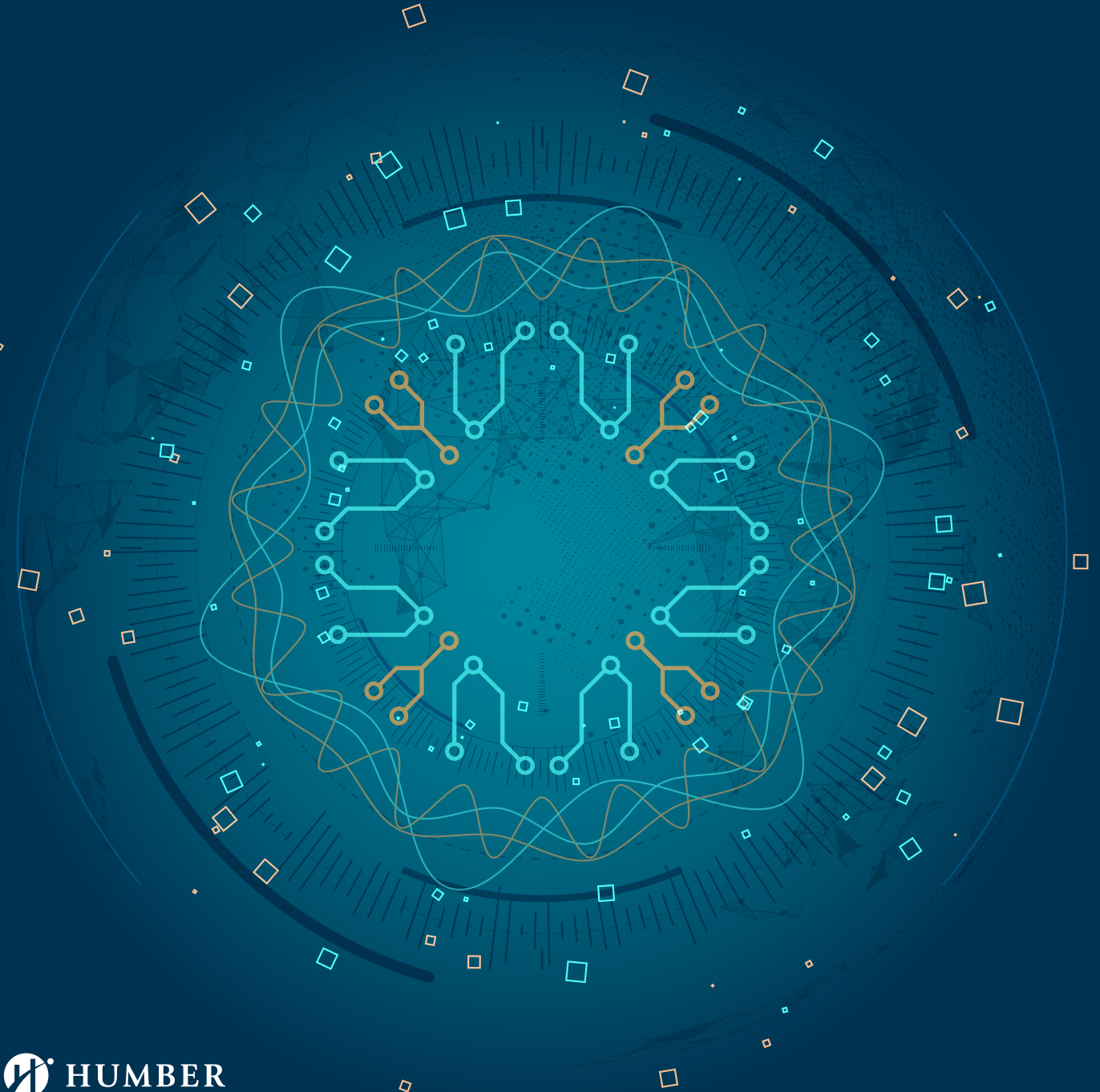


# J I P E

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Innovation in  
Polytechnic  
Education

Volume 1 · Number 1 · March 2018





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# Foreword

Chris Whitaker

*Humber College Institute of Technology & Advanced Learning*

**In an era where disruption rules, no sector is insulated** from the impact of technology-driven change. Whether it is the internet of everything leading to new products, services and business models, or the impact of social media and ubiquitous access to information, every organization is challenged to respond if they are to remain relevant.

Higher education is no exception. Often criticized as slow to adapt and adhering to time-honoured yet outdated approaches, the ivory towers are in for a makeover. Teaching and learning is undergoing transformation as institutions respond to the changing requirements of learners and the demands of modern society and an interconnected global economy.

The Journal of Innovation in Polytechnic Education (*JIPE*) reflects this change and the dynamic environment within which we operate. As a learning-centred polytechnic institution, Humber is excited to create, through *JIPE*, a forum to advance dialogue and improve knowledge and capacity in response to the world around us. We also believe that the scholarship of teaching and learning is critical to informing our practice and building our culture as a learning organization.

With a practical orientation as a distinct model of education, the polytechnic approach is characterized by its adaptive nature, serving both social and economic functions. In focusing on providing access and pathways to a breadth of credentials and professional programming, the polytechnic model engages a wide range of learners while serving a key role in matching supply and demand in the labour market. While there is considerable variation in institutional types adopting or identifying with a polytechnic approach, the common denominator tends to be an integration of theory and practice in an applied, learning-centred environment. Close alignment of curriculum with industry requirements for talent and problem-solving situates polytechnics in an innovation

ecosystem where linkages with employers fine-tune and contribute to the development of the highly skilled workforce demanded by the modern economy.

Through featuring scholarly work exploring innovation in the context of polytechnic education, *JIPE* contributes to communities of practice within higher education sharing a similar outlook and philosophy, and enhances broader understanding of the value of the polytechnic model. As the contributing articles to this first issue demonstrate, innovation occurs in many ways, serving many purposes. From Lego robotics and work-integrated learning, to solutions for national economic challenges, innovation and practical approaches to real world issues are at the core of polytechnic education. In creating a forum about innovation in education we are sharing best practices and ideas, and going a step further to challenge conventional practices and thinking. We need to examine innovation in terms of contribution to present needs and desired outcomes, and also through a future-focused lens of the requirements of tomorrow and beyond.

I hope this inaugural issue sparks interest and ignites excitement for all those passionate about the value and contribution of higher education in making a difference for learners, communities, and society.

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## Author Note

**Chris Whitaker** is the President and CEO of Humber Institute of Technology & Advanced Learning, and the Chair of Polytechnics Canada.

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# The Polytechnic Difference

Eileen De Courcy & Heidi L. Marsh

*Humber College Institute of Technology & Advanced Learning*

**The world is changing at a breakneck pace. Technological advances—particularly** in the areas of biotechnology, robotics, and artificial intelligence—are transforming the ways in which people explore, interact with, and make sense of the world around them (Mayer-Schonberger & Cukier, 2013). Businesses, societal norms, communication patterns, entertainment consumption, and information curation are wildly different today than they were even a decade ago. In a relatively short period of time, technological devices have moved from the external environment (e.g., laptops, tablets, phones) to physically connected wearables (e.g., Go Pro camera, Google Glass, iWatch) to internally embedded devices (e.g., Radio Frequency Identification Devices, or RFIDs, and medical implants). Smartphone biometrics and thumbprint data are used routinely, every day, all over the world. A recent estimate suggested that over half of the world's population accesses information, services and social media from their handheld devices (Saylor, 2012). The enormity of data that is collected, analyzed, and used by technology on a daily basis is truly staggering (Mayer-Schonberger & Cukier, 2013).

This hyper-connected, data-rich world is changing the game, metaphorically and otherwise, and along with it, the ways in which we prepare for and engage with employment. Technology has already begun to replace unskilled labour, and similarly will serve to replace many cognitive functions in the workplace. As Friedman (2014, p. SR11) observed, “this access to data means that people and organizations can instantly replicate what is working on a global scale and instantly improve what isn't working—whether it is eye surgery techniques, teaching fractions,

or how best to operate a G.E. engine at 30,000 feet.” The impact of these technological changes on the workforce goes beyond the usual hype. As recently recognized by The Conference Board of Canada (Alexander, 2018), technology is fundamentally changing the nature of work, and the speed of this transformation outpaces humanity's current ability to respond and adapt.

In response to this changing environment, employees will need to develop skills synonymous with adaptability, creativity and creative thinking (Mayer-Schonberger & Cukier, 2013). In their recent book, *Big Data: A Revolution That Will Transform How We Live, Think and Work*, Mayer-Schonberger and Cukier (2013, p. 137) argue that in an age where information and data are so abundant, the vital skill required “is the knowledge to extract wisdom from [the data]”. Clearly, the requirements of graduates of higher education need to be reevaluated in this information era; students will need to develop different kinds of mindsets, skills and talents for the 21st century (Greenstein, 2012). This includes not only academic outcomes, but also non-academic ones, such as persistence (“grit”), self-regulation, engagement, creativity and motivation (Pea & Jacks, 2014). The value proposition of a post-secondary education can no longer focus on the delivery of content; information is all around us.

This has implications not only for what post-secondary education is teaching to its students, but also for the ways that it is doing so. As noted by Laurillard, Oliver, Wasson, and Hoppe (2009, p. 291):

Education has a role in preparing people for work—traditionally for the industrial environment, but now for the knowledge economy, and that must affect both what and how students learn. ...education has to learn to adapt faster, in line with the rate of change in the worlds of work and leisure.

Indeed, the unprecedented access to information in today's society has blurred the lines between formal and informal learning and education, precipitating questions about the relevance of existing teaching and learning models in higher education. Opportunities that were once unimaginable are now available to

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both educators and students alike. As noted by Saylor (2012, p. 8):

Mobile technology can bring the nation's best teachers and top experts into every classroom, and improve the quality of education while freeing-up budgets. Skilled engineers can be trained for the cost of a few hundred dollars a year instead of tens of thousands. In developing nations, where approximately one-fourth of children never finish primary school, and one billion people remain illiterate, mobile computing will spread education where it hasn't gone before.

There is no doubt that higher education is facing a complex and uncertain future (Vibert & Shields, 2003). Traditional models, approaches and ideas about teaching and learning will need to transform. This is evident in the words of a recent report by The World Economic Forum (2016, p. 7), which argues that "government and businesses will need to profoundly change their approach to education, skills, and employment, and their approach to working with each other," and is further echoed in a report commissioned by the Ontario Government that calls upon educators to ensure students have access to quality learning experiences that are adaptable and appropriate to the individual learner's needs and to the needs of society (Ontario Government, 2016). Although higher education is often thought to live at the "forefront of cutting edge practice," Loughran (2013, p. 5) observed that "for many reasons it struggles to live up to that expectation."

### **The Polytechnic Model of Education**

Enter the polytechnic. Structured to be nimble and responsive to the needs of industry (Pratt, 1997), and with a history of eschewing rigid models of education in favour of flexible, independent learning (Doern, 2008; Pratt, 1997), many would agree that polytechnic institutions are uniquely positioned to thrive in the information era. From the Greek "*Poly-tekhnos*"—"skilled in many arts"—a "polytechnic" education is characterized by its breadth of options. The model emphasizes an applied approach, spanning a wide range of comprehensive programming, including technologies and skilled trades. Credentials are awarded in programs ranging from apprenticeships and certificates through to advanced degrees, all of which are delivered in an experiential, hands-on environment. The programming offered in polytechnic education is also explicitly designed to respond to the changing and specific needs of local economies, thanks to its close ties to industry. Polytechnic programs are directly informed by industry partnerships, and provide symbiotic opportunities for students to engage in work-integrated learning, applied research, entrepreneurial endeavours and international learning opportunities (Böckerman, Hämäläinen & Uusitalo, 2009; British

Columbia Institute of Technology, 2018; Humber College, 2018; Polytechnics Canada, 2018).

But to really appreciate what is unique about this approach and what makes it so well-suited for today's world, it helps to look to the past. Institutes of polytechnic education have long been in existence, although their formations and names have varied (e.g., colleges of professional education, institutes of technology, institutes of applied science, and institutions of Technical and Further Education, Skolnik, 2016). Steeped in history, formal polytechnic education in technical and industrial training can be traced back to Moscow, Russia as early as 1763 (Fuller, 1894/2015). In France, between 1825-1865, the polytechnic was celebrated as it "led the world in the practical applications of science instruction to the improvements of arts, trades and manufacturers" (Fuller, 1894, p. 5). The United States followed in 1861, with the establishment of technical institutions across the country, including noteworthy institutions such as MIT and Caltech. Polytechnics also arose across the United Kingdom and Europe in the mid 20th century, as part of the 'differentiation of higher education' movement (Gellert, 1991). The Canadian story, of course, is much more recent, with polytechnics appearing in a harmonized way in the post-secondary sector in 2003 (for a review of the Canadian context, see Doern, 2008).

Since their inception, polytechnics have had a mandate to meet the immediate needs of society, as informed by their ongoing integration and collaboration with industry. This has required—and inspired—industrial innovation; one does not have to look far to see the significant impact of polytechnics on both local and global economies. As an example, for hundreds of years, "the superiority of polytechnic work has been evident at world expositions" (Paris and Chicago World Fairs) and polytechnics have been credited with developing the skills required for the design and the construction of roads, railways and bridges (Fuller, 1894) that have joined people and nations. More recently, polytechnic students have been credited with inventions such as a payroll software system, thought-controlled home appliances and prosthetic arms and social innovations such as Femme International, which is dedicated to empowering African women through feminine hygiene management (more information on each of these projects is listed at the conclusion of this paper). As the world evolves, so does the learning, curriculum and innovation within polytechnic institutes.

At the same time, bridging the divide between industry and education has kept polytechnics at the forefront of pedagogical experimentation. In serving the needs of a diverse body of students with such a broad range of topics and credentials,



polytechnics have had to “accommodate growth, accept new kinds of students, offer them new kinds of courses, create new structures of study, pioneer new forms of governance, recruit new kinds of staff, and so on” (Burgess & Pratt, 1971, as cited in Pratt, 1997, p. 10). Freed from the traditional educational framework, thanks to their emphasis on applied and experiential learning, polytechnics—like all innovators—“surf on the edge of chaos” (Veletsianos, 2010), challenging the *status quo* out of necessity but also out of curiosity. As such, polytechnics have a long history of pioneering innovative, flexible, student-centered approaches to learning (Doern, 2008; Pratt, 1997). Although individual polytechnics are distinct in their stories of creation, context and structure, common to all—across the sector—is the noble pursuit to provide hands-on, practical training and education suitable to the needs of learners and the community as a whole. Unwavering in their purpose, polytechnics have been steadfast in their commitment to preparing students for an increasingly complex and unpredictable work environment. As Pratt aptly noted (1997, p. 319): “The polytechnics’ experience shows that considering what students might need after their higher education tends to produce different answers to the question of course design.”

So why is this model of education so befitting for the world of today? How are polytechnics positioned to respond to the dynamic and rapidly changing environment? Intrinsically, the educational process in the polytechnic model of education, both then and now, assumes the task and responsibility of developing competent individuals ready to take their position in the profession (Ushatikova, Rakhmanova, Kireev, Chernykh, & Ivanov, 2016). Both in their responsiveness to the ever-changing needs of society, as well as those of their learners, Polytechnics have a proven record of innovative pedagogy, focused on problem-solving, that has uniquely prepared them to meet today’s volatile reality. Moreover, in responding to the dynamic nature of the world’s problems, polytechnics have crafted a networked ecosystem that brings educators, researchers and students together to work in interdisciplinary teams to solve very real problems, in ways that are distributed yet connected (De Courcy, 2015). “Education, innovation, and training are interwoven; learning moves seamlessly between inquiry, experimentation and skill development in both cognitive and non-cognitive domains, creating an instrument for workforce development and innovation” (De Courcy, 2015, p. 5). It is this approach to learning that epitomizes the Polytechnic Difference.

### The Vision for JIPE

A scholarly journal is a place to find evidence to inform one’s practice. Our vision for *JIPE* is to be more than that. We want this journal to be a place to find inspiration; where readers not only learn about “what is” (Hutchings, 2000), but are inspired by what might be. What is *possible*. As we move forward, *JIPE* will feature papers that describe innovative teaching and learning practices that push the boundaries of traditional approaches to learning and demonstrate the impact of industry-integrated activities, both of which have been hallmarks of polytechnic education since its origins. As noted, polytechnics have always had a reputation for innovative and responsive teaching. Polytechnic educators are therefore deserving of their own scholarly space to disseminate their pedagogical innovations, question what innovation is, in the context of today’s polytechnic model of education, and challenge learning and teaching methods and practices in this information era. With the creation of this journal, we hope to inspire larger conversations about what it means to educate in today’s higher education system.

The variety of contributions featured in the journal are also reminiscent of the polytechnic approach, with its range of options. Like the pathways, credentials and choices offered by polytechnics, *JIPE* offers a breadth of options for educators to share and consume the scholarship of teaching and learning literature. The journal features more traditional full-length empirical and review papers as well as “bite-sized” Brief Reports and Innovation Spotlights. All share the rigour of the peer-review process. Finally, the journal is online and open-access following the polytechnic tradition of education for all, with particular regard to scholarly teachers (Trigwell, Martin, Benjamin, & Prosser, 2000) and practitioners (Bjork & Solomon, 2012; Davis, Lewenstein, Simon, Booth, & Connolly 2008).

This inaugural issue features an invited commentary on the future and place of polytechnics in Canada. It also contains reports on innovative pedagogical approaches, including an innovation spotlight highlighting the use of Lego robotics in the classroom and a brief report on internship experiences among polytechnic degree students. Finally, there is a full-length empirical paper on how to support male students in a traditionally female-dominated program, and a brief report describing faculty engagement with research at a polytechnic institute in Alberta. You will find that the polytechnic identity, with its innovative, student-centered integration of theory and practice, is evident throughout the pages of this volume. We hope that you enjoy it.

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### Websites describing recent polytechnic inventions and innovations:

**Payroll system software:** <http://mwnation.com/poly-students-invent-payroll-system/>

**Thought-controlled home-appliance device:** <http://www.asiaone.com/health/poly-students-invent-device-helps-disabled-control-home-appliances-through>

**Thought-controlled prosthetic arm:** <http://www.tnp.sg/news/singapore/ngee-ann-polytechnic-students-invent-mind-controlled-prosthetic-arm>

**Femme International:** <http://humber.ca/today/news/femme-international-continues-work-girls-kenya>

## Canada's Polytechnics Offer Solutions to Pressing National Economic Challenges

Nobina Robinson & Daniel Komesch

*Polytechnics Canada*

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**As we come over the horizon of what many have** dubbed the Fourth Industrial Revolution, Canada's future looks bright. Canada is well positioned to harness new technologies, to adopt new production processes, and to leverage increasingly globalized value chains, to the benefit of all citizens.

However, as bright as the prospective future looks, there are wide-ranging challenges our economy faces. The challenges I am referring to are the likes of innovation lag, a slow-growth macroeconomic environment, rapid technological change, and a looming demographic shift that will see a wave of individuals exit the labour market over a relatively short time period. In order to best position ourselves to reap the full benefits and opportunities presented by the Fourth Industrial Revolution, identifying effective solutions to these pressing challenges is essential.

Since their emergence, polytechnics have consistently contributed solutions to the challenges posed to the Canadian economy, demonstrating a high degree of adaptability, nimbleness, and responsiveness—when the economy changes, polytechnics change too. So, as the Fourth Industrial Revolution shapes the economy of tomorrow, polytechnics will necessarily shape the workforce solutions that this new economy demands.

However, to date, our federal government has not done enough to effectively utilize Canada's polytechnic institutions and

the solutions they provide to the challenges our economy faces. Properly harnessing post-secondary institutions is complex at the federal level, as section ninety two of the Constitution devolves the mandate of education to the jurisdiction of the provinces (Constitution Act, 1867). Yet, when polytechnics are understood not just as education actors, but as *economic actors and innovation intermediaries*, the federal role becomes more obvious and urgent.

In my role as the CEO of Polytechnics Canada, a national association of Canada's largest, research-intensive polytechnics, federal advocacy is my mission and mandate. I am constantly working to ensure that the federal government is re-thinking, updating, and modernizing its policy tool kit, in a way that can best harness Canada's polytechnics to create growth, improve productivity, and stimulate innovation.

In the following, I will highlight how polytechnic education and institutions strengthen Canada's economy by providing solutions to the pressing challenges noted above. Further, I will demonstrate that these institutions are currently underutilized in their innovation capacities, and underleveraged in their ability to contribute to economic growth. Finally, I will spotlight opportunities for federal investment that can have significant positive impacts on the Canadian economy broadly, by better harnessing the talent, equipment, knowledge, and know-how that exist within polytechnics across the nation.

