

The Differentiation of the Ontario University System:
Where are we now and where should we go?

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July 12, 2016

Published by

The Higher Education Quality Council of Ontario

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Cite this publication in the following format:

Jonker, L. and Hicks, M. (2016). *The Differentiation of the Ontario University System: Where are we now and where should we go?* Toronto: Higher Education Quality Council of Ontario.

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Executive Summary

For more than six years, HEQCO has conducted research on the differentiation of Ontario’s public postsecondary system, where institutions build on and are accountable for their specific strengths, mandates and missions. This report identifies clear distinctions between universities in terms of their research and teaching missions. The data point to critical pathways to achieve the benefits of greater differentiation. The goal is a system that is more cohesive, more sustainable and of higher quality.

Following on an [overview](#) of university differentiation in 2010, a subsequent HEQCO [report](#) that examined Ontario universities’ research performance identified four university clusters: the internationally competitive University of Toronto, six research-intensive universities, nine mostly undergraduate universities and four “in-between” institutions. The current report extends that analysis in an important way by going beyond research intensity and examining differences among Ontario universities on four other dimensions:

- **equity of access:** the enrolment of under-represented groups and Ontarians from lower socio-economic backgrounds;
- **demand:** student preference and university selection;
- **the learning journey:** the learning environment, student experience and completion rates; and
- **graduate outcomes:** resultant success on the job market and with the repayment of student loans.

This comprehensive analysis, which includes an innovative [data visualization](#), reinforces the existence of distinct clusters among Ontario’s 20 universities. It also offers a deeper appreciation of how these clusters differ from one another and provides greater clarity on the distinctive nature and role played by those institutions previously classified as “in-between.” This analysis suggests policies and practices within a differentiated system that would lead to more equitable access and success for all students, higher quality outcomes, and greater financial sustainability of the system and its institutions.

Key messages for the Ontario government and universities include:

Recognize and fund equity of access as a significant differentiating feature

Serving a far greater proportion of students who have traditionally been underrepresented at the university level, the equity of access “powerhouse” institutions are clustered within the mostly undergraduate universities, as well as the in-between institutions. This is a critical role and should be reinforced and rewarded. The differentiation opportunity is to ensure that these institutions are oriented, equipped and funded to focus on providing their important, diversified student body access to university and the opportunity for success once enrolled.

Support the University of Toronto as Ontario’s flagship institution

The University of Toronto stands alone as Ontario’s lead contender for international, top-tier status. A differentiated approach demands a restructuring of funding and enrolment expectations to ensure that Toronto continues to be able to play its unique and powerful flagship role for Ontario.

Concentrate research expansion for greater impact

Ontario’s research-intensive universities are also the universities with greater student demand: they attract high-potential student candidates and deliver strong graduate outcomes. While all Ontario universities serve the twin missions of teaching and research, there is a high cost in attempting research intensification within mostly undergraduate and in-between institutions, which would have to divert increasing proportions of their energies and investments to the expansion of research at the very time when equity of access is critical. The most promising strategy is to concentrate research resources – infrastructure, sponsored funding and graduate education – into the already more research-intensive universities that attract the greatest student demand.

Build on the role of regional universities

The four “in-between” universities present relatively balanced profiles among the five dimensions examined. These are institutions that serve their regions in all respects – teaching, access, research – and share some characteristics of the mostly undergraduate institutions, although they never reach the heights of some other universities in individual dimensions such as equity of access or research intensity. Given the data presented here, a more apt description of these “in-between universities” is Ontario’s “regional universities” – providing a balanced set of programs and services with a more moderate research emphasis to their regional demographic and economic base. We encourage the government and these institutions to strengthen their teaching and learning capabilities or cultivate other distinctive qualities, such as what Ryerson University has achieved in its growing reputation for innovation.

Strategic Mandate Agreements: seize opportunity for a bold strategy

[HEQCO’s analysis](#) of Ontario’s initial university Strategic Mandate Agreement (SMA) submissions noted a prevailing institutional interest in research and advanced degrees rather than greater institutional differentiation. While the first signed SMAs, created cooperatively between the ministry and the institutions, reflect a stronger alignment between institutional aspiration and the evidence of differentiation, it is critical that the next round of SMAs seize the opportunity to move strongly and boldly towards more differentiated missions and strategic pathways.

Drive differentiation through funding

Unless aggressively driven through funding, differentiation is little more than a conversation. The current funding mechanism rewards only enrolment growth, which for many institutions is increasingly unattainable. Through the SMAs and appropriate financial incentives, our mostly undergraduate and regional universities would be supported for their proportionally high service to equity of access objectives, also focusing on innovative approaches to teaching and learning or other distinctive missions. Research would be enhanced at the research-intensive universities and the continued international prominence of the University of Toronto would be assured.

As evidenced by its initiation of [Strategic Mandate Agreements](#) with the province’s 24 colleges and 20 universities, and the release of its [Differentiation Policy Framework](#), the Ontario Ministry of Advanced Education and Skills Development has clearly signaled its intention to position differentiation as “a primary policy driver for the system.” The time is now to boldly apply university differentiation across Ontario.

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Introduction

Differentiation has been positioned as an important tool to help meet Ontario's objectives for its higher education system. That is a fundamental change. The province's traditional stewardship of the system rested on a broadly adopted principle of homogeneity. All institutions were treated in a relatively similar manner, on a foundation of identical policy and funding mechanisms, under which differentiated accommodations were the exception rather than the rule.

The shift is important. The province is looking for more equitable access to the system for all Ontarians, higher-quality outcomes and greater financial sustainability. But these objectives must be met against a backdrop of fiscal constraint; neither the province nor students are positioned to purchase success through significant additional investment.

Differentiation can provide greater choice among institutions, leverage and concentrate institutional strengths and contributions towards meeting Ontario's objectives, and avoid expensive duplication of effort and services across the 20 universities and 24 colleges. Differentiation is a strategy for spending existing resources with greater impact and better outcomes.

For differentiation to work, we need to understand the starting point. What are each of the institutions' existing strengths and profiles, and how can those best be leveraged and supported through differentiated funding, policy and service delivery strategies at both the provincial and institutional levels? In this paper, we further our ongoing exploration of a data-driven understanding of institutional differentiation among Ontario's universities.

Differentiation in the college sector is as acute an issue as for the university sector. We would like to do similar analyses for the colleges. Regrettably, though the requisite data exist, we do not have access to them.

The government has developed two important new mechanisms with which to implement differentiation: Strategic Mandate Agreements with each institution and a review of the provincial funding formulae. The data we present are intended to help identify the right differentiation opportunities to achieve Ontario's higher education objectives through these important new mechanisms.

Differentiation – an active file

At HEQCO, we began the exploration of differentiation in 2010, in our paper *The Benefits of Greater Differentiation of Ontario's University Sector*. We identified a suite of benefits that flow from increased differentiation, including higher-quality teaching and research programs, more student choice, a globally competitive system and increased financial sustainability (Weingarten & Deller, 2010).

Our 2013 expert panel report on the prototype generation of provincial Strategic Mandate Agreements (SMAs), *Quality: Shifting the Focus*, reemphasized the opportunities for greater differentiation and recommended that the government take a more active leadership role in system planning (HEQCO, 2013a).

Also in 2013, we published *The Diversity of Ontario's Universities: A Data Set to Inform the Differentiation Discussion*. In this paper, we observed an existing level of diversity among Ontario's 20 public universities on traditional measures such as comprehensiveness and graduate and research intensity. We identified four clusters of universities (the University of Toronto, a cluster of research-intensive universities, a cluster of mostly undergraduate universities and an in-between cluster). We recommended that the province use its funding formula and graduate allocations to reinforce and reward the diversity of our universities and help them aspire to excellence in their areas of strength (Weingarten, Hicks, Jonker & Liu, 2013).

A companion publication, *The Diversity of Ontario's Colleges: A Data Set to Inform the Differentiation Discussion*, highlighted programmatic diversity among the province's 24 colleges of applied arts and technology. We identified degree-granting as the most important distinguishing feature in contemplating formal differentiation between colleges and noted that in its infant state there is little policy cohesion around college degree-granting nor an obvious link to the government's overall goals for the postsecondary sector (Hicks, Weingarten, Jonker & Liu, 2013).

In 2014, we published *Teaching Loads and Research Outputs of Ontario University Faculty Members: Implications for Productivity and Differentiation*. We found that faculty members in the more research-intensive universities have the greatest research success (measured in research funding dollars) and impact (measured in citation volume) and tend to teach less than faculty from universities that are more undergraduate-focused (Jonker & Hicks, 2014).

In our recent publication, *Ontario's PhD Graduates from 2009: Where are they now?*, we found that Ontario's research-intensive universities and the University of Toronto graduate 82% of the province's PhDs and 96% of Ontario PhD graduates who are now working at a top-ranked university in the world (Jonker, 2016).

We are not alone in our focus on differentiation. It is now a major government higher education priority. In November 2013, the Ontario Ministry of Advanced Education and Skills Development (MAESD) released its Differentiation Policy Framework that positions differentiation as "a primary policy driver for the system." MAESD is developing tools to help advance differentiation within the system of institutions, most notably SMAs negotiated with each college and university and its ongoing review of the university and college funding formulae.

Institutions have articulated their commitment to differentiation in the first completed round of SMAs, in which each institution identified the factors it believes makes it unique in the system, and the Council of Ontario Universities regularly showcases examples of differentiation across its member universities.

Differentiation is only a strategy

From its first differentiation paper in 2010, HEQCO has emphasized that differentiation is a means to an end, a strategy and not a goal in itself. Differentiation serves our shared objectives for the Ontario system. Differentiation introduced for its own sake may accidentally serve those objectives, but also carries a large and completely avoidable risk of generating directionless change, consuming scarce resources in the process and eventually fueling resentment while and because it is not driving us closer to those objectives.

So what goals have been set for Ontario's public postsecondary system? Recently, HEQCO condensed its understanding of the overarching objectives for Ontario's higher education system to the following short list (Weingarten, 2016):

- **More equitable access and success for all students.** Differentiation serves this objective by providing Ontarians real choices among the institutions. This increases opportunities for prospective students to select (and be selected by) an Ontario university that fits their particular priorities. It helps the province better serve a diverse continuum of student needs and aspirations. It helps universities position themselves ideally to serve their local, or regional, or international markets, each according to its own situational context, strengths and institutional priorities.
- **Higher quality outcomes: On the education side, ensuring that students acquire the knowledge, skills and competencies for personal and professional success and, on the research side, ensuring that the scholarly output of our institutions has impact and is internationally competitive and recognized.** Differentiation serves this objective by capitalizing on the diverse strengths of individual institutions in both the learning and research missions, with a focus on strengthening the province's overall capacity by optimizing the contributions of constituent institutions within the system.
- **Greater financial sustainability of the system and its institutions.** Differentiation serves this objective by reducing duplication of expenditure, focusing on investment that builds on each institution's areas of strength and concentrating resources towards provincial quality and access objectives.

The success of Ontario's differentiation strategy hinges on this: our shared objectives are provincial. The contribution of each individual institution to meeting those shared objectives varies. Differentiation reflects and intensifies each institution's unique learning and research profiles, while simultaneously driving efficiencies across the system.

Hand on the tiller

It follows for us that differentiation works best when coordinated and supported at the system level, with a central hand guiding the development of differentiation between the participating institutions.

It is tempting to say: let differentiation flow naturally and unfettered from each autonomous and individual institution. This is how innovation will be achieved, buy-in will be secured, agility will be leveraged and aspirations will be realized. There are three problems with this approach.

First, differentiation is by definition relational, not individualistic. An institution cannot say that it is differentiated (or will become differentiated) because of a demonstrable feature set or performance achievement (in certain program areas, or access initiatives, or in research intensity, or undergraduate excellence). It can only say that it is differentiated if it can demonstrate that other institutions do not share the feature set or the performance achievement. This may in turn reflect something unique about the region the university serves (its economy, or its demography), and that too is best identified through data that reveal the difference. Differentiation is by nature a matter of comparison and contrast.

Second, if differentiation is a strategy to achieve provincial and system objectives, then local, self-directed differentiation driven exclusively by institutions might only accidentally and inefficiently achieve those objectives.

Third, past experience in Ontario suggests that in the absence of a steering hand, institutions drift towards homogeneity more than they strive for diversity. HEQCO's 2013 expert panel reviewing the first prototype round of Strategic Mandate Agreements observed that, overall, the submitted institutional SMAs demonstrate a tendency to greater homogenization of the system based on preferences within the academy for research and graduate education, rather than greater institutional differentiation (HEQCO, 2013a).

Although we favour a strong central hand in shaping differentiation to meet the province's objectives, we are also of the view that an exclusively or overly centralized approach to differentiation has little chance of success. Institutions, individually and collectively, must have a voice in developing differentiation. They must have local scope to respond and tailor their programs and activities to the regions and peoples they serve. Successful differentiation therefore requires a partnership between the province and the institutions. Since our original 2010 paper, two potentially powerful tools have been developed to help drive differentiation in partnership with institutions.

The first is the successful negotiation in 2014 of the first generation of SMAs, which frame the current understanding of each institution's differentiated contributions to Ontario's collective needs. They speak to each institution's differentiated mandate and priorities. For example, Ontario's newest and smallest university, Algoma, defines a mission focused on teaching and learning at the undergraduate level and a special focus on serving indigenous people. The SMA for the mid-sized University of Windsor emphasizes its importance to and service of the geographic region in which it is located. The province's largest and flagship university, the University of Toronto, reaffirms in partnership with government its long-term commitment to being an internationally significant research university, with a broad range of program offerings.

The second is a review of the university funding model, the single most powerful lever available to government to implement its differentiation goals. MAESD has identified “supporting the existing differentiation process, which is expressed in each university’s Strategic Mandate Agreement” as one of the principles underpinning the funding model review (MTCU, 2013; 2015). A thorough consultation in 2015 led by former Deputy Minister Suzanne Herbert revealed a range of ideas on how the funding model might recognize each university’s distinctive role.

Forces of homogenization

In many ways, intended or not, homogeneity underlies the investment strategy and policy tools Ontario has developed and applied across the system in the past. In legislation, the powers and objectives of our universities are mostly all identical and largely unfettered.¹ There is one funding formula, with a common set of rules and equations under which all institutions strive to maximize their share of available revenues. There is one tuition policy and a fairly homogeneous price across the province. All institutions generally tend to be eligible for new, marginal-dollar budget resources, such as graduate funding or supports for under-represented students.

Applying the same measures and same math to all participating recipients is the conventional default in public sector funding schemes. The approach is simple to administer and easy to defend as fair. It is not a particularly powerful approach to driving differentiation among the recipient entities.

Despite the longstanding influence of these homogenizing tools and tendencies, there is a surprising degree of measurable differentiation within the system today.

Data depict the starting point

We are starting the differentiation journey in Ontario not with a blank sheet, but with a functional, mature postsecondary system. The efficient approach to driving more differentiation within a mature system is to build on the existing strengths of each institution and/or of sets of institutions with similar profiles (these two approaches are not mutually exclusive).

What are the existing differentiated profiles of our institutions? In our 2013 paper, *The Diversity of Ontario’s Universities: A Data Set to Inform the Differentiation Discussion*, we assembled a picture of university differentiation based on traditional measures of research and graduate intensity. We identified four university clusters on these measures:

¹ There are only four notable exceptions: Algoma’s Act gives it a special undergraduate mission and a focus on aboriginal education; OCADU is programmatically focused on art and design; UOIT is mandated to provide career-oriented programs and offer college transfer; and the objectives for Ryerson emphasize an applied focus.

Toronto



Research-Intensive



In-Between



Mostly Undergraduate



This was a good start, but incomplete in as much as it examined only one of the two missions of the universities: research. Our 2010 report, *The Benefits of Greater Differentiation of Ontario's University System*, emphasized the need to value equally the teaching and research contributions of the universities (Weingarten & Deller, 2010). In fact, given the prominence of the research component, it argues that it was necessary to signal clearly the equal significance of the teaching mission. Interestingly, the primary focus of government in Ontario today is on the teaching mission: quality, what is being learned and the overall student experience. In her report to the ministry on funding reform, Suzanne Herbert emphasized that “The ministry should apply an outcomes lens to all of its investments. Clarity about the objectives the ministry wishes to meet through the outcomes-based funding will be crucial. The outcomes lens should start with a focus on undergraduate student success” (MTCU, 2015).

To round out the differentiation analysis, we needed to examine differentiation within the system with regard to the teaching mission and the students who are served across the 20 universities.

Also, because our 2013 report focused on research and graduate intensity, it easily led to the false conclusion that we were ranking the universities: some are clearly more research intense and others less so. But our goal is not to rank. Rather, it is to describe and better know the universities to leverage observable differentiation in the furtherance of provincial objectives. Doing so with a broader set of data points and across both the teaching and learning mission helps balance the understanding of each university's contributions. Differentiation describes how institutions are different, not which are better. In our various presentations and research, HEQCO has repeatedly emphasized the importance of teaching as at least equal to the value and significance of research in postsecondary education.

To create a more balanced and complete picture of differentiation among the 20 universities, we have now compiled available data that reveal differentiation in the teaching mission, which we have organized into four dimensions:

- **Equity of access:** the enrolment of underrepresented groups and Ontarians from lower socio-economic backgrounds
- **Demand:** student preference and university selection
- **Learning journey:** the learning environment, student experience and completion rates
- **Graduate outcomes:** resultant success in the job market and with the repayment of student loans

Table 1 lists the individual data indicators that inform each university’s profile in the four teaching mission dimensions above, as well as the earlier research intensity dimension from our 2013 study.

