded their 1999-2001 investigation into the use of Knowledge Forum™ software for learners with acquired brain injuries. That application also attracted additional federal government funding and contributions from the private sector, community groups and the software creator, the Cognitive Psychology Department of the Ontario Institute for Studies in Education /University of Toronto (OISE/UT).

Sippel and Hill subsequently received a 1999 Telelearning Award from the National Telelearning Centre of Excellence for their innovative use of the Knowledge Forum™ software. As the coordinator of her Faculty’s international interprofessional field placements program since 2008, Sippel has been engaged in research on health promotion among Costa Rican children. She will continue to collaborate on this research with colleagues from her School and from the School of Nursing.

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Fanshawe College will formally recognize research activity through a new President’s Distinguished Achievement Award. Nominees for the Research/Innovation Award can be full or non-full-time employees who have demonstrated leadership, professionalism, engagement of others, creativity and relevance to the College in their research and innovation activities. Other awards recognize excellence in teaching, administrative and support staff achievements, leadership and teamwork. Detailed criteria and nomination forms are available on the Fanshawe College Employee Portal. Deadline for receipt of all nominations is March 31. The president’s awards will be presented in September 2013.

From the outside, it might just look like a big box. But it’s anything but ordinary. Fanshawe College’s new Atonometrics solar simulator (pictured at top behind student researcher Jonathan Dayus) is the first of its kind to be commissioned in Canada and was custom-made for the College by its Texas manufacturer. Unlike other simulators that only emit intermittent light bursts, the new simulator can emit a continuous stream of light (using the large bulbs inside) at various intensity levels and at ambient temperatures. This type of equipment is used by industry to design and test the durability of solar panels over time and under various weather conditions. Funding to purchase the simulator came from the College and Community Innovation’s Applied Research Tools & Instruments (CCI-ARTI) program, administered by the Natural Sciences and Engineering Research Council of Canada (NSERC).

**NEW SIMULATOR ILLUMINATES RESEARCHERS’ UNDERSTANDING**

**RESEARCH/INNOVATION AWARD JOINS PRESIDENT’S LINEUP**

Fanshawe College will formally recognize research activity through a new President’s Distinguished Achievement Award. Nominees for the Research/Innovation Award can be full or non-full-time employees who have demonstrated leadership, professionalism, engagement of others, creativity and relevance to the College in their research and innovation activities. Other awards recognize excellence in teaching, administrative and support staff achievements, leadership and teamwork. Detailed criteria and nomination forms are available on the Fanshawe College Employee Portal. Deadline for receipt of all nominations is March 31. The president’s awards will be presented in September 2013.

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**upcoming events**

**APRIL 3/2013**

Mark your calendars and be sure to attend the 2nd Annual Student Research and Innovation Day (SRID) on Wednesday, April 3.

**MAY 2/2013**

Prepare to see some outstanding poster presentations from Fanshawe researchers May 2 at the 1st Annual Faculty Research Day (FRID).

Watch the employee portal – and the Research Fanshawe website (www.fanshawec.ca/services/research) – for details and updates. Come help celebrate our innovative students and employees!
Ever read a story about a research project and wonder what happened after the article appeared? Our new sequel feature will tell the story after the story. Our first contribution is from Prof. Carmen Hall, School of Human Services.

In 2011, Fanshawe’s Research Innovation Fund (RIF) awarded a grant to faculty members Carmen Hall, MC, CCC, Coordinator of the Autism and Behavioural Science Graduate Certificate, and Dr. Kimberly Maich, PhD, OCT, both of the School of Human Services. The grant was for a research project to evaluate Stay, Play, & Talk, a peer-mediated approach to teaching social skills to children with social challenges, including Autism Spectrum Disorders.

Since then, the researchers and their Fanshawe student assistants have worked with the Thames Valley Children’s Centre and the community organization All Kids Belong on the project. An Autism Speaks Family Community Grant was sought and secured to expand the program and provide training and resources to 15 London area child care centres who applied to implement it at their facilities. Training took place in October 2012 and the full-day session was well-received. Currently, the centres are working to start their programs, which are expected to help enhance the social skills of children with disabilities and teach others (peers) to accept and understand differences.