### Canada's Current Challenges

In order to reap all of the potential gains a new economy could make available, Canada needs to ensure that we can effectively address all of the pressing challenges currently sitting in front of us. The challenges that hamstring Canada's economy-wide growth and productivity most are laid out below:

**Innovation lag.** On innovation, R&D spending as a share of GDP has been on the decline since 2001 (Sulzenko, 2016) (see Figure 1). Effectively investing in all facets of the economy from which innovation is drawn, and in all stages of the innovation cycle, is critical to producing strong innovation-led economic

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**Nobina Robinson** has served as CEO of Polytechnics Canada since 2009. She regularly writes commentary on Canada's innovation and skills challenges.

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\*Invited commentaries will occasionally be included in issues of the journal, particularly as part of a special issue on a specific teaching and learning topic.



growth. At present, a significant imbalance exists in the federal share of R&D funding between basic and applied research.

**Weak productivity of labour.** Labour productivity, the amount of goods or services one hour of labour produces, has also declined over time in Canada (Drummond, 2015). Weak labour productivity numbers are demonstrative of lagging innovation, but also of human capital that is inefficiently allocated (Guironnet & Peypoch, 2007). That is, there exists a situation in our labour market where the skills that individuals possess, and have garnered through education and training, are not necessarily well aligned with the jobs they hold (see Figure 2).

**The demographic deficit.** The share of Canada's population at ages 59 to 65 (or those at or nearing retirement) is greater than the share of those 30-49, and also the share under 15—those that will fill positions when these individuals retire (Index Mundi, 2017). This demographic deficit is putting severe pressure on the labour market, in particular on sectors and occupations that are already facing labour shortages, such as Canada's construction and information and communications technology sectors (BuildForce Canada, 2017; Information and Communications Technology Council, 2016) (see Figure 3).

**Slow growth.** Canada's macroeconomic environment has largely been one of slow growth in recent decades (Trading Economics, 2017). Slow growth is the result of a confluence of factors, but has, to a degree, been impacted by the combination of innovation lag, weak productivity, and demographic imbalance (see Figure 4).

### Polytechnics as Innovation Intermediaries

The contribution polytechnics make to innovation is not often widely recognized. This could, in part, be attributed to the common tendency to conflate innovation with invention. Polytechnics operate at the near-to-market end of the innovation continuum, where they assist their industry partners with experimental development, business validation, technology adoption and access, and last-mile pre-market product and process testing (Polytechnics Canada, 2017d). Polytechnics further make available physical equipment, such as 3D printers, water laser-jet cutters, and CNC machines, to assist firms in the capital-intensive components of the product development process. The innovation gains at this end of the innovation spectrum are often less apparent, and therefore less celebrated, but nonetheless contribute significantly to innovation-led growth in Canada.

In recent months, much discussion has surrounded the release of Canada's "Review of Fundamental Science". The Review recommends that Canada increase basic research funding to

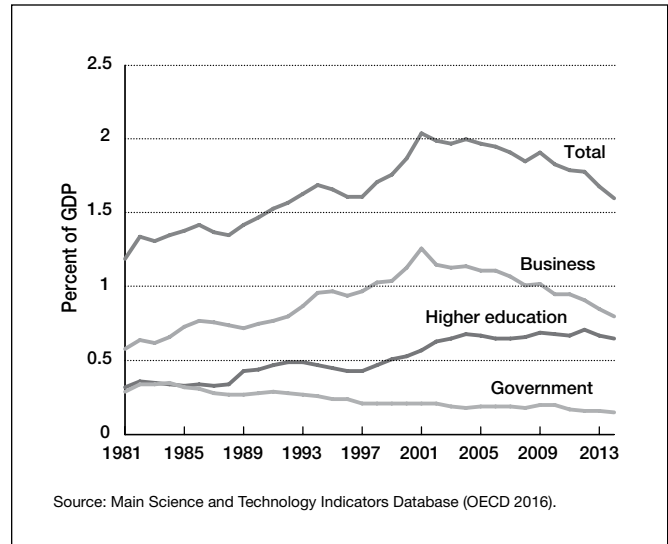


Figure 1. Graph of Canada's R&D spending as a percent of GDP, 1981 – 2013. Reprinted from *Canada's Innovation Conundrum: Five Years after the Jenkins Report*, by Andrei Sulzenko, June 2016, retrieved from (<http://irpp.org/wp-content/uploads/2016/06/report-2016-06-09.pdf>).



Figure 2. Graph of Canada's productivity as a proportion of United States' productivity from 1970 – 2014. Reprinted from *Canada's Innovation Conundrum: Five Years after the Jenkins Report*, by Andrei Sulzenko, 2016 (<http://irpp.org/wp-content/uploads/2016/06/report-2016-06-09.pdf>).

\$4.8 billion from its current \$3.5 billion (Naylor et al., 2017). Policymakers largely view funding increases as a mutually exclusive choice—they can either fund basic or applied research, but funding one has always been at the expense of funding the other.

This has created the conditions for an emerging tendency to pit the spheres of applied and basic research against one

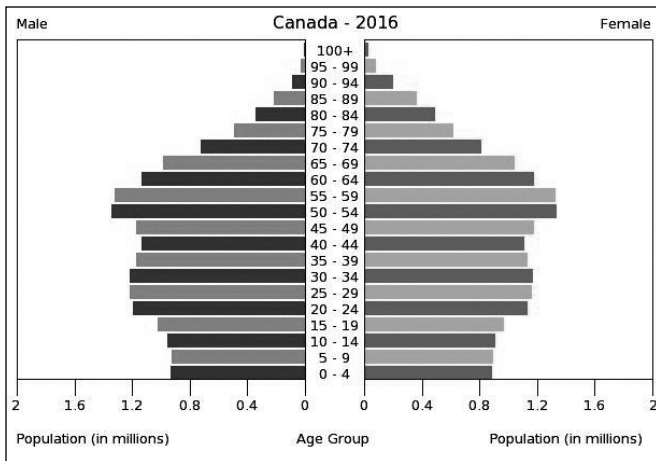


Figure 3. Graph of Canada's population pyramid. Reprinted from *Canada Age structure*, by Index Mundi, 2017, retrieved from [http://www.indexmundi.com/canada/age\\_structure.html](http://www.indexmundi.com/canada/age_structure.html)

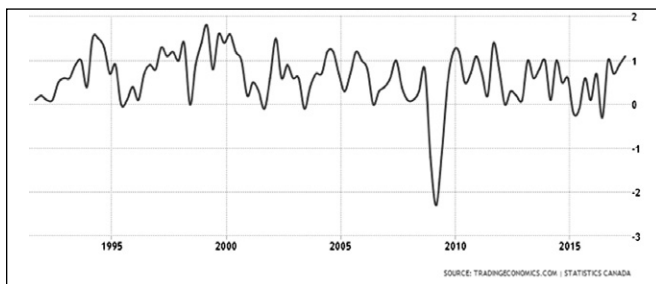


Figure 4. Graph of Canada's GDP growth rate from 1990 – 2020. Reprinted from *Canada Age structure*, by Index Mundi, 2017, retrieved from ([http://www.indexmundi.com/canada/age\\_structure.html](http://www.indexmundi.com/canada/age_structure.html))

another, and by extension, higher education institutions and sectors against one another. This is clear insofar as government support goes for higher education R&D (HERD): Polytechnics are eligible for only 1.7 percent of the federal government's over \$3 billion in HERD funding, and are ineligible for the Research Support Fund, which assists post-secondary institutions with the overhead costs of doing research (Statistics Canada, 2017a).

The choice between basic and applied research is, however, a false dichotomy; a flourishing economy is the result of a healthy ecosystem, where each actor can most efficiently leverage their respective comparative advantages. As such, the differentiated roles post-secondary institutions play in this ecosystem, and in the economy more broadly, need to be encouraged and funded by government decision-makers across the country.

Near-to-market innovation that serves to bridge the commercialization gap—moving products from the lab or shop floor to the hands of customers—is an area on the innovation spectrum in which polytechnics hold a comparative advantage. This advantage is particularly important for innovation-led growth

when considering the varying firm sizes in Canada.

Almost 98 percent of all employer businesses in Canada are Small and Medium-sized Enterprises (SMEs), with an average of 6 to 7 employees and annual revenues of under \$50 million (ISED, 2017). These businesses employ over 70 percent of the private sector labour force, and thus, targeting the innovation potential of SMEs can yield significant economic benefits to Canada (ISED, 2017).

Though Canada's polytechnics contribute solutions to and partner with firms of all sizes, speaking to the contribution they make to SME productivity is particularly germane. Most firms of this size do not have in-house laboratories or equipment, often have not invested in R&D performing staff, and find the innovation process too risky and too costly (Jenkins et al., 2011). Polytechnics fill these gaps by acting both as innovation intermediaries and direct talent pipelines, in a way that is cost-effective and financially beneficial to the firms with which polytechnics partner.

In contrast to universities, polytechnics are not trying to generate revenue through licensing intellectual property—they are not motivated by patents, publications or citations. Rather, the motivation is that applied research projects solve business-identified problems using the polytechnics' faculty, students, facilities and capabilities in innovative ways (Polytechnics Canada, 2017). These are not simply off-the-shelf solutions or services for industry. There must be a novel and innovative solution applied to the industry identified problem or the polytechnic will not accept the project.

Innovation collaboration benefits polytechnics by deepening their business partnerships while improving the learning experience for both faculty and students. Students receive opportunities to participate in real world business projects and build innovation skills. Companies are not in the "research collaboration game" for fun: they actually have a real problem that needs an innovative solution. And that solution involves not simply the "R" of research, but the "D" of development and the "C" of commercialization as well. As innovation intermediaries, polytechnics are able to mitigate the risk associated with innovation and generate new revenue sources for partner firms.

Since 2008, Polytechnics Canada's member colleges and institutes have:

- Serviced **13,000** Canadian **companies**, 75% of which are SMEs
- Conducted **12,900** applied research **projects** solving industry-identified problems

- Engaged **11,500** college **staff and faculty** in applied research activity
- Involved **80,300** college **students** in hands-on applied research projects
- Developed **5,100 prototypes** for their industry research partners

(Source: Polytechnics Canada, 2017a)

### **How the Federal Government Can Better Leverage the Polytechnic Contribution to Innovation**

Canada's innovation performance is sub-optimal, due to the lack of policies and programs that strongly support applied research and the industry-demand for near-to-market innovation. Conflating innovation with invention, or presenting innovation as an end itself, (instead of a means to an end: economic growth and prosperity) ignores the complementary roles played by all the actors in the innovation ecosystem and weakens the collaboration that should occur.

Over several decades, Canada has concentrated primarily on the input of ideas as the spark for innovation, instead of fostering an innovation economy that responds to demand for ideas, demand for solutions, and consumer or market demand for new products or services.

Recognizing that Canada needs to do more to create a competitive and innovative business climate, including opportunities for firms to scale up, it is vital that we revamp and modernize the set of programs and policies that stimulate business innovation.

The first solution to consider is consolidating all key business innovation and industry-academic collaboration programs into one federal agency. This would improve both the efficiency and the impact of public funds targeted for this purpose, by making it easier for business to access services in a "one-stop shop" (Polytechnics Canada, 2017b).

The federal government can further improve Canada's innovation performance by meeting the demonstrated demand from industry for polytechnic innovation. To this end, the federal government should significantly grow its funding to polytechnic applied research by doubling current commitments.

At present, there is only one federal program that supports polytechnic applied research—the Community and College Innovation Program (CCIP). The program currently receives a funding envelope of \$53 million, and is available to over 110 post-secondary institutions across Canada (Bains, 2016). In 2017, the program faced a \$13 million shortfall as a result of being oversubscribed (NSERC, 2017).

There is a clear demand for polytechnic-industry innovation that is demonstrated by the 2,815 unique firms supported by polytechnics and colleges in the last year alone; current funding levels cannot effectively meet this demand. To break the innovation lag that is holding back growth at the national level, the federal government needs to fully support industry demand for polytechnic innovation by making it easier to access polytechnic innovation services, and by significantly increasing funding to the only program that supports industry-polytechnic innovation.

#### **Matching skills to jobs: the polytechnic advantage.**

Canada faces major skills obstacles that further complicate our innovation, productivity, and growth challenges. Skills mismatches persist across regions and industries: young people are working in jobs poorly aligned with their educational experience (Statistics Canada, 2016), and workers are being displaced as once dominant industries decline. The result is high regional unemployment, poor employee and employer satisfaction, and a youth underemployment rate estimated to be nearly 30% (Waye, 2015).

At the same time, as much of the baby-boomer population reaches the age of retirement, the Canadian labour market—and certain occupations in particular—will face significant pressure from this "greying out." One example of a sector facing critical shortages at present is Canada's construction sector, where some estimates state that within ten years, Canada will face a shortage of 250,000 individuals in the construction trades (Ontario College of Trades, 2016).

Shortages in the construction sector are of particular worry because, while many trades face demographic pressure, the federal government is simultaneously committing significant investments to updating infrastructure—nearly \$190 billion and a further \$35 billion invested by the newly created Canadian Infrastructure Bank (Office of the Parliamentary Budget Officer, 2017). These investments will, of course, drive up demand in the very professions that are already facing serious shortages.

With Canada facing these skills challenges and demographic pressures, an increased focus on how we develop the talent that feeds the labour market is critically important to our collective future prosperity. Polytechnics directly address human capital productivity through the myriad of outcome-based and industry-aligned education and training activities that feed the supply side of the labour market. In the search for stronger productivity and enhanced growth, better harnessing the talent that is produced through Canada's polytechnics is a promising path forward.

**Developing a future-forward workforce.** Canada's polytechnics train multidisciplinary talent for the labour market of tomorrow by offering technical, industry-aligned, and hands-on education across all credentials—from four-year bachelor's degrees, to diplomas and advanced diplomas, to apprenticeships in the skilled trades.

At present the 13 members of Polytechnics Canada offer:

- 183 stand-alone Bachelor's degrees
- 952 Diplomas
- 593 Certificates
- 283 Graduate Certificates
- 274 Apprenticeships

(Source: Polytechnics Canada, 2017c)

(Note: BCIT offers two Masters degrees as well, in applied construction disciplines).

The polytechnic model of education ensures that talent is distributed widely across the economy – both through the knowledge economy and the know-how economy. These are important and positive contributions to labour productivity. Polytechnics and colleges offer opportunities for lifelong learning to all learners and workers, effectively graduating students into jobs, but also instilling resilience in those who learn and train at the institutions. Polytechnics are building a cadre of workers who are less susceptible to the effects of job displacement.

Of particular note is Canada's polytechnics' enduring focus on the skilled trades. The knowledge economy and the know-how economy enable each other, and as we move to an increasingly automated future, it is critical we view our skilled tradespeople as automation enablers. Canada's polytechnics have always maintained a strong commitment to developing Canada's skilled trades workforce. In 2015/16, the members of Polytechnics Canada were actively training 48,100 apprentices, across 52 Red Seal trades professions, and prepared another 12,300 last-level completers to challenge for their certifications (Polytechnics Canada, 2017c).

Polytechnic education additionally offers the differentiated advantage of being outcome-based, and industry-aligned. That is, in contrast to universities, the ultimate goal of polytechnic education is employment, and therefore there are numerous built-in levers to ensure strong employment outcomes.

One such lever is the program advisory committee (PAC). PACs are comprised of industry leaders and academic staff. The intent of the PAC is to identify the industry-relevant skills a program should deliver, and assist in the curriculum design to ensure that those skills are delivered in a way that they can be leveraged in an actual workplace environment. Committee

members also assist in identifying industry resources, including guest speakers, work-integrated learning (WIL) opportunities for students, and placements for graduate employment. The overarching goal of a PAC is to smooth labour market transitions for students by creating an efficient institution-to-industry pipeline. Smooth labour transitions are critical to productivity as they ensure that human capital is activated as quickly as possible and never sitting idle.

A second lever that contributes to strong outcomes in polytechnic education is work-integrated learning (WIL). WIL is embedded in the DNA of polytechnic education, and always has been. The applied nature of polytechnic education necessitates that students spend time in the environments in which they will eventually work. Critically, polytechnic education takes a broad perspective of WIL, providing wide-ranging opportunities such as field experience and internships—experiences that extend far beyond the co-op model that is traditionally offered by universities. Polytechnic education also makes WIL available across a broad spectrum of disciplines and credentials, making sure that no matter what field students are pursuing, there are opportunities to garner hands-on experience. Like the PAC, WIL enhances productivity in Canada's labour market by smoothing transitions and ensuring that when students graduate from a polytechnic, they are work-ready.

Thirdly, polytechnic education offers the opportunity to participate in applied research projects. Applied research projects equip students with in-demand innovation skills and innovation literacy, as students collaborate with industry and community partners to solve real-world challenges. Innovation literacy is the ability to think creatively, evaluate opportunities and apply problem-solving skills to diverse business and community challenges. It cannot be taught in the classroom alone; it requires the practical hands-on experience students at polytechnics gain as intermediaries in helping their private or social sector research partners. Polytechnic graduates who gain innovation literacy along with practical skills are ready to make a meaningful contribution to their future employers and the Canadian economy.

**Building a resilient workforce.** Canada's polytechnics offer education and training options to individuals at all stages of their career—to those looking to enter the labour market for the first time, those looking to upgrade skills at mid-career, and those seeking to re-enter the labour market after being displaced (see Figure 5).

Not only does polytechnic education build resilience by providing in-demand, transferable, and future-forward skill sets,

it also offers a multitude of flexible entry and exit points, ensuring that, as an individual's career progresses (or doesn't), there are opportunities to build on existing skill sets, or to acquire new ones.

The availability of lifelong learning opportunities, with flexible entry points, becomes increasingly relevant as the potential for technology to disrupt the labour markets grows. To be sure, the impact of phenomena like automation should not be overestimated, and as technologies emerge, we must remember that some technologies will be enabling (those that assist humans) and some will be replacing (those that are more likely to displace humans) (Acemoglu, 2016).

Polytechnics are exceptional in their ability to connect the supply and demand sides of the labour market. As such, they are well positioned to anticipate how emerging technology will impact the labour market, and therefore, identify the occupations and skill sets that should be supported with academic programming. For example, at present, polytechnics are producing much of the talent that automates—the mechatronics and robotics that design and operate automated and robotic systems, and the skilled tradespeople who build and maintain automated machinery and infrastructure.

Further, as a result of their flexible entry points and ability to deploy short-term and modular credentials, polytechnics are well positioned to absorb and re-deploy labour that may be displaced as a result of emerging technology.

## How the Federal Government Can Better Contribute to the Skills Agenda

Canada's ever-present challenge is getting the right people, with the right skills, to the right jobs. The nation's productive capacity suffers when the skills individuals possess are poorly aligned with the jobs they take. Policies that improve the efficiency of skill-matching in labour markets are essential, so Canada must do a better job of helping individuals to navigate through both the labour market and post-secondary education.

Canada needs a future-focused effort that addresses the economy and labour market of the coming decades. To date, it appears that federal and provincial labour market actions focus overwhelmingly on building workers for the current economy, filling current job vacancies, and rectifying existing and earlier skills mismatches. Future-proofing skills for all Canadian workers is a critically important mission and this can be achieved by focusing data collection efforts beyond existing surveys such as the Labour Force Survey, and creating new surveys with a sharper focus on skills.

Yet, positive signals are coming from the federal government. The 2017 federal budget placed a significant focus on innovation and skills. The Innovation and Skills Plan invested new money in WIL, expanded Canada Students Loans and Grants to be made available to adults looking to retrain, and created a new skills organization that will seek to deploy innovative skills training pilots (Government of Canada, 2017). While positive, more can be done, and specifically more can be done to better harness the proven contributions of Canada's polytechnics.

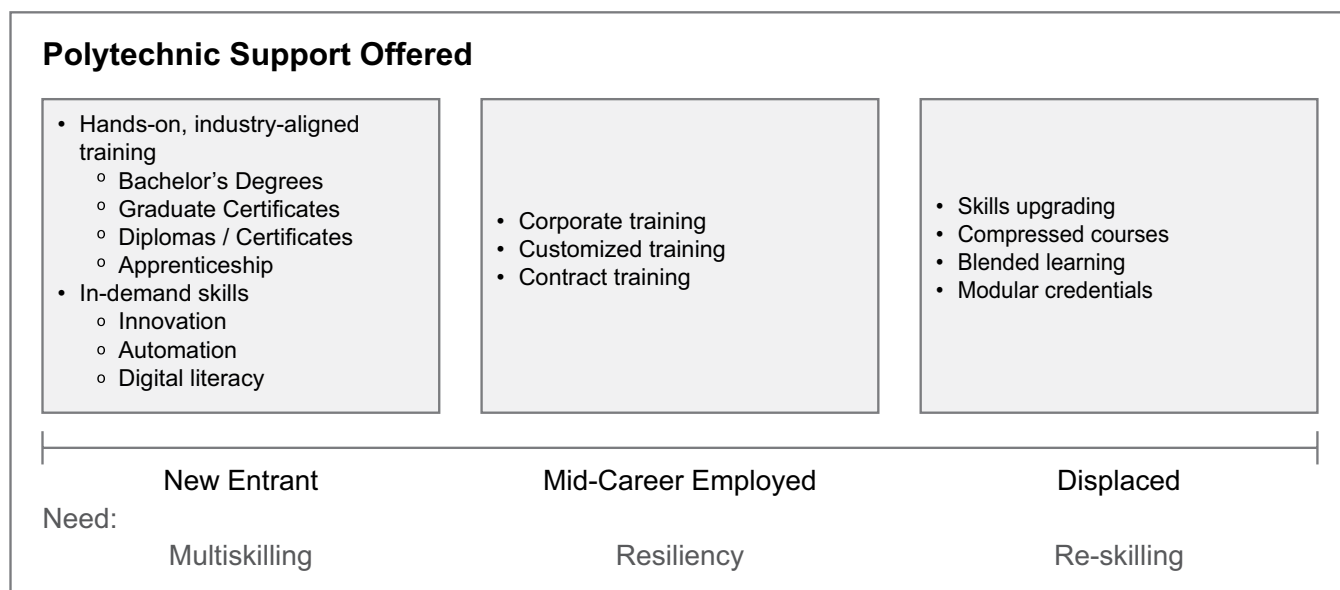


Figure 5: Polytechnic supports offered at different labour market entry periods. Reprinted from Polytechnics Canada (2017).