Table 1: Indicators and Dimensions of University Differentiation

EQUITY OF ACCESS	DEMAND
% first-generation students	Application to registrant ratio
% Aboriginal students	% first-choice applicants
% students with disabilities	% students from other provinces
% francophone students	% international students
OSAP participation rate	% students with entry marks >75%
% part-time students	
LEARNING JOURNEY	GRADUATE OUTCOMES
Retention rate first to second year	Graduate employment rate
Graduation rate	Graduate average earnings
% classes with <30 students	Loan default rate
% undergraduates who had a good experience	
% graduate students who had a good experience	
	RESEARCH INTENSITY
	% graduates who are PhDs
	Sponsored research income per faculty
	Total publications per faculty
	Total citations per faculty
	Research impact: H-scores

Our goal in this paper is to examine and analyze these data at the aggregate level to better understand institutional differentiation. Before proceeding, it is important to make some observations about the data:

- **Are these the right data?** We believe that an examination of the two primary missions of the universities (research and teaching²) is a relevant approach. The actual data elements we bring to bear to conduct the examination are of course limited to those that are collected and made available to us, and also of sufficiently robust quality to warrant inclusion. So, for example, cross-institutional data on learning outcomes would be welcome but are not yet collected. Data on commercialization and patents (important aspects of the research mission) are collected and available but considered by many to be insufficiently robust to be pressed into service. Data on student mobility are collected but are not in the public domain and were not made available to us.

Despite these limitations, we have been able to pool representative data to construct the five dimensions in Table 1. They tell an important story about our universities. In the future, we fully expect the stream of available data to improve and the storyline to be refined. Based on past experience, this will happen slowly and over a considerable span of time. It needs to happen faster.

Pursuing the opposite strategy – waiting to conduct the analysis until the data are fully rounded and perfected – means sitting forever on the sidelines and knowing nothing.

- **How robust are the data?** The data in this report are drawn predominantly from the most reliable of sources: the universities and the federal and provincial governments. Most of the data on which we rely are publicly available. There are only five instances in which we have used custom data extractions.

The metrics we use are not perfect. Some of the data rely on self-reporting (for example, in the self-identification of Aboriginal student populations). Some are harvested from surveys that would ideally have a higher response rate to guarantee a representative sample (for example, graduate employment data come from a survey with a response rate of about 30% of graduates) and others suffer from definitional or methodological variability (for example, each institution selects and reports using its own, non-standardized definition of what constitutes a part-time student).

In all cases, we believe that the data included in this report are sufficiently robust to tell a meaningful and accurate story about institutional characteristics and differentiation. This is especially so when we aggregate the data into our five dimensions, so no single measure unduly influences the observations made about an institution or the set of institutions. For this reason, the body of our report and analysis is driven by the aggregated data. Those who wish to

² We acknowledge but do not attempt to analyze a third mission: service. Teaching and research comprise the majority of university activity (they collectively account for 80% of faculty time in most models) and are the two missions explicitly funded by a combination of students and government in our public system.

examine the individual underlying data in greater detail may do so in Appendices 1 (teaching indicators) and 2 (research indicators).

We recognize that some readers will reject our judgement calls and criticize the inadequacies of the data. Our plea to them is: help us refine and improve the data coming from institutions and governments so everyone has access to robust data to better understand and manage the system.

- **Do the data reveal, and is this study about, university performance?** Our objective is to describe what each university does, who it serves, what outcomes it generates. The intent is descriptive. The hope is that the descriptions will be useful in identifying opportunities for differentiation.

It is important to note that the root drivers of observable differences in the data we have assembled are not inherently or exclusively a matter of institutional “performance” at all. For example, the concentration of francophone learners in a few universities is most obviously the result of a longstanding provincial policy of bilingual designation and concentrated language-funding support to those very universities. The percentage of students self-identifying as Aboriginal correlates with the distribution of Aboriginal populations within the province. These are the very kinds of observable impacts we would expect from either a government policy intervention (French language – a rare and effective example of differentiated support) or a local institutional response to need (Aboriginal student populations). Again, our goal is to describe and understand what is happening and seize opportunities to improve it.

With that said, it will be impossible for some to resist using these data to prompt ranking. This should be resisted. We place no ranking value on the different dimensions we define in this report.

- **Does size matter?** For each of the 20 universities, we report our indicators on the basis of proportion, rate or percentage, rather than sheer numbers. So, for example, whereas the University of Toronto has the highest sheer number of international students of any Ontario university (9,870), Algoma University (with only 259 international students) has proportionally more international students in its student body than Toronto. It is the proportional number that we report (19% of total students at Algoma vs. 13% at Toronto). On sheer numbers, the University of Toronto serves many times the international students than does Algoma. So why are we not reporting sheer number?

If we did, the University of Toronto and a handful of other large institutions would consistently show a higher numerical score on our indicators compared to the other universities, which by virtue of being small would show little volume or presence in any domain. This would at times appear to be to the advantage of the larger institutions (as is the case with the international student example) and in other instances to their collective disadvantage (for example, reporting the sheer number of loan defaults would paint a much higher picture of loan default for larger institutions than does the reporting of relative default rates, where the sheer number in default is divided by the institution’s total population of borrowers).

What we are revealing is not the size of each institution, or the number of students served, or the number of students with certain measurable characteristics, but each institution's character, its foci, its strategic and service orientation. Not whether it is bigger or smaller, but what makes it different from or similar to other institutions. This can only be revealed through proportion or rate-based analysis.

- **Audience orientation:** Our intention is to profile universities in ways that can assist government and institutions to chart the course forward for a more differentiated system of universities in Ontario. The mechanisms for doing this are ones in their purview: institutional strategic plans, the government funding formula, the next round of Strategic Mandate Agreements, enrolment plans and program approvals.

We did not intend to create a university selection guide for applicants with this report. We welcome a broad readership, including of course students who ultimately stand to benefit from better programs, more choice and sustainable costs through a well implemented differentiation strategy. But the indicators and dimensions selected here do not purport to be a guide to university selection or a public ranking scheme, and we did not assemble them with those goals in mind.

Analyzing the data

In the balance of the paper, we will present the data aggregated to our five dimensions in two different ways. The first approach looks at patterns of differentiation among the four clusters of universities we identified in 2013. The second looks at each university individually, on the basis of the five dimensions of inquiry we have identified. We draw conclusions at the end of the paper.

Approach 1: Patterns among the four clusters

We use a simple heat-table (Table 2 below) to reveal patterns among the four clusters of universities we identified in *The Diversity of Ontario's Universities: A Data Set to Inform the Differentiation Discussion*. The table presents each of the 24 indicators we have assembled, organized into our five dimensions of inquiry. For each indicator, the institutions are sorted according to the simple order of their strength, or level of activity, or presence. The names of individual universities are not shown on the table³ to help focus the viewer on the sweep of colour gradients or patterns across the four clusters of universities identified above and to thwart the natural inclination to turn this into a ranking exercise. All we show is the colour of each university according to the cluster to which we assigned it in our 2013 report on research intensity.

³ With the obvious exception of the University of Toronto, which is the only purple university in the set.

Toronto

Research-Intensive

In-Between

Mostly Undergraduate

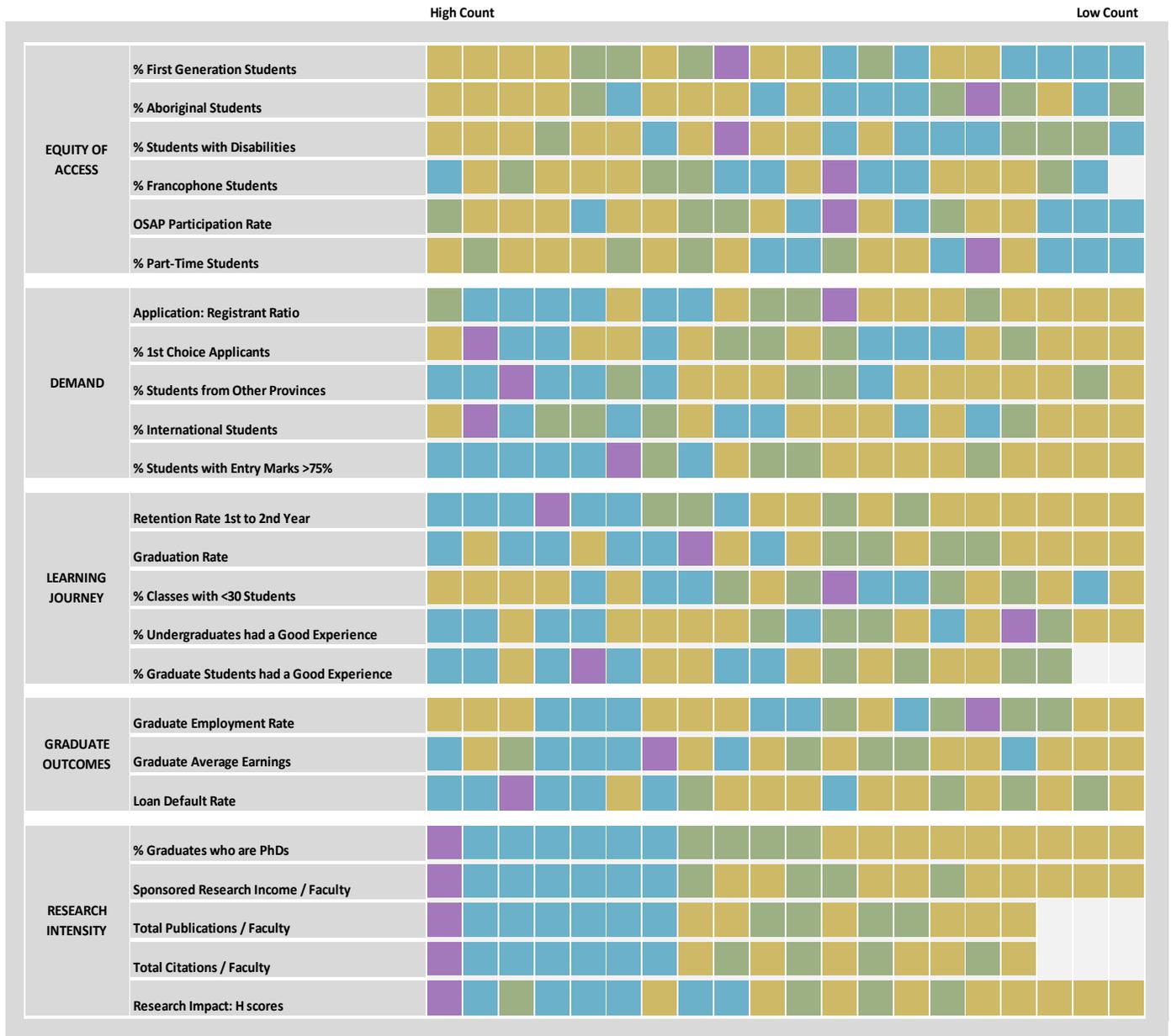


Unshaded cells indicate the few instances in which data were available for less than the full set of universities.

This reveals strong patterning with regard to the dimension of research intensity, as this is the very basis on which the four clusters were identified in the first place. But are the four clusters of universities identified there as useful for thinking about learning-mission characteristics of the universities as they were in thinking about research intensity? This is the question the table seeks to answer.

We present the heat-table here. We discuss its implications in the Discussion section of this report.

Table 2: Heat-Table



Approach 2: Individual institutional profiles

In the pages that follow, we provide a university-by-university visual representation of each institution's differentiated profile. A dynamic version of the visualizations has also been prepared and is viewable [here](#).

The visualizations allow for a quick understanding of each university's profile in the five dimensions we have defined. Which are serving proportionally more under-represented students and which less so? Which are more research intensive and which less so? What is the range of differences in student outcomes between the set of institutions?

To aggregate the 24 indicators into the five dimensions shown on Figures 1 through 20, we first standardized the data values across the 20 universities for each indicator. Using standardized scores reveals whether the differences between universities on each indicator are modest or pronounced. We then averaged together the standardized values for the indicators underlying each of our five descriptive dimensions shown in Table 1. The results are shown university by university, scaled on concentric circles that show the deviation in standard units (or Z-scores)⁴ from the average. The bolded circle within each visualization represents the mean for the system.

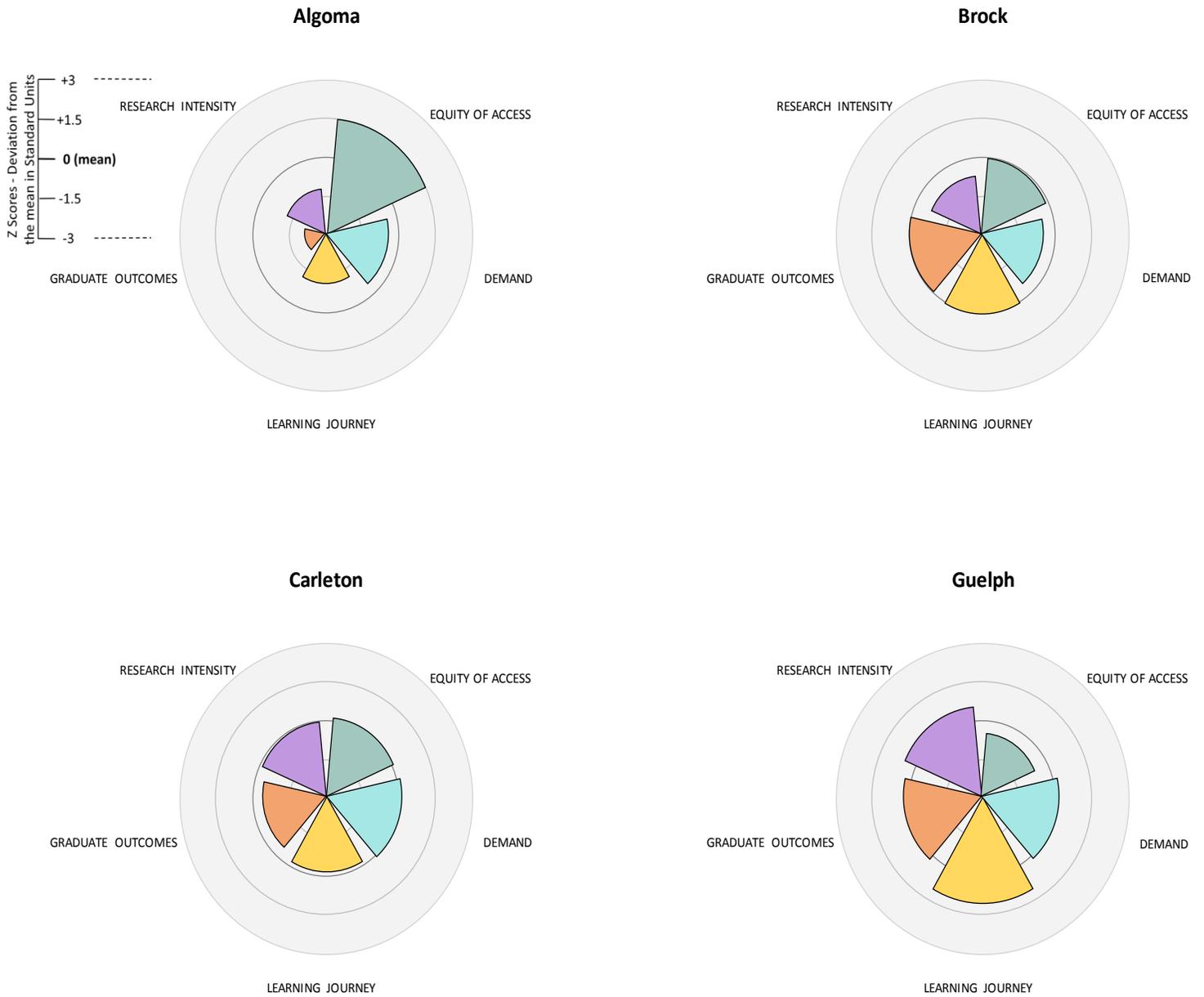
Table 3 immediately following the 20 figures shows the Z-score values.

⁴ If an institution posts a Z-score of 0 on a dimension, then it is at the system average for that dimension. A Z-score above 0 indicates above average strength on that dimension. A Z-score below 0 indicates below average strength. The numerical value associated with each Z-score reflects the number of standardized deviations from the average.