The second phase of data collection for Stay, Play, & Talk also was conducted October in collaboration with Kimberly, now an assistant professor in the Department of Teacher Education, Brock University. The study evaluated data on the social skills developed by the children from the point of view of parents and educators. The team thanks Fanshawe’s Applied Research and Innovation department for supporting the development of new research that has positively impacted the students of Fanshawe College and the community of London, ON, while promoting continued research in this field.

An Invitation to Participate
1ST ANNUAL FACULTY RESEARCH & INNOVATION DAY
Thursday, May 2, 2013
9:30 AM - 2 PM
J BUILDING, LONDON CAMPUS

Fanshawe College Faculty Research & Innovation Day (FRID). This is a great opportunity to share your work with colleagues and the college community at this inaugural event. Posters from all disciplines are welcome.

To reserve a spot at FRID, send an email indicating your intention to participate to research@fanshawec.ca No later than Friday, April 5th, 2013

For more information, contact applied research and innovation (Leslie McIntosh or Lynne Blunt) at research@fanshawec.ca

FRID & Faculty Research Innovation Day
If there’s one word that dominates Canadian media at the start of the 21st Century, it’s “innovation”.

It seems to be everywhere – from the state room to the boardroom to the classroom – and teetering on the edge of becoming the newest cliché. But what is innovation and what does it mean for Ontario college students?

The Oxford English Dictionary defines “innovation” as “making changes in something established, especially by introducing new methods, ideas, or products, introducing something new”. The Social Sciences and Humanities Research Council of Canada (SSHRC) defines innovation as “a new or better way of adding value” that “includes improved processes, policies, standards and models” which can be applied to solve pressing social, political and economic issues. Governments recognize innovation as a great economic and social driver contributing to national prosperity and enhancing the overall well-being of society.

Colleges can contribute to this agenda through "extensive partnerships with business, industry and community organizations [which] position them [colleges] as key players to facilitate research partnerships and knowledge-sharing across all sectors and move Canada’s innovation forward,” according to the Association of Canadian Community Colleges (ACCC).

Today’s employers are seeking graduates with entrepreneurial and innovation skills, says The Conference Board of Canada. The Board’s Innovation Skills Profile isolates “the unique contribution that an individual’s skills, attitudes and behaviours make to an organization’s innovation performance” and notes that “collectively the skills of individuals create an organization’s capacity to innovate.”

As organizations that prepare people for the workforce, Ontario colleges have turned their attention to producing graduates who can explore, invent and innovate, a move that has been largely responsible for a surge in applied research activities across the system. Problem-solving, critical thinking, flexibility, teamwork, communications, the ability to apply concepts to new situations and see old things in new ways, are becoming the most-prized soft skills for today’s postsecondary graduate. One of the ways in which these skills are transferred to students is through participation in applied research and innovation. At Fanshawe, there is a concerted effort to include a research component in virtually every academic program. Studies conducted in the United States among college and university undergraduates (there are few studies in Canada so far) consistently have shown higher academic achievement, greater student confidence, motivation and retention and enhanced interpersonal and work skills among students who have taken part in applied research projects, regardless of the discipline examined.

Prof. Martin Volkening, a principal investigator in Fanshawe’s Centre for Sustainable Energy & Environments (CSEE), said getting students involved in relevant real-life projects with business, industry and community partners teaches students discipline and provides great learning experiences that can give college graduates an edge in today’s competitive job market. Placing students in a learning environment where outcomes aren’t necessarily known or predictable forces them to work “outside their comfort zones” and challenges them, all the while allowing them to make and learn from their mistakes. Dr. John Makaran, Industrial Research Chair and manager of CSEE, says “it’s all about the student experience. We are increasing the chances of students getting work and providing companies with the skilled people they need.”

This issue of research fanshawe magazine focuses on student participation in applied research and innovation and explores just what that experience meant to them.
Joel Foster’s experience in applied research at Fanshawe helped clarify career goals and got him onto a road that includes study in Ireland, an advanced degree and a promising future.