To increase the productivity of Canada's human capital, the federal government should:

- Invest in a "Skills in-Demand" Survey, and;
- Invest in and scale existing capabilities in Prior Learning Assessment and Recognition (PLAR).

Demand-side data are strikingly lacking in Canada.

Polytechnic institutions and learners would both benefit from having clear signals from employers about the skills they require in their workers. Polytechnics would also benefit if all Canadian employers had better (timely, local, granular) awareness of the talent supply in education and training programs, and skills on offer across all credentials. This lack of awareness of "Made in Canada" talent is all the more concerning given the large amount of publicly funded post-secondary institutions that exist in Canada, and given the federal support to individual learners across the learning system.

Equipping individuals with in-demand skills requires first identifying and forecasting the skills necessary for a rapidly evolving labour market. Currently, an employer survey with a specific focus on skills does not exist. Therefore, the federal government should prioritize creating a survey that can inform learners and educators, ultimately creating better labour market alignment between job seekers and employers.

Second, in order to assist workers who have been displaced, there are Prior Learning Assessment and Recognition (PLAR) capabilities that exist in Canada's polytechnics (and community colleges) that could be scaled and used to address the needs of a 21st century workforce, given what we know about our demographic challenge and shrinking working population.

PLAR is the identification and validation of formal and informal learning. PLAR smooths labour market transitions by allowing individuals to establish their existing skill sets and market these skills for future employment or education and training opportunities.

As polytechnics already have core expertise in conducting PLAR, federal investments to enhance these capabilities can address the issue of job displacement due to technological change, by more effectively identifying the re-training and upskilling needs of displaced individuals, and better matching them to existing employment opportunities based on identified skill sets.

With respect to the demographic deficit and its effects on the skilled trades, the key to enhancing innovation, growth, and productivity is ensuring that we have the talent to sustain it. Surely, growth will lag when there exists a deficit in the talent

that knows how to build. In order to ensure Canada is able to effectively maintain and build its in-demand skilled trades talent, the federal government should:

- Implement a Nationally Registered Apprenticeship Number (NRAN), to track apprenticeship pathways, and;
- Ensure that there is apprenticeship involvement on all federally procured infrastructure projects.

There is a dearth of data on Canada's apprentices. At present, the best available tools for Canadian policymakers studying apprentices are the National Apprenticeship Survey (NAS) and the Registered Apprentice Information System (RAIS).

Administered only intermittently by Statistics Canada, the NAS surveys apprentices and collects information on the work and training experiences before, during, and after their involvement in an apprenticeship program (Statistics Canada, 2017b). That said, the data collected through the NAS suffer from significant time lag—the most recent survey was conducted in 2015, which studied cohorts of apprentices that went through their training from 2011-2013 (Statistics Canada, 2017b). The experiences of apprentices in 2011 are guiding policymakers in 2017.

The annual RAIS gathers information on individuals who receive training and those who obtain certification in a trade where apprenticeship training is being offered. Therefore, RAIS is useful in tracking macro-level apprenticeship enrolment and completion trendlines (Statistics Canada, 2017c). Yet, it is unable to provide details on the apprentice's level of training, duration of training, wages, interprovincial migration, previous level of educational attainment, or any qualitative measures such as barriers encountered during training, motivations for completion, or entrepreneurial aspirations post-certification.

In order to better inform policy decisions on apprenticeship, more timely and relevant data are needed—particularly on the various pathways apprentices take through the labour market and to completion of their certifications. The concept is to assign a unique federal identifier to all registered Red Seal apprentices in Canada, and use existing electronic infrastructure to create an online portal for connecting with registered apprentices. Through the NRAN, the federal government, training institutions and employers across Canada would have accurate, up-to-date labour market information on the supply of active apprentices, their trades, and where and how they are progressing toward certification.

Additionally, in implementing the Innovation and Skills Plan, the federal government should make it easier for people to respond to labour market trends and improve the economic

opportunities for all workers in all sectors. This includes supporting Canada's need for certified tradespeople, using the unprecedented opportunity of the \$190 billion that has been dedicated to infrastructure. The impact of these funds can be multiplied if they are leveraged to ensure that our next cadre of skilled workers are getting the experience they need to both build and maintain our next generation infrastructure.

When the federal government procures a new infrastructure project, a simple solution is to award points on bids to employers who are involved in apprenticeship—be it the training of apprentices, or simply activity in the apprenticeship community broadly, as has been suggested by the Canadian Apprenticeship Forum.

Apprenticeship, by definition, requires employment, and therefore there is a role for the federal government to ensure that Canada's young apprentices and prospective apprentices will be able to grow their experience by participating in federally procured projects. Ensuring the federal government provides the opportunity for apprentices to build their experience will further attract talent to the trades that demonstrate significant demand.

## Conclusions

The shifting forces that a pivoting economy creates are never easy to tame, let alone leverage in a way that creates inclusive benefits. However, Canada's polytechnics have, since their creation, acted at the leading frontier of change: polytechnics not only adapt to change, they drive it.

Although our economy faces challenges, wrought with low levels of innovation, productivity, and growth—each of which is compounded by changes in technology and demography—Canada is nonetheless in possession of the solutions that will drive success in the economy of the future. However, all solutions have not yet been effectively leveraged to reap the full benefit of their potential impact. To date, Canada's polytechnics have been underutilized by the federal government as solutions to the challenges outlined above.

To stimulate innovation and productivity, and to kickstart macroeconomic growth, the federal government needs to better use the many assets that are contained within, and produced by, Canada's polytechnics.

As the national advocate for Canada's large and research-intensive polytechnics, I urge the federal government to make polytechnic innovation services more accessible to industry, to scale applied research funding to a level that meets industry demand, to create and disseminate better information on our human capital by deploying new surveys that will ensure we have our finger on the pulse of where skills and demographic deficits

will impact us most, and lastly, to efficiently deploy the talent our labour market already demands by smoothing transitions through endeavours like PLAR.

On a global stage, Canada sits in an enviable position, but better is always possible. Harnessing all that Canada's polytechnics have to offer is one way to get us there.

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## Call for Papers

The Journal of Innovation in Polytechnic Education is pleased to announce a call for papers for a special issue devoted to the topic of **"Innovation in Sustainable Solutions"**. This may include papers that spotlight pedagogical approaches within, or the impact of projects or programs focused on sustainable infrastructure and construction, alternative energy, smart cities, or advanced manufacturing. These are each areas where innovative solutions and wide-ranging talent and skills are needed, and which polytechnics are uniquely positioned to address. Papers may include success stories, best practices, evidence of curriculum shifts to accommodate new needs, or examples of industry partnering with polytechnics to address their own operational need for talent or innovations to help companies grow. To submit a paper, please visit [www.jipe.ca](http://www.jipe.ca). To be considered for publication in this special issue, please submit your paper by **January 15, 2019**.



# Learning Code using Lego Robotics

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## Introduction

**Learning to code has a reputation for being difficult** (Gomes & Mendes, 2007; Jenkins, 2002), and requires a variety of skills, such as math and complex problem solving, that are challenging for many students (Foote, 2014; Gomes & Mendes, 2007; Jenkins, 2002)—especially for those students beginning a college program (Oblinger, 2003). Often, students experience high levels of anxiety even before a programming course has started (Jenkins, 2002). This is particularly true for students who are required to take a course in coding, but who do not plan to continue on to a career in this field. Anecdotally, these students find the fundamentals of code difficult, and often end up “hacking” their way through the course.

One approach to addressing this anxiety that has been used with children and youth is to teach code using robotics (Kurebayashi, Kamada, & Kanemune, 2006; McGill, 2012). Learning to code using robotics was found to have many positive effects: a) it allows students to more easily connect individual lines of code to their result (Kurebayashi et al., 2006); b) it

stimulates intrinsic motivation (Kurebayashi et al., 2006; McGill, 2012); and c) it increases overall student grades (McGill, 2012).

However, there is little to no literature on this type of approach with adult learners. Therefore, the purpose of this study was to look at the effects of incorporating robotics in a playful context (Plass, Homer, & Kinzer, 2015), in a series of “Introduction to Coding” courses at the post secondary level. After teaching code at the post secondary level for over ten years, particularly with students who did not necessarily want to or feel the need to learn how to code, our goal was to find a way to re-engage students.

## Method

### Participants

The students involved in the research included two groups of approximately 60 students (two classes of 30 students each), from two different programs: Web Design and Interactive Media, and Multimedia, Design and Development.

### Web Design and Interactive Media

Students enrolled in this program start the program prepared to learn code and have often already had some form of coding education. Students in this program served as the comparison group, and learned to code using traditional methods.

### Multimedia, Design and Development

Students in this program are often surprised by the amount of code they are required to learn and usually have no previous coding experience. Students in this program served as the test group. They learned code using traditional methods combined with activities incorporating Lego robotics.

## Materials

### Teaching Equipment

One of the challenges with this project was to use equipment that did not add to the existing anxiety and/or workload of the students in the test group. With Lego being a relatively familiar childhood toy, we chose the Lego Mindstorms EV3 kits as our hardware (see Figure 1). We hoped this would also add to the

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\***Innovation Spotlights** are extremely brief contributions that highlight an innovative teaching practice, approach, or tool, and provide accompanying evidence that speaks to the effectiveness of the innovation.



*playful* aspect of the exercise, which has been shown to support learning (Plass et al., 2015). To keep things simple, and avoid requiring students to learn the proprietary Lego coding language, the Lego Bricks were set up using ev3dev (a Linux-based OS, refined for use with the Lego Mindstorms EV3) and a small PHP API. This made it possible to code the robots using the same code editor, browser, and commands that were used when learning to code using traditional methods.

### Research Materials

To assess the impact of the robotics, final average grades were compared between groups, and pre- and post-course surveys were developed. The surveys each consisted of fourteen questions. On the pre-course survey, questions focussed on expectations and coding knowledge prior to the course, and on the post-course survey there were complementary questions focussing on actual experience and coding knowledge after completing the course. See the Appendix for the pre- and post- surveys.

### Procedure

In these programs, students traditionally learn code by attending one weekly three-hour class, consisting of a short lecture followed by coding activities and/or group work. In between classes, students are directed to online supports and are given weekly exercises from resources such as Codecademy, Lynda.com, and Treehouse, to complement the content learned in class. This process works well with students who are interested and self-motivated; however, students who are not interested in learning code struggle to remain engaged.

In the present study, the comparison group maintained this “traditional” pattern of teaching and learning. The test group also received this approach for the majority of the course. However, for

a selection of core programming concepts, the test group spent an additional class reinforcing these concepts by programming Lego robotics, immediately following the lesson in which the concept was taught. For example, after students learned to program a control structure (to allow a program to make a decision), they built and programmed a simple autonomous Lego robot. The challenge was to program a robot to navigate around a table using a proximity sensor and control structures to avoid falling off the edge (see Figure 2). The test group received a total of three sessions with the Lego robots.

Students in both classes were informed about the research project at the beginning of the semester. To prevent any actual or perceived coercion, students were recruited to complete the surveys by a third-party research assistant, who did not have any existing relationship with students. Surveys were anonymized, and were optional for students to complete. Surveys took approximately 5-10 minutes to complete, at the beginning and end of the semester, respectively.

## Results

### Expected vs. Actual Class Enjoyment

On the pre- and post- surveys, students were asked to rank their coding course compared to their other four courses (i.e., Was it their favourite course? Second favourite? etc.). As shown in Figure 3, at the beginning of the semester, approximately one quarter of students in both the comparison (22.5%) and test (25%) groups expected their coding class to rank among their most (1st or 2nd) enjoyable classes. At the end of the semester, while this figure had increased in both groups, the proportion of students in the test group (43.8%) was much larger than the comparison group (28.6%), with 18.9% of students rating it as their very favourite course. Moreover, the proportion of students who ranked the

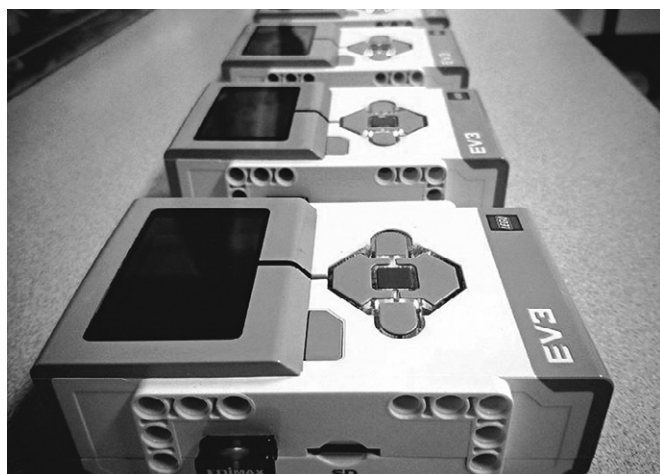


Figure 1. Lego EV3 Kit (Mindstorms EV3, n.d.)

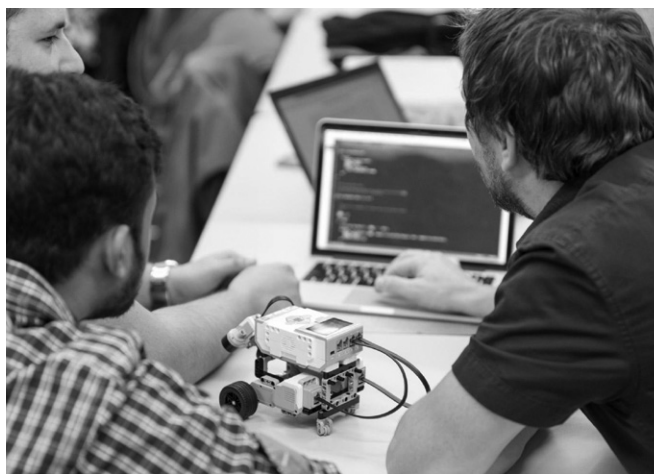


Figure 2. An assembled Lego Robot



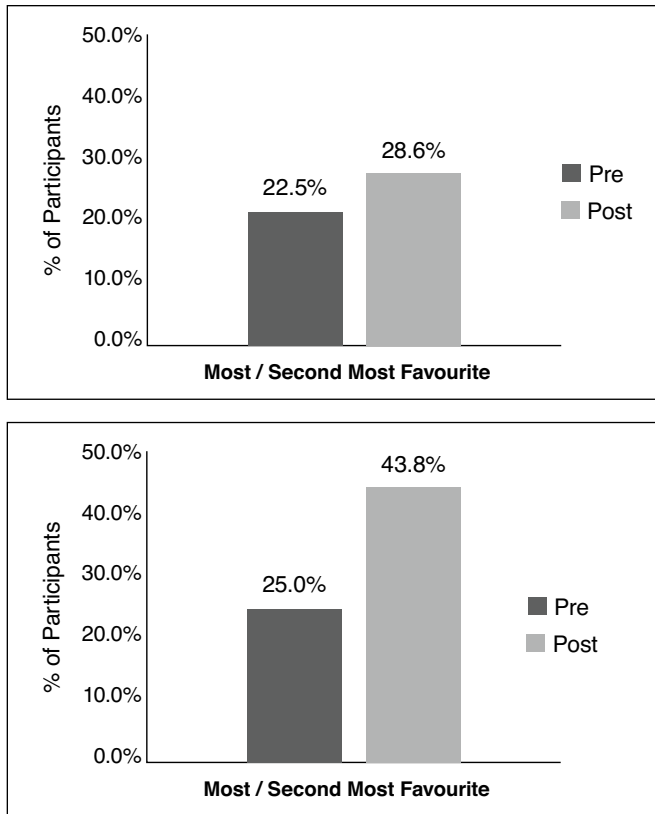


Figure 3. Proportion of students who rated their coding course as their 1st or 2nd favourite course at the beginning (Pre-) and end (Post-) of the semester, for the comparison group (top) and test group (bottom), respectively.

course as their least- or second-least favourite course decreased from 39.2% on the pre-survey to only 25% in the test group. The differences in proportions were not statistically significant between the two groups,  $\chi^2(1) = 0.5, p > 0.05$ , nor between the pre- and post- frequency distributions of the test group,  $\chi^2(4) = 1.55, p > 0.05$ , according to chi-square contingency table analyses. However, this is likely at least partly due to the uneven sample size between the Comparison ( $n=15$ ) and Test ( $n=48$ ) groups on the post-test.

#### Confidence in Coding Ability

Five questions on the pre- and post- surveys asked students to self-report on their confidence levels with executing different concepts in Javascript (the coding language they were learning). Not surprisingly, those in the comparison group (students who were planning to pursue a career in coding) had higher average confidence ratings than the test group, both at the beginning and end of the semester. Still, both groups showed comparable increases in confidence levels over the course of the semester (Figure 4). It should be noted that by the end of the semester, the test group's average confidence levels were similar to those of

the comparison group's pre-semester levels. Due to the relatively smaller sample size of the comparison group on the post-test, an inferential statistical test was not appropriate in this instance.

#### Knowledge of Coding Concepts

As shown in Figure 5, students in both groups rated their knowledge of course content as approximately equal, both pre- and post-semester. In particular, both groups reported increases in their self-rated knowledge of course content over the course of the semester, with a slightly higher rating for the comparison group at both points in time. Once again, inferential statistical testing was not appropriate due to the uneven sample sizes.

The final average grades for both groups were also similar, with the comparison group at an average of 75.0% and the test group at an average of 73.4%. Interestingly, the previous year, students in that program (Multimedia Design and Development) had a final average grade of 69.4%.

#### Anecdotal Class Observations

Initially, there was some concern that college students may perceive the idea of learning code using Lego as childish and prefer not to participate. However, before the first class involving the Lego robotics, an email was sent out informing students of the planned activity. Upon arriving to class, the students, who normally would be sitting at their computer stations, had all brought their chairs up to the front of the computer lab and formed a semicircle, in anticipation of the activity. Faculty consistently observed a higher level of participation, enjoyment and engagement in classes that incorporated the robotic activities.

### Conclusions

The results showed that students participating in the lego robotics activities showed important changes in terms of confidence and enjoyment of the course. Although there was not a difference between groups with respect to the self-rated knowledge gained, there is preliminary evidence to suggest that final grades may have improved compared to previous cohorts, as has been previously shown in the literature (McGill, 2012). Further research is needed to determine whether this reflects a meaningful improvement or random variation.

Arguably, the increases in confidence and engagement are more important for the group under examination. In particular, the fact that a group of students that are traditionally less interested and prepared to learn code showed improvements in these areas is extremely encouraging, and is consistent with gains in intrinsic motivation that have been demonstrated in children and youth (Kurebayashi et al., 2006; McGill, 2012). Had a similar pre- and post- survey been completed with both programs without any robotics activities, we would expect the test group to gain

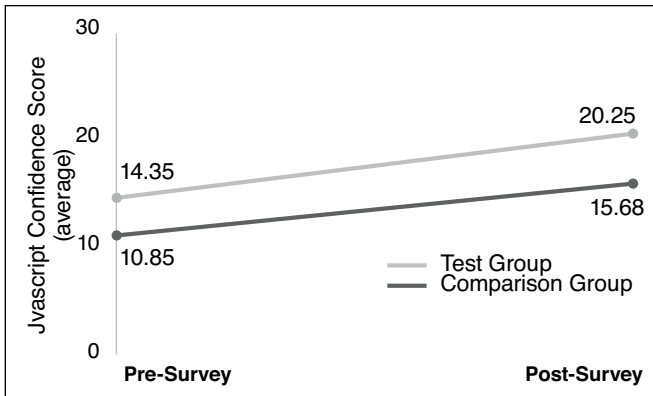


Figure 4. Average confidence index scores for the Comparison and Test groups, respectively, on the Pre- and Post- Surveys. On this scale, the maximum possible score is 25, and the minimum is 0. Higher scores indicate greater self-reported levels of confidence.