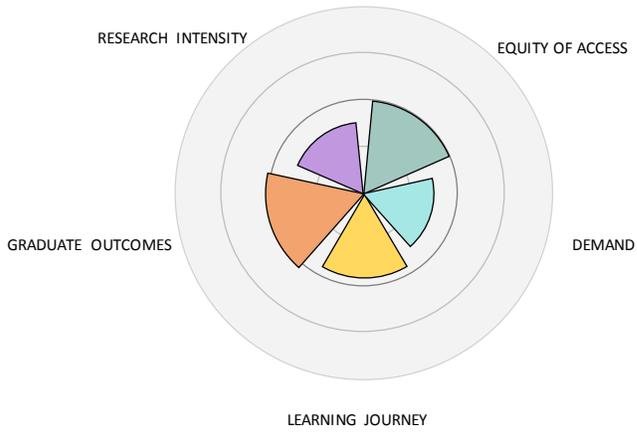
Figures 1 to 20

20 Universities Profiled on 5 Dimensions of Data

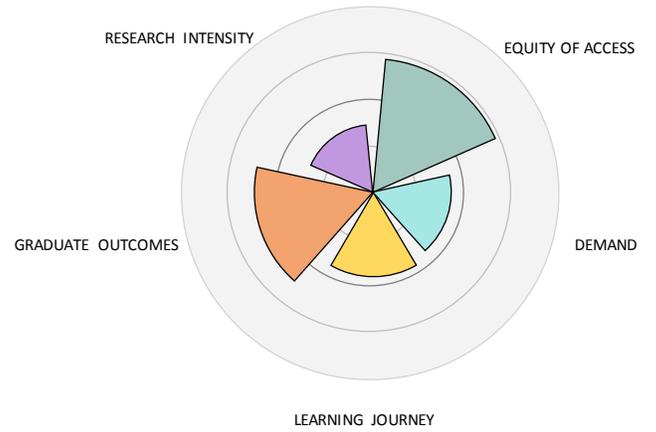
For a listing of the underlying indicators, see Table 1



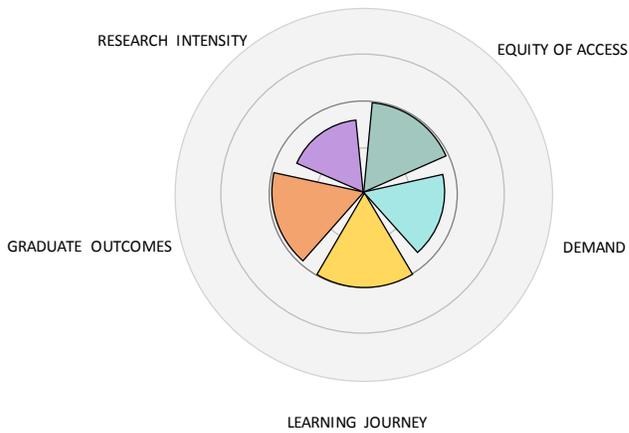
Lakehead



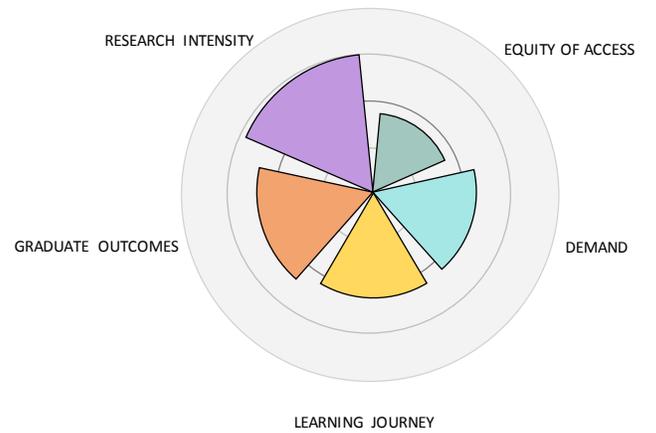
Laurentian



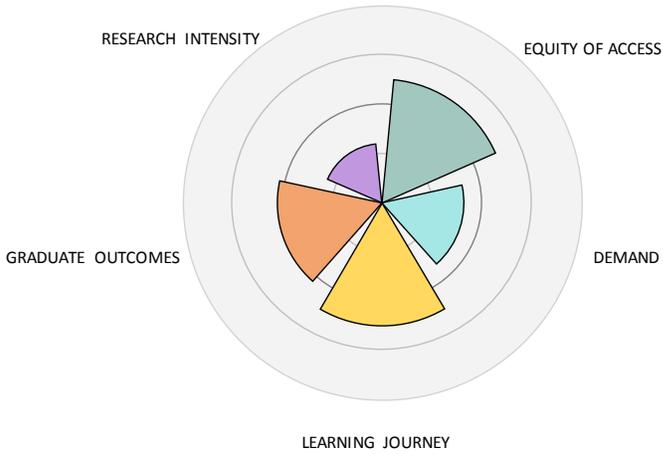
Laurier



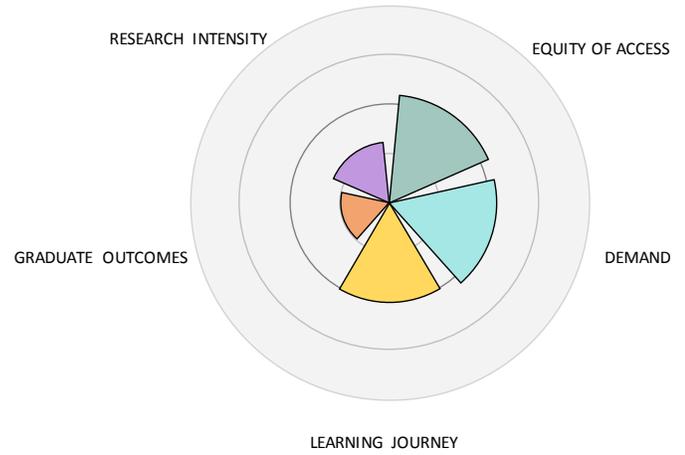
McMaster



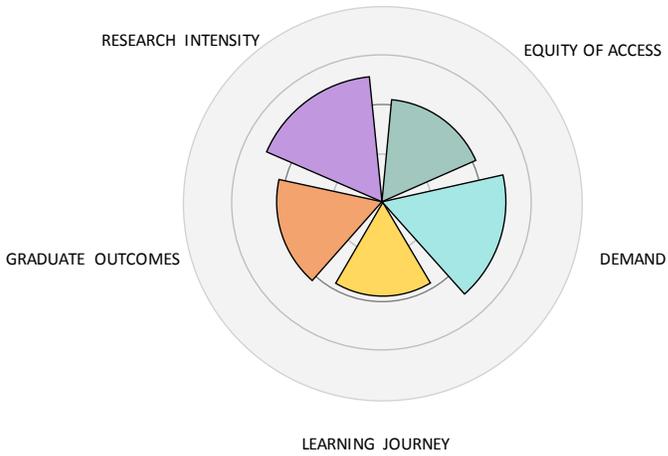
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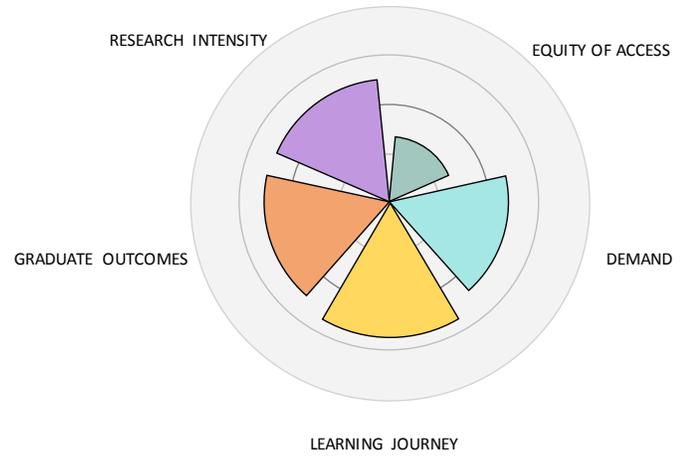
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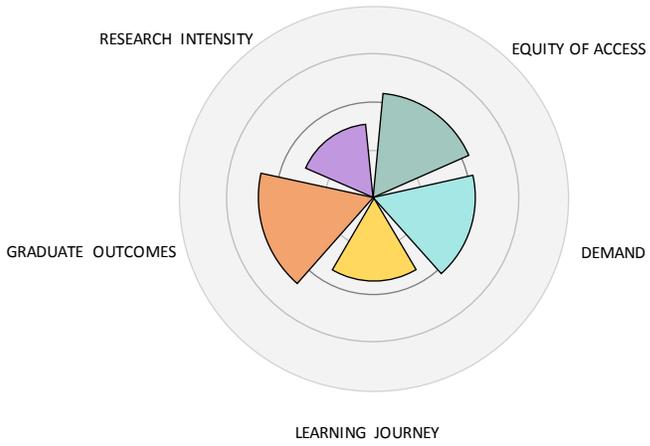
Ottawa



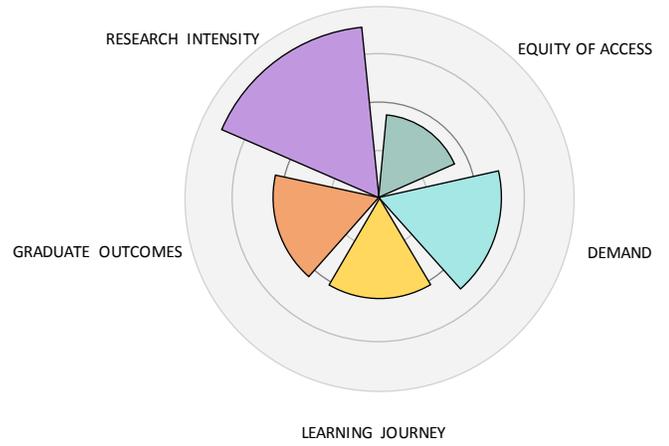
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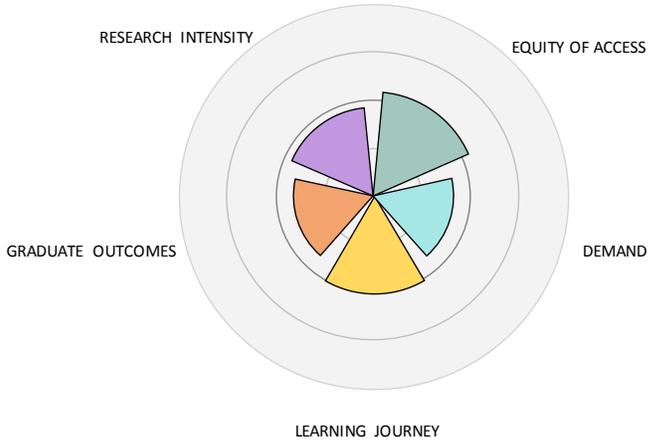
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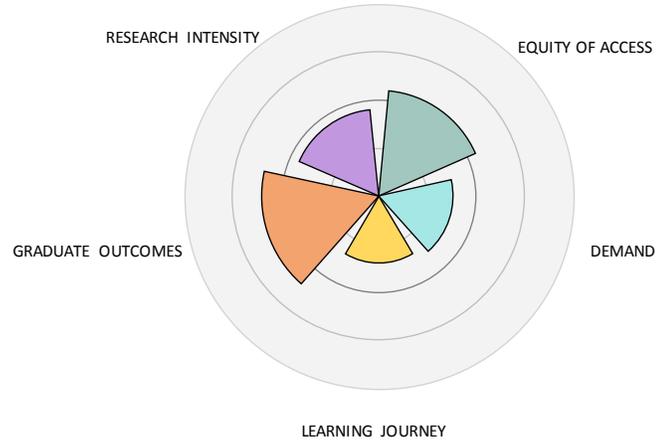
Toronto



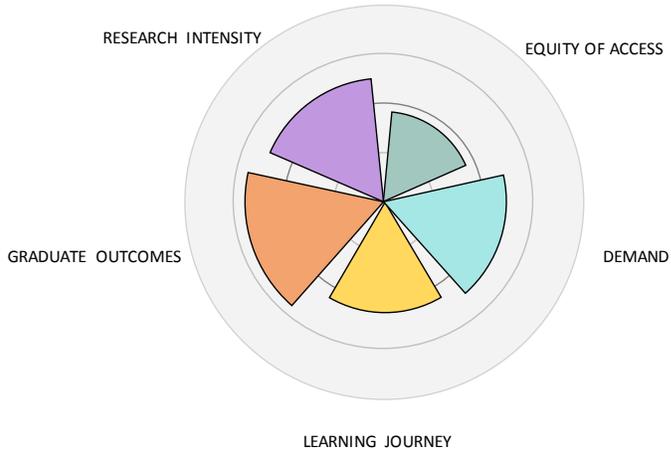
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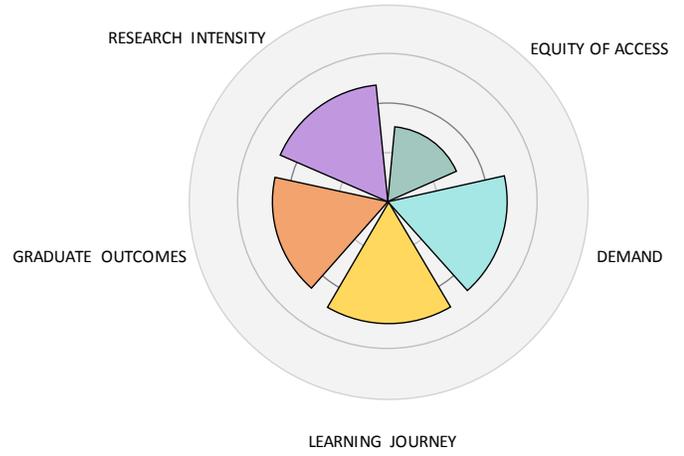
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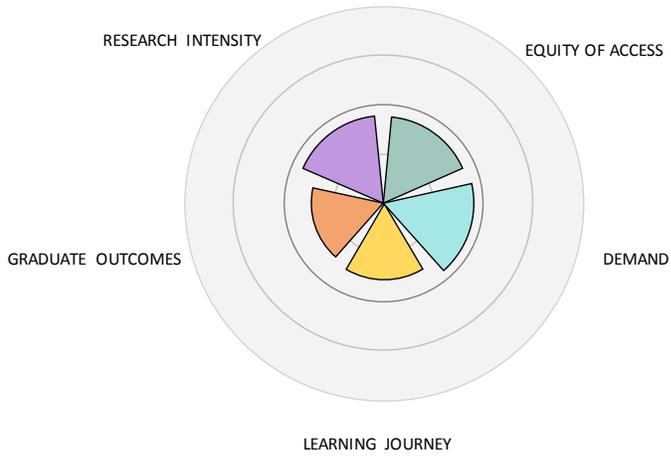
Waterloo



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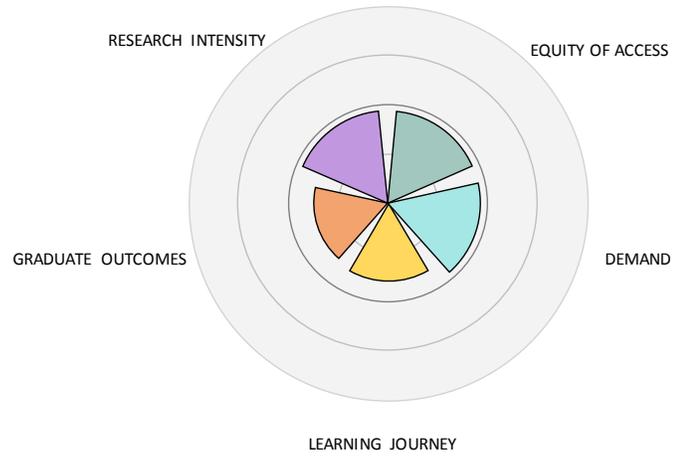


Table 3 shows the Z-score values used in Figures 1 through 20 immediately preceding. The table shows in the rightmost column, for each university, the degree of variance in its Z-score values across the five dimensions. The table helps reveal which universities have a relatively balanced profile across the five dimensions and which do not. This can also be seen visually in Figures 1 through 20 by observing the degree of “roundness” of each institution’s wheel.

