The Undergraduate Skill Crisis in Ontario – How Can We Fix It?

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Executive Summary

It is generally assumed that certain academic competencies are essential for university graduation, occupational success, and democratic citizenship. Unfortunately, many university-based instructors find that a good number of their students are weak in terms of key academic skills, such as analysis and research. Instructors' assessments are similar to those of some prominent Canadian business executives. The latter have lamented the absence of important skills, such as writing ability, among the graduates they hire. This somewhat negative characterization of Canadian graduates has been verified by studies conducted by, among other agencies, Statistics Canada. It finds a surprisingly low level of literacy and numeracy among a sizable proportion of Canadians with degrees.

Because of a mounting frustration resulting from having to teach a growing number of students unprepared for their university studies, two of this report's authors decided to investigate if undergraduate students in their faculty agreed that they lacked key academic skills. With this intent in mind, in late 2017, they surveyed students from all disciplines and levels of study enrolled in the faculty of Liberal Arts and Professional Studies at York University. In this faculty, students take courses in the humanities and social sciences and in some professional fields.

In the 2017 survey, 50 questions focusing on skills were asked of nearly 1,000 students. A number of other demographic and background questions were also included in the survey. The skill questions focused on abilities in writing, taking tests, analysis, time and group management, research, giving presentations, and elementary numeracy. Students were asked to rate their ability with these skills when completing tasks requiring them. The long-term goal of collecting this information was to provide foundational assessments of skills and knowledge that could eventually be used to make curricular changes, if a significant proportion of students reported serious academic skill deficiencies.

The results of the survey confirmed both of the instructors' experiences with their own students, the perceptions of employers, and the results of recent studies such as those reported by Statistics Canada. Overall, based on an advanced statistical classification algorithm, on this suite of questions, only 51% of survey participants scored as "functional" and prepared for the rigors of university life, occupational success, and democratic citizenship. A further 27% were classified by this algorithm as "at-risk." The remaining 22% were categorized as "dysfunctional."

To what extent this was a York problem. In order to answer this question, York researchers invited colleagues at Western University, the University of Waterloo, the University of Toronto Mississauga (UTM), and the University of Toronto Scarborough (UTSC) to replicate the study. Each agreed to conduct exactly the same survey in 2018. In order to minimize bias, the surveys were carried out at the same time of year as the one conducted at York. The surveys at the

other universities also targeted students in faculties similar to Liberal Arts and Professional Studies at York.

When the results of these additional surveys were analyzed, it was clear that York is not an isolated case. After pooling the results of the five surveys, we found that only 44% of survey participants could be classified as functionally prepared to do well in their university studies. An almost equal percentage (41%) were identified as at-risk. The remaining 16% were classed as dysfunctional. Family background did not make a difference: neither first-generation university attenders nor international students were more likely to be dysfunctional or at-risk.

Differences among universities in terms of this skill-level classification system were minimal. Also, in each university and overall, the percentages of students in various skill groupings did not vary by year of study: apparently large numbers of students enter, and leave, university without having mastered some very basic academic skills.

For various reasons, universities are concerned with outcomes such as student learning, retention, and overall satisfaction with the university experience. But to what extent do the skill deficiencies we discovered have consequences for these outcomes? The answer is that they have a considerable impact. For instance, students in both the at-risk and dysfunctional skill-level groups were less likely than students in the functional group to achieve high grades. In addition, they were considerably more likely to consider leaving their campus prior to degree completion and to be dissatisfied with their university experience. These effects held independently of students having good grades in high school, of being a domestic or international student, of being the first in their families to attend university, of gender, and of having spoken English in their homes while growing up.

As a final step in the research, in 2020-21, the skills embodied in the surveys were operationalized in an objective test-based format. The tests were then completed by students at the beginning and end of the academic year. The results were merged with information in administrative records. Analyses of the collective information revealed patterns similar to those evident in the survey results, thereby confirming the validity of the latter.

In broad terms, the data we collected have important implications. Although the provincial secondary educational system has clearly articulated and laudable objectives, these desiderata are not being met to the extent that most people assume. Our results suggest that large numbers of unprepared graduates of Ontario high schools enter the province's universities. Moreover, their deficiencies are often not remedied over the course of their studies. As a result, it is likely that many employers end up with new employees who are unable to live up to expectations regarding their ability to process more abstract types of information.

What is to be done? Most importantly, steps need to be taken to ensure that, consistent with provincial objectives, graduates of the Ontario's secondary schools possess the basic academic skills necessary for university success, future employment, and democratic citizenship. Once these skills are established, they need to be further honed at the university level.

At the same time, hopefully as an interim measure, universities themselves could consider ways of utilizing the curriculum to reduce their students' skill deficits. Consistent with this possibility, in our study, 69% of students felt the need for a "compulsory, first-year credit course that would cover subjects such as university standards, criteria, and procedures; critical thinking; effective studying; time management; improving writing; and jobs in the field in which you are majoring." Such a course could be based on, and be a remedy for, some the skill deficiencies identified in this report.

Introduction

A student wrote to us saying, "IM IN FIRST YEAR AND IM DOING SO BAD AND IM SO SCARED BC IM FINDING IT REALLY HARD TO MANAGE MY TIME AND MY ANXIETY HAS GOTTEN SO BAD AND IDK WHAT TO DO AND IM SCARED OF GETTING KICKED OUT AND IM JUST SCARED."

Another student lamented, "Not enough time on tests. Have difficulty citing. We are not taught. Have difficulty with multiple-choice, short and long answer questions on tests. We should be taught how to cite properly!"

Clearly, these students were dealing with big problems. How typical were they?

In order to answer this question, in 2017, a survey of all 22,000 students registered in the faculty of Liberal Arts and Professional Studies (LA&PS) at York University was carried out. A year later, students in similar areas of study at the University of Toronto Mississauga (UTM), the University of Toronto Scarborough (UTSC), Western University, and the University of Waterloo were sent the same survey. For the sake of convenience, in many analyses, we are treating UTM and UTSC as separate institutions. *As a result, in many tables and graphs, figures are presented for five campuses.* It is noteworthy that, together, these institutions enroll 41% of Ontario's undergraduates.[1]

A final part of the research was conducted at York University in 2020-21. For this endeavour, the skills measured in the surveys were operationalized in 'objective' test question format. When merged with important information obtained from administrative records, this study went a considerable distance in validating the measures utilized in the surveys.

Institutional Review (ethics) Boards at each university reviewed and approved the research. It was unfunded, drawing on existing resources at each university.

In no particular order, we are grateful to the following individuals at York who made this study possible: Hazel O'Loughlin-Vidal, Amalia Sylgardakis, Alex Neumann, Jen Brundage, April Walker, Richard Smith, and Timothy Hudson. We are particularly grateful to Rhonda Lenton. Without her active support, the study would not have been possible.

At Western, we would like to thank Tracey Adams, Anders Holm, Charles Levine, and Anton Allahar, all from the Sociology Department, for commenting on the survey questions and

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[1] Universities Canada, "Enrolment by University: 2108 Full-Time and Part-Time Fall Enrolment at Canadian Universities," (https://www.univcan.ca/universities/facts-and-stats/enrolment-by-university/2018).

ethics application. We would also like to thank the personnel at the Registrar's Office for their assistance in contacting students by email to invite them to participate in the study. At the University of Waterloo, we would like to thank Chelsea Bryn Davies-Kneis for her help with adapting and programming the survey for that university and the Registrar's Office for their assistance in sending out the call for participants.

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The Context

In the United States, there is growing concern that post-secondary education has increasingly focused on quantity over quality. For example, two highly acclaimed American researchers concluded from their landmark study that people are now expected to be more *highly* educated, but unfortunately are not necessarily "better educated."[2] Though higher education is providing students with unprecedented levels of information through course content, these students are not necessarily learning how to think or write about this information. That is, the amount of information students are exposed to has increased, but the quality of their skills in processing information has apparently decreased.[3]

Similarly, in Canada, there is a belief among many faculty members that students entering universities lack the skills essential to academic success. For instance, over a decade ago, two professors at the University of Western Ontario observed that "universities now assume the same type of sorting, weeding, and cooling functions once carried out . . . by high schools."[4] In the intervening years the situation has not improved. Consistent with this observation, a 2016 survey of 1,300 faculty members, commissioned by *Maclean's*, revealed that a mere 32% thought entering students had adequate academic skills, only 23% believed students were able

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[2] R Arum and J Roska, *Academically Adrift: Limited Learning on College Campuses* (Chicago: University of Chicago Press, 2011).

[3] L Tsui, "Fostering Critical Thinking through Effective Pedagogy: Evidence from Four Institutional Case Studies," *The Journal of Higher Education* 73, no. 6 (2002): 740.