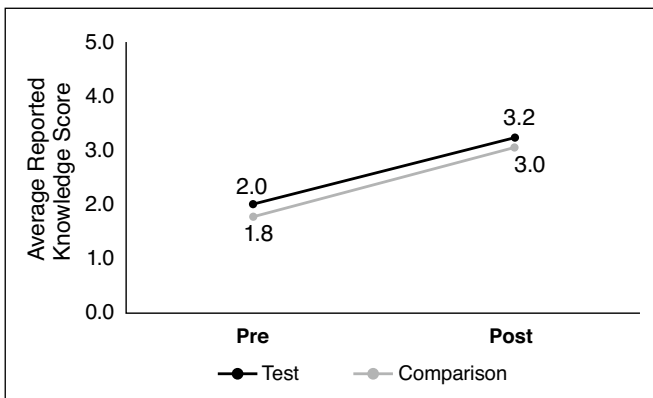


Figure 5. Average self-reported computer programming knowledge score for both Test and Comparison groups from Pre- to Post- survey. Scores are from 1 (Nothing) to 5 (Expert).

relatively less knowledge, and show much lower levels of confidence and enjoyment than the comparison group. Future research could determine whether this is the case, and also whether students in the comparison group (those in Web Design and Interactive Media) show similar gains when they learn with Lego robotics. Given the encouraging findings reported here, we are now in the process of replicating and expanding on these results with improved equipment, more frequent robotics activities, increased methods of quantitative measurement, and a larger sample of students.

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## Appendix

### Pre-Course Survey

Please answer the questions by circling the answer that best represents your perspective:

- How would you rank your current knowledge of programming? (1 being nothing and 5 being an expert)
- Based on your current knowledge, how difficult do you expect this introduction to programming course to be? (1 being very easy and 5 being very difficult)
- How enjoyable are you expecting this introduction to programming course to be? (1 being you will NOT enjoy this course and 5 being you WILL enjoy this course)
- Compared to the other courses in this semester how would you rate your expectations for this course? (1 being your most favourite and 5 being your least favourite)
- How many hours a week do you expect to dedicate to this course?  
2 or less    3 to 5    6 to 9    10 to 12    More than 12
- How likely will you be to incorporate programming into your employment after you graduate? (1 being NOT very likely and 5 being VERY likely)

7. How much do you think concepts taught in this introduction to programming course will help in your everyday life?  
(1 being never and 5 being very often)
8. How would you rate your current understanding of JavaScript?  
(1 being none and 5 very skilled)
9. I am confident with creating output and manipulating HTML with JavaScript.  
(1 being not confident and 5 being very confident)
10. I am confident with using JavaScript variables to store and manipulate data.  
(1 being not confident and 5 being very confident)
11. I am confident with using JavaScript control structures (if statements) to make decisions.  
(1 being not confident and 5 being very confident)
12. I am confident with using JavaScript loops (for or while loops) to make repeat code.  
(1 being not confident and 5 being very confident)
13. I am confident with using built in JavaScript functions (substr, toUpperCase, to Fixed).  
(1 being not confident and 5 being very confident)
14. I am confident with using and creating custom JavaScript functions.  
(1 being not confident and 5 being very confident)
6. How likely will you be to incorporate programming into your employment after you graduate?  
(1 being NOT very likely and 5 being VERY likely)
7. How much do you think concepts taught in this introduction to programming course will help in your everyday life?  
(1 being never and 5 being very often)
8. How would you rate your current understanding of JavaScript?  
(1 being none and 5 being very skilled)
9. I am confident with creating output and manipulating HTML with JavaScript.  
(1 being not confident and 5 being very confident)
10. I am confident with using JavaScript variables to store and manipulate data.  
(1 being not confident and 5 being very confident)
11. I am confident with using JavaScript control structures (if statements) to make decisions.  
(1 being not confident and 5 being very confident)
12. I am confident with using JavaScript loops (for or while loops) to make repeat code.  
(1 being not confident and 5 being very confident)
13. I am confident with using built in JavaScript functions (substr, toUpperCase, to Fixed).  
(1 being not confident and 5 being very confident)
14. I am confident with creating and using custom JavaScript functions.  
(1 being not confident and 5 being very confident)

### Post-Course Survey

Please answer the questions by circling the answer that best represents your perspective:

1. How would you rank your current knowledge of programming?  
(1 being nothing and 5 being an expert)
2. How difficult did you find this introduction to programming course?  
(1 being very easy and 5 being very difficult)
3. How enjoyable did you find this introduction to programming course?  
(1 being you did NOT enjoy this course and 5 being you DID enjoy this course)
4. Compared to the other courses in this semester how would you rate this course?  
(1 being your most favourite and 5 being your least favourite)
5. How many hours a week did you dedicate to this course?  
2 or less   3 to 5   6 to 9   10 to 12   More than 12

## Male ECE Students in Post-secondary Classrooms: Enrolment and Retention

Anthony Randall

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### Abstract

**This study examines the underrepresentation of male Early Childhood Education (ECE) students in post-secondary classrooms.** Through the implementation of a mixed methods design, quantitative data on student enrolment and graduation rates were collected (N=3009) and discussed in the context of the perspectives of male interview participants (n=4). Data collected from a large Ontario college demonstrated that males comprised an average of only 5.4% of students enrolled in the ECE program over an eight-year timespan, and of that demographic (n=159), only 30.8% of male students graduated. This rate was significantly lower than that seen in female students during the same time period. Interviews revealed that male ECE students face a number of deterrents, from bias to gender imbalance in post-secondary classrooms and placement settings. However, these variables can potentially be mitigated through protective factors, for example, connections with faculty, motivation and self-efficacy. In light of the continued low enrolment for male ECE students, and recent downward trend in graduation rates, research-based support strategies are recommended to help increase enrolment and retention.

**Keywords:** male students, Early Childhood Education, post-secondary, enrolment, retention, support

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### The field of Early Childhood Education (ECE) is characterized

by an underrepresentation of male educators. Based on data compiled by the Organization for Economic Co-operation and Development (OECD), average international participation in the early learning workforce by male educators is 4% in member countries (OECD, 2015). Current statistics in Canada from the 2011 National Household Survey indicate that national representation for male educators in childcare is 3.2% (Statistics Canada, 2016). This level of participation by male educators has remained relatively static in Canada over the last two decades (Statistics Canada, 2013, 2014a, 2014b, 2016).

Lack of male representation in the field of ECE is intrinsically linked to low male representation at the post-secondary level. In other words, numbers in the field will not increase unless numbers in the classrooms are first examined and addressed. In order to become employed as a registered early childhood educator (RECE) in the province of Ontario, a two-year college diploma is the minimum requirement. Research focused on male ECE students in post-secondary classrooms is extremely limited and, to my knowledge, non-existent in the Ontario context.

A descriptive mixed-methods study from Quebec completed by Besnard and Diren (2010b) addressed enrolment and graduation data for male ECE students in the province. Using data published by the *Service Régional d'Admission du Montréal métropolitain* (SRAM), these researchers found that male students accounted for 3.6% of registrants in ECE programs at publicly funded vocational colleges (CEGEPs), and of that population, only 25% successfully graduated (Besnard & Diren, 2010b). Besnard and Diren (2010b) employed a transversal research strategy to examine the educational experiences of male students, and sought the input of three sample groups: high school students (n=625); registered college students (n=19); and college instructors from ECE programs (n=49). The researchers employed mixed data sampling methods for each group, including a Likert-type survey instrument, semi-structured interviews, and semi-structured focus groups, respectively. Quantitative and

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\*Original Research Articles are papers that report on original empirical research with a focus on teaching and learning. Papers may be qualitative or quantitative and include an Abstract, Introduction, Method, Results, Discussion, and Reference section, as well as any tables and/or figures.

qualitative data analyses yielded five main findings: (1) prejudice continued to impact viewpoints of male students who opt for non-traditional fields; (2) self-efficacy supported the perseverance of male ECE students, especially for mature students; (3) supportive figures in students' social networks served a protective role; (4) group integration in college classrooms supported program completion; and (5) male ECE students lacked male role models (Besnard & Diren, 2010b).

Despite the paucity of research on the topic of male students in ECE programs, uniform themes have emerged from the existing literature. An examination of current international studies and publications, in conjunction with the above-discussed Quebec study, point towards a commonality in student experiences. Key concepts can be condensed into three major themes: deterrents, protective factors, and strategies to support male ECE students.

### **Deterrents**

Prospective male ECE students face an array of deterrents before stepping into a post-secondary classroom. These deterrents take the form of stereotypes about the male gender's lack of nurturing abilities (Holm, Janairo, Jordan, & Wright, 2013; Piburn, 2011) and the ECE profession itself as low-status "women's work," with the resultant negative connotations associated with that phrase (Crisp & King, 2016; Rich, 2014; Russell, 2013; Tucker, 2015). Perhaps more troubling for potential male ECE students is the stigma associated with male teachers and the sexual abuse of children (Crisp & King, 2016; Weaver-Hightower, 2011; Russell, 2013; Tucker, 2015). In addition, Besnard and Diren (2010a, 2010b) highlighted the fact that male students typically select their career paths in high school, which is a time when they are most susceptible to the influence of stereotypes and their impact on identity formation.

Once accepted into an ECE program, male students continue to be impacted by these stereotypes, especially outside of the classroom context. Biased attitudes that tend to reject or question the motives of male ECE students seem most prevalent in practicum settings. One of the biggest challenges that has been found is in the attitudes of parents whose children attend the childcare centres where male ECE students are placed (Besnard & Diren, 2010b; d'Arcy, 2015; Farquhar, 2012). This bias is often presented in concerns about diaper changing (Besnard & Diren, 2010b, Farquhar, 2012; Nelson & Shikwambi, 2010; Piburn, 2011) and requests to have children placed in a different room (Besnard & Diren, 2010b). Further, biased attitudes have been found in the opinions of ECE professionals tasked with mentoring students in placement settings (Farquhar, 2012). Negative practicum experiences have been identified as a key contributor

to male students withdrawing from ECE programs (Besnard & Diren, 2010a).

Further deterrents faced by male students looking to enroll in an ECE program include low wages and gender imbalance. Low wages for early childhood educators are common throughout multiple countries (Besnard & Diren, 2010b; d'Arcy, 2015; Farquhar, 2012; Holm et al., 2013; Weaver-Hightower, 2011). It should be noted that this factor would also act as a deterrent for prospective female ECE students; however, an examination of the female student experience is beyond the scope of the present study. In Ontario, the average yearly income for an ECE was listed at \$27,351 in 2010, less than half of the average income of \$61,495 across all occupations (Government of Ontario, 2017). Once in the classroom, male ECE students experience the challenges of gender imbalance—many are often the only male student (Friedman, 2010; Russell, 2013; Tucker, 2015). This imbalance could lead to feelings of isolation (d'Arcy, 2015; Weaver-Hightower, 2011). Further, a series of implicit exclusions, for example, teachers that only use feminine pronouns and class materials that only depict images of female educators, may highlight a male student's outsider status (Nelson & Shikwambi, 2010; Piburn, 2011). These above-mentioned deterrents coincide with both low enrolment and high rates of attrition for male students in post-secondary ECE programs (Besnard & Diren, 2010a, Nelson & Shikwambi, 2010).

### **Protective Factors**

Perseverance of male students in ECE programs has been attributed to a variety of personal attributes that can be condensed into the following factors: age, self-efficacy, and motivation. Besnard and Diren (2010a, 2010b) cited age as a major contributing factor to program retention, and identified mature students as demonstrating a greater ability to adapt within a female-dominated educational setting. Male ECE students with previous professional work or post-secondary experience also demonstrated an increased likelihood of succeeding in ECE programs and their ensuing careers (Friedman, 2010; Nelson & Shikwambi, 2010).

Self-efficacy has also been linked with perseverance in ECE programs for male students (Besnard & Diren, 2010b; Friedman, 2010; Weaver-Hightower, 2011). Faced with multiple challenges, from bias to isolation, male students seem to thrive when they employ "winning strategies" (Besnard & Diren, 2010a, p. 3). Some of these strategies include: seeking support, demonstrating initiative, patience, and the ability to adapt (Besnard & Diren, 2010a). Related to self-efficacy is the motivation to support others, specifically children who lack a male role model



(Friedman, 2010; Ho, 2016; Russell, 2013); this internal drive helped male ECE students overcome obstacles (Weaver-Hightower, 2011). Motivation for teaching, often referred to as “passion,” is another common thread among successful male ECE students (Friedman, 2010; Nelson & Shikwambi, 2010; Russell, 2013).

An additional—and possibly controversial—protective factor identified is the issue of perceived or actual special treatment. While male students have been identified as a numerical minority in ECE programs, they have still benefited from the privilege associated with being male (d’Arcy, 2015; Weaver-Hightower, 2011). Besnard and Diren (2010b) posit that male ECE students may also occasionally be “appreciated, mothered and pampered” (p. 3214) in the classroom environment and placement settings, which may artificially increase their ability to succeed in the program. Further exploration of privilege in relation to the educational experiences of male students in non-traditional fields is an important undertaking that extends beyond the scope of the present study.

### **Strategies to Support Male ECE Students**

Researchers that have examined the perspectives of male ECE students have identified strategies to support these students at the post-secondary level. While there are commonalities in the ideas presented, these recommendations have not yet been validated through longitudinal studies. Suggestions that recur throughout the literature on male ECE students include scholarships, mentoring, and supportive environments.

Scholarships for male ECE students have been proposed as a support mechanism. However, the strategy of providing financial incentives to boost male enrolment numbers (Holm, Janairo, Jordan, & Wright, 2013; Nelson & Shikwambi, 2010; Russell, 2013) has been met with some resistance. The argument against some form of male-centric scholarship is that it creates a system of inequity that favours male students over prospective female students (d’Arcy, 2015; Farquhar, 2012). Further, as stated in the previous section, the historical tradition of men as a dominant, as opposed to an oppressed, segment of the population precludes them from equity-focused financial opportunities (d’Arcy, 2015).

In light of the aforementioned challenges faced by male ECE students, a less controversial proposal is to link these students with a responsive faculty mentor (d’Arcy, 2015, Friedman, 2010; Nelson & Shikwambi, 2010). Nelson and Shikwambi (2010) supported the strategy of offering positive mentoring experiences as it has been shown to reduce attrition rates. The possibility of placing male students with male mentors, specifically in practicum settings, has been suggested

to help bolster transitions into the ECE work environment (Besnard & Diren, 2010a, d’Arcy, 2015).

In addition to mentorship programs, the practice of ensuring inclusive, anti-bias classrooms and practicum environments has been proposed to actively support male ECE students. Nelson and Shikwambi (2010) highlighted the importance of examining the “cultural climate” (p. 39) created by faculty and placement teachers; biases must first be recognized before they can be addressed. In addition, language used in the classroom should be gender-inclusive (Nelson & Shikwambi, 2010) along with the images contained in course readings and presentations (Piburn, 2011).

Although many key issues pertinent to male ECE students have been identified, there remains a gap in the research on educational experiences in the multicultural Greater Toronto Area (GTA). The purpose of the present study was to expand the body of knowledge on the enrolment and retention of male ECE students in post-secondary classrooms. Encompassing a time span of eight years, from 2008 to 2015, this analysis of enrolment, graduation and interview data aimed to provide a portrait of male involvement at a large Ontario college. In addition, the present study sought to confirm and expand upon previously identified support strategies for male ECE students, as identified by Besnard and Diren (2010a, 2010b). For the purpose of this paper, the designation of “male” or “female” was based on how students chose to identify themselves within the college’s record system.

The study by Besnard and Diren (2010a, 2010b) was the most comprehensive and applicable study on male ECE students to date. Given the geographical proximity of Quebec and Ontario, it was hypothesized that enrolment and graduation rates at an Ontario college would be similar to those found in Quebec, with male enrolment and graduation rates comparable to 3.6% and 25%, respectively (Besnard & Diren, 2010a). Beyond attempting to replicate their findings in a different provincial context, the present study also aimed to expand on their work in order to further delineate the extent of male underrepresentation in post-secondary ECE programs in culturally diverse regions of the country. In addition to the quantitative analysis of enrolment and graduation data, the present study sought to further identify factors that contribute to male students successfully completing the ECE program, with a goal of highlighting additional targeted support strategies.

### **Method**

In order to gain a more detailed understanding of the male ECE student experience at a large Ontario college, a mixed methods approach was employed. The quantitative component of this study

provided descriptive and inferential statistics related to enrolment and graduation rates for male ECE students. The qualitative component provided context to these numbers through a series of one-on-one, semi-structured interviews with male students currently enrolled in the ECE program and those that had graduated.

Prior to the collection of data and completion of interviews, this study received approval from the institution's Research Ethics Board (REB). Due to the potential power imbalance inherent in teacher-student relationships, a third-party researcher from the institution completed participant recruitment and gathering of informed consent for interviews.

### Participants

The qualitative component of this study was comprised of one-on-one, semi-structured interviews with male ECE students and graduates of the ECE program. Invitations to participate in the study were sent by email via a third-party researcher to current and former male ECE students using email addresses on file at the college. Respondents completed an informed consent form and their contact information was forwarded to the researcher. Several limitations restricted the number of participants in these interviews. First, the low number of male students enrolled in the ECE program at the college limited the population size. Second, due to ethical concerns about a power imbalance, the study excluded any students that were registered in courses taught by the researcher (n=6). In total, four students were interviewed, with one participant being a graduate of the program.

### Materials

The quantitative component of this study involved ECE students at a single Ontario college, who self-identified their gender as male, as the target population (n=159). The ECE diploma program at this college requires two years to complete. Enrolment and graduation data were initially gathered through password-protected spreadsheets from the registrar's office for a five-year period (September 2009 – April 2015) to allow for three graduating cohorts (n=1442). Initial analysis of these data pointed towards a gradual and consistent decline in graduation rates for male ECE students starting in Fall 2011 (see Figure 1). To confirm whether this decline was part of an ongoing trend, enrolment and graduation data were gathered from the preceding, and overlapping, five-year period (September 2008 – April 2012) to allow for another three graduating cohorts (n=1567). In total, data were collected for an eight-year period (September 2008 – April 2015) to allow for six graduating cohorts (N=3009).

The qualitative interview protocol (see Appendix) contained a simple opening question that focussed on demographic

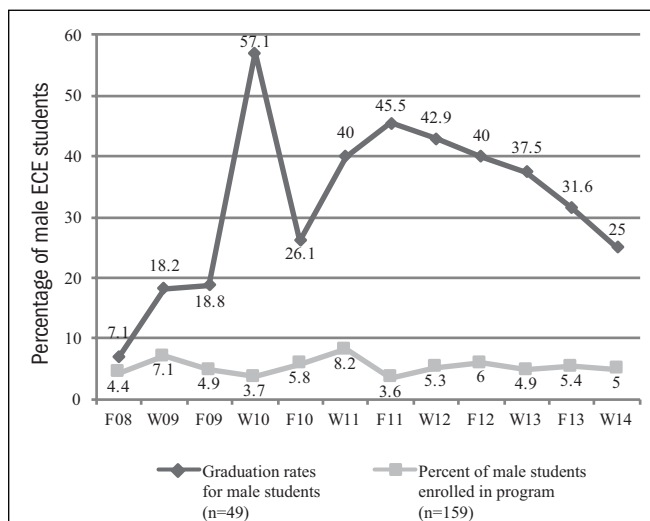


Figure 1. Enrolment data in relation to graduation rates for male ECE students.

information, followed by four open-ended questions, for example, what factors contributed to you applying for the ECE program at this college? After the predetermined questions ended, interview participants were given the opportunity to add any further comments or expand upon previous ideas.

### Procedure

The collection of quantitative data included both fall and winter intakes into the ECE program, and excluded the summer intake. Although the fall and winter cohorts started at different times, they graduated at the same time (April), which allowed for comparison between data sets with similar variables. In other words, the students in both strands experienced similar educational environments, for example, academic policies and curriculum, concurrently. The different graduation schedule for students in the summer intake (December) meant that they could be exposed to new variables in their final semester of study, for example, updated policies and curriculum content. Further, due to the small number of students in a typical summer intake, for example, one section of students compared with multiple sections in the fall/winter, the disparity in sample size would have made it more difficult to draw comparisons between the groups. With summer intake data excluded, the enrolment and completion data for fall and winter intakes then formed a non-random sample to allow for calculation of descriptive and inferential statistics. Male enrolment and graduation rates were compared between the fall and winter cohorts and against female rates, using the Z-ratio to test for the significance of difference between two independent proportions.

In terms of the qualitative component of the present study, the researcher arranged interviews with students who

had submitted their informed consent form to the third-party researcher. Interviews were conducted and audio-recorded in available office space at the college, and lasted between 15-20 minutes in duration. The participants were provided with a ten-dollar gift card as a token of thanks. Interview data files were then transcribed by the researcher using the *Transcribe* web app available on the Google Chrome web browser. The resulting transcripts were analyzed using a coding system developed by the researcher and condensed into themes consistent with those from the literature, including deterrents, protective factors, and support strategies.