Foster, an architectural student in the School of Building Technology was hired for a co-op position in Fanshawe’s Centre for Sustainable Energy & Environments (CSEE).

Working under two of his professors, Steven Ries and Tom Davis, who were doing research projects on solar shading and transfer of energy within structures from multiple, renewal sources (called UHEAT), Foster suspected he had at last found his niche.

“I’ve always been interested in sustainability. That’s what I am going to continue with in my career,” Foster says.

During his eight-month co-op term, he worked with Ries’ team on software technology, data collection and analysis in the College’s new simulation laboratory. He was involved in the design, costing and building of test sheds at the UHEAT research site on Cuddy Court.

Student researchers were given areas of inquiry to pursue and general directions for their research but left largely to “figure stuff out” themselves.

The work was at times a challenge, says Foster. “It was an eye-opener to what the real world would be like. You weren’t spoon fed. We had to figure out what the next step was, rather than being on a string-line.

“It [the research] was exactly what I thought it would be. But I didn’t think it would get as in-depth as it did with some of the research we got into. When you see research on TV, you don’t realize how many steps there are that you have to go through. It was great thing.”

A highlight of his research experience was participating in a presentation about CSEE to the City of London’s Mayor’s Sustainable Energy Council. He also attributes having research experience to his subsequent success at getting a job with a local architectural firm within weeks of his June 2012 graduation, where he achieved his LEED designation.

In fall 2013, Foster will be packing his bags for Cork, Ireland, where he has enrolled at the Cork Institute of Technology to complete the fourth year of a Bachelor of Science (BSc Hons) in Architectural Technology.

(The College recently signed an agreement with Cork and another Irish institute of technology that recognizes Fanshawe’s three-year advanced diploma program in Architectural Technology as fully equivalent to their three-year bachelor degree programs.)

Foster will be completing the honours bachelor’s program, then enrolling in a master’s program.

Says Foster: “Involvement in research really helped me out and guided me into what I am now doing for a career. I want to get a master’s degree in building sciences, become a consultant and work on sustainability, especially the renovation and reuse of existing buildings.

“I’m going to use the education from Ireland combined with the learning I got here at Fanshawe. I wouldn’t say it [the research] opened a lot of doors, but it forced me through a lot of doors, if you know what I mean.”
RESEARCH INVOLVEMENT “A GREAT EXPERIENCE”

Teamwork and the chance to collaborate with knowledgeable faculty are the two things Marjie Hiebert will take away from her experience with applied research at Fanshawe College.

Hiebert was a second-year architectural technology student in 2011 when she heard about Fanshawe’s Centre for Sustainable Energy & Environment (CSEE) and spoke with Joel Foster, a member of the student research team. Listening to Foster describe his work on a two projects—one aimed at using various renewable energy sources to heat and cool buildings (UHEAT) and another on solar shading and windows—she jumped at the opportunity to become involved and joined the team that September. A new building simulation laboratory had just been established in T Building, using funding from the College’s Community & College Innovation (CCI) research grant.

“A lot of the technology we’d be able to use interested me, especially the new software programs. Using Revit Architecture 2011 and Ecotect Analysis [two of the programs], you can actually analyze whatever building structure you want using climatic data. You can test a structure in different climate conditions, and all different building materials can put under different test situations,” she says.

The team received some training on the new software but also had to explore it themselves on a trial-and-error basis. Using the programs, Hiebert helped conduct a series of energy analysis simulations. The UHEAT project, a project that examines the use, integration and control of different energy harvesting technologies (solar, geothermal, etc.) to heat and cool buildings and involves building sheds for testing, had the student researchers running solar radiation, daylight analysis, thermal heat gain/loss and other associated tests. “With this software, and the building simulation laboratory, we could properly analyze our structure under various weather conditions as well as conduct numerous environmental studies and calculations.”

In doing this, Hiebert says, “I found I really like research and it presented me with a different career idea.”

Hiebert found the work challenging at first. She thought it would be more “managed”, that is, the faculty investigators (Building Technology faculty Tom Davis and Steven Ries) would simply give the team instructions. Instead, they were assigned tasks with some direction, but were expected to figure out how to accomplish those tasks. Hiebert says that turned out to be one of the most significant skills she acquired.