[4] J. E. Côté and A. L. Allahar, *Ivory Tower Blues: A University System in Crisis* (Toronto: University of Toronto Press, 2007), 42; *Lowering Higher Education: The Rise of Corporate Universities and the Fall of Liberal Education* (Toronto: University of Toronto Press, 2011).

to write at a university level, 41% stated students could do mathematics at a university level, and only 34% thought students could work independently.[5]

Moreover, evidence is growing that these deficiencies persist after graduation. For example, the Conference Board of Canada points to continuing academic-skill deficiencies.[6] Consistent with the *Maclean's* survey and the opinion of the Conference Board, a 2014 Statistics Canada study found that 27% of Canadians with university degrees scored in the lowest two ranks (there were a total of five) for literacy. Accordingly, the report authors estimated that these degree holders were "likely only to have the ability to undertake tasks of limited complexity such as locating single pieces of information in short sections of text."[7] The figures for numeracy were even more discouraging. Thirty-one percent (31%) of university graduates scored in the lowest two categories. Individuals in these groups were unlikely "to use problem solving strategies, and [were] . . . likely only to have the ability to perform [simple] mathematical operations."[8] One implication of this problem is borne out by other research conducted by Statistics Canada, which found that about half of university graduates who are "overqualified"—employed in jobs not requiring a university credential—have low levels of literacy.[9] In other words, their credentials may not have culminated in commensurate employment because their skills were insufficiently developed for the knowledge economy. Unfortunately, among young adults, already low skill levels have declined over the past decade.[10]

In view of findings like these, it is not surprising that the popular press often paints a negative picture of the outcomes of post-secondary education. For example, in an article in the *Globe and Mail*, a reporter lamented, "Not enough . . . graduates excel at the liberal arts education's core skills—writing, critical thinking, research ability, social curiosity—for the BA to carry much weight."[11] Such comments are common.[12]

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[5] Aaron Hutchins, "Which Universities Prepare Students for Employment?," *Macleans* April 17, 2017.

[6] Maureen Mancuso, "Which Skills Do Our Graduates Lack?," *University Affairs* January 15, 2014

[7] Daniel Munro, "Skills and Higher Education in Canada," (Statistics Canada2014), 2.

[8] Ibid.

[9] Statistics Canada, "Overqualification, skills and job satisfaction, 2012." *The Daily* September 14, 2016.

[10] Parisa Mahboui, "Talkin' Bout My Generation: More Education Less Skilled Canadians," (https://www.cdhowe.org/public-policy-research/talkin%E2%80%99-%E2%80%98bout-my-generation-more-educated-less-skilled-canadians: C. D. Howe Institute, 2017).

[11] James Bradshaw, "When a University Degree Just Isn't Enough," *Globe and Mail* May 9, 2011.

[12] "Shocking Number of Canadian University Grads Don't Hit Basic Literacy Benchmark," *Huffington Post* April 29, 2014 http://www.huffingtonpost.ca/2014/04/29/oecd-canada-literacy_n_5233220.html; Louise Brown, "Young Grads Need to Brush up on 3 Rs, Employers Say," *The Star* February 22, 2016

Given such research findings and reactions, there has been some recognition in the university sector of the need to measure university graduates' academic skills.[13] In addition, in co-operation with the University of Toronto, the University of Guelph, Queen's University, and a number of colleges, in 2013, the Higher Education Quality Council of Ontario (HECQO) announced the intent to develop a program to measure university students' academic skills upon entry and exit.[14] By 2017, 11 colleges and 11 universities in Ontario were affiliated with the project.[15] Results of this endeavour are consistent with the Statistics Canada findings reported above.[16]

While studies such as these yield invaluable information, they are limited in two senses. First, they fail to connect students' skills to successful resolution of daily problems in specified contexts, like a university. Second, while they identify skill deficiencies, the studies do not provide information that could be utilized at a curriculum level to make improvements.

The current study attempts to remedy these deficits. Rather than dealing with generalities and abstractions, it focuses on specific, tangible skills on which students must rely as they negotiate their undergraduate careers. The result is the identification of specific issues that can be addressed via curricular reform.

In Ontario, it is important to recognize that efforts are taken at the secondary school level to develop the types of academic skills with which we are concerned. For example, the Canadian and world studies curriculum—endorsed by the provincial government and encompassing economics, geography, history, law, and politics—defines *critical thinking* in the following way:

> Critical thinking is the process of thinking about ideas or situations in order to understand them fully, identify their implications, make a judgement, and/or guide decision making. Critical thinking includes skills such as questioning, predicting, analysing, synthesizing, examining opinions, identifying values and issues, detecting

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[13] Nicholas Dion and Vicky Maldonado, "We Need to Assess Student Literacy Skills," *University Affairs* December 4, 2013

[14] Harvey P. Weingarten, "We Have to Measure Literacy and Numeracy among University Graduates," *Globe and Mail* September 12, 2014 https://www.theglobeandmail.com/news/national/education/we-have-to-measure-literacy-and-numeracy-among-university-graduates/article20371931/.

[15] Higher Education Quality Council of Ontario (HEQCO, "HEQCO Essential Adult Skills Initiative 2016/2017: Status Report," (http://www.heqco.ca/SiteCollectionDocuments/HEQCO%20EASI_Status%20Report%20on%20College%20Pilot_March2017_English.pdf2017).

[16] Harvey P. Weingarten and M. Hicks, "On Test: Skills. Summary of Findings from Hecqo's Skills Assessment Pilot Studies," (Toronto.: Higher Education Quality Council of Ontario, 2018).

bias, and distinguishing between alternatives.[17]

In addition to critical thinking, this government report defines *critical literacy* as follows:

> Critical literacy is the capacity for a particular type of critical thinking that involves looking beyond the literal meaning of a text to determine what is present and what is missing, in order to analyse and evaluate the text's complete meaning and the author's intent. Critical literacy goes beyond conventional critical thinking by focusing on issues related to fairness, equity, and social justice. Critically literate students adopt a critical stance, asking what view of the world the text advances and whether they find this view acceptable, who benefits from the text, and how the reader is influenced.[18]

It will become clear that the above definitions include many of the skills identified in our study. Unfortunately, we find that it is questionable whether these laudable objectives have been achieved by the time the majority of students reach university.

Background

As already noted, in late 2017, in order to assess the degree to which students conformed to the characterizations of contemporary students found in the media and elsewhere, a survey was conducted of those enrolled in the faculty of Liberal Arts and Professional Studies at York University in Toronto. That survey focused on the extent to which students believed that they possessed the academic skills that educational researchers consider essential to optimal academic outcomes,[19] the development of "human capital" necessary for future career success,[20] and the promotion of democratic citizenship. In the latter, critical thinking takes precedence over blind faith in ideologies.[21]

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[17] Ontario, "The Ontario Curriculum Grades 11 and 12: Canadian and World Studies," (2015 http://www.edu.gov.on.ca/eng/curriculum/secondary/2015cws11and12.pdf), 58.

[18] Ibid., 59.

[19] Robert L. Williiams and Susan L. Stockade, "High-Performing Students with Low Critical Thinking Skills," *The Journal of General Education* 52, no. 3 (2003).

[20] A longitudinal study of York students found that, two years after graduation, mathematical, computer, entrepreneurial, and particularly organizing skills were most important in explaining career success. See J. P. Grayson, "Social Dynamics, University Experiences, and Graduates' Job Outcomes," *British Journal of Sociology of Education* 25, no. 5 (2004).

[21] G. ten Dam and M. Volman, "Critical Thinking as a Citizenship Competence: Teaching Strategies," *Learning and Instruction* 14, no. 4 (2004).

The approach taken was to give students the chance to report their perceptions of their academic skills. However, the word *perceptions* is used advisedly in this report. In some instances, students may be unaware of the nature of their skill limitations. By contrast, those grading their papers and tests, individuals conducting research on student experiences and outcomes, and employers, may be in a better position than students to identify their strengths and weaknesses. To put it bluntly, students' perceptions of their adequacies should not be used as the gold standard in accordance with which all other assessments of their competencies are judged. This said, it is important to see the situation from the perspective of students. For one thing, students are more likely to be amenable to attempts at remediation if the assessments by their instructors of their limitations are consistent with their own. In addition, it is possible that some students are unaware of their shortcomings and rate themselves more highly than is the case. Indeed, an important line of research has found that the more someone is unaware—or ignorant—of the limited extent of their skills or knowledge in an area (e.g., grammar, computer skills), the more erroneous they are in their self-assessments. They usually think they are far more competent than is the case.[22] If this principle applies to our survey questions, actual skill deficiencies would be greater than estimated by students. In other words, it is possible that this measurement approach provides underestimates of skill deficiencies. Notwithstanding the foregoing caveats, part of the research on which the report is based relied on objective measures of skills. The results of the analysis of this information were consistent with the survey-based findings.

Independent of any qualifications, the results of the initial survey at York were sobering. For example,

1. 48% indicated that they lacked confidence in their ability to write a critical book review;

2. 56% admitted that they found it difficult to identify the types of arguments embodied in journal articles; and

3. 38% indicated that they did not have confidence in using a standard referencing style in their essays (e.g., APA or Chicago).