## Results

### Quantitative Analysis

The data for each graduating cohort were divided into two separate strands, the fall and winter intakes. Although the fall intake accounted for more students ( $n=2032$ ) than the winter intake ( $n=977$ ), the proportion of males in each cohort did not differ significantly,  $Z = -0.76, p > 0.05$ . Specifically, over the course of six graduating cohorts from September 2008 to April

2015, the average percentage of male students enrolled in the fall was 5.0% ( $M = 17$  students,  $SD = 4.0$ ), and for the winter intake was 5.7% ( $M = 9$  students,  $SD = 2.9$ ) (see Table 1). Because the proportions did not differ, these two sets of cohorts were combined for subsequent analyses.

### Enrolment

Over the span of eight years, male students accounted for a total of 5.3% of students enrolled in the ECE program at the college (see Table 1). This proportion was significantly lower than that of their female counterparts, who comprised 94.7%,  $Z = -69.4, p < 0.001$ .

### Graduation Rates

The overall graduation rate for male students was 30.8% ( $n=49$  graduates), or approximately one-third of the enrolled male students (see Table 2). Further, the overall rate for female students was 47.1% ( $n=1342$ ), or roughly one-half of the enrolled female students. A Z-test revealed a significant difference in the graduation rates for male and female students, with a significantly greater proportion of females graduating than males,  $Z = -4.00, p < 0.001$ .

**Table 1**

Enrolment data: Percent of students identified as male

Cohort start date	Cohort end date	Male	Female	Total	Percentage male
F08	S10	14	302	316	4.4%
W09	S10	11	143	154	7.1%
F09	S11	16	312	328	4.9%
W10	S11	7	181	188	3.7%
F10	S12	23	376	399	5.8%
W11	S12	15	167	182	8.2%
F11	S13	11	294	305	3.6%
W12	S13	7	124	131	5.3%
F12	S14	20	315	335	6.0%
W13	S14	8	155	163	4.9%
F13	S15	19	330	349	5.4%
W14	S15	8	151	159	5.0%
<b>Totals (N=3009)</b>		159 <b>Overall Percent</b> 5.3%	2850 <b>Overall Percent</b> 94.7%	3,009	Average $M=5.4\%$
		Fall $M = 17$ Winter $M = 9$		Average Fall $M = 339$ Average Winter $M = 163$	Average Fall $M = 5.0$ Average Winter $M = 5.7$

Note. "F" indicates fall intake (September), "W" indicates winter intake (January), and "S" indicates spring completion of the program (April).

## Trends in the Data

Although the overall proportion of males enrolled in the fall and winter cohorts did not differ significantly, an examination of the graduation rates revealed some interesting trends. While the quantity of male graduates was greater in the fall cohorts ( $n=29$ ) versus the winter ( $n=20$ ), the graduation rates appeared to differ (see Figure 1). In terms of percentage, 28.2% of male students in the fall strand ( $n=103$ ) graduated, compared to 35.7% of male students in the winter strand ( $n=56$ ); a difference of 7.5 percentage points. However, a Z-test for independent proportions revealed that this difference was not significant,  $Z = -0.99$ ,  $p > 0.05$ . While the average graduation rate for male students may be higher for the winter intake, there was similar variability in the data for each cohort. Further, seemingly anomalous graduation rates, for example, 57.1% in Winter 2010 and 7.1% in Fall 2008, most likely skewed the data for both strands (see Figure 2).

The graduation rates for male students were plotted on a line graph and transposed with the enrollment data outlined in Table 1 (see Figure 1). Once these two data sets were combined, an intriguing alignment between the numbers for graduation rates and

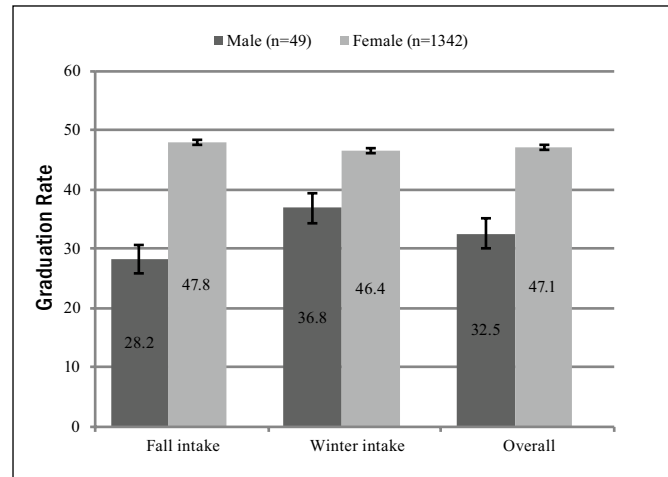


Figure 2. A comparison between fall, winter, and overall graduation rates for ECE students. Error bars depict the standard error for each group.

male representation became visible. The two highest graduation rates, 57.1% (Winter 2010) and 45.5% (Fall 2011), coincided with the lowest enrollment of male students at 3.7% and 3.6% respectively. While it is tempting to speculate on the meaning of this trend, the very small sample sizes preclude that possibility.

## Table 2

Success rates: Percent of enrolled male and female ECE students who graduated

Cohort start date	Cohort end date	Male graduated/enrolled	Female graduated/enrolled	Percentage male graduates	Percentage female graduates
F08	S10	1/14	120/302	7.1%	39.7%
W09	S10	2/11	56/143	18.2%	39.2%
F09	S11	3/16	120/312	18.8%	38.5%
W10	S11	4/7	74/181	57.1%	40.9%
F10	S12	6/23	162/376	26.1%	43.1%
W11	S12	6/15	75/167	40.0%	44.9%
F11	S13	5/11	170/294	45.5%	57.8%
W12	S13	3/7	72/124	42.9%	58.1%
F12	S14	8/20	169/315	40.0%	53.7%
W13	S14	3/8	78/155	37.5%	50.3%
F13	S15	6/19	178/330	31.6%	53.9%
W14	S15	2/8	68/151	25%	45.0%
<b>Totals (N=3009)</b>		49/159 <b>Overall 30.8%</b>	1342/2850 <b>Overall 47.1%</b>	Average $M = 32.5\%$	Average $M = 47.1\%$
				Average Fall $M = 28.2$ Total Fall 28.2%	Average Fall $M = 47.8$ Average Winter $M = 46.4$
				Average Winter $M = 36.8$ Total Winter 35.7%	

Note. "F" indicates fall intake (September), "W" indicates winter intake (January), and "S" indicates spring completion of the program (April).

As noted previously, a downward trend in graduation rates was observed after Fall 2011 (see Figure 1). Interestingly, enrolment remained relatively stable during this time, with 4.9% at the lowest point (Winter 2013) and 6% at the highest point (Fall 2012). A  $\chi^2$  contingency table analysis revealed that none of the differences in proportions over the eight year period were statistically significant,  $\chi^2(11) = 11.38, p > 0.05$ . Still, while enrolment remained fairly constant between 2012 and 2014, graduation rates dropped from 42.9% in Winter 2012 to 25% in Winter 2014. Whether this drop in graduation rates represents a meaningful trend, or just random variation, is not clear, and warrants further investigation.

### Qualitative Analysis

To further understand and contextualize the enrolment and graduation data, one-on-one, semi-structured interviews were conducted with four male students who either completed, or were enrolled in the ECE program. The students in the study were given the following pseudonyms (in alphabetical order): Amir, Bill, Chris and Jake. Of these students, Bill had successfully graduated from the ECE program, while Amir, Chris and Jake were at various stages in their programs.

In order to analyze the qualitative data, interview transcripts were coded, based on a broad range of descriptors, and then condensed into themes by the researcher. Two over-arching components or major themes present in the literature on male ECE students became apparent throughout the coding of the data: deterrents and protective factors. These themes were drawn from the existing literature on male ECE students, and the researcher identified additional sub-themes that arose. Specifically, each major theme was broken down into four related sub-themes (see Figure 3). For deterrents, the sub-themes included gender imbalance, salary, bias and external factors, while the subthemes for protective factors included experience, job prospects, support systems and personal attributes. In addition, all students offered input on support strategies throughout the interviews, and these insights were combined into a separate discussion following the thematic analysis.

### Deterrents

**Gender Imbalance.** All four students experienced gender imbalance in school and placement settings. Amir observed that there were “many, many female teachers in the child care centre, and then school, where [he] was placed.” Two students, Bill and Chris, stated that they were the only male students in their classes. Chris jokingly described how the faculty would say “good morning ladies, and Chris,” at the beginning of class. Both Bill and Jake used the word “awkward” to describe the experience of

being the only male in a college classroom. Bill described how, at first, he thought to himself, “what am I getting into?” On the other hand, Jake, who had previous experience in the field through placement and work opportunities, stated that it “wasn’t really a shock to [him] being around all girls.”

**Salary.** Two students, Jake and Chris, described hearing feedback from peer groups and work groups that the pay for ECEs was low. Jake mentioned some concern about wages, but stated that “it will work out, I’m not too stressed out about the pay and everything” and further cited his passion for the career as a driving factor in his decision-making process. Chris cited the Ontario wage enhancement (Government of Ontario, 2016) as proof that wages are starting to increase in the ECE sector. In contrast, when asked to provide any additional information not covered in the interview, Bill described low wages as a major barrier for male students entering the ECE field because “you will not be able to support a family on this salary.”

**Bias.** All of the students interviewed described experiencing biased attitudes about the ECE profession, in general, and male involvement in childcare. Chris and Bill specifically mentioned hearing the stereotype that the ECE profession is “babysitting.” In addition, the interviewees experienced the stereotype that the male gender cannot effectively interact with young children. Bill mentioned that male ECE students confront layered stereotypes and that “you have to [fight] both, it’s discouraging.”

Amir, Chris and Jake specifically mentioned having their ability to work with young children either overtly or covertly called into question. Amir mentioned that he was specifically asked by one of the co-operating teachers at placement why he, as a male student, was in the ECE program. Amir stated that this question “shocked [him] ... [and was] difficult to face,” especially when it was coming from a professional in the field. In one placement, Chris felt that the teachers limited his interactions with the children by having him “doing a lot of cleaning.” During a work experience, Jake felt “condemned” by another staff member when, during a typical adult-child hug, the child kissed him without any warning. The staff member then stated to Jake, “if anyone ever saw that ... you would have never been able to work in a daycare ever again.” Jake further mentioned that he was aware of the “stigma” associated with male educators who work with young children.

**External factors.** For all interviewees, the bias they experienced towards male educators was primarily experienced outside of the college setting. The three major sources of bias were friends, parents at the childcare, and ECE professionals (including co-operating teachers and co-workers). Jake and



Chris received negative responses from friends with regard to their decision to pursue ECE qualifications. Jake stated that “a lot of people [gave] him a hard time [about the] pay scale,” and Chris felt pressure from friends who asked him: “why do you want to get into that?” In addition to friends, this questioning of intent extended to parents at the childcare centres. Chris stated that he felt he was “looked at differently by the parents,” while Jake said the he felt “the parents look at [him] like, ‘who’s this guy in here?’”

Amir described how his decision to pursue ECE qualifications was questioned by the co-operating teacher at placement. He further discussed how he felt the need to prove his worth as an ECE throughout the semester, and only felt accepted after successfully demonstrating the required competencies. Jake received negative viewpoints about the ECE profession from co-workers, for example, the low pay, and was not supported by a coworker during the kissing incident (see above). Chris described how a male colleague of his had a discussion with an ECE in the field that resulted in discouragement. This colleague was told that being an ECE “was a lot of work for very little pay ... [and] that a lot of the female teachers kind of take advantage of you.” Chris further explained how his colleague’s grades began to decrease, and how he contemplated withdrawing from the program, all because of “one little conversation with someone else.”

### **Protective Factors**

**Experience.** There was a convergence in demographic details for the interviewees in that they all had some form of professional work/study experience prior to entering the ECE program. Two students, Jake and Amir, had direct experience working with young children. Jake gained childcare experience through an organization that offered paid community placements and Amir taught elementary-level children in private school settings. The other two students, Bill and Chris, had previous unrelated full-time work and post-secondary school experience, respectively, before enrolling at the college.

**Job prospects.** Each of the four students described motivation to get a job as an important factor in regards to pursuing ECE qualifications. Bill came to the ECE program through an employment agency because of restructuring at his previous employment. For Jake, the community placement led to paid work with children, and he viewed ECE as a stable option to help support his creative pursuits. Chris cited a lack of career options in his previous area of studies, and brought up the point of better prospects in this field as a male. Further, he was aware of the limited number of males in the field of ECE, and saw this as an advantage. Chris seemed unsettled with this

position of privilege, and brought up the point that this advantage he felt over female job candidates made him feel uncomfortable, or “weird” as he put it. The fourth student, Amir, was also aware of the need for male educators in the field of ECE, and mentioned this as a contributing factor to pursuing ECE instead of elementary or secondary qualifications. In addition, three of the four students specifically mentioned the enjoyment factor involved in working with young children. When completing his research about the ECE program, Chris said that it looked “exciting and fun,” and Jake stated that if “more guys knew what [we] did here, I think they’d love it.”

**Support systems.** Each of the four students identified the importance of personal, professional, or organizational supports that helped them either get in to, or succeed in the ECE program. Both Chris and Jake identified specific family members as supporting them with their decision to enter the ECE program. At the college, all four students mentioned that the supportive learning environment was related to their successful completion of courses. Faculty members were specifically identified in terms of being supportive and making them feel welcome in the program regardless of their identified gender. Amir felt that faculty “treated [him] equally” and Jake used the word “unbiased” to describe his teachers. Jake mentioned a specific teacher that took extra time to meet with him when he was feeling “stressed and overwhelmed,” and how this helped him persevere in the program.

In addition to the faculty, two students described their peers as being part of their professional support system. Bill identified that “other students kept [him] going,” especially when faced with the challenges of multiple assignments and field placement responsibilities. Further, Bill identified the sense of community, and resulting feeling of belonging that had developed in his cohort, as an important factor in his successful graduation from the program. Chris specifically addressed the importance that humour played in his interactions with other students, especially since he was the only male student in the classroom.

Outside of the classroom setting, two of the students identified support systems at the community level. Bill was directed to the field of ECE through an employment agency, and Jake first experienced childcare through a community placement organization. Further, once at school, Jake found support through services offered at the college, for example, student writing services.

**Personal attributes.** Throughout the interviews, each of the students demonstrated similar personality traits that link with their progression in the ECE program. These traits can be

condensed to three primary traits: *commitment*, *confidence*, and *self-efficacy*.

In terms of commitment, both Amir and Jake used the word “passion” to describe their interest in becoming an educator, which links with the fact that both Amir and Jake had teaching experience prior to registering in the ECE program at the college.

Confidence can be measured in terms of the students’ perceived ability to respond to overt or subtle challenges to their ability to work with young children. In response to being questioned about his decision to enroll in the ECE program while at placement, Amir responded by saying that “[there are] two things I cannot do in this field, bearing a child and breastfeeding.” A parent at Bill’s placement asked him, “How can you do this?” While this question seems rhetorical and good-natured at first glance, a male student already doubting their place in the program could interpret it negatively. Bill responded to the parent by saying, “it just takes a lot of patience.” Chris, who felt that the parents were taken aback by his presence in the childcare, made it a personal goal to introduce himself to each parent at the centre.

Though related to confidence, self-efficacy involves more finely tuned responses from an individual. As defined by Bandura (1977), self-efficacy refers to how “people process, weigh, and integrate diverse sources of information concerning their capability, and they regulate their choice behavior and effort expenditure accordingly” (p. 212). Amir, Chris and Jake described that they were exposed to individuals with biased attitudes during placement, but persevered using different strategies. Amir decided to take action and consulted his co-operating teacher, but continued to feel like he had to prove his worth. Chris and Jake identified more passive strategies. At placement, Chris overheard teachers talking about him in the lunchroom. Instead of confronting the staff or becoming deterred by the situation, Chris stated that it “wasn’t that big of a deal. I got through it and I passed with a good grade. You take that to the side [*sic*][and] you don’t let it bother you.” Jake shared a similar nonchalant response, and attributed co-workers’ negative views of the ECE profession to their “personal problems ... [and] projecting their own issues” instead of internalizing their criticism.

### **Student Suggested Support Strategies**

In addition to providing details on deterrents and protective factors, each student identified potential strategies to both attract and retain male students. These strategies were condensed into two major areas and include *classroom-level* strategies implemented by faculty, and *institution-level* strategies requiring the support of the organization.

**Classroom-level.** The classroom-level strategies suggested by the interviewees included: one-on-one interactions, group work opportunities, and course content on appropriate touch. The first two measures were already being practiced at the institution where these students attended, however, consistency across faculty (both full and part time) has not been assessed. In terms of one-on-one interactions, Amir noted the importance of seeking “regular feedback from teachers and ... [having] a good connection with them.” Chris and Jake both specifically mentioned the phrase “one-on-one time” in their suggestions for supporting male ECE students. Chris suggested that these types of interactions could help male students, not only in terms of clarifying course content, but to support students as they adapt to the program and “talk about the differences [of being a male ECE student and] how it’s affecting you.”

Along with connections with faculty, group work was suggested as a support strategy for male students. Two students described the importance of having connections with other students in the classroom, and that these peer support groups enhanced their ability to feel integrated in the program and persevere with coursework. Jake mentioned that group work acted as an icebreaker, which helped him get to know other students in the program. Bill found that group work was “helpful because [they] could bounce ideas off each other if anything [was] unclear,” whereas if you’re working by yourself and have “writer’s block ... you have to dig yourself out.”

The final classroom-level strategy involved the inclusion of guidelines for appropriate touch in the ECE program’s curriculum. Jake mentioned that in the toddler room at his placement, every time he would “sit down, like guaranteed ... one or two [toddlers] come and try and ... sit on me.” Jake described that he “think[s] it’s okay,” but a “little bit of reassurance” would help him feel less “awkward,” especially being a male working with young children. If appropriate touch was clearly explained and covered in class, Jake mentioned that male ECE students would feel more comfortable at placement during their interactions with children.

**Institution-level.** Several strategies offered by the interviewees would require implementation by departmental or administrative teams, and included: supportive environments outside of the classroom, financial support, and a greater male presence. In order to further support male ECE students at the college, three students specifically discussed the importance of supportive environments, especially in practicum settings. Amir, Chris and Jake described how they experienced ECE professionals with biased attitudes about male students and the profession in general. As a strategy, Amir and Chris proposed that having male

ECE students placed with co-operating teachers who consistently practice an inclusive approach would be beneficial.

Three of the four students identified the importance of having a male presence in either the faculty or student population. For Bill, who was also the only male student in his class, having a male faculty member as a teacher was important and confirmed that “there are males in classroom.” Both Jake and Amir mentioned the importance of having other male students in the classroom. Jake found it reassuring to have “someone ... you can relate to” in the classroom. Amir echoed this sentiment, and reached out to a male student who stopped attending class to offer himself and another male student as a support system.

## General Discussion

### Male Representation

The data analyzed in the present study covered an eight-year span at an ECE program situated in a large Ontario college and revealed similar enrolment and graduation rates for male ECE students when compared to data from Quebec, as hypothesized (Besnard & Diren, 2010a, 2010b). In terms of the enrolment of male ECE students, the averages between the two were comparable, with 5.4% in Ontario and 3.6% in Quebec (Besnard & Diren, 2010b). Graduation rates for male ECE students were slightly higher in Ontario, with one-third (30.8%) of enrolled students graduating as opposed to one-quarter (25%) of male ECE students in Quebec (Besnard & Diren, 2010b). While the average enrolment and graduation rates for male ECE students at the Ontario college were slightly higher, this variation in the data may partially be explained by differences in sample size. The data presented in this study were based on a single institution over an eight-year span, while the Quebec data were based on multiple institutions over a ten-year span (Besnard & Diren, 2010b).

### Special Treatment

Although an increased male presence was suggested by the participants in the present study as a possible support strategy, at the same time, having a limited number of male students in the classroom may yet be advantageous. The quantitative data in the present study showed that the two highest graduation rates for male ECE students coincided with the two lowest percentages of male enrolment (see Figure 1). Moreover, Besnard and Diren (2010b) raised the possibility of actual or perceived special treatment for males, as a minority in the classroom; they specifically quoted a male student who said that “[teachers] take care of us a bit more because they do not want us to leave” (p. 3211). This may also be controversial for some, especially when framed by the concept of male privilege. Further, special

treatment calls into question the professionalism of faculty. While this link between graduation rates and enrolment could be coincidental, it is important for ECE programs to take steps to avoid actual and perceived special treatment for male students (d’Arcy, 2015). An examination of classroom composition, for example, assessing whether male ECE students have demonstrated significantly higher graduation rates when randomly spread throughout multiple course sections versus being purposefully grouped together in a cohort model, could potentially inform the development of new intervention approaches.