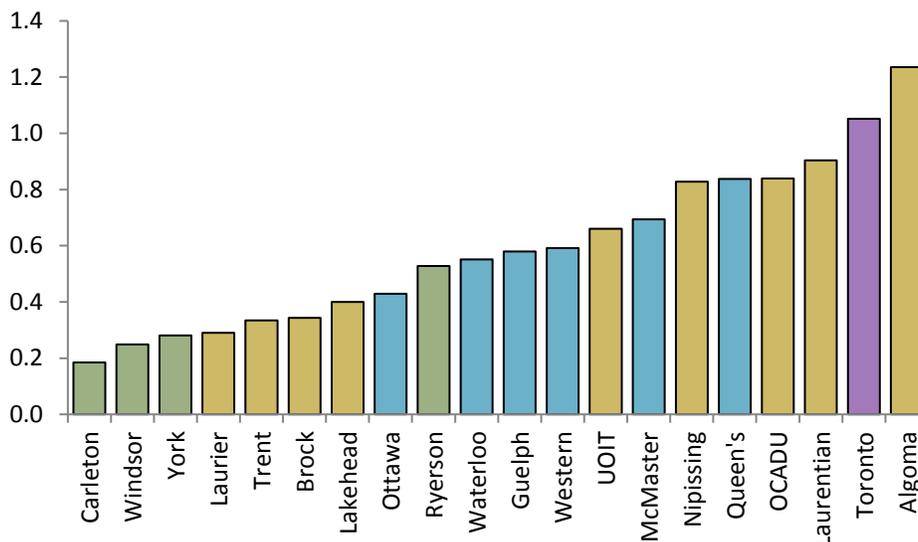
Table 3: Average Standardized Z Scores and Dispersion

	Equity of Access	Demand	Learning Journey	Graduate Outcomes	Research Intensity	Standard Deviation
Algoma	1.1	-0.4	-1.1	-2.2	-1.3	1.2
Brock	-0.1	-0.4	0.1	0.0	-0.8	0.3
Carleton	0.0	0.1	-0.1	-0.4	-0.1	0.2
Guelph	-0.5	0.2	1.1	0.2	0.5	0.6
Lakehead	0.0	-0.7	-0.3	0.2	-0.7	0.4
Laurentian	1.3	-0.5	-0.3	0.8	-0.8	0.9
McMaster	-0.5	0.3	0.4	0.7	1.4	0.7
Nipissing	0.8	-0.5	0.7	0.2	-1.2	0.8
OCADU	0.3	0.3	0.0	-1.5	-1.1	0.8
Ottawa	0.1	0.8	-0.2	0.2	0.8	0.4
UOIT	0.3	-0.7	-0.9	0.6	-0.3	0.7
Queen's	-1.0	0.6	1.1	0.8	0.7	0.8
Ryerson	0.2	0.2	-0.4	0.6	-0.7	0.5
Toronto	-0.4	0.8	0.1	0.3	2.3	1.1
Trent	0.2	-0.5	0.0	-0.5	-0.2	0.3
Waterloo	-0.3	0.7	0.3	1.2	0.8	0.6
Western	-0.7	0.6	0.7	0.5	0.6	0.6
Laurier	-0.1	-0.4	0.0	-0.1	-0.7	0.3
Windsor	-0.4	-0.3	-0.7	-0.8	-0.3	0.2
York	-0.2	-0.2	-0.6	-0.8	-0.2	0.3
Standard deviation	0.6	0.5	0.6	0.8	0.9	

This column also shown in Figure 21, following

The following figure shows the dispersion of results across the five dimensions for each university from the rightmost column of Table 2. The smaller the spread (measured as the standard deviation across the five dimensions we are tracking), the more balanced a university. In Figures 1 through 20, the same characteristic can be seen in the “roundness” of each institution’s wheel.

Figure 21: Standard Deviation across the Five Dimensions



Discussion

Balancing our data-driven perspective

Our 2013 report focused on research and graduate intensity. This report rounds out the perspectives on institutional differentiation. We can now look at the diverse profiles of the 20 universities on five dimensions that speak to both the research and teaching missions and provide evidence-based suggestions for the road ahead.

Recognize and fund equity of access as a significant differentiating feature

Across our institutions, an important differentiating feature is revealed by the data on equity of access. The heat chart (Table 2) and individual institutional visualizations (Figures 1 through 20) reveal that a strong institutional focus on equity of access is the most obvious counterbalancing characteristic to research intensity. In fact, equity of access correlates negatively with all four other dimensions we measured. It is a defining characteristic with regard to institutional diversity.

Table 4: Correlation Coefficients between the Five Dimensions⁵

	Equity of access	Demand	Learning journey	Graduate outcomes	Research intensity
Equity of access					
Demand	-0.56				
Learning journey	-0.53	0.48			
Graduate outcomes	-0.34	0.31	0.47		
Research intensity	-0.66 ⁶	0.76	0.41	0.48	

Our equity of access powerhouses are clustered within our mostly undergraduate universities and some regional or in-between institutions. They serve a greater proportion of students who have traditionally been underrepresented at the university level. They also serve students who arrive with lower marks, experience lower persistence and completion rates (within the learning journey dimension) and higher loan default rates (within the graduate outcomes dimension). Nor do they benefit from the high overall level of student demand experienced by the research-intensive universities, which enables them to attract and assemble the strongest incoming cohorts.

The differentiation opportunity is to ensure that we orient, equip and fund these institutions to focus on providing their important, diversified student bodies access to university and the opportunity for success once they are enrolled. The stewardship tools the province is creating through SMAs and its review of the funding formula present opportunities to strengthen these supports.

Of course the research-intensive universities have large numbers of students from under-represented groups on their campuses. But proportionally they serve fewer. The profiles of their admittedly larger student bodies and campuses are different.

⁵ Correlation coefficients measure how closely two sets of values move together. In our case, the two sets of values are the institutional dimension-level values for each possible pairing of dimensions. The results for each pairing are expressed as a number between -1 and 1 in Table 4. A positive correlation means that as one dimension's values grow, so do the values of the paired dimension. A negative correlation means that as one dimension's values grow, those of the paired dimension diminish. The closer the result is to either 1 or -1, the tighter the positive or negative relationship. The closer the result is to 0, the less of a relationship at all between the values in the two dimensions.

⁶ Only one of the research-intensive universities, the University of Ottawa, has an equity of access score greater than the system average. This is because of its francophone focus, which reflects both its geographical location and the profound impact of government's differentiated French language support in the sector. If francophone access is taken out of the calculation of correlation coefficients, the negative correlation between research intensity and equity of access is even higher at -.72.

Good learning everywhere

We favour broad institutional and faculty latitude in developing different approaches, styles and modalities to the business of teaching and learning. But on learning outcomes – the mastery achieved not only in disciplinary knowledge but in basic and higher-order cognitive skills and personality skills – we want all students from all programs across all universities to be well equipped and ready for the labour market. For Ontario, as the government has clearly indicated, the spotlight today is on enhancing the quality of the teaching and learning mission and improving the overall student experience.

Ontario is in the early stages of learning how to directly measure non-disciplinary learning outcomes for Ontario students. In classrooms across the province, HEQCO is working with university and college faculty and administrators to pilot different and innovative formative assessment tools. HEQCO's Learning Outcomes Assessment Consortium is experimenting with rubrics, e-portfolios and check lists to create a toolbox of valid and reliable assessment practices.

At the institutional and sector level, HEQCO is conducting important field trials in partnership with colleges and universities to measure the value added of a postsecondary credential from point of entry to completion. We are piloting the use of large-scale assessment tests such as the [Education and Skills Online](#) assessment of literacy, numeracy and problem solving skills; and [HEIghten](#) and the [Collegiate Learning Assessment](#), both tests of critical thinking skills.

In the meantime, we have assembled available measures and proxies to construct our learning journey and graduate outcomes dimensions. We need to work with each university to strengthen these outcomes across the board. To do so, an important focus must be on understanding the variety of starting points for the student bodies at our 20 universities. To echo what we already said: some universities may serve proportionally more complex student bodies with more complex needs, and they should be supported in meeting those needs. Every student, no matter where they are studying, deserves a strong end point.

Build on the role of regional universities

Our 2013 report revealed four “in-between” universities: Carleton, Ryerson, Windsor and York. Within that more limited analysis of institutional differentiation, we were unsure how to characterize these institutions. The current analysis allows us to do so. As shown in Figure 21, these “in-between” universities present relatively balanced profiles among the five dimensions we measure in this examination. These are institutions that serve their region well in all respects – teaching, access, research – although they never reach the heights of some other universities in individual dimensions such as equity of access or research intensity. Given the data presented here, we propose to re-label this cluster Ontario's *regional* universities: providing a balanced set of programs and services with a more moderate research emphasis to their regional demographic and economic base. Some of the mostly undergraduate universities are also relatively balanced in terms of their performance in the dimensions examined. We encourage the government and these institutions to strengthen their teaching and learning capabilities or cultivate other distinctive qualities, such as what Ryerson University has achieved in its growing reputation for innovation.

Concentrate research expansion for greater impact

All Ontario universities serve the twin missions of teaching and research. This is not about to change, nor should it. The two are the existential core of the university concept.

However, research intensity varies more dramatically among our 20 universities (higher institutional deviations from the provincial mean) than any of the other four dimensions. The data demonstrate that a wide range of research intensity can be accommodated within the provincial system. The data also indicate that Ontario's research-intensive universities are also the universities with greater student demand: they attract high-potential student candidates and deliver strong graduate outcomes.

Research intensity comes with both opportunity and cost. Currently, Canada does not adequately fund the indirect costs of research. The implication of this reality is that to sustain a quality research profile, universities must divert funds from tuition and government grants to underpin research infrastructure. The cost of research intensification would be especially high for our access and undergraduate institutions, who would have to divert increasing proportions of their energies and investments to the expansion of research at the very time we want them to increase the focus on their important equity of access and teaching contributions. The most promising strategy is to concentrate research resources – infrastructure, sponsored funding and graduate education – into the already more research-intensive universities that attract the greatest student demand.

Support the University of Toronto as Ontario's flagship institution

It is important for Ontario to have at least one internationally ranked top tier university. This reflects well on the entire system and, like a rising tide, lifts all boats. Under the current funding regime and absent of a more aggressive differentiation framework, it is improbable that we would be able to sustain two or more Ontario universities among the top 50 in the world.⁷ On the basis of the data, the University of Toronto and only the University of Toronto plays this important role for the province.

Ontario funds the University of Toronto in the same manner and through the same incentives as the rest of the system. Ontario asks it (and it has stepped up) to be not only our premier research and reputational powerhouse but also our largest capacity undergraduate institution (17% of the system) in the fastest growing region of Ontario.

A differentiated approach suggests seizing the opportunity to restructure funding and enrolment expectations to ensure that Toronto continues to be able to play its unique and powerful flagship role for Ontario.

⁷ Though in the California postsecondary system, seven of its publicly supported universities appear in the top 50 universities on either the Times Higher Education, QS or Shanghai global rankings. It is perhaps not coincidental that the California system is historically a highly differentiated postsecondary system.

Strategic Mandate Agreements: seize opportunity for a bold strategy

Our expert panel reviewing the first prototypical set of SMAs observed “a tendency to greater homogenization of the system based on preferences within the academy for research and advanced degrees, rather than greater institutional differentiation” (HEQCO, 2013a, p.11).

The first signed SMAs, created cooperatively between the ministry and the institutions two years later, reflect a stronger alignment between institutional aspiration and the evidence of differentiation presented in this report. In their SMA mission/mandate statements, four of Ontario’s seven research-intensive universities (as defined by HEQCO) describe themselves as such, while only one of the 13 undergraduate/regional institutions does so. Six of the 13 undergraduate/regional institutions (as defined by HEQCO) identify service to an under-represented group, adult learners or transfer students, while only one of the research-intensives does so (and that is the bilingually designated University of Ottawa).

It is critical that the next round of SMAs seize the opportunity to move strongly and boldly towards more differentiated missions and strategic pathways. The institutional profiles revealed by the data in this report should help with this, as well as related and downstream government decisions on matters like program approvals, capital funding, enrolment targets and graduate allocations.

Drive differentiation through funding

Differentiation is little more than a conversation unless funding structures support and incent it. Today’s funding mechanism is a uniform tool that rewards only enrolment growth, and enrolment growth is for many institutions increasingly unattainable.

Our clusters of universities and the data in this report suggest a series of simple questions by which potential new funding models can be evaluated for their ability to support differentiation. How well would they reward the mostly undergraduate universities for their proportionally high service to equity of access objectives, and for the provision of high-quality undergraduate education that supports students through their journey and into the labour market? How well would they support and reward the regional hubs for their balanced performance and important regional contributions? How well would they support the research-intensive universities for just that, as well as for graduate intensification? And lastly, would they ensure that the University of Toronto is recognized and supported for its unique Canadian flagship role and international prominence?

As evidenced by its initiation of [Strategic Mandate Agreements](#) with the province’s colleges and universities, and the release of its [Differentiation Policy Framework](#), the Ministry of Advanced Education and Skills Development has clearly signaled its intention to position differentiation as “a primary policy driver for the system” (MTCU, 2013, p. 6). The precedent has already been set. Thanks to deliberate policy and funding supports, French-speaking students and services are highly concentrated in three institutions (Ottawa, Laurentian and its affiliate Hearst, and York). Appendix 1 indicator 1.4 demonstrates the impact. This is a dramatic and still rare example of differentiation that has worked well. The time is now to boldly apply differentiation across Ontario.

References

- Berger, J., Motte, A., & Parkin, A. (2009). *The Price of Knowledge: Access and Student Finance in Canada*. 4th edition. Montreal: Canada Millennium Scholarship Foundation.
- Canadian University Survey Consortium (2013). *First-year University Student Survey Master Report*. Retrieved from http://www.cusc-ccreu.ca/publications/2013_CUSC_FirstYear_master%20report.pdf
- Council of Ontario Universities (2010). *Ontario universities welcome the debate on enhancing the differentiation of universities*. Retrieved from <http://cou.on.ca/articles/ontario-universities-welcome-the-debate-on-enhancing-the-differentiation-of-universities/>
- Dooley, M. D., Payne, A. A., & Robb, A. L. (2009). *University Participation and Income Differences: An analysis of applications by Ontario secondary school students*. Toronto: Higher Education Quality Council of Ontario.
- Gordon, C., & White, J., (2013) *Meeting Demand: Trends in Aboriginal Post-Secondary Education (PSE)*. Retrieved from <http://www.queensu.ca/sps/events/conferencesandworkshops/ipp/ipp2013/bkgrndmaterials/MeetingDemandWhiteGordon.pdf>
- Hicks, M. (2015). *Design Questions: Funding Models for Ontario*. Toronto: Higher Education Quality Council of Ontario.
- Hicks, M., & Jonker, L. (2015). *Still Worth It After All These Years*. Toronto: Higher Education Quality Council of Ontario.
- Higher Education Quality Council of Ontario (2012). *The Productivity of the Ontario Public Postsecondary System Preliminary Report*. Toronto: Higher Education Quality Council of Ontario.
- Higher Education Quality Council of Ontario (2013a). *QUALITY: SHIFTING THE FOCUS. A Report from the Expert Panel to Assess the Strategic Mandate Agreement Submissions*. Toronto: Higher Education Quality Council of Ontario.
- Higher Education Quality Council of Ontario (2013b). *Performance Indicators: A report on where we are and where we are going*. Toronto: Higher Education Quality Council of Ontario.
- Jonker, L. (2016). *Ontario's PhD Graduates from 2009: Where are they now?* Toronto: Higher Education Quality Council of Ontario.
- Jonker, L., & Hicks, M. (2014). *Teaching Loads and Research Outputs of Ontario University Faculty Members: Implications for Productivity and Differentiation*. Toronto: Higher Education Quality Council of Ontario.
- Kerr, A. (2011). *Teaching and Learning in Large Classes at Ontario Universities: An Exploratory Study*. Toronto: Higher Education Quality Council of Ontario.

- Ontario Ministry of Training, Colleges and Universities (2011). *Aboriginal Postsecondary Education and Training Policy Framework*. Toronto: Queen's Printer. Retrieved from <https://www.tcu.gov.on.ca/pepg/publications/APETPFramework.pdf>
- Ontario Ministry of Training, Colleges and Universities (2013). *Ontario's Differentiation Policy Framework for Postsecondary Education*. Toronto: Queen's Printer. Retrieved from http://www.tcu.gov.on.ca/pepg/publications/PolicyFramework_PostSec.pdf
- Ontario Ministry of Training, Colleges and Universities (2015a). *Focus on Outcomes, Centre on Students: Perspectives on Evolving Ontario's University Funding Model Final Consultation Report*. Toronto: Queen's Printer. Retrieved from https://www.tcu.gov.on.ca/pepg/audiences/universities/uff/UniversityFundingFormulaConsultationReport_2015.pdf
- Ontario Ministry of Training, Colleges and Universities (2015b). *Strategic Mandate Agreement* (common language). Retrieved from <https://www.tcu.gov.on.ca/pepg/publications/vision/OttawaAgreement.pdf>
- Ontario Ministry of Training, Colleges and Universities (2015c). *University Funding Model Reform Consultation Paper*. Toronto: Queen's Printer. Retrieved from http://www.tcu.gov.on.ca/pepg/audiences/universities/uff/uff_ConsultationPaper.pdf
- Ontario Ministry of Finance (2016). *Ontario Budget 2016: Improving Access to Postsecondary Education*. Toronto: Queen's Printer. Retrieved from <http://www.fin.gov.on.ca/en/budget/ontariobudgets/2016/bk1.html>
- Pizarro Milian, R., & Hicks, M. (2014). *Ontario Private Career Colleges: An Exploratory Analysis*. Toronto: Higher Education Quality Council of Ontario.
- Rae, Hon. Bob (2005). *Ontario A Leader in Learning*. Toronto: Queen's Printer.
- Statistics Canada (2015). *Education Indicators in Canada: An International Perspective 2015*.
- Truth and Reconciliation Commission of Canada (2015). *Honouring the truth, reconciling for the future: summary of the final report of the Truth and Reconciliation Commission of Canada*. Retrieved from http://www.trc.ca/websites/trcinstitution/File/2015/Honouring_the_Truth_Reconciling_for_the_Future_July_23_2015.pdf
- Weingarten, H. P. (2016). *Goals vs. strategies: A postsecondary primer*. Itsnotacademic blog. Toronto: Higher Education Quality Council of Ontario.
- Weingarten, H. P., & Deller, F. (2010). *The Benefits of Greater Differentiation of Ontario's University Sector*. Toronto: Higher Education Quality Council of Ontario.
- Weingarten, H. P., Hicks, M., Jonker, L., & Liu, S. (2013). *The Diversity of Ontario's Universities: A Data Set to Inform the Differentiation Discussion*. Toronto: Higher Education Quality Council of Ontario.
- Weingarten, H. P., Hicks, M., Jonker, L., Smith, C., & Arnold, H. (2015). *Canadian Postsecondary Performance: Impact 2015*. Toronto: Higher Education Quality Council of Ontario.