“The best thing about this research is the ability it gives you to be able to analyze problems. In this situation, you have a task, but all the steps aren’t exactly clear. So you have to figure it out, there’s a lot of problem-solving. That’s what you’ll need in the workforce. There are going to be many tasks you won’t be sure about, and if the boss isn’t around or doesn’t know, you are going to have to figure it out yourself,” she says.

“I also liked it because it is a mix, you know? You get hands-on work, and then other tasks. I knew I would be able to get a variety of skills so I would be able to go into the workforce and present myself in a way that they [prospective employers] would think I would make a valuable employee.”

How does being involved in a research project differ from attending classes? “Classes are more bookwork and memorization. Applied research is more hands-on and practical. In school, we do some site visits, but not many. With research, we actually got to go down to the workshops and build the UHEAT sheds.”

During her time on the projects, Hiebert also became involved with Tom Davis’ student research group, Sustainable Energy for Environment Design (SEED). In that group, she had the chance to explore and discuss global environmental issues with students from other Fanshawe programs. The group does research on issues on their own time.

Hiebert says she feels the research experience better prepared her for a career. “I problem-solved. We wrote a lot of reports and were included in meetings with project partners. I was able to collaborate with a group.”

“Being able to work on the software and working side-by-side with not only team members, but faculty (Ries and Davis), who are highly educated professors; well, being able to do that was a great experience.”

“Some students think the most important thing teachers do is to teach them stuff. Sometimes they become irate if teachers don’t show them how to use every tool and solve problems for them.

“But I think the most important thing we can do is to teach students how to figure things out. Anybody can learn about the tools, and we are always limited in what we can do in class. But you can’t have a class in learning how to think.”
Research, as a foundation for learning and practice, has long been embedded in the Early Childhood Education Program at Fanshawe College. More recently however, research has come to the forefront in the School of Human Services, largely due to the changing needs of our early childhood community and the much deserved professional recognition that our field has worked so diligently to obtain.

In response to Ontario’s Full Day of Learning initiative and the newly established registration process, mandated by the College of Early Childhood Educators, Fanshawe has stepped up to the plate to ensure that the changing needs of students and our community partners are met.

In addition to our two-year Early Childhood Education diploma, Child Development Practitioner/Apprenticeship and Fast Track programs, students now have the opportunity to complete a degree, either through direct entry from high school or by bridging into Year 3, once having obtained an ECE diploma.

Research, in both academic and field practicum experience, is a foundational component of our new four-year Bachelor of Applied Arts in Early Childhood Leadership Degree (ECL) program and it plays a fundamental role in preparing future early childhood professionals for leadership roles in their fields.

The students in the ECL Degree Program have opportunities to learn about, analyze, reflect on and actively practice quantitative and qualitative research. In Year 2, students complete an Applied Research Methods course, followed by the Research in Early Childhood course in Year 4. In numerous other courses students review research documents and scholarly articles and complete literature reviews. As a core component of their academic work they also submit research proposals and papers and submit requests to the Fanshawe Research Ethics Board when applicable.

These experiences allow students to gain an understanding of the process of conducting ethical, valid, and credible research.

Faculty in the ECL degree program have comprehensive backgrounds in qualitative and quantitative research thus allowing students to be taught and mentored by experts in the field. ECL degree faculty guide students to determine the ‘best’ fitting model for their independent research project, which unfolds in their fourth and final year of the degree program. The first research poster conference, where the research projects of our first graduating class will be presented and exhibited, is planned for the spring of 2013.

In addition to exploring the methodologies and ethical perspectives of research in the classroom setting, our ECL students have the opportunity to begin to practice data gathering and analysis in their 420-hour internship and in their subsequent ‘Solutions’ and Independent Study courses.

Students investigate diverse pedagogical approaches and curriculum, providing them with the skills required to gain employment and further their education in their specialized area of interest, and other areas of focus determined by their internship agency.