### Recommended Support Strategies

The quantitative analysis of graduation data presented in this study showed a significant difference between male and female ECE students. Given that two-thirds of male students who enroll in ECE leave the program before completion, there is an urgent need to devise support strategies to reduce such high levels of attrition. The interviews in the present study corroborate previous evidence that suggests that male ECE students are confronted with multiple deterrents, including gender imbalance, wage uncertainty, and biased interactions, often before they even step into a post-secondary classroom.

The interview data contained many similarities with the literature on male ECE students, for example, the pervasiveness of negative stereotypes (Besnard & Diren, 2010a, 2010b) and the importance of making connections with faculty (Nelson & Shikwambi, 2010). The strategies discussed below (see Figure 4) were drawn from interviews with male ECE students for this study and the literature on the topic of male ECE students. These support strategies are divided into two levels of implementation: organizational strategies requiring administrative oversight and teaching strategies delivered by faculty. Absent from this discussion of recommended strategies is the implementation of financial incentives for male ECE students. Scholarships are not being proposed, given the controversy surrounding inequity for

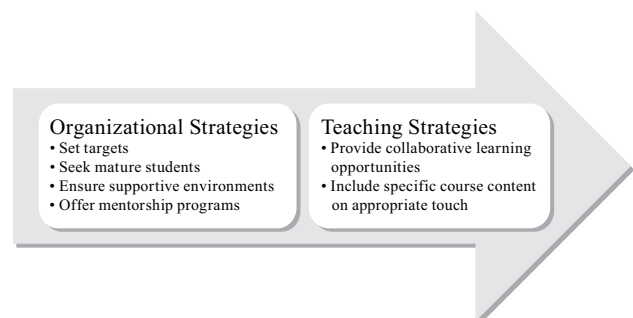


Figure 4. Recommended support strategies to increase the enrolment and retention of male ECE students.

other minority groups, especially groups that may not have the same level of access and privilege traditionally associated with the male gender.

## **Organizational Strategies**

**Set targets.** In the interviews completed for this study, both Amir and Bill stressed the importance of change at the institutional level to enhance male involvement in ECE programs and childcare. An achievable strategy that can be implemented by institutions is setting targets for male involvement. Jones (2009) identifies the necessity of setting specific targets in childcare and the resulting positive impacts in several European countries. Yang (2013) further writes, “no countries ... have managed to increase male participation without specific government policies to encourage it” (p. 6). At the college level, ECE departments should identify current statistics on male enrolment in the program and set reasonable targets for growth. The average enrolment for male students was identified as 5.4% in this study and hence, the target for enrolment could be set in the range of 6-10% depending on feedback from stakeholders. These targets would serve to coordinate efforts to increase male participation in the ECE program.

**Seek mature students.** All of the students interviewed in this study had formalized work/study experiences before enrolling in the ECE program, which differs from the traditional direct-entry from high school pathway. Amir and Jake had previous educational experience with young children, while Bill and Chris had engaged in previous work and post-secondary studies respectively. Profiles of successful male educators often mention work and school experience as well (Friedman, 2010; Nelson & Shikwambi, 2010). Besnard and Diren (2010b), highlighted the link between maturity and perseverance in ECE programs in their research and recommend targeting mature students as a recruitment strategy. Besnard and Diren (2010b) also found that mature students often demonstrate comfort in their identity and seem less impacted by stereotypes. Further, they suggested that the life experience of mature students often resulted in having increased confidence while navigating the deterrents faced by male educators (Besnard & Diren, 2010b). Targeted advertisements addressing mature male students/employees, combined with collaborations with community employment agencies, would help support the implementation of this support strategy.

**Ensure supportive environments.** One of the key deterrents faced by male ECE students is the persistence of negative stereotypes and resulting biased opinions faced outside of the college classroom. While the students interviewed noted support

from faculty, three of the four students had negative interactions at practicum and workplace settings. Amir and Chris specified that students should be placed in centres that provide responsive and inclusive environments for male ECE students. Chris shared a story of a colleague who almost ended his studies because of a negative interaction with a professional in the field. Indeed, Besnard and Diren (2010a) noted that negative placement experiences are often the “trigger that leads [male students] to leave the program” (p. 3). Practicum settings should be reviewed for discriminatory practices, e.g., not allowing male students to change diapers when female students are allowed, and should be provided with resources to help alleviate parent/guardian misconceptions about male students.

**Offer mentorship programs.** Once in the program, male ECE students should have the opportunity to be linked with a mentor. Three of the four students interviewed mentioned the importance of connecting with faculty as a support measure. Chris and Jake specifically mentioned that faculty could help male students to integrate into the program by providing a discussion partner. The idea of linking male ECE students with a responsive mentor is supported in the literature (Besnard & Diren, 2010b; Nelson & Shikwambi, 2010) and is evident in profiles on successful male educators (Friedman, 2010).

## **Teaching Strategies**

**Provide collaborative learning opportunities.** Collaborative learning opportunities allow students to engage with their peers, expand their knowledge base and build social competencies (Osterholt & Barratt, 2010). In the interviews, Bill and Jake highlighted the importance of group work in supporting peer integration and collaborative problem solving. While these types of learning opportunities are promoted at the College in this study, the consistency of practice across faculty (both full and part time) is unknown. Discussions on this topic at faculty meetings could help draw the connection between collaborative learning opportunities and social integration for male students. Further, hands-on, collaborative learning classrooms have been identified as particularly supportive of male ECE students (Besnard & Diren, 2010a).

**Include specific course content on appropriate touch.** A major deterrent faced by male students interested in pursuing the ECE profession is the unnerving stereotype of male educators being sexual predators (Crisp & King, 2016; Russell, 2013; Tucker, 2015; Weaver-Hightower, 2011). The impact of this stereotype, as discussed by Jake in his interview, is the creation of doubt in male ECE students that can hinder their positive interactions with children in placement settings. Jake was unsure about something

as common and essential to quality care as toddlers sitting on a teacher's lap to read a book. To address this stereotype, and reassure male ECE students, specific course content should be developed that provides guidelines for appropriate touch. Besnard and Diren (2010a) support this strategy and specifically mention providing students with strategies to address false accusations. Blatz (as cited in Ho, 2016) describes the importance of developing *touch* policies, as opposed to the common no-touch policy found in elementary schools, to support positive interactions with children.

## Conclusions

The underrepresentation of male educators in the field of ECE (Statistics Canada, 2016) is consistent with numbers found in post-secondary classrooms (Besnard & Diren, 2010b). This study found that in one Ontario college, the average enrolment for male ECE students was 5.4% over an eight-year time span, and of that population only about a third of male students graduated from the ECE program. In post-secondary ECE classrooms, male students face a number of deterrents, from bias to gender imbalance. However, these variables can potentially be mitigated through protective factors, for example, connections with faculty, motivation and self-efficacy.

With the continued low enrolment for male ECE students, and recent downward trend in graduation rates, the following evidence-based support strategies are recommended to help increase enrolment and retention: set targets for increased male participation; seek mature students through advertising and liaisons with community agencies; ensure supportive environments in classroom and practicum settings; offer mentorship programs; provide collaborative learning experiences in the classroom; and include specific course content on appropriate touch.

## Limitations and Future Research

The scope of this study is limited to issues that impact enrolment and retention for male ECE students in post-secondary classrooms. Absent from this study is an examination of the benefits of male involvement, as the framing of the discussions presented in this study are based on occupational segregation as opposed to teaching efficacy.

In terms of the quantitative and qualitative components of this study, both the collection of enrolment data and involvement of interview participants encountered limitations with sample size. For the quantitative data, some of the statistical variance in the numbers for male students could be the result of a smaller sample size when compared with female students. In terms of

the qualitative component, the low enrollment numbers for male students limited the population size. This limitation became more pronounced given the number of male students who were enrolled in courses taught by the researcher, and thereby excluded from participation.

A further limitation on this study includes the lack of interview data from male students who left the program before graduating. While invitations to participate were sent through email via a third-party recruiter, no responses were received. This is an important area for future research, to identify factors that led these students to leave their programs.

Given the diverse population of students at the college where this study was completed, the results are limited to the unique identities included here and can't be generalized to other institutions. An additional limitation concerns the experiences of diverse students and how the components of diversity, e.g., race, sexuality, age, and ability, intersect with and inform the student experience. Potential barriers and support strategies that are tailored to diverse student experiences may not have been identified in this study, and warrant further study.

Finally, the purpose of this descriptive study was to expand our knowledge of the experiences of male ECE students in post-secondary classrooms in relation to enrolment and retention. To enhance the findings presented in this study, an expansion of the scope of research should be undertaken to include multiple institutions in the province. This larger sample size would provide a more detailed understanding of male ECE student experiences at the provincial level. Further, an expanded study would ideally include the perspectives of male students who do not complete their ECE programs, as this demographic was not included in this study. In addition, the strategies recommended in this study—where implemented—should be tracked to validate their potential success, or ineffectiveness, in recruiting and retaining male ECE students.

## Contact

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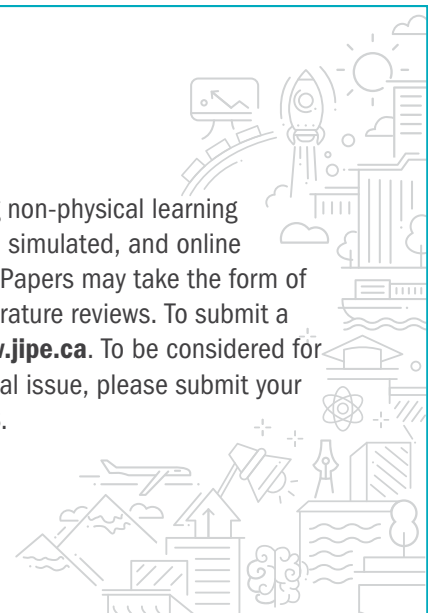
## Call for Papers

The Journal of Innovation in Polytechnic Education (JIPE) is pleased to announce a call for papers for a special issue of the journal, titled "**Innovative Learning Spaces**". To truly support formal and informal learning that it is ubiquitous, educators need to reimagine the ways in which students engage with the curriculum. In this issue, we will feature the latest in innovative learning

space design, including non-physical learning spaces, such as virtual, simulated, and online learning environments. Papers may take the form of empirical studies or literature reviews. To submit a paper, please visit **www.jipe.ca**. To be considered for publication in the special issue, please submit your paper by **July 15, 2018**.



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Education



## Appendix

### Interview Protocol

Interview Protocol	
Title of study: <i>Male ECE Students in Post-secondary Classrooms: Enrolment and Retention</i>	
Date:	Location:
Time interview began:	Time interview ended:
Status as an ECE student: <input type="checkbox"/> Currently enrolled in the Humber ECE program <input type="checkbox"/> Left the Humber ECE program <input type="checkbox"/> Graduated from the Humber ECE program	
Interviewer:	Pseudonym:
<p>Introduce myself and discuss the study using the following script:</p> <p><i>“The purpose of this mixed methods study is to gain a deeper understanding of the low numbers of male ECE students at this College. Along with this and other interviews with male ECE students and graduates, anonymous enrolment and graduation data for male ECE students from 2008-2015 will be analyzed. The information that you have shared will be used to develop strategies for attracting male ECE students to the program and supporting them during their time at Humber. You are welcome to review and initial the notes taken during this interview and you can withdraw your participation at anytime without fear of reprisal. Your identity will be kept confidential as you will be given a pseudonym for all rough notes and working documents, and your real name and any identifying features will not be used in the written report. This interview is being recorded and is scheduled to last 15 minutes.”</i></p> <p>Refer back to the signed informed consent form, and ask if there are any questions before starting the interview. Next, test the recording device and then begin recording.</p> <p>Questions (<i>more space will be included after each question for interviews</i>):</p> <ol style="list-style-type: none"><li>1. Please describe when, and for how long, you were an ECE student at Humber.</li><li>2. What factors contributed to you applying for the ECE program at Humber?</li><li>3. Were there any differences between your experiences in class and your experiences in field placement?</li><li>4. What factors contributed to you successfully completing, or leaving, the ECE program at Humber?</li><li>5. What suggestions would you have for Humber employees, e.g., faculty and field placement supervisors, to further support male ECE students?</li><li>6. Is there anything else that you would like to add that hasn't been covered, or that you would like to expand upon?</li></ol> <p>Stop the recording. Thank the interviewee for participating in the study and restate that their identity will remain confidential.</p> <p>Gift card given to interviewee.</p>	

## Nurse Faculty Experiences with Research at a Polytechnic: A Qualitative Study

Chau Ha & Madeline Press

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### Abstract

There is increasing pressure to engage in research within the polytechnic and college sector, which is a role not historical to the setting (Roberts & Glod, 2013). There is little literature that applies to polytechnic and college faculty as it pertains to engaging in research. The purpose of this qualitative study was to understand the lived experiences of nurse faculty at a polytechnic, and the barriers and facilitating factors they experienced as they engaged in a large research project. Seven faculty members participated in total. Five of the seven faculty members participated in two different focus groups, and the remaining two faculty members participated in individual interviews. Faculty were recruited from those who had recently participated in a large, collaborative research project at the institution. The participants experienced being a learner, being part of a community of practice, experiencing frustration, and needing more support in their ability to complete the research project. These findings are supported by the literature related to university faculty engaging in research. Recommendations for facilitating faculty's engagement in research include providing access to a variety of library databases, professional development opportunities, and institutional supports.

**Keywords:** Nursing, faculty, institutional support, library, polytechnic

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### Author Note

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**There is increased pressure on faculty at polytechnics and colleges** – particularly on faculty that teach in degree-granting programs, such as nursing – to engage in research and scholarly activities. An interesting observation made by Roberts and Glod (2013) was that nurse faculty roles have changed over time, with faculty educators at polytechnics and colleges being encouraged to evolve into teacher-scholars. They reported that the research role is increasingly becoming more common for nursing faculty at polytechnics and colleges, and the dilemmas arising from this role change include the following: not every faculty member agrees with the role change or expectation, part-time faculty require job security or the same rights as tenured faculty, and there are different role expectations between clinical practice and academia (Roberts & Glod, 2013).

The research environments at polytechnics and colleges are unique as compared to universities, where research is a historical expectation of the faculty role. The lived experiences of nursing faculty engaged in research at colleges and polytechnics are not well understood. Thus, information is lacking on how institutional leaders can facilitate research productivity and the research success of polytechnic and college faculty.

The current trend is for colleges and polytechnics to become more research intensive, resulting in an expectation that nurse faculty will engage in research and disseminate their findings. However, expecting faculty members to be active in all areas of scholarship including professional practice, research, and teaching may be an unrealistic expectation with respect to workloads (Fontenot, Hawkins, & Weiss, 2012). Traditionally, the institutional infrastructure has not been in place to support college and polytechnic faculty to engage in research and

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\***Brief Reports** are papers that report on empirical research, but are shorter and more limited in scope, such as results from a pilot study, or those with a small sample size.

scholarly activities. Morest (2015) stated that structural barriers such as rules, procedures, hiring contracts, funding, and collective agreements may hinder faculty members' engagement and success with research.

In a descriptive study exploring the motivation for research, Hardre (2012) found that college faculty members were intrinsically motivated to engage in research, but experienced external resource constraints. She found that faculty perceived that organizational expectations and demands on their time and energy exceeded what they could accomplish. Although research may be encouraged in polytechnics and colleges, the infrastructure may not be in place to support these activities.

Several barriers and facilitating factors for nursing faculty members engaging in scholarly work were identified in the literature. In an exploratory qualitative study of novice, doctoral-trained nurse faculty in Jordan, Al-Nawafleh, Zeilani, and Evans (2013) investigated factors that are important to developing a productive research program. The participants reported mentorship, leadership, and peer support were important to their success, but those supports were not always available. Despite having research knowledge and experience from their doctoral programs, these novice researchers still faced barriers to conducting research. Additionally, McDermid, Peters, Daly, and Jackson (2016) interviewed novice nurse academics and found three themes on how they developed resilience in their role as nurse educators: developing supportive collegial relationships through mentorship, having a positive outlook in the face of challenges in their role, and transformative growth through learning and professional development opportunities. Several other barriers to engaging in research have also been identified: time to do research, lack of research skills, difficulty managing work-life balance, lack of mentoring, conflict in the workplace, duties other than research, and lack of resources (Al-Nawafleh et al., 2013; Oyama et al., 2015).

Mentorship or communities of practice may benefit faculty members who are interested in improving their research skills. Holmes and Kozlowski (2014) stated participation in a learning community has benefits for novice faculty members increasing their research productivity. In their phenomenological study of the lived experiences of faculty in a research learning community, Holmes and Kozlowski (2014) identified five themes: accountability, belonging, interconnections, mentoring, and expectations. They suggested implementing a learning community to improve research productivity in educational institutions.

The purpose of this paper is to describe a qualitative study exploring the lived experiences of nursing faculty at a polytechnic

after engaging in a multi-institutional, multi-disciplinary, collaborative research project. This approach was taken to describe the perceptions, experiences, and feelings of nurse faculty as their polytechnic institution works to increase the scholarship activities within the faculty of nursing. This qualitative study will endeavour to add depth of understanding to the few empirical research articles found in the literature focused on the barriers and facilitators nurse faculty face when engaging in research activities at polytechnics and colleges.

## Method

### Background

Prior to the research presented here, nurse faculty researchers at a polytechnic were asked to participate in an interdisciplinary research project with a university team from 2014-2017, investigating miners' engagement in safety behaviours. The project resulted in multiple teams conducting scoping reviews on sub-topics supporting a broader research topic. As the interdisciplinary research project was nearing completion, an email was sent only to the polytechnic nurse faculty engaged in the project to recruit for the present study.

### Participants

As noted in Table 1, 7 of the 39 nurses that were recruited took part. Each had a Master's degree in nursing, but not a Ph.D., and since many nursing Masters' programs are not research focused, they had little experience conducting research and writing for publication. These novice faculty researchers were mentored by an investigative team consisting of a principal investigator (Ph.D.-prepared nurse faculty member and director of nursing scholarship), project manager (Ph.D.-prepared nurse faculty member), and the nursing liaison librarian.

### Materials and Procedure

The 7 participants were interviewed by a researcher who was not employed by the educational institution and did not participate in the interdisciplinary research project. Two of the participants were interviewed individually, and five of the participants were interviewed in a focus group. The interviews were conducted

**Table 1**  
*Demographics of Participants*

Demographic	Participants
Number of years in nursing practice	~13.5 years
Number of years teaching	~11 years
Highest degree obtained	Master's

*Note.* Due to a small sample size, more specific demographics were not collected

outside work hours, either in person or over the phone. Interviews were recorded and later transcribed by an administrative assistant. Each participant's experience was considered separately, and then all of the individual descriptions were combined into an overall description of the phenomenon under study. Prior to conducting the study, ethics approval was obtained. Informed consent was received from all participants. Participants were notified of the difficulty of maintaining anonymity due to the nature of group interviews.

Semi-structured interviews were used to collect the data for this study. The same questions were used in the individual interviews and the focus group interviews. The interviews lasted between 30 and 45 minutes. After obtaining informed consent, the participants were asked to respond to the interview questions listed in Table 2.

The researchers sought to understand the experiences of nurse faculty engaged in a large, interdisciplinary research project. To achieve this understanding, the researchers used Moustakas' (1994) modified Van Kaam method of analysis which included two stages. Stage one included bracketing, phenomenological reduction, imaginative variation and synthesis of meanings/essences, and stage two included developing narrative descriptions of the phenomenon representing the perceptions of the individual participants, and the experiences of the participant group.

### Trustworthiness

Bias was avoided in the following ways: (1) The interviewer was from another institution and had no contact with the participants except during the interview; (2) The transcripts were completed by an administrative assistant; (3) The researchers coded and themed the data independently of each other; (4) The results were discussed and agreed upon; and (5) Two of the coded transcripts were reviewed and analyzed by a nurse researcher with no relationship to the participants to help reduce researcher bias. Another means of ensuring trustworthiness was that the findings included verbatim examples from the participant interviews.

## Results

Four themes emerged from the interviews. The participants reported the following experiences: being a learner, being part of a community of practice, experiencing frustration, and needing more support in their ability to complete the research project.

### Being a Learner

The participants were novice researchers employed at a non-research-intensive polytechnic. Engaging in research has not been an expectation, and teaching is the primary focus. The

**Table 2**

### *Semi-structured Interview Questions*

Questions
How did you prepare yourself for engaging in research?
What factors helped or hindered your experience?
What dimensions or incidents of your experience with research stand out for you?
What changes to your practice do you attribute to your engagement in research?
What are your beliefs about engaging in research as part of your practice?
What influence did institutional policies have on your experience?
What influence did your colleagues have on your experience?
What were the challenges to engaging in research?
What supports did you have that helped you engage in research?
What role does library services play in your ongoing research efforts?

participants described working towards self-efficacy in their research skills and abilities. Reflecting on their past research experiences (or lack thereof), they described a lack of confidence with comments such as "well you've done a thesis, you know how to do this, so can you do it." (Interview Participant 1), and:

I am so new to this process and [...] lacking of experience, but I just really felt almost like I was on an assembly line, like I was being told what to do and I was trying to figure it out and do it, but I wasn't confident [...] (Focus Group Participant 2)

Participants also reported acquiring new knowledge through mentorship, and the experience of engaging in research:

Having my office near the PI [principle investigator] was very helpful because you could just [...] email a question anytime and it would get answered, [or] you would just bump into them at the photocopier and just say, hey. And even that commiserating was helpful. (Interview Participant 1)

Participants also described what they learned from engaging in this research project, such as: how to navigate the library's website, search the literature, use two different reference management software programs, use screen sharing applications, and gaining a greater familiarity with the research process.