Zhao, H. (2012). *Postsecondary Education Participation of Under-Represented Groups in Ontario: Evidence from the SLID Data*. Toronto: Higher Education Quality Council of Ontario.

Appendix 1: Indicators of Equity of Access, Demand, Learning Journey and Graduate Outcomes

Assembling the Dimensions

This appendix presents the source data behind four of the five dimensions of differentiation defined in this report:

- Equity of access
- Demand
- Learning journey
- Graduate outcomes

Appendix 2 does the same thing with regard to the indicators underlying the fifth dimension, research intensity.

The Data

As noted in the body of this report, the data we have collected and presented are imperfect. They are drawn from reliable sources – predominantly the universities themselves and the federal and provincial governments – but they fall prey to a number of weaknesses and limitations:

- Some are generated through student surveys and are commonly thought to contain a margin of error due to reluctance of students to reveal details about themselves. (Example: the self-identification by students as Aboriginal)
- Some of the data are collected using inconsistent definitions or methodologies across the 20 institutions. (Example: the definition of the course-load threshold at which a student toggles between full-time and part-time status)
- Some may be proxies at best for what we are measuring. (Example: institutional OSAP participation rates, which are an imperfect measure of socio-economic background as they are also influenced by variables such as the percentage of the institution’s student body that lives at home, the variability in program tuition fees, and the reach of OSAP eligibility into middle-income background students)

For specific indicators for which there are known problems with the data, we will indicate these in the accompanying notes.

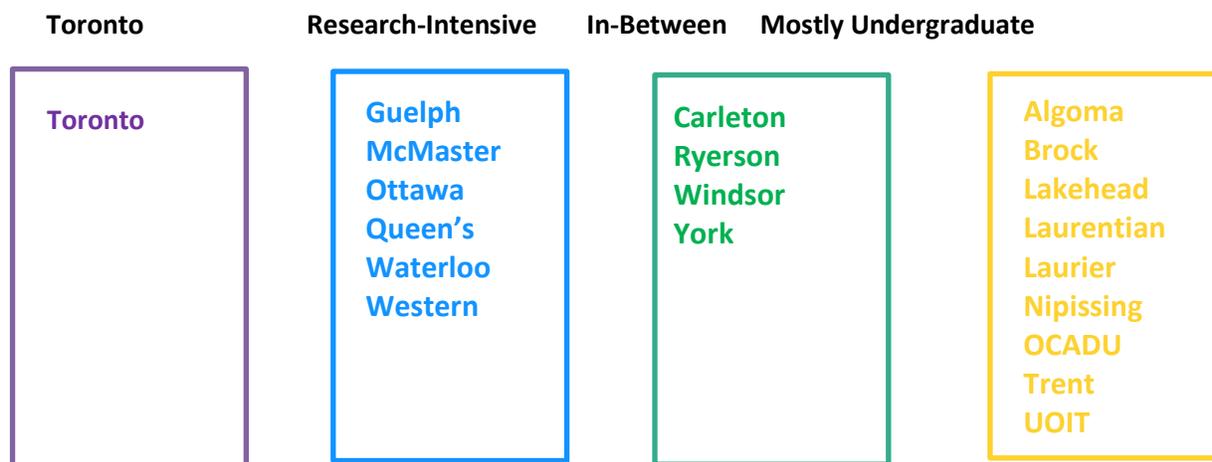
In all cases, the data included in this report are sufficiently robust to tell a meaningful and accurate story about institutional characteristics and differentiation. This is especially so when we aggregate the data, as we do in the report, so no single measure unduly influences the observations made about an institution or the set of institutions.

The indicator data are not intended to assign a mark or performance score to each of the universities. They, and the dimensions to which they aggregate, are descriptive. Some of the indicators of differentiation are not even within the control of a university. They are the product of local environments or policy and funding practices. Nor is “more” of something we measure intended as a value judgement. For example, to say that one university has a higher percentage of first-generation students in its population is not to imply that it is more equitable or performs better on equity of access. It is simply to observe something important about its student body that might be relevant in planning the future path and provincial funding supports that best fit such an institution.

As we said at the outset of the report, pursuing the opposite strategy of waiting to conduct the analysis until the data are fully perfected effectively results in waiting forever and continuing to make decisions in the total absence of any data.

Colour Scheme

As noted in the body of the report, data in the figures below have been colour-coded to identify the institutions in each of the four clusters of universities observed in *The Diversity of Ontario’s Universities: A Data Set to Inform the Differentiation Discussion*:⁸



⁸ For consistency and ease of cross-reference, the same colour scheme was also applied in HEQCO’s report *Teaching Loads and Research Outputs of Ontario University Faculty Members: Implications for Productivity and Differentiation* and in *Ontario’s PhD Graduates from 2009: Where are they now?*.

Equity of Access Measures

The province's access priorities are slowly crystalizing. Access was traditionally a two-pronged agenda for Ontario. One prong was achieving growth in sheer numbers of enrolments and driving to a 70% overall adult population postsecondary attainment rate target. That target is now achieved⁹ and the focus is squarely on the second prong: equity of access for those groups and individuals who are traditionally underrepresented and not yet afforded equal opportunity to participate and succeed. Ontario has identified the following equity of access priorities: first-generation students, students with disabilities, Aboriginal students, Francophones, low-income students and students transferring between college and university.

The indicators that follow reflect considerable diversity of focus and profile among the 20 universities with regard to these priorities.

Indicator 1.1: Percentage of Students who are First-Generation Students

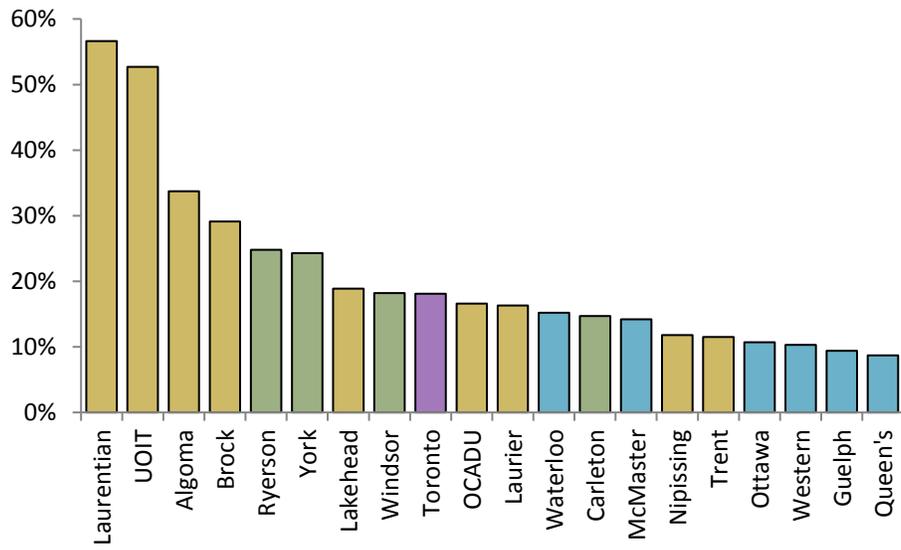
Our first indicator looks at the percentage of each university's student body whose parents did not complete higher education. The 2005 Rae Report identified these first-generation students as an access priority for Ontario. The government responded with a first-generation funding program. The priority placed on first-generation students is based on research that indicates that the probability of attending university is considerably less for children of parents who do not themselves have a postsecondary education (Zhao, 2012).

Figure 1.1 shows the percentage of full-time students at each Ontario public university who self-identify as first-generation students. The data are generated through self-reporting by students on survey instruments and likely reflect an unmeasurable degree of self-selection bias.

Although the pattern is imperfect, we note that the percentage of first-generation students is generally higher at Ontario's mostly undergraduate and in-between institutions than it is at our research-intensive institutions. This is simply an observation about these institutions, not a performance metric.

⁹ See Tables A.1.1 and A.1.3 in Statistics Canada's *Education Indicators in Canada: An International Perspective 2015*, which show adult postsecondary attainment (including trades and apprenticeship) of 65% in 2014, but higher for adults aged 25 to 44.

1.1 Percentage of Students who are First-Generation Students



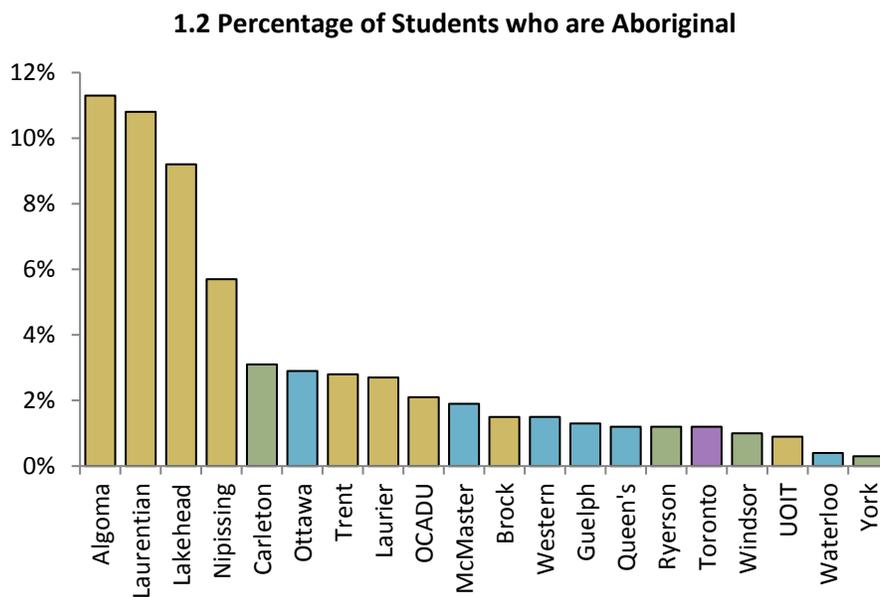
Source: Institutional Multi-Year Accountability Agreements (MYAAs), 2013

Indicator 1.2: Percentage of Students who are Aboriginal

The development and implementation by MAESD of the Aboriginal Postsecondary Education and Training Policy Framework (MTCU, 2011) signals its commitment to support postsecondary education for Ontario’s Aboriginal population. The recent report of the Truth and Reconciliation Commission of Canada calls for the elimination of gaps in Aboriginal educational attainment (Truth and Reconciliation Commission, 2015). The gap between Aboriginal and non-Aboriginal educational attainment is highest at the university level, and much less at the college and trades levels (Gordon & White, 2013).

Figure 1.2 shows the percentage of full-time students at each Ontario public university who identify as Aboriginal. As already noted, these data are self-reported voluntarily and widely considered to be a rough comparative tally at best.

Geography appropriately plays a role in the distribution of Aboriginal students. Institutions operating in regions of the province with proportionally higher Aboriginal populations tend to enrol higher proportions of Aboriginal students.



Source: Institutional MYAAs, 2013

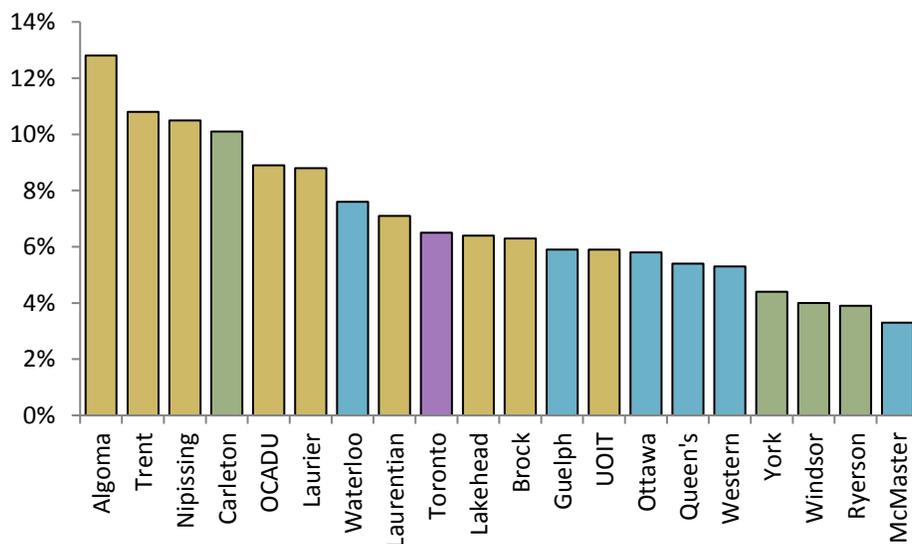
Indicator 1.3: Percentage of Students with Disabilities

Access and accommodation for students with disabilities are both legal obligations of institutions and policy priorities for the province. Ontario distributes dedicated funding to help defray the additional costs associated with serving students with special needs.

Figure 1.3 shows the percentage of full-time students at each university in Ontario who registered with the institution's office for students with disabilities and received support services in 2013-14. The data do not capture students who may have been diagnosed or self-identify as having a disability but who did not seek accommodation through their university.

Although the pattern is imperfect, we note that the percentage of students with disabilities is generally higher at Ontario's mostly undergraduate and in-between institutions than it is at our research-intensive institutions. This is simply an observation about these institutions, not a performance metric.

1.3 Percentage of Students with a Disability



Source: Institutional MYAAs, 2013

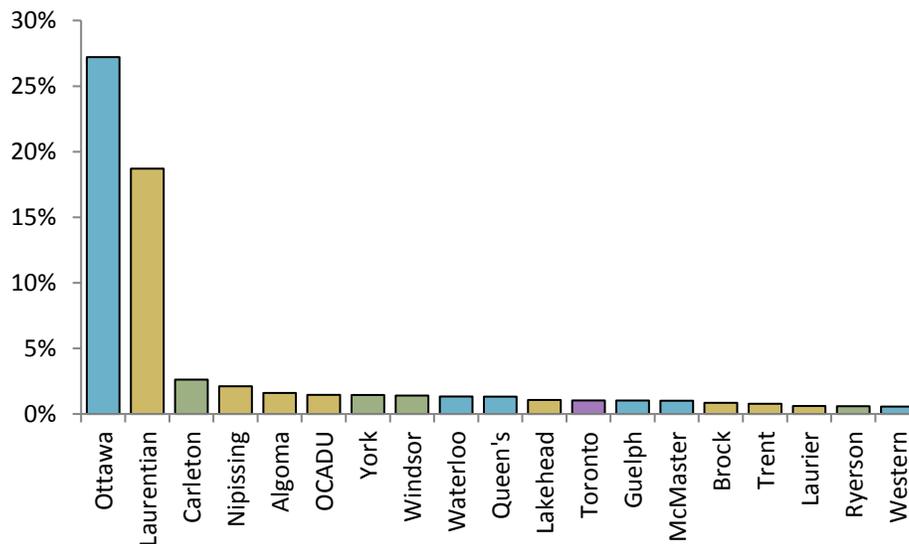
Indicator 1.4: Percentage of Students who are French-speaking

In a rare and profound instance of differentiated policy and funding practices, the Ontario government has actively promoted the concentration of French-language university services. The results are dramatic. Three institutions are provided with proportionately significant French language funding (more than 10% of their total provincial grants): Laurentian, Hearst and Ottawa. One other institution, York, also receives considerable government grants for French programming at Glendon College, though York's overall enrolment is so large that its French student funding and population is proportionally small.

The corresponding proportion of enrolment of French speakers in each university is shown in Figure 1.4. As we noted, York has a considerable French language student population but it is proportionally small in relation to its overall size. This is reflected in Figure 1.4. We could not include Hearst in this figure – or more generally in this paper – as data are missing for this very small institution, which legally is an affiliate of Laurentian. If it could be added to Figure 1.4, Hearst would also show a high concentration of French language speakers: it provides programming exclusively in French. Data for Figure 1.4 were also unavailable to us for UOIT.

The data do not capture French speakers who learned French as a second language, such as French immersion students from Ontario's school system.

1.4 Percentage of Students for whom French is Mother Tongue



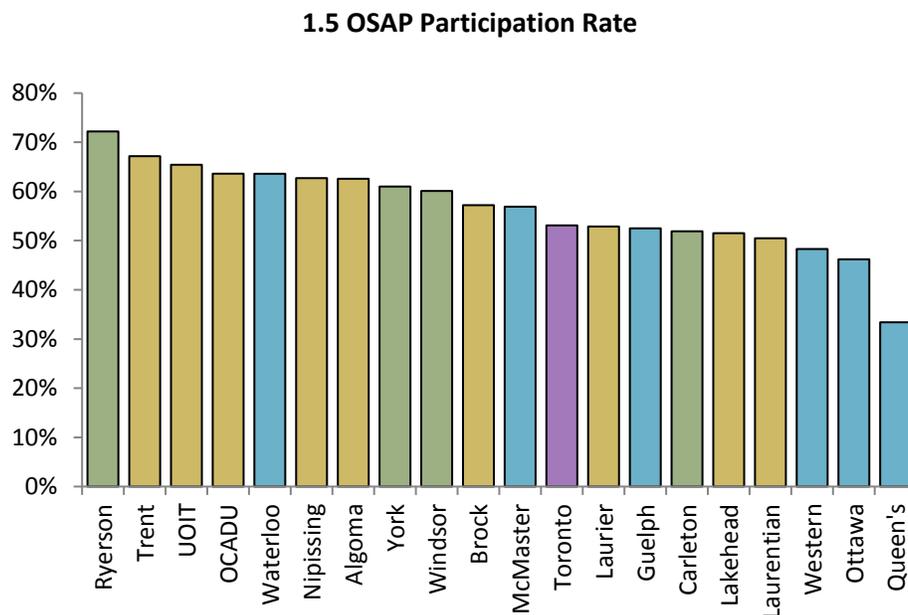
Source: MTCU, 2012

Indicator 1.5: OSAP Participation Rate

The removal of financial barriers to participation has been a long-standing priority for Ontario, implemented primarily through the federal-provincial Ontario Student Assistance Program (OSAP).