Overall, approximately 49% of the sample lacked the skills considered essential to academic success.[23]

As part of their attempt to determine whether this might be an isolated problem limited to York, the York researchers teamed-up with colleagues at Western University, the University of Waterloo, the University of Toronto (Mississauga and Scarborough campuses). Each agreed to conduct the survey using exactly the same questions about skills. In order to minimize bias, the surveys were to be carried out at the same time of year as the one conducted at York (in the

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[22] Justin Kruger and David Dunning, "Unskilled and Unaware of It: How Difficulties in Recognizing One's Own Incompetence Lead to Inflated Self-assessments," *Journal of Personality and Social Psychology* 77, no. 6 (1999).

[23] J. Paul Grayson and Robert A. Kenedy, "The Generic Skills Crisis in LA&PS," (Toronto: York University, 2018).

late fall) and were to involve students in disciplines similar to those found in York's Liberal Arts and Professional Studies faculty.

Knowledge versus Skills

Before describing the methodology and results of our survey study, it is useful to distinguish between knowledge and academic skills. Knowledge can be seen as the acquisition of facts. For example, a student may know that Sir John A. MacDonald was the first prime minister of Canada and that we live in a parliamentary democracy. He or she may also know that federal elections are held every four years or so but that, although unlikely, a governing party could change a prime minister at any time between elections: the party would simply have to replace its leader. Indeed, this occurred in Britain in 2022. The then Conservative Prime Minister, Boris Johnson, lost the confidence of his party. As a result, he resigned.

Academic skills can be viewed as the vehicles whereby such knowledge is learned, processed, applied to analyze new and diverging circumstances, and communicated to others. For example, from 2016 to 2020, Americans had an increasingly unpopular president, Donald Trump. Nonetheless, barring resignation, or the discovery of wrongdoing and subsequent impeachment, Americans were stuck with their choice until the next presidential election. Although the issue may never have been raised in a class, a student with a modicum of analytical skill would be able to recognize that, in a parliamentary democracy, in contrast to the United States, an undesirable leader could be stripped of his or her leadership position between elections. Once coming to this realization, among other things, a student would be able to abstract and generalize the information as well as to write about these abstractions in an eloquent and understandable way. Abilities such as these also would likely stand the student in good stead when, for example, analyzing, synthesizing, and writing about theories of social inequality. But, in this formulation of knowledge versus skills, such processing and application need not occur. Students could simply increase their knowledge without necessarily improving their academic skills.

Consistent with the foregoing, it is important to distinguish between knowledge and skills, as discussed thus far, and intelligence and motivation. Students can be both intelligent and motivated; however, if they have not learned certain skills, intelligence and motivation cannot be utilized in productive and rewarding ways. [24]

Academic skills can also be thought of as a form of *human capital*. Human capital is a concept that is popular among economists and forms the basis of many government policies regarding

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[24] Cf. James E. Côté and Charles G. Levine, "Attitude versus Aptitude: Is Intelligence or Motivation More Important for Positive Higher-Educational Outcomes?" *Journal of Adolescent Research* 15, no. 1 (2000).

how to fund educational systems and stimulate the economy.[25] Human capital skills are cognitive *resources* necessary to accomplish certain tasks that reside in people, and are therefore embodied—they go where the person goes. People with more human capital in the form of academic skills tend to do better in terms of occupational attainment.[26] Academic skills acquisition thus constitutes an "investment," and, like monetary investments, can eventually pay off for investors—at both the individual level (e.g., higher salaries) and the societal level (e.g., national prosperity, more competence in political decision making). In other words, the greater the stock of national human capital, the more prosperous individual citizens will be, and, in turn, the more wealthy the country.

Universities are believed to be prime drivers of higher forms of human capital acquisition. Indeed, economists point to studies that show that university graduates have lower unemployment rates and higher salaries than those with other types of education.[27] Accordingly, most economists and policy makers believe that educational credentials are sufficient indicators (or operationalizations) of human capital. Whereas research based on credential attainment supports this belief, this assumption is justified for higher education only to the extent that these higher credentials actually represent gradations of key skills above lower forms of education.[28] As we see in this report, increasingly, university credentials no longer guarantee that the holder has advanced human capital skills. It is our hope that this situation can be rectified.

Based on these considerations, we operationalized skills in terms of success: in programs in the humanities and social sciences; in some undergraduate professional studies, such as administrative studies; and in human capital acquisition for future career success. We identified seven types of academic or human capital skills that contribute to academic and career success: writing, test taking, analysis, time and group management, research, presentations, and *elementary* numeracy.[29] In our study, students were asked to assess their own abilities to conduct research, analyze, write, complete tests, give presentations, carry out elementary numeric calculations, and manage their time and their learning groups.

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[25] Gary S. Becker, Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education (Chicago: University of Chicago Press, 1964); Côté and Allahar, *Lowering Higher Education*.

[26] James E. Côté and Charles Levine, "Student Motivations, Learning Environments, and Human Capital Acquisition: Toward an Integrated Paradigm of Student Development," *Journal of College Student Development* 38 (1997).

[27] Gary S. Becker, *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education, 2nd ed.* (New York: Columbia University Press, 1975).

[28] Côté and Allahar, *Ivory Tower Blues*; *Lowering Higher Education*; Ana M. Ferrer and W. Craig Riddell, "The Role of Credentials in the Canadian Labour Market," *Canadian Journal of Economics* 35 (2002).

[29] Examples of the operationalization of these skills can be found in the academic literature: e.g., Williiams and Stockade, "High-Performing Students with Low Critical Thinking Skills."

Methodology

The Sample

Overall, 2,239 students responded to the surveys. The sample size for each institution is provided in Table 1. Not shown in table form is that 13% of the sample were international students, 39% were classified as first-generation university attenders (based on reported parents' education, these students were the first in their family to attend university), and 63%

Table 1: Sample Sizes by Institution

Institution	Number	Percent
University of Toronto Mississauga (UTM)	359	16%
University of Toronto Scarborough Campus (UTSC)	414	19%
Waterloo	296	13%
Western	204	9%
York	966	43%
Total	2,239	100%

Note: Of the combined University of Toronto samples, 208 were math/science students and were removed from analyses.

identified as female (26% males, 2% LGBT, 1% "other," and 8% no response).

For practical reasons associated with the original data collection in York's Liberal Arts and Professional Studies faculty, students at the other universities were selected on a faculty-by-faculty basis. At Western and the University of Waterloo, it was relatively easy to restrict participants to those enrolled in the humanities and social sciences. In some cases, students in professional programs, such as administrative and business studies, were included because these departments are housed in social science faculties, as is the case at Western. Despite some differences in those eligible to participate in the study, the relevant faculties at York, Western, and Waterloo housed no students in math or science.

On the University of Toronto campuses, the situation was different. Given the nature of the programme structure at the University of Toronto Mississauga (UTM) and the University of Toronto Scarborough (UTSC), 208 students majoring in certain math and science programs

completed the survey. With an exception to be noted later, *these students were removed from analyses.* A list of disciplines/majors included in the sample can be found in Appendix A.[30]

Overall response rates were disappointing and differed among the institutions, varying from 3% to 6%. In general, restrictions on how prospective subjects can be approached, as required by current ethics review boards, has greatly reduced response rates in student surveys.[31] Moreover, because of differing levels of restrictiveness among the administrative and ethics boards of the universities associated with this study, it was not possible to replicate exactly the original invitation email wording used at York (which had the highest response rate), to send the same number of email reminders, or to phrase email reminders in the same ways.

Despite these limitations, recent research has compared answers to questions in surveys of students with low response rates and answers to the same questions from surveys with high response rates. This research suggests low response rates should not be confused with bias. To illustrate, although the response rate for the York survey was only 6%, the results of research suggest that with 967 respondents, correlations of approximately .99 would be achieved between the responses from samples and replies from the relevant population.[32] In other words, when analyzing relationships among variables in a given sample, even if it has a low response rate, the results will be almost identical to samples having a high response rate so long as the sample size is sufficient to ensure statistical power, which is the case in our study.

Measurements and Variables

The Survey Questions: Seven Academic Skills Measurement Scales

Fifty questions constituted the core of the survey. They focused on students' self-assessments of their ability to utilize specific academic skills in their programs.

All skill questions had a fixed format with five response options, either on an easy–difficult or a confident–unconfident range. For example, one question was "In your courses, how easy or difficult is it for you to figure out the main point being made in scholarly articles?" For these

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[30] The assignment of majors to faculties is somewhat arbitrary because of differences among universities in how certain majors are defined and housed by faculty (e.g., in some universities psychology is in the social sciences, whereas in others, like York, it is in the health sciences). Consequently, any classification system across universities will have some overlapping categories.

[31] J. P. Grayson and R. Myles, "How Research Ethics Boards Are Undermining Survey Research on Canadian University Students," *Journal of Academic Ethics* 3, no. 4 (2005).