It was a good learning experience in the sense that just recognizing some of the terminology [...]. But on the other hand, I realize really how unprepared I was for it and I think really should I really have even been doing this without better preparation...in the interim, I have actually taken a research class, not for this but for some other education I am doing and that really opened my eyes to, boy - I don't know that I should have even been responsible for any of those decisions I made. (Focus Group Participant 2)



As the participants gained skills and completed the project, they reflected on their learning and their skills acquisition.

[...]if I want to do this another time, now I feel like [...]if I do see something that I could make a change with then I feel like I know how to go about it. But I still would certainly need a lot of help. (Focus Group Participant 3)

### Being Part of a Community of Practice

The participants described how being part of a community of practice influenced their decision to participate in the research. They described being interested, engaging in opportunities, having a sense of obligation, making a difference, and feeling negligent when they did not follow through. The participants' interest in the research project and their commitment was affected by how the investigative team presented the project to the faculty, the nature of the project itself, and the faculty member's interest in the research question. As one participant noted, "I was interested when they came around and did all the presentations and were asking for people to help [...] you know, trying to get everybody more involved in research, and there was opportunity for everybody." (Interview Participant 2).

Most of the participants also experienced a feeling of responsibility. They reported feeling a sense of obligation to complete the study. The participants reported they volunteered to be a part of the research project because they valued the importance of research, and they felt obligated to keep current as part of their licensing requirement. Registered Nurses (RN) are accountable to maintain a level of proficiency in certain competencies, as dictated by a regulatory body to practice as an RN (Saskatchewan Registered Nurses Association, 2013). One of the competencies listed by the regulatory body is related to research.

Participants also reported feeling the need to meet the expectations placed on them by the nursing program and the core investigative team.

It's always been something that I do - trying to stay up on the research, especially teaching undergrads [...] you don't want them having old information before they're even working, so it's always something I've been doing. (Interview Participant 1)

The participants described wanting to make a difference. They felt a sense of satisfaction in being able to contribute to the health and safety of workers (which was the topic of the larger research project). "I think it's, I mean it is a huge project and it's going to have some major implications if people actually do the pieces and get it done" (Interview Participant 1). The participants valued the implication of this project and recognized that being a

part of this project was important for themselves as nurses. "Yes, if it's a satisfying experience...or if you're making a difference somehow, so there is going to be some sort of change and I guess there could be with this project" (Focus Group Participant 2). The following comment highlighted how important making a difference was to nurse faculty:

[...] whatever we can do to make less accidents and deaths in the workplace, boy if we can do something to help that, I would be so proud to be part of this. (Focus Group Participant 3)

Conversely, some participants disengaged from the research project as their level of interest in their subtopic decreased over time. "People were sort of dropping off [...] which is sort of typical with anything." (Interview Participant 1).

### Experiencing Frustration

Participants expressed frustrations with various aspects of engaging in research. These frustrations are listed in Figure 1.

We had a few frustrations in figuring out the process because it is very difficult to figure out what the process is going to be for each of the teams when you really haven't had one [...] go through and [a chance to] identify where the issues are and what information you might need. So, we did struggle a little bit with that throughout the whole timeframe. (Interview Participant 2)

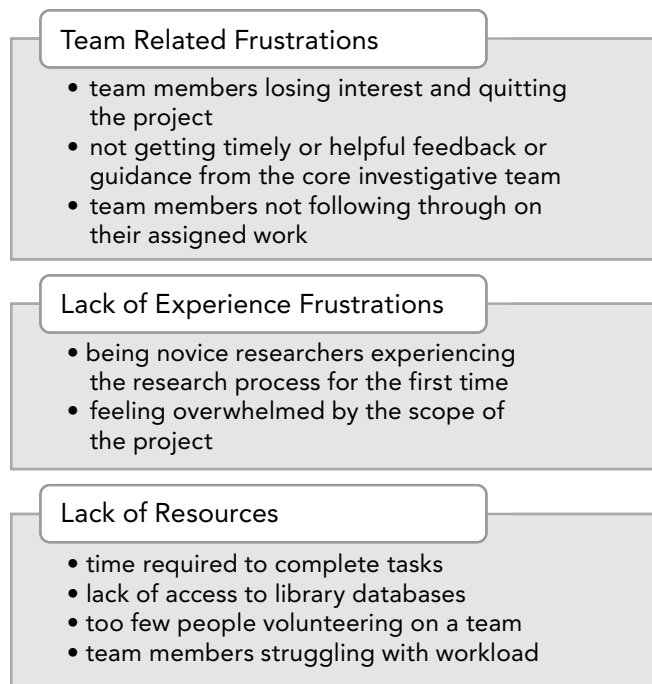


Figure 1. Participant frustrations with various aspects of engaging in research. Being able to share their experiences with other nurse faculty engaging in research was important for them, and allowed them to communicate their frustrations.

They wanted us to do our database search through the [university] library but not all my team members had access to that. We had one member from the university and she didn't have access to the [polytechnic] database...and some of the databases that we wanted to search were not available at [this site]. So, it worked out in the long run, but the initial plan was we are going to use this [university] one and we are going to set up a login for the team and then everybody can keep all of their information in this one place and it will be easy to access it all and everybody can see it. Didn't happen. (Interview Participant 2)

The sense of camaraderie and collegiality that the participants experienced working within their teams depended on the following variables: interest in their subtopic, time to do the work, their overall workload and the support they received from their fellow team members and from the core investigative team. Some faculty researchers noted the importance of having humour throughout the research process: "If the team isn't a lot of fun, you won't persevere. You have to have fun." (Focus Group Participant 1). Others felt that the sharing of experiences with other research teams is also important for team-building to occur:

Well I actually had two team members who were very helpful. They were getting their stuff done on time, they were willing to do a little extra work when asked to do it; and I think if it wasn't for them, I probably would have pulled the plug. They were the ones that kept me going, because I knew at least I wasn't the only one that had to do all the extra workload. (Interview Participant 2)

### **Needing More Support**

Communication within the team, with the core investigative team, and with other faculty research teams was important so that teams could get timely information, guidance, and coaching. Within the research team, issues that arose included being prepared, attending team meetings, committing to the work and following through with the assigned work.

But one by one [the other team members] all sort of fell away... it was just too much with what they were already doing. And the people on these research projects... at least they were willing to talk about what they were struggling with and I found that it was the same things that I was struggling with, so that was good to hear and then you could talk things through and have it all straightened out. Yeah, nobody was nasty [...] everybody was very supportive. It was good. (Focus Group Participant 3)

The support that I needed was not always [...] received was not always done in a timely manner, and that's just to do with

everybody else's workload and what they're juggling as well, and perhaps I wasn't giving them enough time. (Interview Participant 2)

Faculty researchers also understood that team members have different levels of experience and strengths and may contribute to the work of the team at different stages. "We're all at different levels and so you have to kind of work your way around and try and bring everybody up to the level that you need them to be in." (Interview Participant 2)

The participants identified barriers to engaging in research, including having the time needed to do the work, their overall workload, access to all the databases needed for the literature search, and institutional policies.

I think the challenge is the actual number of hours that you have to put in with regard to the other project that I've been involved with, I wish I would have tracked all of my hours, [because] everything takes five times longer than you would have anticipated it could take. There is hurdles, that takes incredible perseverance and sometimes the discouragement of having to refine the question again and go back to the literature [and...] re-word the question[...] I was just overwhelmed by the time. (Focus Group Participant 1)

Institutional expectations were focused on teaching and not research. "I think, at a university, [research] is much more supported financially and workload wise compared to here. Which maybe we'll get there, but I think we are just in that transition right now, so we'll see what happens." (Interview Participant 1). Concrete institutional support such as release time and recognition of faculty members' engagement in research were not embedded in the policy or collective agreement facilitating faculty members' engagement in research.

[The institution is] saying they're supportive of us doing a Ph.D. or us doing research...but I find the support is sometimes more of a "way to go, awesome," as opposed to "we'll take this class [away]," ... It's not financial or work release or anything, it's just "yay" and we'll publish you, you'll get a little byline in our monthly newsletter, or we'll say something at a faculty meeting. (Interview Participant 1)

You know, what I really find is this whole, at the start of it, you've got to apply for the funding, the call will come out - there's funds available. Then you've got to write up a whole deal and try to get the funding and then, you know, you're probably turned down, so that's frustrating right there. Then you have to do all the other approvals and ethics approvals and there is all that up-front stuff before you ever even get started and that to me is a little bit frustrating. (Focus Group Participant 1)

The participants described the help they received from the research team and the librarian liaison in terms of teaching, coaching, and guidance. “[The librarians] are always very supportive and you know they’re there, you know who they are. Any question that you have, they are always very quick to respond and help you with what you need” (Focus Group Participant 1). One participant spoke of the infrastructure related to research:

Developing the Institute for Nursing Scholarship and having policies that actually aid in getting grants and funding obviously it’s impacted it because otherwise we wouldn’t have this big research project going on and I wouldn’t have been involved in that research. (Interview Participant 2)

## Discussion

The participants described being a learner, being part of a community of practice, and needing more support related to their participation in research. As a learner, building self-efficacy was important and was reflected in level of confidence, experience, interest, and professional development with the research process. Finch, Cornwell, Ward, and McPhail (2013) also found that clinical speech language pathologists had a greater interest in engaging in research when they had previous research experience and confidence with all aspects of the research process. Loke, Laurenson, and Lee (2014) found clinical nurses wanted more professional development with research skills in order to feel more confident when engaging in research. The professional development participants gained from their experience with this project increased their sense of confidence and self-efficacy. This finding is supported by several research studies. Heinrich, Hurst, Leigh, Oberleitner, and Poirrier (2009) found that underlying fears faculty members had was identifying themselves as “scholar-imposters,” and they recognized that it takes time to build the teacher-scholar identity. Reader, Fornari, Simon, and Townsend (2015) found that the scholar’s self-reporting skills rating improved after workshops, writing retreats, and seminars. Professional development appears to be helpful in promoting nurse researchers’ feelings of competence and confidence in their research endeavours.

## Recommendations

Nurse faculty assume many responsibilities. Among them are teaching, research and scholarly activities, professional and institutional service, as well as academic advising of students (Candela, Gutierrez, & Keating, 2013). As polytechnics and colleges move toward becoming more research intensive, institutional changes must take place to encourage and facilitate faculty success with scholarly activities. This section will discuss

various individual and group supports as well as recommended institutional changes that may result in increased research and scholarly productivity among faculty members.

Travis and Anthony (2011) described how a non-academic school of nursing began its process of becoming a research-intensive university. The authors stated that the school increased funding for skills development and created an infrastructure to facilitate research success and rewards, which resulted in mentorship and an increased number of grant submissions, proposal submissions, publications, and presentations, as well as increased funding.

Relieving nurse faculty workload is an important consideration when encouraging an increase in research productivity. Begley, McCarron, Huntley-Moore, Condell, and Higgins (2014) reported an effort of a nursing school to increase research capacity by giving sabbatical leaves, student stipends, reduced teaching loads, and protected time for doctoral studies. They found an increase in doctoral studies, peer-reviewed publications, conference presentations, and external research funding. Begley et al. (2014) determined strong research leadership, support, and encouragement enabled the school to move from a teaching-focused to a research-focused culture. Chaudhry and Prelock (2012) recommended that institutional leaders provide research grants, research support, and faculty training in order to promote research and scholarship activities. Morest (2015) recommended supports such as rewarding scholarship achievements, hiring faculty who value research and who are doctorate trained, providing mentorship, and overcoming a culture of research isolation in order to increase research productivity at community colleges.

Criteria necessary for experiencing successful research collaboration when part of a community of practice include: effective communication, timeliness, expectations around authorship, clearly defined roles, different experience levels, work styles, and levels of commitment (Ulrich et al., 2015; Zanchetta et al., 2016). Smeltzer et al. (2014) found that additional supports necessary for research productivity were: supports with the teaching workload, having a supportive institutional structure and research climate and supporting self, institutional, and disciplinary sustainability (such as work-life balance and strategies for success). This indicates that the leadership roles within research teams, such as the principle investigators and project managers, play a key role in the success of research projects. Leadership skills development may be helpful for the investigators leading the research project for successful mentorship to occur.

Regarding the role that librarians and library services can play in order to facilitate faculty success with research, library services may want to consider the type of services they offer to faculty and how they want to collaborate with faculty (Lorenzetti & Rutherford, 2012). Library services can provide support for nurse faculty members engaging in research and scholarly activities in a number of ways. Hollister and Schroeder (2015) stated library support can improve research productivity by providing traditional supports as well as additional supports relating to grants, data and intellectual property management, and bibliometric analysis. The value of the librarian's involvement in nursing research was echoed by the participants and supported by Bohman, Ericsson, and Borglin (2013), who found that nurses lacked the literature searching skills needed to begin the work. Vaughan et al. (2013) found that librarian support to researchers is valuable in the following areas: developing ideas, funding, proposal writing, conducting research through literature searching and citation management, and disseminating results. A variety of factors contribute to institutional research success, with the underlying principle being a culture of inquiry and scholarship, in which the leadership creates a research infrastructure that supports faculty endeavours in a tangible way.

### Limitations

Only 7 out of a potential 39 faculty members volunteered to participate in this study. Although this is a small sample size, it is appropriate for a small-scale qualitative study. A limitation, however, is that it is unclear whether this sample differed systematically from those who were recruited but who chose not to take part. A second limitation is that it is difficult with this methodology to be free of biases and preconceptions that may influence one's interpretation of the data (Reiners, 2012). Pereira (2012) found that generic qualitative criteria for discerning the validity of qualitative – in that case, phenomenological --research were inadequate, and suggested the focus should be on integrative validity. Therefore, this study would be strengthened by following up with additional research related to being a learner, being part of a community of practice, and needing supports.

### Conclusions

As nurse faculty at polytechnics and colleges increase their research and scholarship activities, administrators looking to encourage and support faculty in this endeavour need information to guide their strategic planning. Although there is a plethora of articles on barriers and facilitators facing scholarship activities at universities, few focus on the polytechnic and college environments. The findings from this qualitative study found that

faculty at polytechnics and colleges face similar barriers and facilitators as their university colleagues. Additionally, what may contribute to research success includes providing professional development, mentorship, and support. Administrators may want to build an infrastructure that includes access to a variety of databases, offer professional development and leadership opportunities for faculty researchers, appeal to a sense of obligation as practitioners, and address the institutional barriers to engaging in research. Future research on how polytechnics and colleges develop programs to achieve research goals is needed to inform strategic planning.

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# An investigation into the experience of advertising students in seeking and working in internships

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### Abstract

**Internships are an essential part of the work experience** for many students. This study asked advertising students in Humber College's Bachelor of Creative Advertising program what their expectations of their internships were before they started them in January 2016, and afterwards what the experience was like. Most had a positive experience. They particularly valued having real work experience and a supportive environment. These aspects were rated as more important than formal training at their placement. Improvements could be made by providing more mentorship for interns and by paying students. Mentorship in particular was valued by students, but many didn't receive it.

**Keywords:** Internship, work placement, mentorship, advertising

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### Internships and work placements are integral to college programs.

In this context we are defining internships as temporary positions in which students get work experience as part of their education, and which may be paid or unpaid. As such we are using the terms internship and work placement

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interchangeably. At Humber College, internships are a required component of six advertising-based programs involving upwards of 300 students each year (Humber College, 2015). There is also a move to expand internships. The Business/Higher Education Round Table, conducted by the Canadian Broadcasting Company, recently recommended mandatory co-op placements and internships for all post-secondary students in Canada (CBC, 2016).

However, there is also increasing scrutiny being placed on these internships. In 2014, the Ontario government issued orders to *The Walrus* and *Toronto Life*, indicating that their interns would have to be paid unless they were part of a post-secondary course, as per Ontario law. The internships were consequently shut down, though they were later revived, in different forms. (CBC 2013, 2014). Many advertising agencies are reviewing their practice in this area. The Institute of Communications Agencies (ICA), which represents most of the larger advertising agencies, is actively looking at internships, partially because of these issues, but also as part of their larger goal of helping members attract, develop and nurture the best possible talent (ICA, 2016a).

Internships have been found to be valuable to both students and employers. For students they provide real world experience (Attfield & Couture, 2014; Maertz, Stoeberl, & Marks, 2014), training in new skills (Attfield & Couture, 2014; B&T, 2015; Maertz et al, 2014), improved work habits (Maertz et al., 2014), networking opportunities (Attfield & Couture, 2014; B&T, 2015), personal growth and development (Maertz et al., 2014; PRA, 2012), an opportunity to sample a company (Coco, 2000) and enhanced employment opportunities (Fullerton & Kendrick, 2017; Maertz et al., 2014). They ease students' transition into the workplace (Attfield & Couture, 2014; Maertz et al., 2014; Shoenfelt, Kottke, & Stone, 2012). Internships are also popular with students. The Canadian University Survey Consortium (PRA, 2012, p. 33) found university students were "most likely to say that practicums, internships and co-ops related to the program contributed very much to their growth and development." None of

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\***Brief Reports** are papers that report on empirical research, but are shorter and more limited in scope, such as results from a pilot study, or those with a small sample size.

the school-based activities, including regular classes, came close in terms of positive ratings. For employers, internships provide new expertise and thinking (e.g., students engaging in new digital media), cover routine tasks freeing up time of full-time employees, provide a trial period for the employer to preview potential new employees, and enhance retention rates (Yoo & Morris, 2015).

There has been less research on what variables contribute toward a successful internship. Studies looking at internships in general have found that important factors include clear communication of expectations and progress (Maertz et al., 2014; Shoenfelt et al., 2012), being involved in meaningful and relevant work (Maertz et al., 2014; Shoenfelt et al., 2012; Yoo & Morris, 2015), and having high quality supervision (Maertz et al., 2014; Shoenfelt et al., 2012).

Pay has also been found to be a factor in successful internship experiences. A survey by the National Association of Colleges and Employers in the U. S. (Griffin, 2013) found students doing paid internships regarded them as more valuable preparation for employment and more of an educational experience, and that the students were given more creative tasks than students in unpaid internships.

However, with the exception of Yoo and Morris (2015), these studies were not specific to advertising, and were predominantly U.S.-based. We wanted to see what students' perceptions were with regard to the world of advertising in Ontario, Canada. Additionally, as we have seen, the world of internships is rapidly changing. Therefore, the objective of our research was to address the following main question: What are the elements of a successful advertising internship program according to students? There were three subsidiary questions:

- i. What are the expectations of students for an internship before they begin?
- ii. To what extent do internship experiences meet their expectations?
- iii. Which aspects did the students find most beneficial in their internships?

## Method

### Participants

Thirty five students (of 36 available) from the Bachelor of Creative Advertising (BOCA) program completed a survey in class in December 2015, before they began 14-week internships, and again in May 2016 after they returned from their internships. These internships take place in the penultimate semester of a four-year program and are a mandatory part of the program. Students are required to find the internships themselves. These

students represented the main advertising agency roles (account management, copywriting and art direction). All students were enrolled in a professional practices course. Participation in the survey was voluntary and anonymous, but a \$25 Tim Horton's card was provided as an incentive. Of the surveyed students, 74% were women, the average age was 24, and 56% were recipients of OSAP (Ontario Student Assistance Program), which for most meant they had student loans to pay off.

### Materials

A voluntary intercept survey consisting of a mixture of dichotomous, open-ended, multiple choice, ranking and short-answer type questions was used. Questions included student expectations and needs in relation to a number of areas: skill development and training, job environment, effect on employability, pay and other specific needs. Students were also asked about the process they went through to get an internship.

A related questionnaire was administered to the same students when they returned from their internships in May 2016. This included the same areas but they were then asked what they found to be valuable and what their actual experience was. It also asked details on what their actual internship involved and their level of satisfaction with it. Responses from 32 of the 36 students were obtained in this post-internship questionnaire.

### Procedure

Both questionnaires were administered in class in paper form. The person administering the questionnaires was unrelated to the students, and their professor was not present. Data were anonymized before they were stored and analyzed.

The data were analyzed using IBM SPSS version 23. A descriptive analysis of the data was carried out. To find the relationship between the main overall ratings (overall satisfaction and likelihood of recommendation) and the ratings of the specific aspects of the internship, a series of Pearson's Correlations was performed. A  $p$  value  $< 0.05$  was considered statistically significant.