One of the highlights of our 2012 ECL Degree Internships is the work of Carol Ratcliffe-Chapman, an ECL intern. In the spring of 2012, Carol, in collaboration with the Chair of Human Services, identified the need for an additional Infant/Toddler demonstration classroom as well as the need to update the current B Building demonstration classroom at Fanshawe College. This need surfaced as a result of the changing face of early years services in Ontario, which has led to a 100% increase in enrollment in our Early Childhood Education program.

Using funding obtained through our Child Development Practitioner (CDP)/Apprenticeship Program, Carol investigated college processes and protocol to modernize the two classrooms, and then in collaboration with Facilities Management organized the updating of the physical space. Teaching and learning resources were also sourced out and purchased to ensure that the classrooms are equipped with current and progressive technology and reference materials that allow students to actively ‘practice’ theoretical and research ideas in a concrete way.

Carol submitted a research proposal in fall 2012 that reviewed the updates of the two demonstration classrooms and made recommendations to obtain further funding, through an EFO Performa grant, to support additional updates in an effort to continue to modernize the spaces. Through her research of quality physical learning spaces, this ECL student has put research into action to ensure that students have the opportunity to learn and practice their skills in a progressive and stimulating environment.

...students investigate diverse pedagogical approaches and curriculum, providing them with the skills required to gain employment...
Innovation a valuable tool in “teaching us how to learn”

A keen interest in renewable energy and a job opening on a research team was the perfect “solar” convergence for Matthew Mayberry.

The second-year electrical engineering technology student had just decided to take the coop option available to students in his program when he saw a posting for a student research assistant in the Centre for Sustainable Energy & Environments (CSEE). It was to work on two solar energy projects -- the first, a solar power station optimization project with London Hydro studying energy collection/ controls/batteries and transference of solar power to the Ontario power grid; the second, helping develop a small solar-powered utility vehicle. (The first project involves Prof. Martin Volkening of the School of Applied Science & Technology; the latter is led by Dr. Ke Liu of the same school. Dr. John Makaran, Industrial Research Chair, also is involved in solar research.)

Mayberry says he was attracted to this position over other coop job postings because of his interest in solar energy as a career direction.

One of his main responsibilities as a member of the team is to collect data from the two solar panels installed atop B Building at the London Campus. He was involved in the recent installation of a weather station designed to collect more real-time climate data, and currently monitors and modifies the software program to streamline collection. The program allows researchers to measure and analyze solar radiation levels in order to make better forecasts about the amount of energy that can be collected each day.

The solar-powered utility vehicle -- known as the SUV -- is a project examining how to better collect and manage solar energy systems in small vehicles in order to improve performance, extend battery life and running time. So far, the research team has built three prototypes using golf cart chasses. They are currently being tested and modified as the research progresses.

Mayberry worked with Jonathan Dayus, another coop student, on the SUV micro-controls and has been involved in experimenting with thinner, more flexible solar panels to boost efficiency and be more esthetically pleasing to SUV customers. Mayberry was also involved in ordering parts and various tasks for the projects.

A newcomer to research, Mayberry says he expected the projects to be more structured than they were. “I thought research would be much more like a classroom, where you are told to do this and this and this. We go have an end goal for the project but how you get there is a lot less regulated than in a classroom whether the teacher has expectations and things have to be done a certain way. Here, you're much more left to your own devices. How you reach that goal is much more up to you.”

This worked for him because he is a hands-on learner, and learns and remembers more if he has worked it out on his own, Mayberry says.

“One of the things our teachers always stress is that they are not teaching us to do things, they are teaching us to learn how to do things. So they give us the resources to research things so we can learn them on our own.”

Participation in applied research has resulted in some improved communication skills as well, he says. What surprised him most about his work was “the difficult of trying to communicate with people over the telephone and by email. I never appreciated face-to-face talk until I had to order parts or get information on something through the phone or emails. It’s like you’re speaking different languages to people. Eventually you do get what you need but it takes much longer than you’d expect it to. It’s helped my communication skills. It has also made better me at wording what I am asking for so the person on the other end understands me more. I found that especially when I talk to sales representative using technical talk. They don't understand, but they really do, they just use different words,” he says.