[32] Kevin Fosnacht et al., "How Important Are High Response Rates for College Surveys?," *The Review of Higher Education* 40, no. 2 (2017).

types of easy–difficult questions, the possible responses, from which respondents chose one option, were:

1. Very easy
2. Easy
3. Neither easy nor difficult
4. Difficult
5. Very difficult

In interpreting these fixed-response questions, we initially reasoned (later confirmed) that responses from 1 to 3 indicated that, at least from the student's point of view, he or she had sufficient *proficiency* with the skill in question to support academic success. By contrast, responses of 4 and 5 indicated a student's awareness of a *deficiency* in that skill.

To simplify the interpretation of results, for many analyses, responses 1, 2, and 3 were combined and recoded as "0." Options 4 and 5 were also combined and recoded as "1." In examining the data, we were most concerned with this recoded category of "1" as an indicator of skill deficiency. As will be seen, this variable allowed us to estimate the percentage of students reporting skill deficiencies on each of the seven measurement scales.

Based on the recoding of all 50 questions into the "0/1" format, measurement scales showing the perceived skill deficiencies are presented in Table 2, broken down for each institution. Each of the 50 skill questions was assigned to one of the following academic skill measurement scales: writing, tests, analysis, time and group management, research, presentations, and *elementary* numeracy. Each of these scales was calculated as the mean of all items in the list.

The first column of Table 2 identifies the skill question under consideration. The remaining columns show the percentage of students in each institution indicating that they found the skill in question difficult or very difficult.

Overall, percentages in Table 2 point to a great deal of uniformity of response from one institution to the next. For example, to focus on the first mentioned skill, 26% of students at Waterloo pointed to difficulty with writing a one-page summary of an article. The highest figure for this item (35%) was recorded for UTM and UTSC. Overall, 30% of students reported difficulty with the task.

When examining the percentages in Table 2, we can see that students reported the greatest difficulty in identifying the types of arguments embodied in articles and books (a question in the analysis scale). Despite minor fluctuations from one university to the next, overall, 57% of students reported that for them the task was difficult or very difficult. The second most frequently cited deficiency was writing a critical book review (writing scale). Forty-nine percent (49%) of students recognized difficulties with this task. In contrast, the least difficult task was simple subtraction, with only a small percentage (8%) rating it as difficult (elementary numeracy scale).

Table 2: Students' Skill Deficiencies by Measurement Scale

% Difficult/Very Difficult or Unconfident/Very Unconfident						
	UTM	UTSC	Waterloo	Western	York	Overall
Writing						
Difficulty with one-page summary of article	35%	35%	26%	28%	28%	30%
Difficulty with formulating theses for essays	24%	28%	14%	29%	28%	26%
Lack of confidence in ability to apply APA/Chicago style in written work	21%	24%	32%	27%	25%	25%
Lack of confidence in knowing sequencing in APA/Chicago	43%	43%	43%	42%	38%	41%
Difficulty with evaluating appropriateness of referencing in essays	25%	20%	26%	25%	27%	25%
Difficulty with evaluating appropriateness of footnote usage in essays	39%	36%	49%	39%	38%	39%
Lack of confidence in own use of English grammar	12%	17%	11%	18%	19%	17%
Difficulty with identifying grammatical mistakes	26%	26%	21%	22%	29%	26%
Difficulty with identifying plagiarism in essays	21%	21%	21%	25%	21%	22%
Difficulty with summary of thesis and strengths of article	24%	22%	18%	24%	21%	21%
Lack of confidence in knowledge of writing critical book review	47%	50%	54%	53%	48%	49%
Lack of confidence in writing effective papers	14%	17%	11%	23%	20%	18%
Difficulty with taking effective lecture notes	26%	23%	32%	40%	30%	29%
Mean	27%	28%	28%	30%	29%	28%
Tests						
Difficulty with studying for tests	36%	36%	32%	39%	32%	34%
Lack of confidence in approach to short test questions	22%	25%	22%	27%	26%	25%
Lack of confidence in approach to long test questions	31%	33%	28%	34%	34%	33%
Lack of confidence in approach to multiple-choice test questions	19%	21%	15%	23%	17%	18%
Mean	27%	29%	24%	31%	27%	27%
Analysis						
Difficulty with determining main point in articles	29%	30%	28%	24%	27%	27%
Difficulty with determining perspective of articles	25%	27%	17%	26%	23%	23%
Difficulty with synthesizing views of articles	22%	26%	19%	25%	25%	24%
Difficulty with identifying types of argument in articles	58%	55%	60%	57%	56%	57%
Difficulty with determining bias and its effect on argument in articles	23%	28%	17%	26%	25%	24%

Table 2: Students' Skill Deficiencies by Measurement Scale (cont.)

Difficulty with interpreting numerical tables	18%	22%	15%	18%	13%	16%
Difficulty with integrating new knowledge into moral framework	25%	25%	22%	21%	22%	22%
Mean	28%	30%	25%	28%	27%	28%
Time and Group Management						
Lack of confidence in time management skills	31%	33%	29%	35%	28%	30%
Lack of confidence in study-group management skills	16%	24%	17%	21%	20%	20%
Lack of confidence can foster group productivity	24%	29%	31%	26%	23%	25%
Lack of confidence in handling problem group members	24%	26%	26%	29%	20%	23%
Mean	24%	28%	26%	28%	23%	24%
Research						
Difficulty with identifying good evidence	17%	13%	8%	12%	15%	14%
Difficulty with identifying good sources for essays	35%	34%	31%	27%	27%	29%
Lack of confidence in online search abilities for essays	17%	13%	8%	12%	15%	14%
Lack of confidence in other than online search abilities for essays	35%	34%	31%	27%	27%	29%
Lack of confidence in identifying scholarly sources	14%	15%	13%	17%	21%	18%
Mean	24%	22%	18%	19%	21%	21%
Presentations						
Difficulty with verbally summarizing articles' strengths and weaknesses	22%	27%	16%	22%	22%	22%
Difficulty with preparing for presentations	22%	27%	16%	22%	22%	22%
Difficulty with formulating argument for presentations	17%	22%	12%	16%	20%	19%
Difficulty with giving presentations	46%	39%	32%	34%	36%	37%
Difficulty with verbally handling criticism in presentations	36%	33%	31%	38%	31%	32%
Difficulty with using technological enhancements for presentations	7%	6%	3%	6%	9%	7%
Difficulty with speaking clearly when giving presentations	28%	26%	15%	27%	20%	22%
Difficulty with identifying controversial issues in presentations of others	15%	16%	7%	14%	14%	13%
Difficulty with identifying flaws in presentations of others	24%	27%	23%	32%	22%	24%
Mean	24%	25%	17%	23%	22%	22%

Table 2: Students' Skill Deficiencies by Measurement Scale (cont.)

Elementary Numeracy						
Difficulty with elementary subtraction	9%	7%	8%	8%	7%	8%
Difficulty with elementary percentage calculation	36%	29%	42%	39%	26%	31%
Difficulty with elementary multiplication	27%	24%	37%	32%	23%	26%
Difficulty with elementary addition	8%	8%	7%	7%	9%	8%
Difficulty with elementary algebra	20%	16%	28%	21%	26%	24%
Difficulty with explanation of square root	20%	18%	26%	19%	27%	24%
Mean	20%	17%	25%	21%	20%	20%

The Skill-Proficiency Typology: Skill-Level Groups

Although the percentages presented in Table 2 are revealing, it is not possible to tell from them the degree to which having a weakness in one skill scale predisposed students to shortfalls in other areas. For example, do those who have problems with writing also face difficulties in the areas of research and analysis? Possibilities such as these were explored through the utilization of a statistical procedure referred to as *two-step cluster analysis*. The procedure takes the information from all variables (mean scores summed in the seven scales) and enters them into an algorithm to produce a typology based on how those variables cluster with each other to form groups of like-scoring respondents. We call the results of this procedure the *skill-proficiency typology*.

With the data from the respondents from all universities combined (excluding science and math), this procedure produced a three-group typology:

1. 44% were clustered into a "functional" group;
2. 41% were classified as "at-risk"; and
3. the remaining 16% were categorized as "dysfunctional" (figures are rounded, so do not sum to 100%).

The groups of students identified by the procedure are a typology of *skill-level groups*. The definition of these groups is clarified in the following section.[33]

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[33] At the end of the survey, students were given the option of providing additional comments. A sample of these is provided in Appendix B.