Because OSAP is needs based, program participation serves as a proxy for socio-economic background. It is an imperfect proxy, influenced by other factors such as what proportion of each institution's student body is regionally based and living at home (lower living costs) and program mix (variability in tuition fees). Not all low-income OSAP-eligible students apply for assistance under the program (Berger, Motte & Parkin, 2009, p. 159). OSAP also extends income-tested eligibility into the middle class (Ontario Ministry of Finance, 2016). It is, however, the best available proxy at the institutional level. An alternative approach would be to map the applicants and students at each institution to neighbourhood-based census data on family income (see, for example, Dooley, Payne & Robb, 2009). These institutional-level data were not available to us.

Figure 1.5 shows the OSAP participation rate for undergraduate programs at each Ontario university. The impact of tuition variability has been reduced by excluding the following high-tuition professional programs: law, dentistry, dental specialties, medical specialties, surgical specialties, optometry and pharmacy.



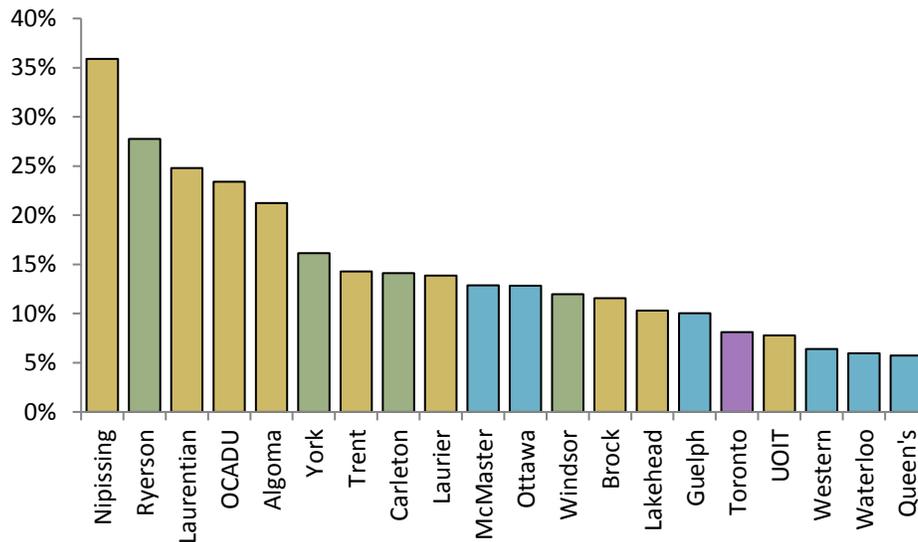
Source: MTCU, 2013

Indicator 1.6: Percentage of Students Studying Part-time

Another general indicator of access is the proportion of students studying part-time, perhaps because they need to work or are balancing other obligations with their studies. Figure 1.6 shows the percentage of students at each university who are studying on a part-time basis.¹⁰

There is some variability in this data set, as the 20 institutions do not use a common definition of the course load at which a student moves from full-time to part-time status. The results should be viewed for overall trends, not for precise institutional values and placements. Generally, a greater percentage of students at mostly undergraduate and “in-between” universities are studying on a part-time basis.

1.6 Percentage of Students Studying Part-time



Source: Council of Ontario Universities, Common University Data Ontario (CUDO), 2014

¹⁰ Students participating in a co-op program are not by virtue of this fact part-time, so the high levels of co-op programming at the University of Waterloo do not drive up Waterloo's proportion of part-time students.

A Note on Transfer Students

Transfer opportunities, especially from college to university, are an important access priority for Ontario. The province has created and funds the Ontario Council for Articulation and Transfer (ONCAT) to drive the agenda in this area and remove barriers to mobility between institutions.

We would have liked to include institution-level data on transfer students. We know of five potential sources. Of these, only one is available to us (it is published and updated annually), but its methodology is too limited to present even a crude summation of transfer activity.

Ontario needs to make transfer data publicly available in short order.

Demand

Do students choose universities or do universities choose students? It is a bidirectional matching process, wherein prospective students make the opening move by applying, universities respond by selecting applicants to whom they will make offers of admission, and students make a final pick from the offer(s) they receive.

We have already investigated one outcome of this iterative two-way selection process in our canvassing of equity of access indicators above. This next section of the paper asks more generally: are some institutions in higher demand? Do some institutions attract and take academically higher-performing entrants?

Indicators 2.1 and 2.2: Application to Registrant Ratio, and Percentage of Applicants who Ranked the University as their First Choice

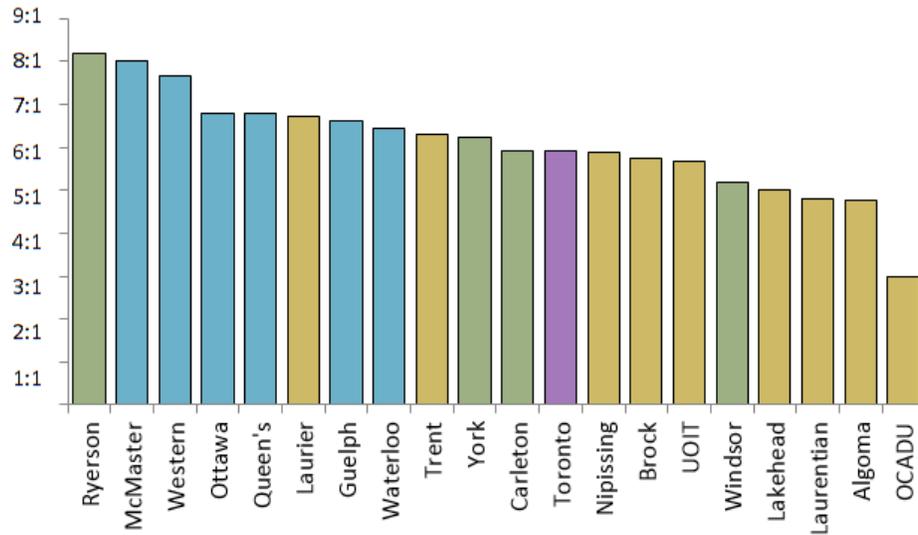
Ontario operates a centralized application service for all 20 public universities. Prospective students select the institutions to which they wish to apply, and if applying to several institutions they place these in rank order.

This theoretically allows for an analysis of which institutions are in higher demand. We wanted to show the “yield rate” for each university using the universities’ data: for each institution, what is the ratio of applicants to registrants?

Unfortunately, the publicly available data on the universities’ Common University Data Ontario site lend themselves only to deriving a less accurate ratio of total applications to registrants for each university. This ratio is less precise because individuals can submit up to three applications at one institution. The number of applications is therefore greater than the number of applicants by an unknown (to us) amount and with unknown variability across the institutions. In Figure 2.1, we have decided to use the less precise data available to us, as they still project a generalized picture of the yield rate. We would welcome the release of even better data by the universities in the future.

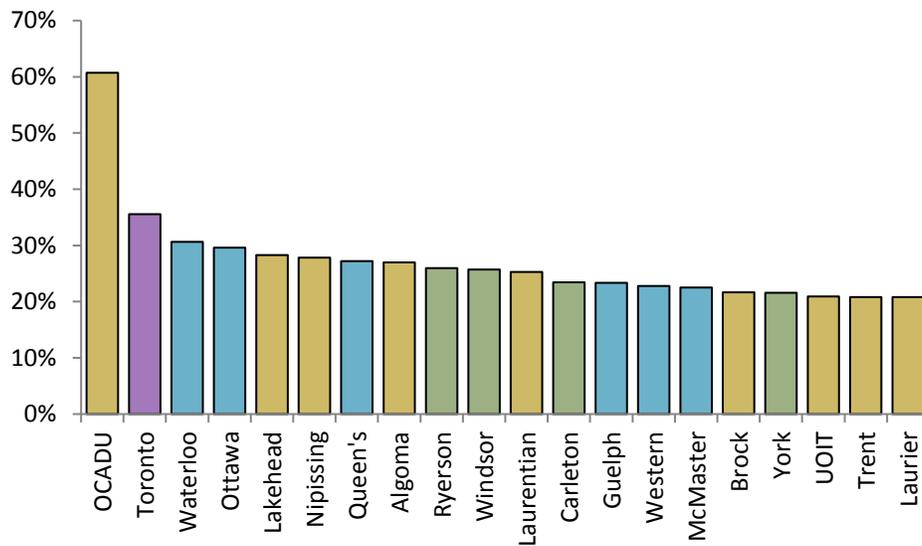
We supplement Figure 2.1 with Figure 2.2, which shows, for the pool of applicants to each university, the percentage that selected the university as their preferential first choice. We note the impact that intense mission and programmatic differentiation can have on this ratio: OCADU, exclusively focused on art and design, has by far the highest proportion of students selecting it as their first choice of university.

2.1 Application to Registrant Ratio



Source: Council of Ontario Universities, CUDO, 2014

2.2 Percentage of Applicants who Ranked the University as their First Choice



Source: Council of Ontario Universities, CUDO, 2014

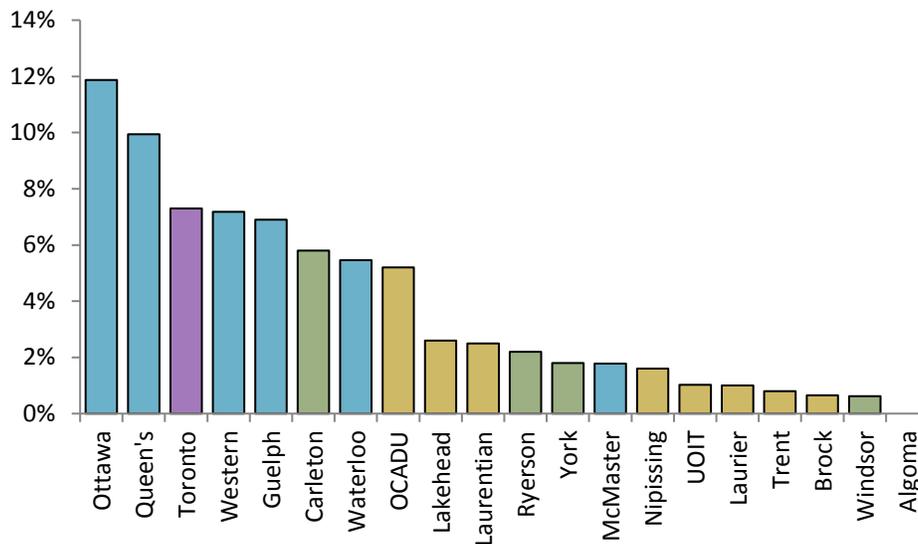
Indicators 2.3 and 2.4: Percentage of Entering Students who are from other Canadian Provinces and Territories, and Percentage of Students who are International Students

The decision to move to Ontario from another jurisdiction in order to attend university, be it from elsewhere in Canada or from abroad, is not made lightly. If one is taking the trouble to relocate to Ontario, it is likely because there is a sense or knowledge of superior value and opportunity. The choice of Ontario institutions made by students from outside the province is a reflection of their reputational and educational appeal. We recognize that these numbers can also be influenced by an institution’s international student policies and recruitment strategies.

Figure 2.3 shows the percentage of entering first-time, full-time, first-year undergraduate students who are from other Canadian provinces and territories. We draw attention to the unique circumstance of the University of Ottawa, which attracts a significant number of French-speaking students from border communities in Quebec. Most universities attracting a high proportion of international students are among those in the research-intensive clusters.

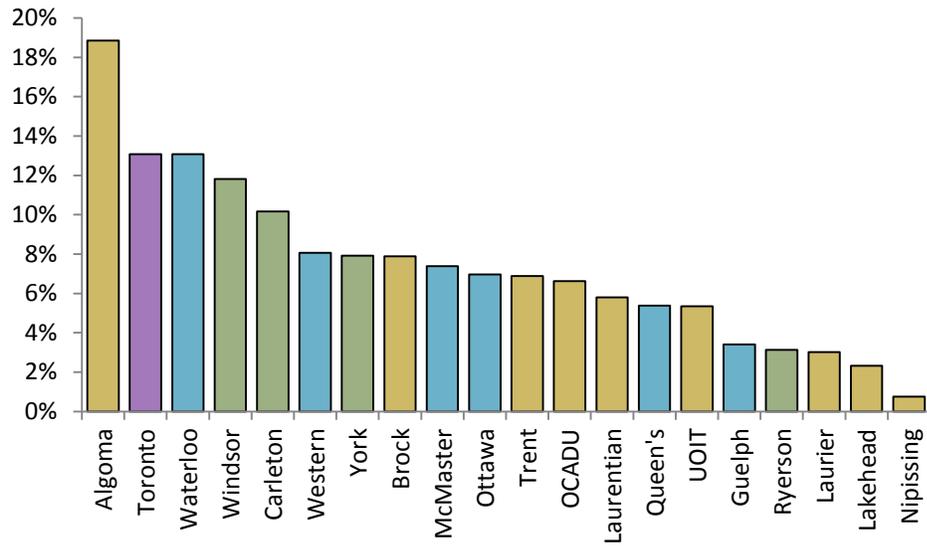
Figure 2.4 shows the proportion of the student population at each university that is made up of international students.

2.3 Percentage of Entering Students who are from other Canadian Provinces and Territories



Source: Council of Ontario Universities, CUDO, 2013

2.4 Percentage of Students who are International Students



Source: Council of Ontario Universities, CUDO, 2014

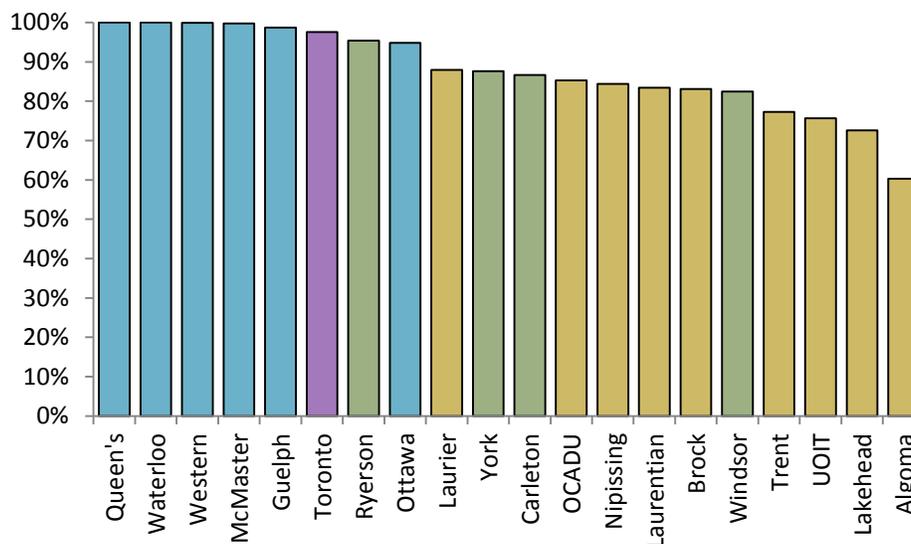
Indicator 2.5: Percentage of Entering Students with High School Marks Above 75%

For the most part, each of the universities in Ontario makes offers to its pool of applicants on the basis of entering (high school) marks. Marks are readily and universally available, are a simple filter to apply to winnow the applicant pool, and are generally accepted as a good predictor of success at university.

Figure 2.5 measures the percentage of students entering each of Ontario’s public universities with high school marks above 75%. Ontario’s research-intensive universities are generally able to attract and enrol students with the best entering grade averages.

To test whether different program offerings at the universities influence this measure, we also examined the distribution of high school marks just for arts and science entrants, a common programming core for all universities save OCADU. The results were similar.

2.5 Percentage of Entering Students with High School Marks Above 75%



Source: Council of Ontario Universities, CUDO, 2014

Learning Journey

Once students have selected (and also been selected by) an institution, the focus shifts to their journey through their program. What do they want from university, and what do the province and the institution want for them?

They want to learn, they want to graduate, they want a good student experience, they want a successful transition to the labour market, and they want costs and any resultant debt loads to be manageable. Direct measures of student learning outcomes are not yet available. We examine transitions to the labour market and debt in the next section of this appendix. In this section, we look at measured differences between our universities on indicators of progress to graduation, and of the student experience.

Indicators 3.1 and 3.2: Retention and Graduation Rates

Our capacity to fully capture retention, progression and graduation rates in Ontario will be improved once we harness the potential of the Ontario Education Number, which will enable us to track students across time and programs, and between institutions.¹¹ But we do have a solid head start by way of tested measures of retention and graduation at the intra-institutional level through existing reporting mechanisms. Figure 3.1 shows the retention rate of undergraduate students from first to second year. Although the research-intensive universities generally have higher rates, it is important to note that the range of values across the universities is very small.