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“My last semester has a lot of project-based classes. If I really like the project-based atmosphere I might start my own company and go with projects I create myself. Or I may go into the industry for say, five or 10 years to get more experience, network, meet people. Eventually I would like to start my own company. It’s just matter of getting there.”
Juduk Lee’s research experience opened up a new world of possibilities that ultimately led to a change in career direction.

Lee, who graduated from the Architectural Technology advanced diploma program in December 2011, worked as a coop student on the UHEAT project (aimed at using various renewable energy sources to heat and cool buildings) and on a study on orientation-specific windows that was part of the solar shading project.

Both projects were part of a portfolio of projects in Fanshawe’s Centre for Sustainable Energy & Environments (CSEE).

He was hired to work on the projects in early 2011, then returned to school for semester 6 of his program, then was hired back to work on the projects.

In UHEAT, Lee contributed to the design of the test sheds and worked on the piping system that will help control temperatures inside.

The window project focused on the feasibility of developing different types of windows for different directions in a residential building.

Academically, the experience “definitely helped improve my reading, writing and research skills,” he says, noting that his family moved to Canada from South Korea when he was in Grade 6, so English is his second language.

Technologically, it was “surprising” and made a huge impression.

Lee’s major role in the window project was to research designs and related heating and cooling products/components online.

That research led him to look at the Internet in a new way.

“The work here allowed me to go to websites and explore current research on new technologies, look at things like TED talk, find out what researchers are doing. If I hadn’t been involved in this research, I wouldn’t have tried to look these things up.

“I wouldn’t have known the information was there. Some people think the Internet is full of lies and junk, but there also is a lot of legitimate scholarship. If you know how to use it properly, there is a lot of great information,” Lee says.

“I knew working here I would be getting educated and getting paid. That’s heaven for a student who is willing to learn. It would help me upgrade my resume.”

But, says Lee, “what I didn’t know is that it would really open my eyes about what the world market is focusing on.”

“I’m really interested in new technologies and where my future is going. I want to focus on what’s going to be big when I am out in the field, what’s going to grow that’s not here now,” Lee notes.

Lee says participation in research has been a positive experience that has helped prepare him for the workforce and taught him to look ahead. He also credits it with making him more confident to start taking the initiative on tasks.

Consequently, he decided to change his plans to be a designer to a career as an engineer, and has since enrolled in the engineering program at the University of Windsor.

He says he would definitely recommend becoming involved in research to students who are curious, want to learn and are interested in the field.
For Colin Taylor, the issue wasn't what to put into the game, but what to leave out.

Scoping the project was one of the challenges facing the information technology student when he was asked to help develop the next generation of a new game.

The concept for the new game came out of a math game designed by faculty members Kit Silcox, Lawrence Kinlin School of Business, and Michael Feeney, School of Information Technology. That game originally focused on business mathematics and featured quizzes and rewards. The group decided to expand the idea, turning it into a game where players can choose from four different types of businesses to run (a coffee shop, juice bar, ice cream parlour or submarine sandwich shop), order supplies, pick products, set prices and make or lose money over the course of a business day. A math challenge section appears at the close of business, and its content can be changed to make the calculations align with any math course. The result was the Grow Your Business game.

Taylor, a graduate of Fanshawe’s Computer Programmer Analyst diploma program and a student in the Game Development — Advanced Programming graduate program, started work on the project about two years ago.

"Actually, when I applied for the job, the real interest was in the game development. For me, the research began when trying to design a game for a broad age range. The best experience, I think, was that this job provided a chance to learn what realistic goals are in game design. In the beginning, I had a huge list of things I wanted to include in the game to make it fun for people who like games, but also to-the-point for those that just wanted the math aspect of the game. Over time, I learned that the best approach is to really nail down fewer pieces that make the core of the game more detailed, rather than too many pieces that might not mesh together as well," says Taylor.

Working with Silcox and Feeney, and with student Jeff Balicky and faculty member Rob Haaf from the School of Contemporary Media, Taylor says he learned to scope the project, work independently and come up with workable design ideas.