Results

Percentage of Students Reporting Skill Deficiencies

Graph 1 shows how the cluster analysis produced three distinct groups in terms of levels of deficiencies in academic skills. In that graph, separate lines identify each of the three skill-level groups in terms of how they score on each of the seven academic skill measurement scales. In this way, the mean scores that we have inserted above the skill-level groups' label helps to define the character of each group. For example, among the functional group, the mean score for writing difficulties is only 13%. (That is, if all combined answers of difficult or very difficult are averaged for this group, the mean score is 13%. Had every student reported difficulty with the skills identified as writing difficulties, the score would have been 100%.) The mean increases to 39% for those at risk. For the dysfunctional group, the figure is a far higher 81%. Differences of this general nature are found for all of the skill scales used to define the groups.[34]

Graph 1: Mean Skill Deficiency Scores by Skill-Level Group for All Five Universities Combined


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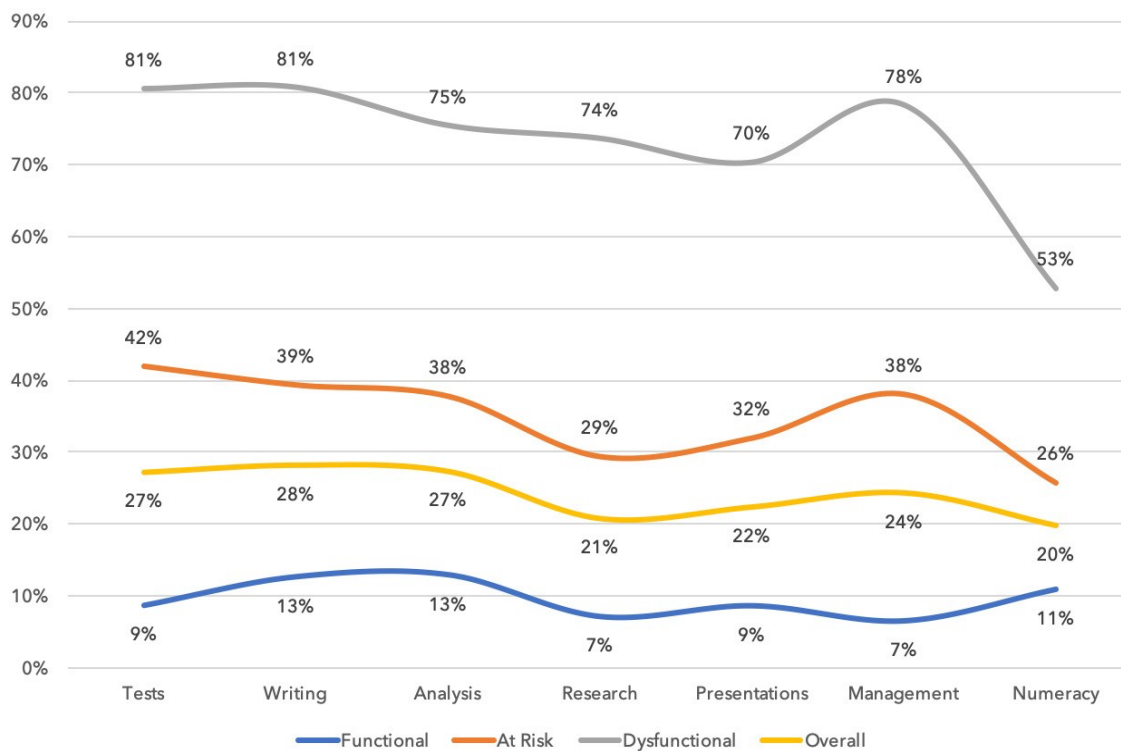
[34] A statistical procedure called discriminant analysis revealed the differences between the groups to be statistically significant.

More importantly, the information in the graph clearly shows that students with a given level of deficiency in one skill scale are also likely to have a comparable level of skill difficulties measured in other scales. In other words, difficulties are not randomly distributed throughout the student population—students suffer from an accumulation of disadvantage or advantage.

The extent to which the number of students in each skill-level group varies by institution is expressed in Graph 2. Overall, Graph 2 illustrates that differences among universities are minimal; indeed, we found that four of the seven variations were not statistically significant. The only statistically significant differences were for presentations, time and group management, and numeracy, but in absolute terms it can be seen on the graph that the differences are minor (in statistical language, there is a small effect size).

Graph 2: Average Skill Deficiency Scale Scores by Category and University
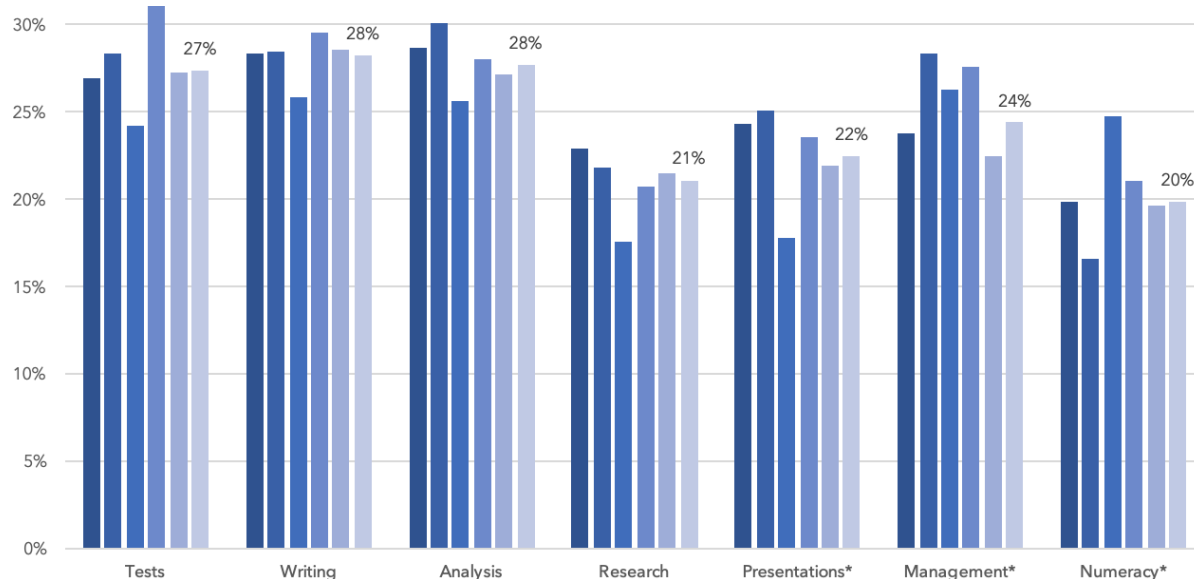
When examined in a different way, even these minor distinctions disappear. In Graph 3, the seven skill scales are combined. This gives an overall measure of skill deficiency. When this overall measure is used to compare universities, even the small differences evident in Graph 2 disappear. The highest deficiency scores are only three percentage points higher than the lowest. Needless to say, differences in the graph are not statistically significant.

The conclusion that derives from these data is simple: each institution involved in the study has an equal proportion of skill deficiency/proficiency. Given that the majority of students were drawn from the same Ontario high school system, this finding is not surprising. For example,

Graph 3: Average Overall Skill Deficiencies by University
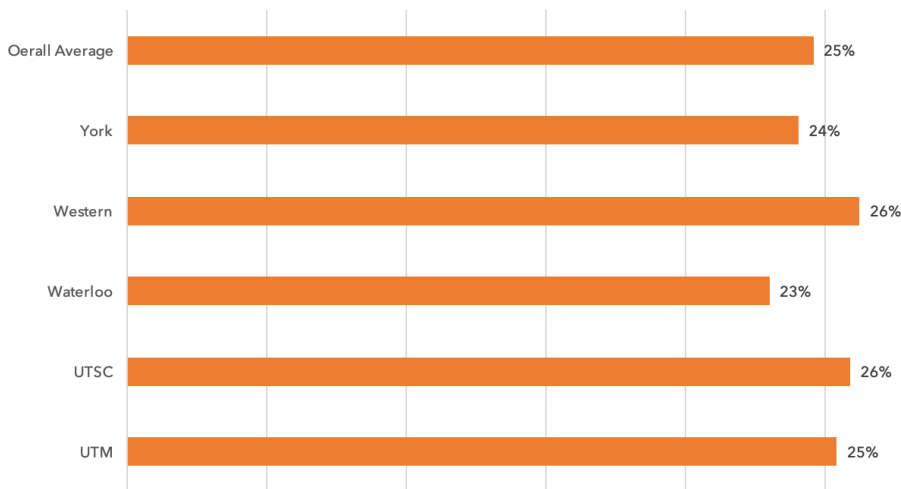
previous research has found significant grade inflation in Ontario high schools,[35] and researchers have also found that grade inflation is associated with lower skill acquisition.[36] Unfortunately, grade inflation is widely ignored and even denied among school administrations, to the detriment of many of the students given such false feedback.[37]

Distributions of Skill-Level Groups

Graph 4 shows the distribution of the three clusters of skill-level groups within each university. It can be seen that the pattern is similar in each institution. However, York stands out as having a slightly (and statistically significant) higher proportion of functional students and a lower percentage of at-risk students compared to all but one of the other institutions.