For the qualitative data, a thematic analysis was done. The text was entered into an Excel sheet and data were coded for recurring themes. The text was filtered based on the codes. The thematic groupings were then formed.

## Results

### The Search Process

Students were asked to answer the question: "What did you find most difficult during the internship search process?" The two main difficulties were: A) waiting for the agencies to respond back once students had reached out to them and B) how to

find the agencies actually interested in hiring an intern. Table 1 summarizes their answers.

**Ratings of importance: Before and After**

Students were presented with a list of a number of aspects of the internship experience, and were asked to rate their importance on a five-point scale, from “Not important” to “Absolutely Essential”. As shown in Figure 1, the percentage of students rating items as “Absolutely Essential” generally increased from before to after their internships reflecting their increased knowledge and their increased appreciation of the value of the internship. However, more interesting were the dimensions that increased the most. “Good experience to add to resume,” “Enhanced personal employability” and “Improved network for future opportunities” showed substantial increases, with the percentage of students rating the item as “Absolutely essential” increasing by 20% or more. By contrast the students did not regard “good chance of getting a job from that company” as important either before or

**Table 1**

Difficulties faced during internship search process (Open-ended)

Improvement	Percentage
Waiting for the response	35.5
Finding agencies actually interested in hiring an intern	25.8
Finding key person to send resume	6.5
Networking	6.5
Balancing school, building portfolio and finding job	6.5
Uncertainty of getting job	6.5
Getting started	3.2
Competition	3.2
Getting an interview	3.2
Choosing where to go after getting multiple offers	3.2

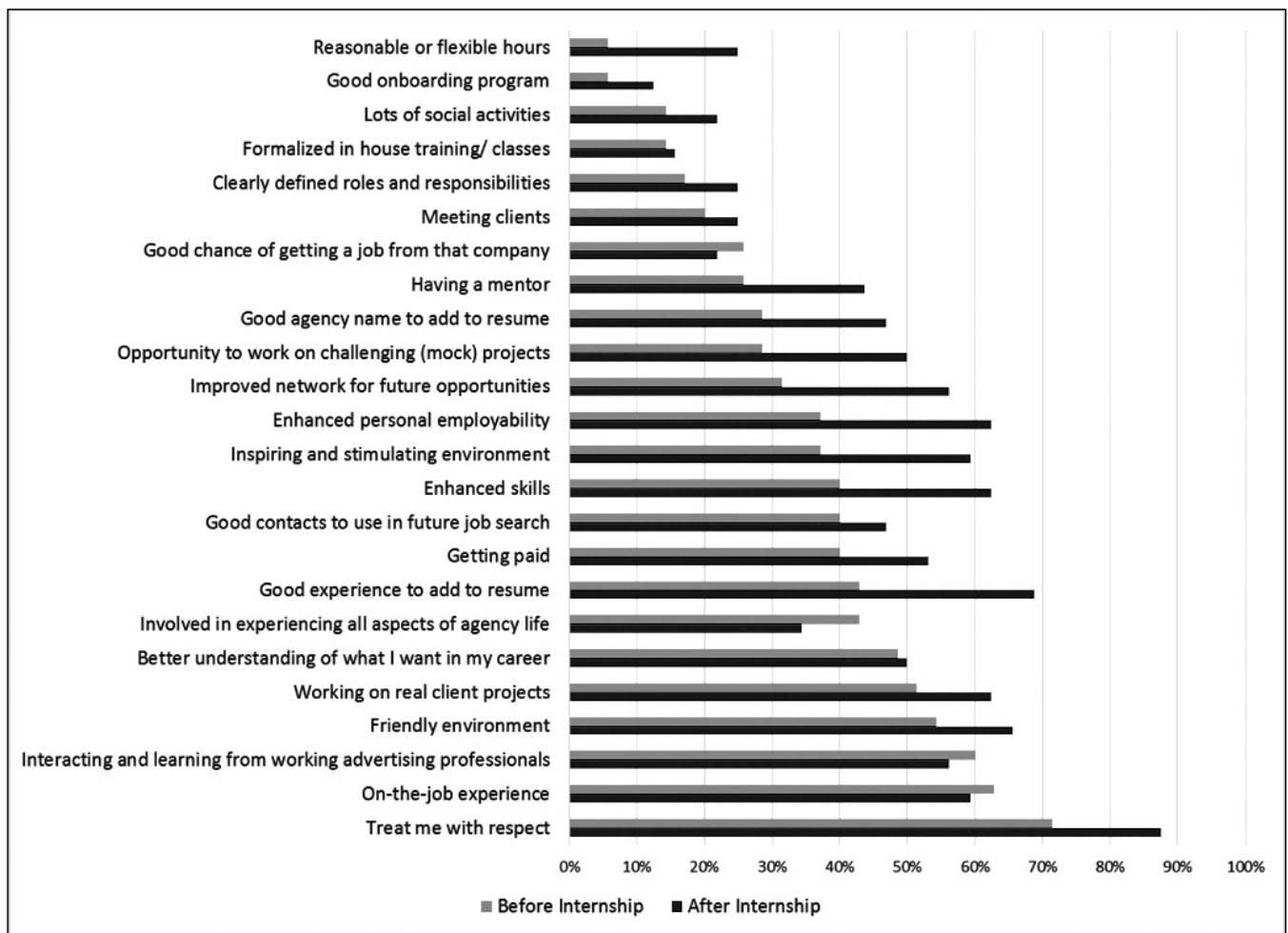


Figure 1: Importance of Factors in Internships. Percentage saying “Absolutely essential” on a 5-point scale  
 Pre-internship: “In terms of what you are hoping to get out of your internship, how important are each of the following factors?”  
 Post-internship: “How important are each of the following factors in making an internship a success in general”

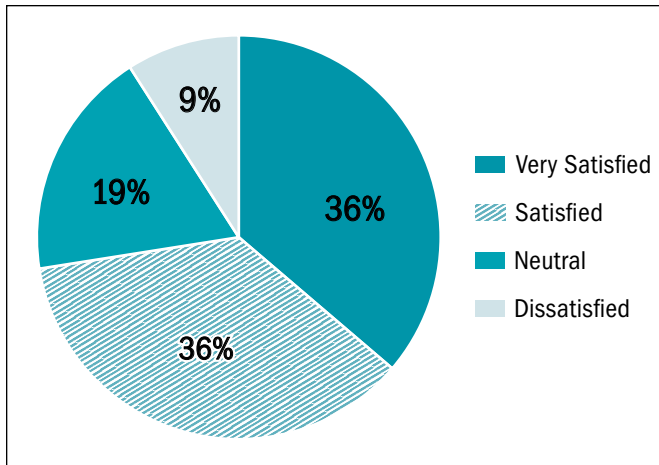


Figure 2: Level of satisfaction with their Internship

after the internship. Another dimension that showed a substantial gain was “Having a mentor”. Prior to going on the internship, only 26% rated it as essential. However, after the internship that increased to 46%.

### What makes a good internship?

A majority of students were satisfied with their internship: 36% were very satisfied and 36% were satisfied. Only 9% of the students reported dissatisfaction with the internship (Figure 2). The quality of specific aspects of their actual internship experience were rated highly. The vast majority of students said the agency “Treats me with respect” (97% excellent or good). Other dimensions that received similarly positive ratings included: “Working on real client projects” (91% rated as “excellent” or “good”), “Friendly environment” (88%), and “Good experience to add to resume” (86%) (Table 2). All of these were also rated highly in terms of importance. Correlations were calculated between the quality ratings for each dimension of the experience (from poor to excellent), with ratings on “How satisfied are you with your internship? They were also correlated with ratings on whether students would recommend the agency for internship to others. All of the above dimensions correlated with “satisfaction.” But two other dimensions also stood out: satisfaction correlated particularly strongly with “On-the-job experience” ( $r = .79 p < .01$ ) and “Inspiring and stimulating environment” ( $r = .76 p < .01$ ). (Table 3)

These ratings were also reflected in the comments given by students:

“It had an amazingly friendly and creatively stimulating environment. They trusted me to handle some of their biggest clients. They had a bar, jam-room and lots of dogs. Agency life was exactly as I hoped.”

“They treated me with respect and really made me feel like a part of the agency family. My opinion and suggestions were always taken into consideration. The trust they gave me allowed me to create better work.”

“My team was unbelievable for challenging me and giving me opportunities to learn.”

“The people are really great and I am learning so much.”

### Areas of dissatisfaction

There were three main areas of dissatisfaction: training, pay and mentorship.

Many reported little formal training; 24% received no “Formalised in house training” and another 15% rated what they received as “poor.” However, this aspect was not rated as important for students: Only 14% regarded formalised training as an essential part of their internship experience, as compared to “Working on real client projects” at 64% (Figure 1). Similarly, few experienced a “Good onboarding program,” but again, most did not regard it as important.

Pay was the biggest single point of dissatisfaction: when rating “getting paid”; 42% said they received “none” or rated it as “poor.” This was the highest proportion of “none/poor” ratings given for any of the dimensions. In terms of the pay they actually received, 9% of our sample were unpaid, 51% received some compensation (e.g., honorarium) which totaled less than minimum wage, and 39% received minimum wage or more. When asked in an open-ended question how the experience could be improved, “pay us” was a repeated refrain. (Summarised in Table 3). Similarly, there was a correlation between good scores for an agency on pay and the likelihood of the student recommending the agency to other interns ( $r = 0.60 p < 0.01$ ). However, this was numerically lower than “On the job experience” ( $r = 0.83, p < .01$ ) or “Inspiring and stimulating environment” ( $r = 0.74 p < .01$ ). Importantly, pay was not significantly correlated with satisfaction ( $r = 0.34, n. s.$ ). (Table 4).

However, pay may have been of particular importance for the 17 students in the study who were on the Ontario Student Assistance Program (OSAP), for whom an unpaid internship would provide real hardship. OSAP does not generally cover internships. As one student said, “I live on my own and had to get my parents to help me out while I worked unpaid.” Others had to reject offers from good agencies if they were unpaid. 56% of students on OSAP ended up at agencies that paid them at least minimum wage, as opposed to 31% of non-OSAP students (Figure 3).

Mentorship was an area of dissatisfaction, with 36%

expressing some level of dissatisfaction with their level of mentorship. It was also, with pay, an area where students felt the experience could be improved (Table 3). As one student noted: “I am disappointed by the lack of leadership or mentors that were assigned to interns.” As mentioned, students did not initially regard mentorship as important, but this changed for many students following their internships. Furthermore “Having a mentor” correlated highly with satisfaction ( $r=0.67$   $p<.01$ ).

## General Discussion

Despite many concerns about internships in the media and public policy discussions, our findings were that students’ current internship experiences were largely positive, particularly in the areas of the work experience received and the supportive

environment. There were, however, clear areas where the internship experience could be improved.

The majority of our students received pay well below minimum wage. Currently, Ontario law says unpaid interns are also not allowed to “generate commercial value” (Whitten, 2013). Most other provinces also restrict what you can do without pay (Canadian Intern Association, 2017).

But meaningful work is precisely what students want—to work on real client projects. This is the single aspect of the internship most strongly correlated with satisfaction. This reflects what others have found (Garcia-Borrego, Campos, & Battle, 2017; Maertz et al., 2014; Shoenfelt et al., 2012; Yoo & Morris, 2015). For example, Garcia-Borrego et al. (2017) found a similar

**Table 2**

Student ratings of the quality of their internship experience (Percentages; Ranked in order of reported importance on the post survey)

Factors	None	Poor	Fair	Good	Excellent
Treat me with respect	-	-	3	45.5	51.5
Good experience to add to resume	-	-	15.2	39.4	45.5
Working on real client projects	-	3	6.1	30.3	60.6
Friendly environment	-	6.1	6.1	21.2	66.7
On-the-job experience	-	-	24.2	30.3	45.5
Enhanced personal employability	-	-	21.2	42.4	36.4
Enhanced skills	-	-	27.3	39.4	33.3
Inspiring and stimulating environment	3	9.1	27.3	27.3	33.3
Interacting and learning from working advertising professionals	6.1	3	24.2	30.3	36.4
Improved network for future opportunities	3	3	12.1	36.4	45.5
Getting paid	12.1	30.3	9.1	24.2	24.2
Better understanding of what I want in my career	3	3	12.1	36.4	45.5
Opportunity to work on challenging (mock) projects	6.1	9.1	12.1	27.3	45.5
Having a mentor	6.1	12.1	18.2	42.4	21.2
Good contacts to use in future job search	3	3	15.2	36.4	42.4
Good agency name to add to resume	3	3	18.2	33.3	42.4
Involved in experiencing all aspects of agency life	-	6.1	18.2	39.4	36.4
Meeting clients	21.2	15.2	27.3	21.2	15.2
Clearly defined roles and responsibilities	-	3	39.4	30.3	27.3
Reasonable or flexible hours	-	-	9.1	45.5	45.5
Good chance of getting a job from that company	6.1	12.1	12.1	33.3	36.4
Lots of social activities	-	9.1	24.2	33.3	33.3
Formalized in house training/ classes	24.2	15.2	15.2	24.2	21.2
Good onboarding program	3	24.2	15.2	39.4	18.2



**Table 3**

“What could your agency do to improve the experience?”  
(Open-ended)

Improvement	Percentage
Pay Me	19%
Better Mentorship of Interns	16%
Better Organization of Internship	16%
More Client Interaction	9%
More Inclusion in Agency	6%
Better Communication with Interns	6%
Hire Me	3%
Nothing	25%

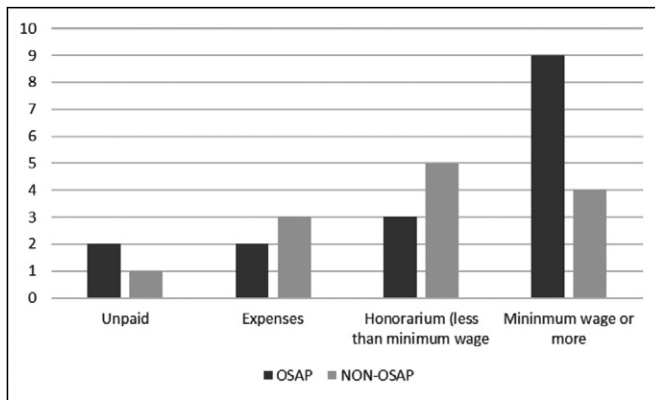


Figure 3: Internship pay levels split by OSAP/Non-OSAP Students (actual numbers)

contrast with journalism students in Portugal: They worked long hours with low pay doing similar work to paid employees, but they were satisfied with the experience because it provided real work experience that made them more likely to get employment.

Pay may not have been a legal issue for the students in this study because they were completing their internships as part of a school program, which exempts them from the employment law in most of Canada (Canadian Intern Association, 2017). Further, although their experience of “getting paid” was rated poorly, it did not correlate with overall satisfaction with the internship. It does, however, remain an issue in terms of equity. Not all internships are equally open to all students, especially those with financial constraints. Equally, it means agencies can miss out on good talent.

One unexpected topic that emerged was that of mentorship. This factor was not highly rated in terms of importance before the internships began, but became recognized as important once students were in their internships: 36% expressed some level of dissatisfaction with their level of mentorship. It was also,

with pay, often spontaneously cited as an area for improvement by students. Although the students in the present study did not initially appreciate the value of mentorship, its importance has been known for some time. Narayanan, Olk, and Fukami (2010), for example, found increased mentor involvement led to improved internship outcomes. Similarly, Maertz et al. (2014) report that having little mentorship support reduces internship satisfaction. This research shows that there is a need to increase awareness among advertising agencies and other employers of the importance of mentorships in creating successful internship experiences. Currently, many agencies do not include mentorship in the internship planning. Similarly, students need to be told of the importance of finding a mentor at their internship. As we saw, many did not initially regard it as important, before they arrived at the internship. It should be noted that since mentorship was self-defined in this survey, it may have included informal mentorships from people within the agency as well as formal ones.

A further area of concern is the process by which students and internships are matched up. As stated, students found the experience of finding an internship difficult and stressful. One concrete way to address this is to have a centralised database of internships available, as noted by one student’s suggestion: “Have one place where all the agencies post their job openings.”

The other areas identified by Shoenfelt et al (2012) as important, including onboarding and other aspects of the orientation process, were not an issue with this group of students. Our students were interested in getting into the job market and having an authentic experience, and their complaints were mostly when something stopped them from doing that. This could be related to the fact that they had completed nearly 4 years of education and were ready to enter the workforce. This is reflected in the increases we saw in terms of importance for enhanced employability. Students see the internship as path to a successful job; not the beginning of that job itself.

Of course, care must be taken in interpreting the results. The sample, though it reflected almost all the available students in the program (N =36), was relatively small, at 35. The group surveyed was restricted to one program from one college and therefore may not be representative of students from other programs. Finally, much of the discussion is based on correlations between the ratings of the elements of the experience and overall satisfaction. There is no proven causality.

In summary, we started off asking what students’ perspectives were on internships. Based on our data, the current system of internships is working well for most students. Students in the present study particularly appreciated the

**Table 4**

Correlations between statements and satisfaction and likelihood to recommend (Ranked in order of reported importance, post survey)

Statement	Satisfaction with Internship	Recommend the agency to others
Treat me with respect	.57**	.52**
Good experience to add to resume	.75**	.65**
Working on real client projects	.64**	.43*
Friendly environment	.67**	.71**
On-the-job experience	.79**	.83**
Enhanced personal employability	.81**	.62**
Enhanced skills	.82**	.75**
Inspiring and stimulating environment	.76**	.74**
Interacting and learning from working advertising professionals	.71**	.54**
Improved network for future opportunities	.66**	.75**
Getting paid	.34	.60**
Better understanding of what I want in my career	.59**	.30
Opportunity to work on challenging (mock) projects	.50**	.31
Having a mentor	.68**	.44*
Good contacts to use in future job search	.75**	.59**
Good agency name to add to resume	.57**	.58**
Involved in experiencing all aspects of agency life	.72**	.75**
Meeting clients	.43*	.32
Clearly defined roles and responsibilities	.55**	.43*
Reasonable or flexible hours	.25	.14
Good chance of getting a job from that company	.60**	.69**
Lots of social activities	.36*	.30
Formalized in house training/ classes	.45**	.51**
Good onboarding program	.53**	.46**
Satisfaction with internship	1	.70**

\*\* Correlation is significant at the 0.01 level, \* Correlation is significant at the 0.05 level

real-life experience and the chance to work with active industry professionals. However, internships could be improved in three areas: pay, mentorship, and helping students in their search for placements. This is only one perspective, and others (e.g. those of agencies and the broader public) need also to be considered. Humber College and the ICA are currently working together to develop guidance for member agencies in these areas.

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## Submissions

Please note: For **any type of research paper** (Original Research Article, Brief Report, or Innovation Spotlight), the expectation is that evidence has been systematically gathered, using an appropriate amount of scientific rigour. Accordingly, whether a quantitative or qualitative approach is taken, all manuscripts submitted as **Original Research Articles, Brief Reports, or Innovation Spotlights must** include a “Method” section that describes the empirical approach, and a “Results” section that summarizes the findings. JIPE especially encourages submissions that include **multiple forms of evidence** (e.g., collected at multiple points in time, using multiple data collection instruments, and/or from multiple sources).

**Original Research Articles** – papers that report on original empirical research with a focus on teaching and learning. Papers may take a qualitative or quantitative approach, but must include an Abstract, Introduction, Method, Results, Discussion, and Reference section, as well as any tables and/or figures. **Research articles should be approximately 5000-8000 words in length.**

**Brief Reports** – These are papers that report on empirical research, but are shorter and more limited in scope. Examples of research that might be presented in this format include results from a pilot study, findings from a study with a small sample size that show promise of a large effect size, research using a simple design and answering a single, specific question, or reports from an early phase of a project that is still ongoing. **These papers still include an Abstract, Introduction, Method, Results, Discussion, and Reference section, but are no longer than 2500 words in length.**

### **Innovation Spotlight**

These are extremely brief contributions that highlight an innovative teaching practice, approach, or tool, and provide accompanying evidence that speaks to the effectiveness of the innovation. Papers should include a very brief review of the most relevant literature to situate the approach, a brief method section, a results section, and a discussion/conclusion section. An Abstract is not required. Papers should be approximately 1500 words.

### **Review Papers**

These are papers that provide a balanced synopsis of the current literature within a specific area of inquiry. These papers should not only summarize the literature comprehensively, but should also identify outstanding questions and areas for future inquiry. **Review Papers should be approximately 5000-8000 words in length.**

### **Book Reviews**

Scholarly reviews of books are occasionally considered for publication, depending on the relevance of the book for the journal readership. These papers should present a brief summary of the book as well as a critical reflection on the book’s strengths and weaknesses. Of critical importance is that the review situates the book within a teaching and learning framework. These papers are no more than 1500 words in length.

### **Invited Commentary**

Invited commentaries will occasionally be included in issues of the journal, particularly as part of a special issue on a specific teaching and learning topic.



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