"It’s helped me become more confident in my own ideas and analysis, as well as increased my understanding of what people expect from an educational game. I feel like I was not involved in the research as much as I might have been in another research job, but learning about people is what really pushes you forward in life. Collecting and analyzing data, especially about human behaviour, is always surprising and there is always much to learn about humans," he notes.

The IT student is optimistic that his experience will help in his job search. “I really think the number of tasks I had to take on will impress an employer. Also, a project like this has also given me an idea of what self-employment would be like — the challenges, the time management, presenting ideas and working with others.”

Meanwhile, the game has reached the beta testing phase and the research team is looking into educational and commercialization opportunities.
One of the joys of working in the college sector is the knowledge that, together, we are having an impact on the economy, society, and, most importantly, on the lives of students who attend our institutions.

The influences of the student experience during postsecondary studies are many. Friendships, career directions, commitment to life-long learning, and civic engagement are but a few. The learning environment is crucial in ensuring these influences are positive.

When discussing the postsecondary learning environment, engagement is a term that is often used. College education has a focus on experiential learning. How then, do we create an engaging learning environment that supports experiential learning? Many scholarly papers, studies, and indeed books have been written on this topic, which is well beyond the scope of this short article. I would like to focus on one area – that of student engagement in research activities.

This issue of researchfanshawe has been dedicated to the student experience with research. The students interviewed for this issue have been involved in applied research projects that are tied directly to their program of study. Creating learning tools, developing processes, building prototypes, evaluating performance, and conducting simulations all contribute to engagement with learning.

As educators, we know this; but what about from the students’ perspective? Was their experience of value? Was extra work involved? Have they learned more about a specific area than they would have in a traditional lecture based classroom? Did the opportunity enhance their skills and abilities? Do they have greater self-confidence? As you read the students’ accounts of their experiences, you will find that the answer to all of these questions is a resounding, yes!

Such success does not occur by chance, but rather by design.

In order for research to meet the experiential goals of a program of study, there needs to be careful consideration to planning and developing the activity. This requires a collaborative effort by faculty, staff, students, and industry. Faculty and staff expertise need to be matched with industry needs. Curriculum fit needs to be identified. Projects need to be scoped to determine timelines and resources; both human and financial. Contracts may need to be created and signed. The goals of all parties need to be clearly articulated and understood. All of these precede the development of the actual research activity.

The connection of faculty and staff to industry is crucial during all stages of the project development and execution. Faculty working with an industry partner may find that they experience an unintended professional development opportunity which they use to update the curriculum.

Industry engagement with the College provides companies with an insight into the postsecondary education process, and access to College resources that they may be unable to obtain independently, as well as a preview of potential future employees.

Once the project is underway, students require advising and supervision by faculty, staff and/or industry partners.

Although the students featured in this issue of researchfanshawe have largely been involved in industry projects, there are also other forms of college research that provide experiential learning opportunities. Engaging in consulting activities with local businesses to expand their markets, travelling to Costa Rica to work with children in elementary schools, investigating improvements in educational processes, conducting literature reviews for specific social and/or health issues, creating community redevelopment plans, and working with community agencies to address their needs are but a few of the ways in which research is included in the curriculum.

To expand these opportunities, we need to look not only at increasing our networks with industry and community, but also with other postsecondary institutions. Cross-institution and cross-disciplinary partnerships present a wealth of opportunities.

There are many steps in the research process and sharing the work with collaborative teams that capitalize on individuals’ strengths can result in some very exciting activities.

When well planned, the outcome for the student participation in research is a strong experiential learning opportunity for the student that not only supports learning, but also develops strong student-faculty relationships and student-industry relationships. The link between research and experiential learning is a natural marriage.

But before the marriage comes the engagement, that period of excitement, discovery, learning, and collaboration.

I hope for a long engagement!

Dan Douglas is the Acting Dean, Applied Research and Innovation. An architectural technologist and a graduate of both Fanshawe College and The University of Western Ontario, he has served in a variety of capacities at Fanshawe including co-op consultant, professor, program coordinator, School Chair, and Acting Dean, Faculty of Technology. He has special interests in historical buildings and sustainable building practices, and has been instrumental in advancing sustainable initiatives at Fanshawe in both curriculum and practices.
This month's release of the latest Applied Research Environment Scan 2011/12 by the Association of Canadian Community Colleges (ACCC) carries good news for the private sector, especially small and medium-sized businesses (SMEs) across Canada.