Based on the common assumption that people learn as they have new experiences, we assumed that even students lacking certain academic skills upon entry to first year would, over the course of their studies, have developed these skills to the point where they would not find as many tasks difficult, and they would be more confident in their abilities (i.e., responses 4 and

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[35] E.g., Côté and Allahar, *Ivory Tower Blues*; Alan Slavin, "Factors Affecting Student Drop Out from the University Introductory Physics Course, including the Anomaly of the Ontario Double Cohort," *Canadian Journal of Physics* 86, no. 6 (2008).

[36] E.g., Robert Laurie, *Setting Them Up to Fail? Excellent School Marks Don't Necessarily Lead to Excellent Exam Marks* (Atlantic Institute of Market Studies, 2007), http://www.aims.ca/site/media/aims/Gradeinflationvfinal_cc.pdf.

[37] Côté and Allahar, *Lowering Higher Education*.

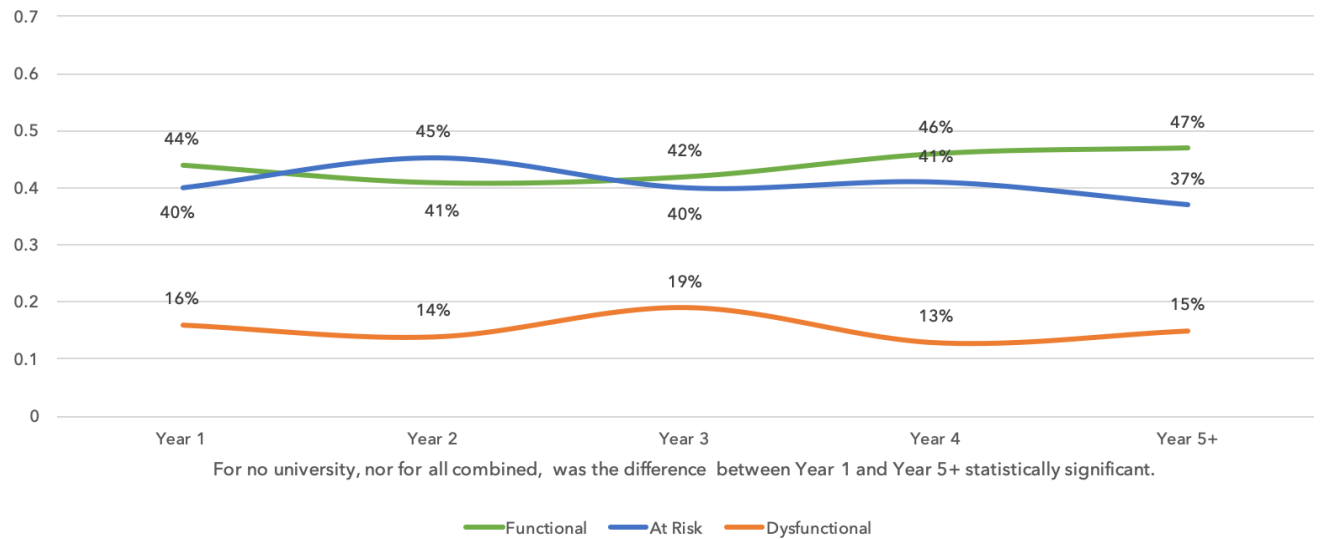Graph 4: Distribution of Skill-Level Groups by University
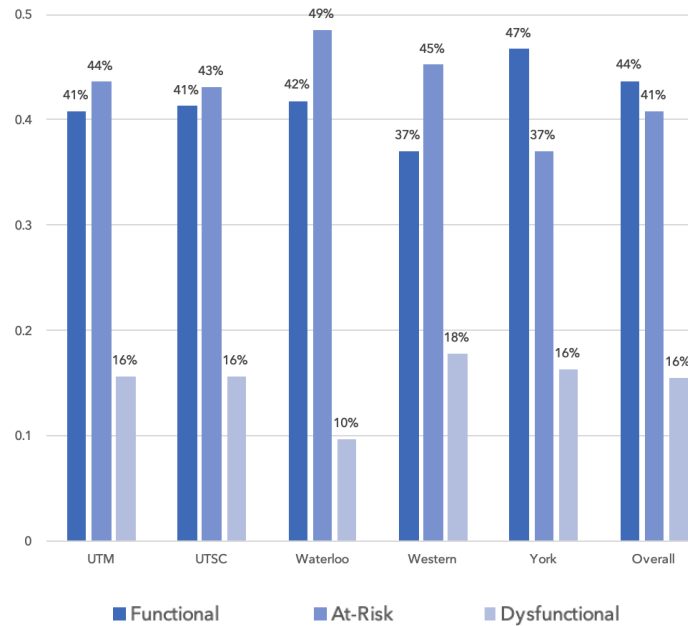
5 would be rare on the 50 questions). Accordingly, we expected that skill deficiencies should decrease and be lowest among those in upper years.

This assumption is tested in Graph 5. Contrary to expectations, the information plotted in the graph indicates that the allocation of students to skill-level groups remains virtually constant over five time periods. In other words, for no group did skills improve or decline over the course of their university studies. Although our study was not longitudinal, this result suggests that those who emerge from high school with skill deficiencies do not significantly improve these skills over their academic careers.[38]

A further examination of two important distinctions commonly made among university students revealed a lack of statistical difference in spite of some stereotypes: neither first-generation university attenders nor international students were more likely to be dysfunctional or at-risk, overall or in any of the four universities (not shown in graph).

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[38] Although a longitudinal study would be required to confirm this possibility, previous longitudinal studies conducted at York confirm no increase in generic academic skills that can be attributed to the university experience: J. P. Grayson, "The Impact of University Experiences on Self-Assessed Skills," *Journal of College Student Development* 40, no. 2 (1999); "Linguistic Capital and Academic Achievement of Canadian and Foreign Born University Students," *Canadian Review of Sociology* 45, no. 2 (2008).

Graph 5: Number of Students in Skill-Level Groups for All Universities by Year

For no university, nor for all combined, was the difference between Year 1 and Year 5+ statistically significant.

Functional — At Risk — Dysfunctional

Skill-Level Group Placement and Grades

What is the relationship between skill-level group placement and grades? The answer to this question is provided in Table 3. Survey participants were asked to provide information on both their average grade in their final year of high school and their anticipated grade for the current year.

Information in Table 3 indicates that in their final year of high school, 63% of students in the functional group achieved a grade of A or more (GE A). This might be expected because of university entrance grade requirements. Less anticipated was the grade distribution of the dysfunctional group. Almost half (45%) also had grades of this magnitude. Apparently, it was possible to be dysfunctional as defined here and still pass high school courses with flying colours.

We see here one of the consequences of high school grade inflation. Universities should keep this finding in mind during their recruitment drives. They might consider keeping data on the GPAs of their feeder high schools and exercise careful recruitment from schools where the majority of students graduate with an A or A+ average (e.g., require independent evidence of academic abilities, such as well-designed entrance assessments that do not place students from less privileged backgrounds at a disadvantage).[39]

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[39] Cf. Laurie, *Setting Them Up to Fail?*

Table 3: Relationship Between Skill-Level Groups and Grades

High School Grades	Functional	At-Risk	Dysfunctional
LT B	4%	6%	13%
B	13%	17%	13%
B+	20%	21%	29%
GE A	63%	56%	45%
Total	100%	100%	100%
Cases	890	706	117
Anticipated University Grades			
LT B	12%	25%	53%
B	25%	29%	27%
B+	28%	28%	15%
GE A	35%	19%	5%
Total	100%	100%	100%
Cases	930	740	121
For each sub-table Fisher's p < .001			

It is useful to point out that Table 3 suggests university grades are not as inflated as high school grades (compare anticipated grades with high school grades). Among the functional group, only 35% expected grades of A or greater. Put differently, in university, being functional did not guarantee a grade of A or more. At the other end of the scale, 48% of the students classified as dysfunctional expected a grade of at least B. However, it is clear that the dysfunctional group experienced the greatest "grade drop" from high school (i.e., 45% received an A average in high school, but only 5% did so in university), an experience that is likely stressful and a source of emotional upheaval. Given this possibility, future research needs to fully examine the relationship between poor high school preparation, stress, and what has been called the mental health crisis on Canadian campuses.[40]

University Outcomes

We noted earlier that skills such as those currently under discussion are often associated with university graduation, occupational success, and, more generally, the capacity to engage in

[40] E.g., Mike Condra et al., "Academic Accommodations for Postsecondary Students with Mental Health Disabilities in Ontario, Canada: A Review of the Literature and Reflections on Emerging Issues," *Journal of Postsecondary Education and Disability* 28, no. 3 (2015); James E. Côté, *Youth Development in Identity Societies: Paradoxes of Purpose* (New York: Routledge, 2019).

informed democratic citizenship. While it is beyond the scope of the current undertaking to deal with occupational success and democratic citizenship, we can assess the impact of skill-level group placement on three important university outcomes: anticipated grades, thoughts of leaving prior to degree completion, and overall satisfaction with the university experience.[41]

Why do these outcomes matter? There are several reasons.