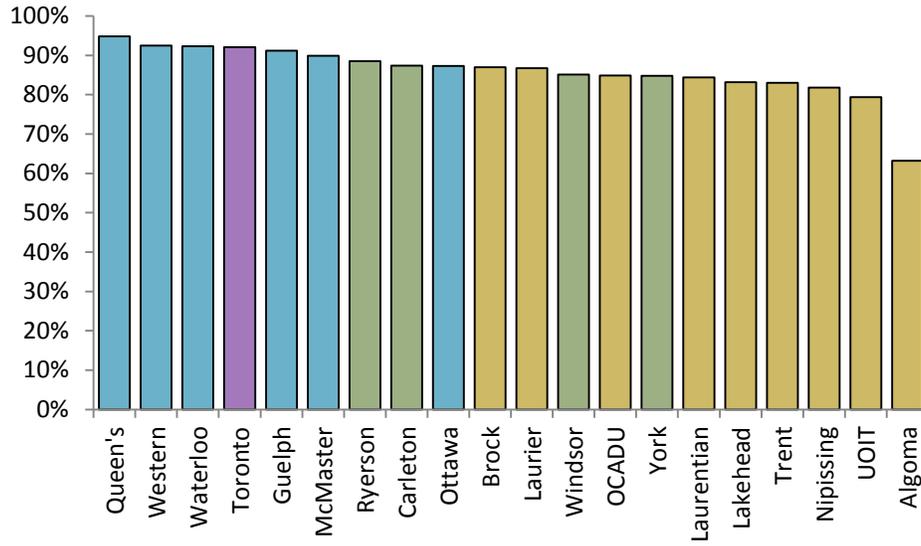
Figure 3.2 shows the undergraduate graduation rate. The rate captures students who graduate from the university in which they started within six years of entry.¹²

Overall, Ontario's research-intensive universities report higher graduation rates than the more undergraduate institutions. For context, it is important to note that Ontario's graduation performance across the board is significantly higher than in the United States, where the National Centre for Education Statistics reports a baccalaureate graduation rate after six years of just under 60%.

¹¹ The Ontario Education Number is a unique student identifier. It has been issued to Ontario elementary and secondary students since 2003. The OEN was extended to all colleges and universities beginning in 2012. Once an OEN is assigned to an individual, it travels with the individual and therefore enables the assemblage of a longitudinal picture of all steps in their educational journey. As of the time of writing, there are three years of postsecondary OEN data collected, but no analysis has been released.

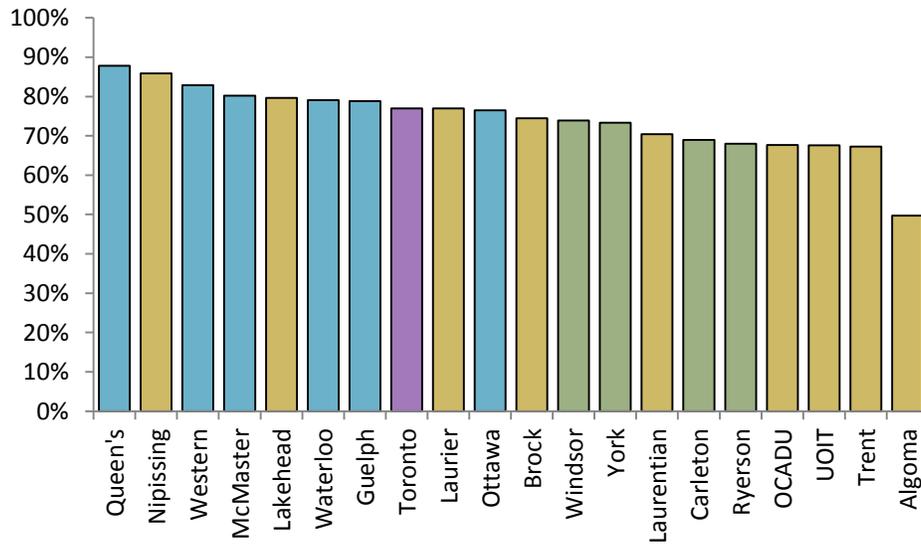
¹² The seeming discrepancy at Nipissing and Lakehead between retention rates (lower) and graduation rates (higher) may reflect the large proportion of students in one-year (at the time of measurement) Bachelor of Education programs at those universities.

3.1 Retention Rate from First to Second Year



Source: Council of Ontario Universities, CUDO, 2013

3.2 Graduation Rate

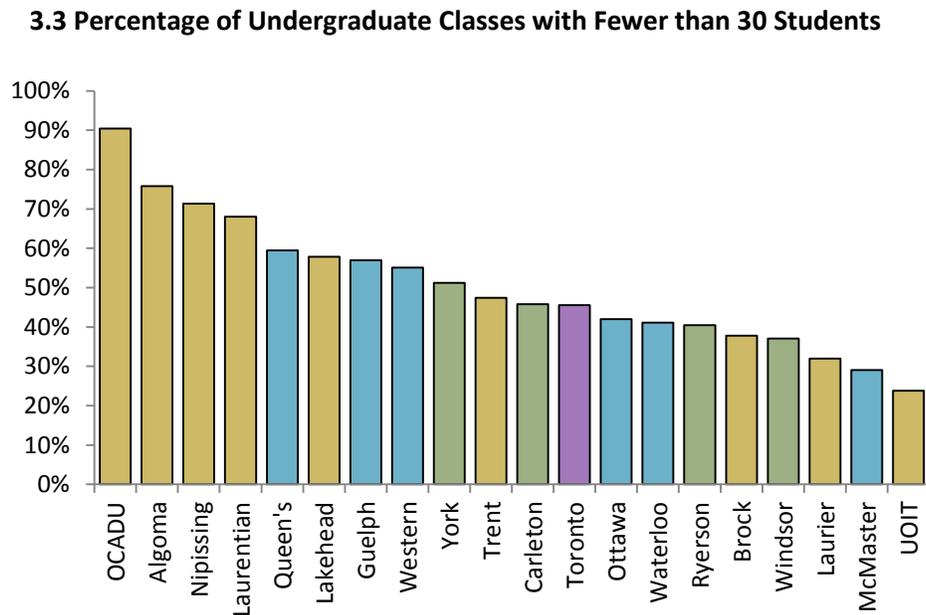


Source: MTCU, Key Performance Indicators, 2012

Indicator 3.3: Percentage of Undergraduate Classes with Fewer than 30 Students

Larger classes are one of the adaptations used by Ontario universities to accommodate ever-increasing enrolment levels against a backdrop of fiscal constraint. A 2011 HEQCO report *Teaching and Learning in Large Classes at Ontario Universities: An Exploratory Study* (Kerr, 2011, p. 3) found that “Intuitively, there is an assumption that smaller classes provide better learning environments, but finding empirical evidence for this assumption is more challenging.” The study cited some evidence of negative impact on retention as class size increases, but mixed results with regard to the impact on student performance. Nonetheless, class size is routinely reported and a number of institutions market smaller class size as a competitive advantage.

Figure 3.3 reports the percentage of undergraduate classes at each university that are small (less than 30 students).



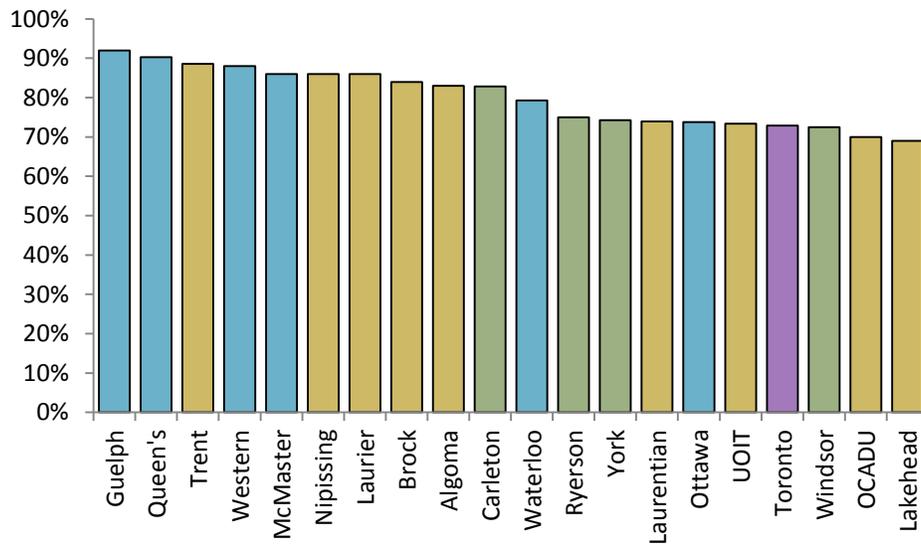
Source: Council of Ontario Universities, CUDO, 2014

Indicators 3.4 and 3.5: Student Engagement Scores

The National Survey of Student Engagement (NSSE) and the Canadian Graduate and Professional Student Survey (CGPSS) are standardized instruments used by many North American universities to measure student participation and time use at university and to gauge what students gain from attending university. Figure 3.4 shows the percentage of senior (final-year) undergraduate students who reported that they had an excellent or good educational experience. Figure 3.5 shows the percentage of graduate students who reported they had an excellent, very good or good overall experience.

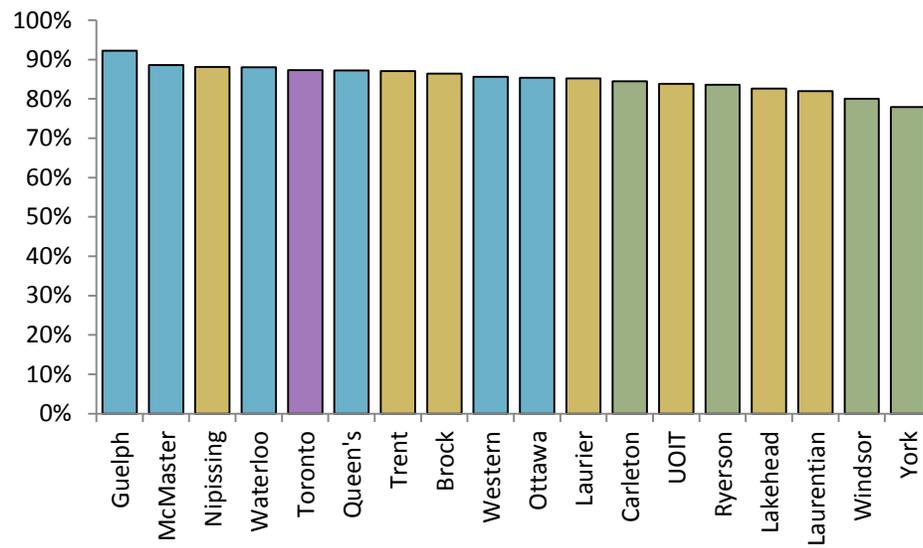
There are no strong patterns against our four clusters of universities in the NSSE and CGPSS results.

3.4 Percentage of Senior Undergraduate Students who had an “Excellent” or “Good” Educational Experience



Source: Council of Ontario Universities, CUDO, 2014

2.6 Percentage of Senior Graduate Students who had an “Excellent”, “Very Good” or “Good” Overall Experience



Source: Council of Ontario Universities, CUDO, 2013

Graduate Outcomes

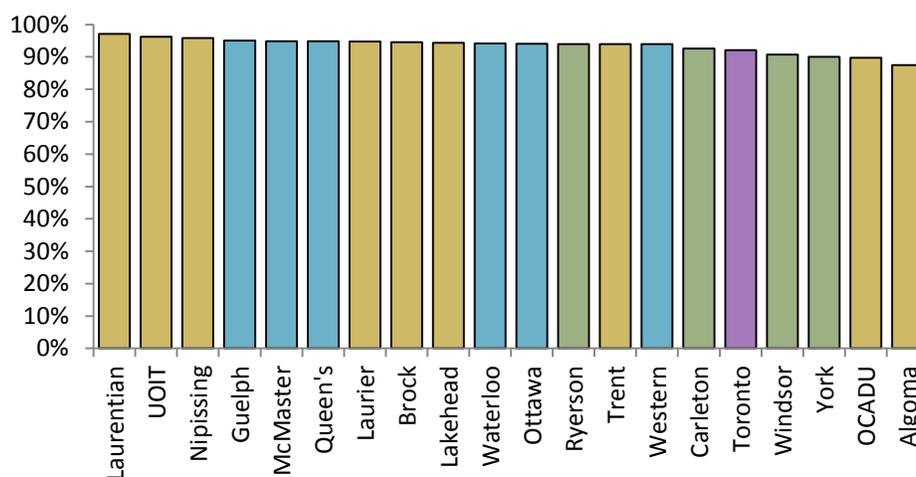
Students consistently define success in the labour market as an important return for their investment of time and money into their university education (CUSC, 2013). The province and institutions also view labour market outcomes as an economic return on public investment.¹³ Our recent report, *Still Worth It After All These Years* (Hicks & Jonker, 2015), reveals that the returns from a university education are strong overall. This section of our report looks at variations between institutions on post-graduation outcomes. We look at two types of indicators for which data are available: the first examines post-graduation employment and the second looks at loan (debt) repayment.

Indicators 4.1 and 4.2: Employment Rates and Average Earnings of University Graduates Two Years after Graduation

Figure 4.1 shows the institution-by-institution undergraduate employment rate two years after graduation from an Ontario university. The employment rate is calculated only for those graduates who identify as being in the labour market and is therefore not influenced by any variation in the number of graduates from each institution who have moved on to further study. The results are high and strikingly uniform across the 20 universities.

Figure 4.2 shows the average earnings for graduates working full- or part-time, using data from a survey of graduates conducted two years after the time of graduation. HEQCO and others are funding development work that will provide more robust, long-term data in the future on graduate employment earnings by matching graduates with their post-graduation income tax returns.¹⁴

4.1 Employment Rates of University Graduates Two Years after Graduation

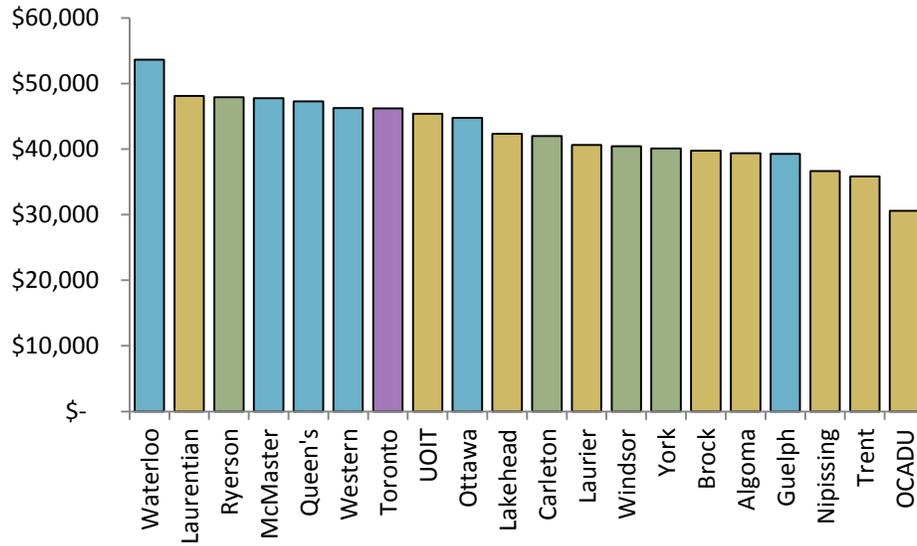


Source: Council of Ontario Universities, CUDO, 2013

¹³ See, for example, the Council of Ontario Universities at <http://cou.on.ca/key-issues/social-economic-impact/>, and the Ontario Premier's 2014 Mandate Letter to the Minister of Training, Colleges and Universities at <https://www.ontario.ca/page/2014-mandate-letter-training-colleges-and-universities>.

¹⁴ For a preview of what will be possible, see the work done by the Education Policy Research Initiative at the University of Ottawa at <http://www.epri.ca/>.

4.2 Average Earnings of University Graduates Two Years after Graduation



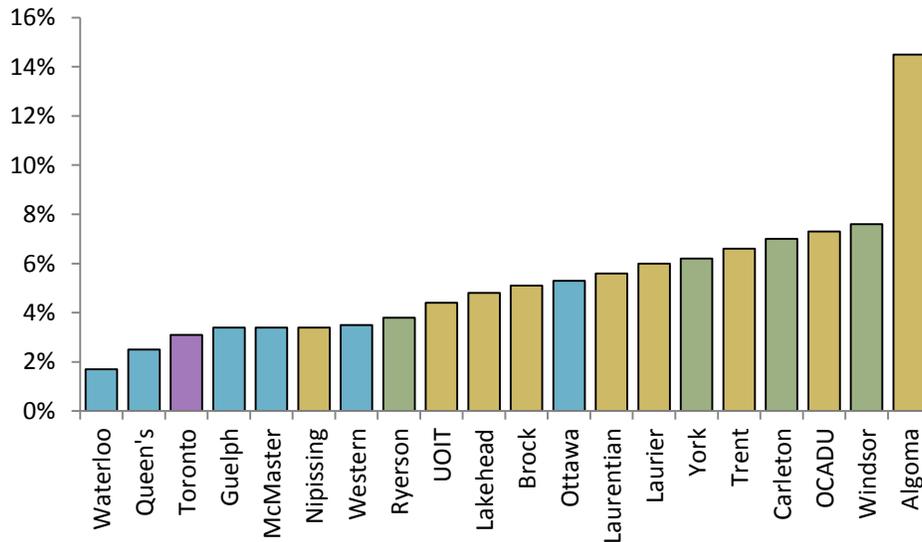
Source: MTCU, 2013

Indicator 4.3: OSAP Loan Default Rate

There are many ways to measure whether debt loads after leaving university are manageable or not within the context of post-graduate earnings: overall loan levels at graduation; the rate of repayment; debt as a percentage of post-graduate income; educational debt against consumer and other debt of graduates; the impact of loan forgiveness and relief measures, some of which are geared to income; or the impact of debt repayment on the overall multi-year return on investment from a university education.