A record number of partnerships were reported between private companies and colleges in 2011/12 with an increase of 18% in private sector dollars contributed toward applied research projects. In all, 4,586 Canadian companies received R&D assistance from public Canadian colleges and polytechnics. Twenty-eight percent of companies served were large, 64% were SMEs, and 8% were microenterprises.

The fact the greatest number of clients were SMEs makes sense, since about 98% of Canadian companies fit in this category, and SMEs employ about 60% of the workforce. They represent half the national economy and generate about 70% of new jobs. If Canada is to compete in a global marketplace, say politicians and pundits, this is the sector from which growth must come. But many SMEs lack the personnel and/or facilities to undertake their own research, prototype development or testing. This is where Canadian colleges can step in and fill the need.

Lest anyone think that research is just about widgets and commercialization, colleges also reported 338 social innovation partnerships with non-profit and community organizations as well.

By far the best news in the environmental scan is the phenomenal rise in student participation in applied research and innovation projects. In 2008/09, the first year of the scan, a mere 2,500 college students were reported as having participated. In a little more than three years, that number has grown to 24,108, an increase of about 10.3%.

Why is this important? Because today's graduates – whatever their discipline – will need higher soft skills levels in order to help their employers compete and prosper. Skills like critical thinking, problem-solving, flexibility, teamwork, communication and the ability to apply and adapt concepts and theory to real life situations – all of these are what the Conference Board of Canada calls “innovation skills” and all are deemed essential to the nation's economic prosperity.

And where do many learn those skills? At Canada's colleges. Doing applied research, capstone, group and individual projects. Working with talented college faculty and staff, and staff from the partner company.

It is these types of collaborations, with the transfer and building of knowledge among all three parties (companies, colleges and students) that will lead to increased productivity, innovative products, processes and services, and more qualified graduates to tackle the pressing social and economic challenges we face.

In its 2013 pre-budget submission to the House of Commons Standing Committee on Finance, made last August, ACCC points to a study by the Canadian Federation of Independent Business (Canada's Training Ground: SMEs $18 Billion Investment in the Nation’s Workforce) that concluded:

“Internships, co-ops and placement programs have always been geared toward graduate-level students and newly minted university graduates; therefore, industry has had only that finite talent pool from which to choose when accessing placement programs, leaving substantial resources in colleges untapped”.

Besides the usual appeal for more funding — ACCC would like to see colleges get about 5% of total federal research funding, double the current amount — its 2013 brief also contains a request for more student internships.

“An investment to support college student internships under the College and Community Innovation Program would be a sound investment and provide more companies with access to highly talented interns.”

Canada, says ACCC, needs to develop a vision for a higher level of educational attainment as a national goal. “With growing skills gaps, demographic pressures and increasing technological sophistication in everything we do, Canada must do all in its power to equip every citizen with the skills required to participate in the economy.”

Well said.
Join us April 3 for a celebration of student innovation and achievement!

2nd Annual
STUDENT RESEARCH & INNOVATION DAY
Wednesday, April 3, 2013

PROGRAM:
1 p.m. Guest Speaker (speaker and location TBA)
2 p.m. Exhibition floor opens in the J. A. Colvin Atrium
2:30 p.m. Judging begins
4:30 p.m. Announcement of winners and awards ceremony

FIRST PRIZE $1,000
SECOND PRIZE $500
THIRD PRIZE $250

NEW PEOPLE’S CHOICE AWARD** $250

Questions?
Contact Lynne Blunt, Assistant to the Dean, or Leslie McIntosh, Research Facilitator, Applied Research and Innovation (ARI) at research@fanshawec.ca.

* In the case of team entries, cash prizes will be equally divided between all project team members. Responsibility for accurately listing all team members on the entry form lies with the individual who submits and signs the entry form.
** The People’s Choice Award will be determined by ballot on April 3, 2013. All persons attending the event will be eligible to cast a vote.

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