Anticipated Grades: A student's grades are an (imperfect) indication of the extent to which he or she has acquired information made available through various courses. As a result, from the perspective of both students and university administrators, high grades are important indicators of student success (although, as noted, grade inflation is often ignored or denied as a problem).

Thoughts of Leaving: For a number of reasons that need not be elaborated here, students who leave a given university prior to degree completion represent a financial loss to that university. As a result, it is in the interests of universities to retain students. For the student, premature departure from school may have two consequences: a lost opportunity for the development of human capital and a loss of future earnings (not to mention any costs already incurred to cover educational expenses).

Research has shown that in any given year the best predictor of a student's return for a subsequent year of study is his or her commitment to that objective.[42] As a result, a student who states that he or she constantly thinks of leaving prior to degree completion is more likely than others to fulfill that possibility.

Satisfaction: Student satisfaction with the university experience is a desirable outcome in its own right. In addition, satisfaction has been associated with a number of other positive university outcomes, such as alumni financial support. Moreover, various agencies collect and publish the degree of satisfaction reported by undergraduates at various universities. These measures are often used to rank, and thereafter sell, particular institutions to potential students. Consequently, from an institutional perspective, it is important to maximize students' satisfaction with the university experience.

The overall relationship between skill-level group and these outcomes for students in all universities combined is expressed in Graph 6. As can be seen from the graph, and as was examined above in Table 3, 35% of students in the functional group expected grades of A or

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[41] Canadian information on the interrelationships among satisfaction and other variables can be found in J. P. Grayson, "The Relationship between Grades and Academic Program Satisfaction over Four Years of Study," *The Canadian Journal of Higher Education* 34, no. 2 (2004); "Repeated Low Teaching Evaluations: A Form of Habitual Behaviour?," *Canadian Journal of Higher Education* 45, no. 4 (2015).

[42] J. P. Grayson and K. Grayson, "Research on Retention and Attrition," (Montreal: Canadian Millennium Scholarship Foundation, 2003).

Graph 6: Selected Outcomes by Skill-Level Groups for All Five Universities
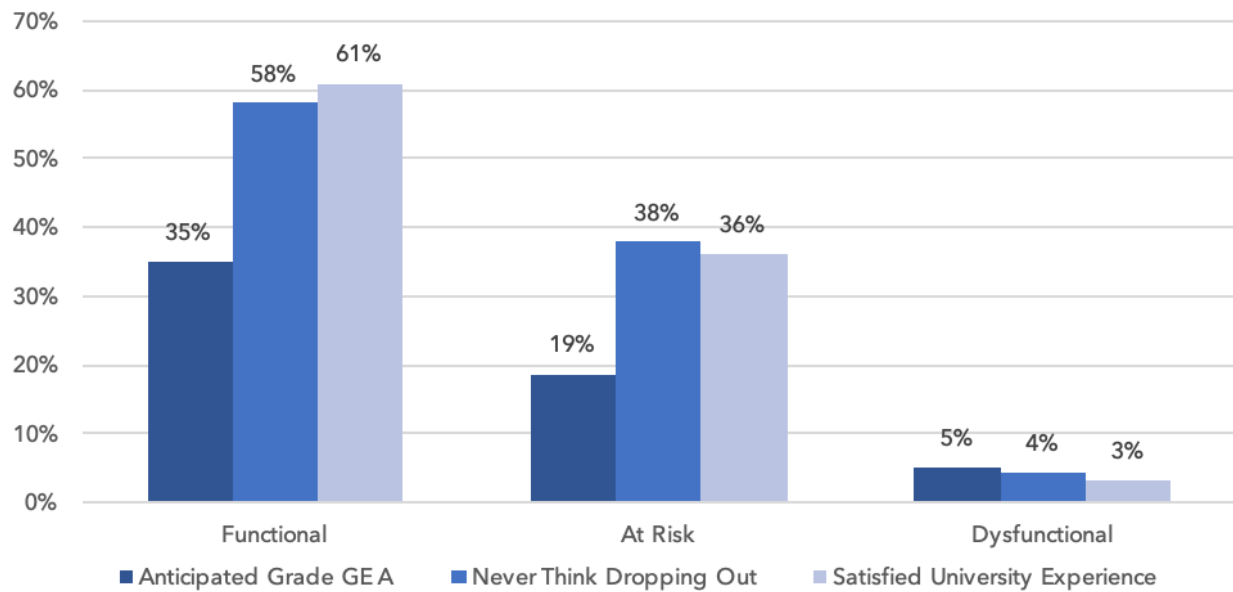
higher. The figures for the at-risk and dysfunctional groups were 19% and 5% respectively.

Figures for thoughts of leaving and university satisfaction follow the same trajectory. While 58% of the functional group never thought of leaving their universities, the figure for those in the at-risk group declined to 38%. For the dysfunctional the number was only 4%. Similarly, while 61% of the functional were satisfied or very satisfied with their university experience, the figures for the at-risk and dysfunctional groups were only and 36% and 3%, respectively.

In the York report referenced earlier,[43] it was shown that a number of variables have the potential to affect the relationship between skill-level group placement and outcomes such as grades, thoughts of leaving, and satisfaction. They include gender, having been raised in a family in which English was not their first language (ESL),[44] being the first in the family to attend university (first generation),[45] the number of years spent in university, and high school

[43] Grayson and Kenedy, "The Generic Skills Crisis in LA&PS."

[44] J. P. Grayson, "Language Background, Ethno-Racial Origin, and Academic Achievement of Students at a Canadian University," *International Migration* (2008).

[45] R. Auclair et al., "Research Paper 2 - First-Generation Students: A Promising Concept?," (Montreal: Canadian Millennium Scholarship Foundation, 2008); J. P. Grayson, "Academic Achievement of First-Generation Students in a Canadian University," *Research in Higher Education* 38, no. 6 (1997); "The Experiences and Outcomes of Domestic and International Students at Four Canadian Universities," *Higher Education Research and Development* 27, no. 3 (2008); "The 'First Generation' in Historical Perspective: Canadian Students in the 1960s," *Journal of Historical Sociology* (2018 (accepted for publication)).

grades.[46] (For a fuller explanation of these possibilities, readers should consult the York document.)

We can give an example to illustrate these possibilities. Although few in the dysfunctional group anticipated the highest grades, it is possible that this skill-level group included large numbers of individuals for whom English was a second language. As a result, it would be necessary to remove this possibility from analysis in order to detect the unique effect of being dysfunctional as defined here. This objective is achieved through the means of a statistical procedure referred to as multiple regression analysis.

Sorting Out Potential Causes: Multiple Regression Analyses

Multiple regression analysis allows researchers to estimate the *unique* effect of a particular independent (or causal) variable on a dependent (or caused) variable. In this report, utilization of this procedure allows, for example, the estimation of the effect of skill-level group placement after the removal of a possible gender effect.

In the current analyses, the regression scores presented are *betas*. Only those variables that make a statistically significant contribution to the dependent variables will be reported.

Betas are standardized measures of the effect of independent on dependent variables. For purposes of this report, we can consider them to range from -1.0 to +1.0. A negative sign indicates that the higher the value of the independent variable, the lower the value of the dependent variable. A positive sign signifies that as the value of the independent variable increases, so does the value of the dependent variable.

An important feature of betas is that, because they are standardized, it is possible to compare the effects of different independent variables. For example, if a beta for one independent variable is .30, and for another it is .60, we know that the second variable has twice the impact of the first on the dependent variable.

Most importantly, *the beta is a measure of impact after the influence of all other variables has already been considered.*

In order to carry out multiple regression analyses for this report, it was necessary to construct binary variables that are also called *dummy variables*. For example, rather than treating skill-level group placement as a single variable, separate variables were constructed for each group in the original variable. To illustrate, reference will be made later to separate dysfunctional and at-risk variables. The first variable includes only students who were classified in the dysfunctional group. The at-risk variable refers only to students categorized into this group. In

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[46] Grayson, "Language Background, Ethno-Racial Origin, and Academic Achievement of Students at a Canadian University."; "Linguistic Capital and Academic Achievement of Canadian and Foreign Born University Students."

both instances, comparisons will be made to the functional group that serves as a *reference* category. This means that any scores for the dysfunctional and at-risk variables are in relation to the functional category.

In the following analyses, anticipated grades were measured by the original survey question in which students were asked their expectations on an eight-point scale where 1 = D and 8 = A+.[47] The same scale was used for high school grades.

Thoughts of leaving prior to degree completion were assessed by asking respondents how often they felt "fed up" and thought that they might leave the university. Response options were "never," "sometimes," "often," and "all the time" (coded 1, 2, 3, and 4).

Finally, survey respondents were asked in the questionnaire how satisfied they were with their university experience. A response of 1 indicated very satisfied. If students were very dissatisfied they chose 5. Other options fell between these extremes. In the following analyses, satisfaction was recoded for ease of interpretation, where a score of 5 now indicates a response of "very satisfied" and 1 signifies "very dissatisfied" (with the 2, 3, and 4 values recoded accordingly).