We prefer to return to an approach we used in the [report](#) *Still Worth It After All These Years*. At the end of the day, the degree to which borrowers are defaulting on repayment reflects the extent to which the debt burden has become unmanageable given all factors, including post-study incomes and the mitigating impact of the various debt management/relief initiatives available. Figure 4.3 shows each institution's integrated Canada and Ontario student loan default rate. Generally, the risk of default is lower for those who studied at a research-intensive university.

4.3 Canada-Ontario Integrated Student Loan Default Rate



Source: MTCU, 2013

Appendix 2: Research/Graduate Intensity Data From our Earlier Report

In this appendix, we present data from our earlier report, *The Diversity of Ontario's Universities: A Data Set to Inform the Differentiation Discussion*, which we use to populate the research intensity dimension of the individual institutional visualizations presented in Figures 1 to 20 of our main report.

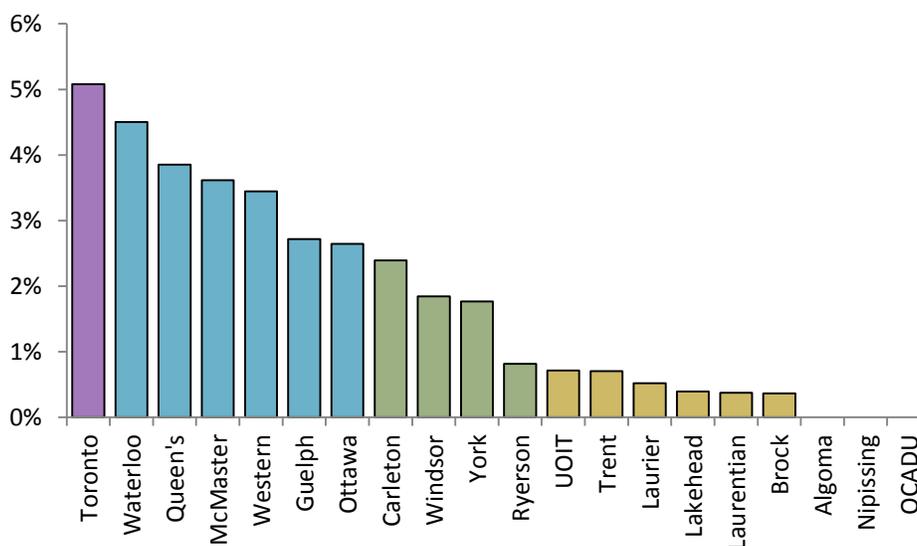
We have updated the data from the original report where newer information is available, as indicated in the source reference under each figure. Consistent with our overall approach in this report, we have presented all of the indicators on a proportional or rate basis. For example, where in our previous report we showed the overall sponsored research income of each university, here we show sponsored research income per full-time faculty member.

It is unremarkable that these indicators show a strong patterning against our four clusters of universities, as it is the earlier generation of this very data that we used to define the four clusters in the first place.

Indicator 5.1: Percentage of Graduates who are PhDs

A companion indicator of the level of institutional research focus and intensity is the percentage of degree-level graduates from each institution who graduate with a PhD.

5.1 Percentage of Graduates who are PhDs

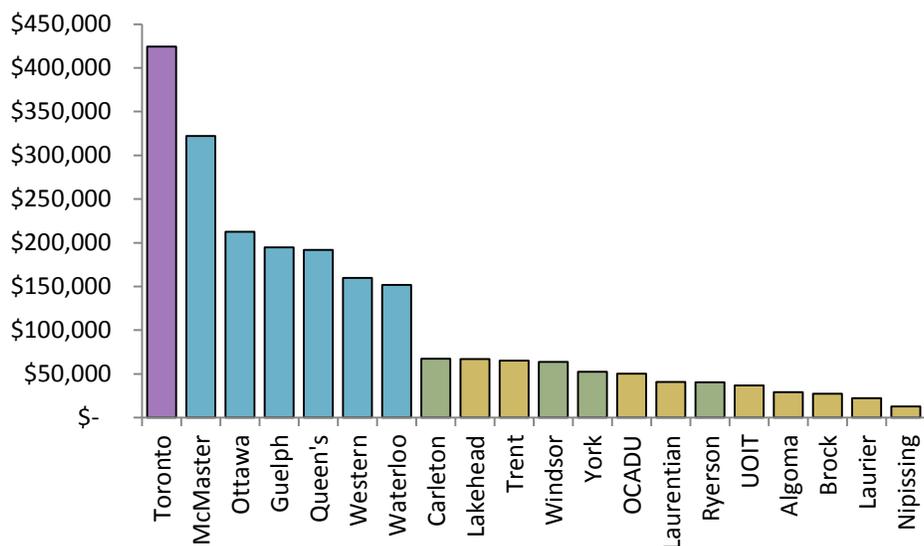


Source: Council of Ontario Universities, CUDO, 2014

Indicator 5.2: Sponsored Research Income per Full-time Faculty Member

Figure 5.2 shows the value of sponsored research income per full-time faculty member for each Ontario university.

5.2 Sponsored Research Income per Full-time Faculty Member

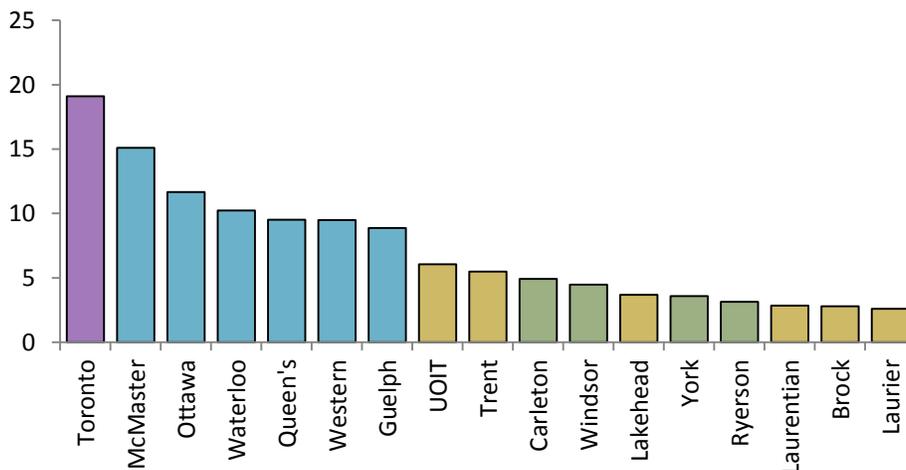


Source: Council of Ontario Universities, Council of Ontario Finance Officers, 2013

Indicators 5.3 to 5.5: Research Volume and Impact

Figure 5.3 shows the volume of publications of each Ontario university between 2008 and 2012 per full-time faculty member. There were no data available to us for Algonia, Nipissing and OCADU.

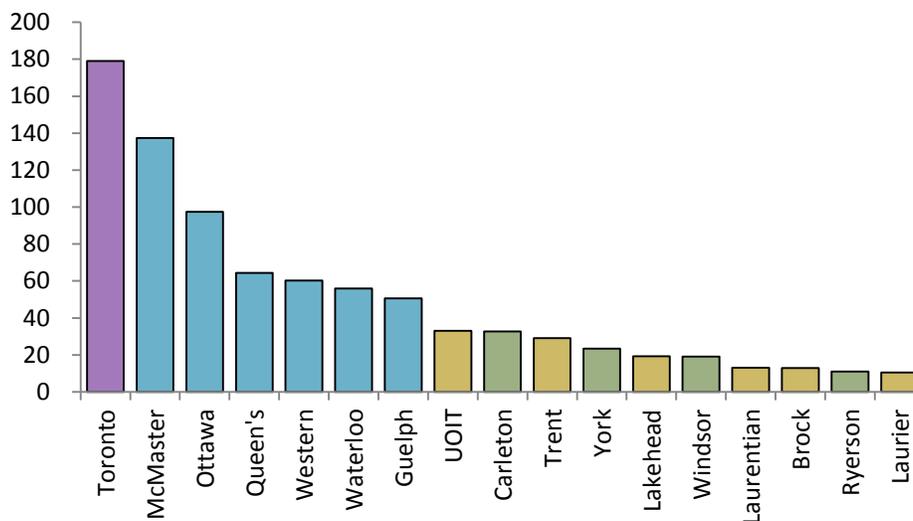
5.3 Total Publications per Full-time Faculty Member



Source: Incites™, 2008-2012, CUDO 2010

Figure 5.4 shows the research impact at each university represented by the total number of citations of papers published by the university and its faculty per full-time faculty member between 2008 and 2012. There were no data available to us for Algoma, Nipissing and OCADU.

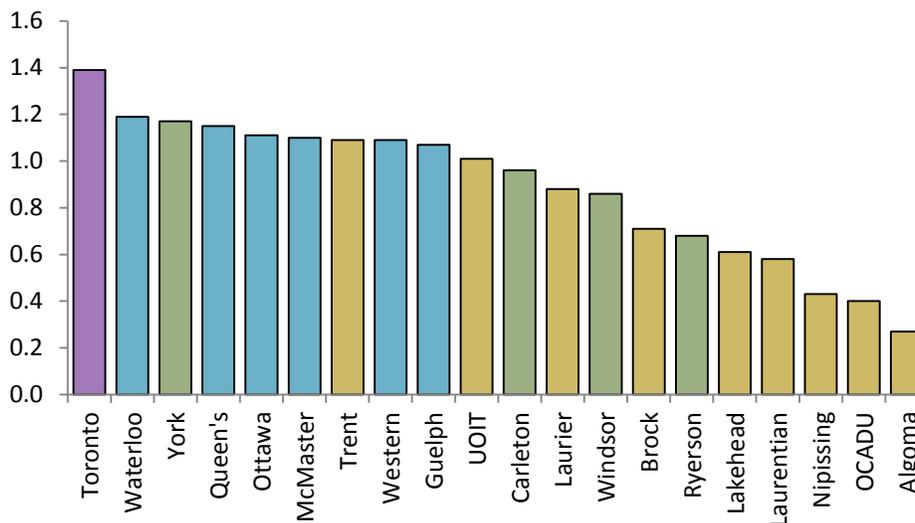
5.4 Total Citations per Full-time Faculty Member



Source: Incites™, 2008-2012, CUDO 2010

Figure 5.5 reproduces the Hirsch indices of faculty at each Ontario university. H-indices capture both the number of research publications by faculty members and also how often these publications are cited.¹⁵

5.5 Research Impact: Mean Standardized H-Scores



Source: Higher Education Strategy Associates (HESA), 2012

¹⁵ For a fuller description of the H-index and how it is calculated, see Appendix 4 of HEQCO's report *The Productivity of the Ontario Public Postsecondary System Preliminary Report* (HEQCO, 2012).

Additional Endnotes to Appendices 1 and 2: Explanatory Notes for Figures

Figure 1.1: Percentage of Students who are First-generation Students

- The data are for the 2013-2014 academic year and include full-time undergraduate and graduate students who are eligible for funding.
- Universities identify first-generation students using different data sources and methodologies. For example, some universities use results from OUAC applications, institutional voluntary surveys, etc.

Figure 1.2: Percentage of Students who are Aboriginal

- The data are for the 2013-2014 academic year and include full-time undergraduate and graduate students who are eligible for funding.
- Aboriginal students include the following three groups: Indians (First Nation), Metis and Inuit.
- Universities identify Aboriginal students using different data sources and methodologies. For example, some universities use results from OUAC applications, institutional voluntary surveys, etc.

Figure 1.3: Percentage of Students with a Disability

- The data are for the 2013-2014 academic year and include full-time undergraduate and graduate students who are eligible for funding.
- A student is identified as having a disability if he or she registered with the Office for Students with Disabilities.

Figure 1.4: Percentage of Students for whom French is Mother Tongue

- The data are for fall 2012-2013 and include undergraduate and graduate students and exclude students whose mother tongue was unknown.

Figures 1.5: OSAP Participation Rate

- The OSAP participation rate is based on comparing the total number of 2013-14 OSAP awards issued to full-time students to fall 2013 head count operating grant-eligible enrolment. OSAP participation rates have been adjusted to exclude recipients of 30% Off Ontario Tuition who applied using the stand-alone application to be considered for this grant only.
- OSAP participation rates are calculated for undergraduate students and exclude students attending the following professional programs: law, dentistry, dental specialties, medical specialties, surgical specialties, optometry and pharmacy.

Figure 1.6: Percentage of Students Studying Part-time

- Data are based on headcounts and are for fall 2014, with the exception of Algoma, which are for fall 2012.
- Institutions have varying definitions of what constitutes a part-time student.

Figure 2.1 and 2.2: Application to Registrant Ratio and Percentage of Applicants who Ranked the University as their First Choice

- Data are based on the number of full-time, first-year applicants and registrants in first-entry programs for fall 2014, with the exception of Algoma, which are for fall 2012.
- The application to registrant ratio includes all applications and all registrants. As such, applicants may be double counted.
- The percentage of applicants who ranked the university as their first choice includes the number of applicants and registrants who selected the university as their first choice.

Figure 2.3: Percentage of Entering Students who are from other Canadian Provinces and Territories

- Based on home address where the student resided in the previous year. Includes full-time first-year undergraduate students enrolled in fall 2013.
- Data for Algoma and Lakehead are for fall 2012.
- Affiliates are included, with the exception of Guelph, Ottawa and Western.

Figure 2.4: Percentage of Students who are International Students

- Data are based on headcounts and are for fall 2014, with the exception of Algoma, which are for fall 2012.

Figure 2.5: Percentage of Entering Students with High School Marks Above 75%

- Entering marks represent the secondary school averages of full-time first-year students. Averages are based on final grades for grade 12 university destination courses.
- Affiliates are included, with the exception of Ottawa and Western.

Figure 3.1: Retention Rate from First to Second Year

- First to second year retention rates report the percentage of first-time, full-time, first-year students in the fall term of 2013 who returned to the institution in the next fall term in 2014.

Figure 3.2: Graduation Rate

- Graduation rates are defined as the total graduates by 2012 who were enrolled in full-time first-year undergraduate studies in fall 2005.
- The graduation rate involves the selection of all first-year, new to the institution, undergraduate students from the fall 2005 enrolment file who were seeking a bachelor's or first professional

degree, for whom an FTE value of 0.4 or greater is recorded and who also have a valid student ID number. This subset of year one enrolments is then matched against records of students who received a bachelor's or first professional degree from the same institution between 2006 and 2012.

Figure 3.3: Percentage of Undergraduate Classes with Fewer than 30 Students

- Data are for fall 2014, with the exception of Nipissing, which are for fall 2013, and Algoma, which are for fall 2012.

Figure 4.1: Employment Rates of University Graduates Two Years after Graduation

- The employment rate is defined as the number of employed persons expressed as a percentage of the labour force, where the labour force is those persons who were employed or unemployed but looking for work.
- Affiliates are included, with the exception of Ottawa and Western.

Figure 4.2: Average Earnings of University Graduates Two Years after Graduation

- The data represent average annual salaries of 2011 graduates employed both full-time and part-time two years after graduation. Salaries were calculated using an imputed average based on the midpoint of each salary range.

Figure 4.3: Canada-Ontario Integrated Student Loan Default Rates

- Default rates are calculated as the number of borrowers who received a Canada-Ontario Integrated Student Loan in 2010-11 and did not receive funding through the Ontario Student Assistance Program in 2011-12 and were in default of the loan repayment obligations as of July 2013, divided by the number of borrowers who received a Canada-Ontario Integrated Student Loan in 2010-11 and did not receive funding through the Ontario Student Program in 2011-12.
- The default rate for Laurentian does not include the Northern Ontario School of Medicine.

Figure 5.1: Percentage of Graduates who are PhDs

- Data are based on the 2014 calendar year.

Figure 5.2: Sponsored Research Income per Full-time Faculty Member

- Sponsored research income data are for 2013 and are divided by the number of full-time instructional faculty members from 2013.

Figure 5.3 and 5.4: Total Publications per Faculty and Total Citations per Faculty

- Publications and citations data are for the period 2008-2012 and do not include Algoma, Nipissing and OCADU, as these institutions fall below the threshold employed by Incites™.
- Total publications and total citations are divided by the number of full-time instructional faculty members from 2010.

Figure 5.5: Research Impact: Mean Standardized H-Scores

- The Hirsh, or “H”, index is designed to measure both the quantity of faculty research publications and their impact as measured by the number of times these publications are cited in the Google Scholar database.
- H-indexes were calculated for faculty with both a teaching and research role, including full, associate and assistant professors; deans; associate deans; chairs; associate chairs; research chairs; lecturers and instructors.
- H-index includes peer-reviewed articles, conference proceedings, books and scholarly articles.
- Scores are standardized to account for disciplinary differences.
- A score above 1 means that the average academic at an institution has a higher H-index score than the national average.