In the following examinations of outcomes, dummy variables were created for university, skill-level group, gender, language first spoken in the home, and being an international or domestic student. The respective reference categories were York University, functional group, male gender, English language, and international student.
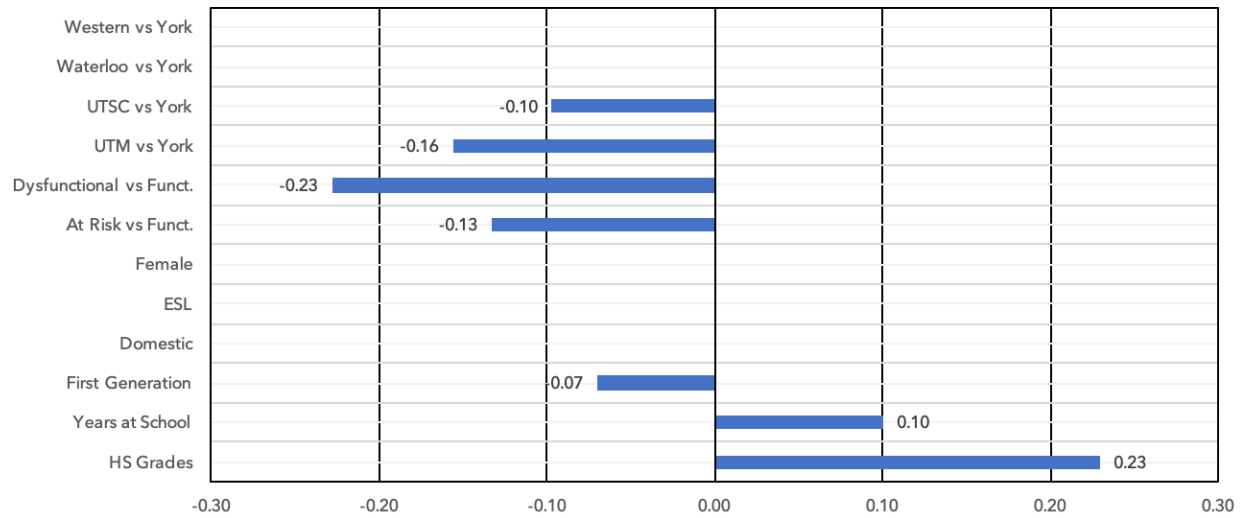
Predictors of Anticipated Grades

Graph 7 provides a simplified illustration of the regression results for anticipated grades.[48] As a first step in reading this graph, it is useful to distinguish between positive and negative effects

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[47] Note that the National Survey of Student Engagement (NSSE), which the instructions in this report replicate, also relies on subjective estimates of academic achievement in its analyses.

[48] In the United States and Canada, research indicates that a growing number of students attribute high grades to their own efforts and not grade inflation. By contrast, they tend to believe low grades result from instructors' shortcomings: Bryan G. Griffin, "Grading Leniency, Grade Discrepancy, and Student Ratings of Instruction," *Contemporary Educational Psychology* 29 (2004); John McClure et al., "Students' Attributions for Their Best and Worst Marks: Do They Relate to Achievement?," ibid.36 (2011); Tracy Vaillancourt, "Students Aggress against Professors in Reaction to Receiving Poor Grades: An Effect Moderated by Student Narcissism and Self-Esteem," *Aggressive Behaviour (online first)* (2012).

Graph 7: Statistically Significant Betas for Anticipated Grades for All Universities

on this outcome (illustrated on the right and left side of the graph, respectively). Consistent with prior research, high school grades (beta = 0.23) are the best predictors of anticipated grades. In addition, students with more of years of university report higher estimated grades (beta = 0.10). In other words, senior students expect to achieve slightly higher grades than others.

The left side of the graph depicting negative effects shows the variables predicting lower anticipated grades. Chief among these is membership in the dysfunctional group (beta = -0.23). Next in order of impact are being a UTM student (beta = -0.16), membership in the at-risk group (-0.13), being a UTSC student (beta = -0.10), and being a first-generation student (-0.07). (The lower anticipated grades at both University of Toronto campuses might be due, among other possibilities, to slightly lower levels of grade inflation there.)

It is important to stress that the values above indicate the unique contribution of each independent variable to anticipated grades. Given the objective of the current report, *the most important finding is that independent of high school grades and the other independent variables, compared to the functional group, membership in both the dysfunctional and at-risk groups is associated with lower anticipated grades.*

These findings have the following curricular implications. Universities have no control over high school grades, first generation university attender status, or gender. By comparison, they could do something about students' skills. Were they to do so, levels of achievement, as measured through grades, could increase.

Predictors of Thoughts of Leaving

In examining information in Graph 8 on frequency of thoughts of leaving university prior to
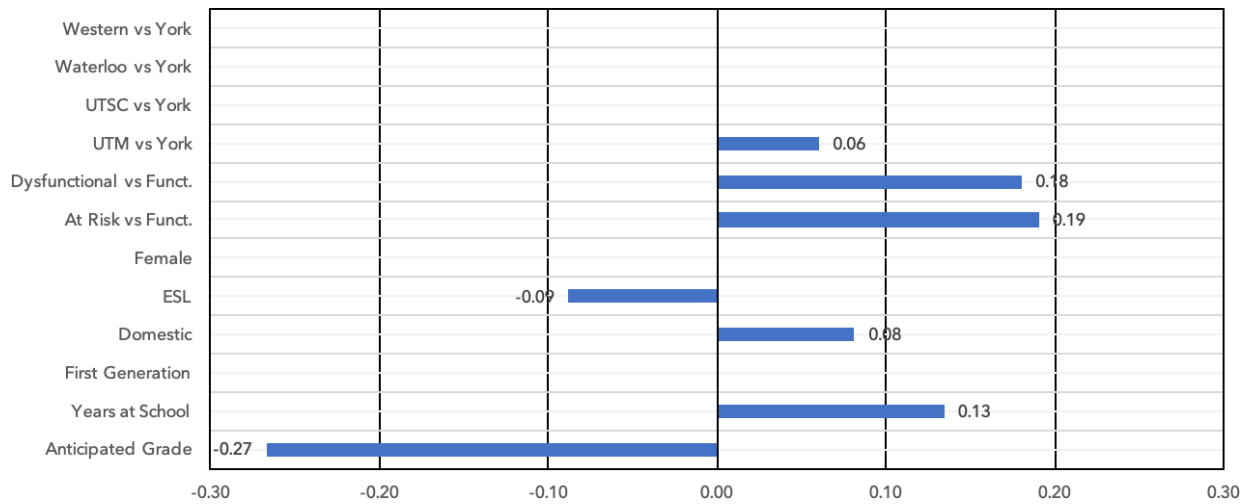
degree completion, we will begin with the left side of the graph. Clearly, students who consider leaving university prior to degree completion have lower anticipated grades (beta = -0.27). Indeed, the variable "anticipated grades" has the single greatest effect on thoughts of leaving. The only other negative effect is found with ESL status (beta = -0.09). In other words, ESL students are slightly less likely to think of leaving as compared to students for whom English is a first language.

On the other side of the ledger, students who are at-risk (beta = 0.19) or dysfunctional (beta = 0.18) are more likely to think about leaving campus. Domestic (as compared to international) student status also has a slight positive effect (beta = .08) on thoughts of leaving, as does number of years at school (beta = 0.13). Put differently, thinking of quitting university increases with being a domestic student and the amount of time spent at university. Being a UTM student also contributes slightly to thoughts of abandoning studies (beta = 0.06).

For current purposes, the most important finding illustrated in Graph 8 is that students with deficits in their academic skills think more often of leaving prior to degree completion, while controlling for the other variables in the equation. To illustrate, students might achieve high grades; however, should they lack key academic skills, they are more likely than others to think of abandoning their studies. This is an important finding, because thoughts of leaving have been found by researchers to be the best predictors of actual attrition the following year.[49]

The implications for the findings in this section are similar to those identified in the prior section. Universities are unable to affect students' statuses. However, they could attempt to improve students' academic skills. The likely effect of this measure would be increased

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[49] Othman Aljohani, "Comprehensive Review of the Major Studies and Theoretical Models of Student Retention in Higher Education," *Higher Education Studies* 6, no. 2 (2016).; Grayson and Grayson, "Research on Retention and Attrition."

retention.

Predictors of Student Satisfaction

Students' satisfaction with the university is examined in Graph 9. From the right side of the graph we see that the only variable contributing to satisfaction is anticipated grade (beta = .26). By contrast, both at-risk (beta = -0.17) and dysfunctional (beta = -0.20) group status detracts from satisfaction. Also, the longer students have been at university, the lower their satisfaction (beta = -0.12). Finally, it is important to note that level of satisfaction does not vary among the four universities (or five campuses) sampled by our survey (i.e., no betas are statistically significant).

Graph 9: Statistically Significant Betas for Satisfaction for All Universities
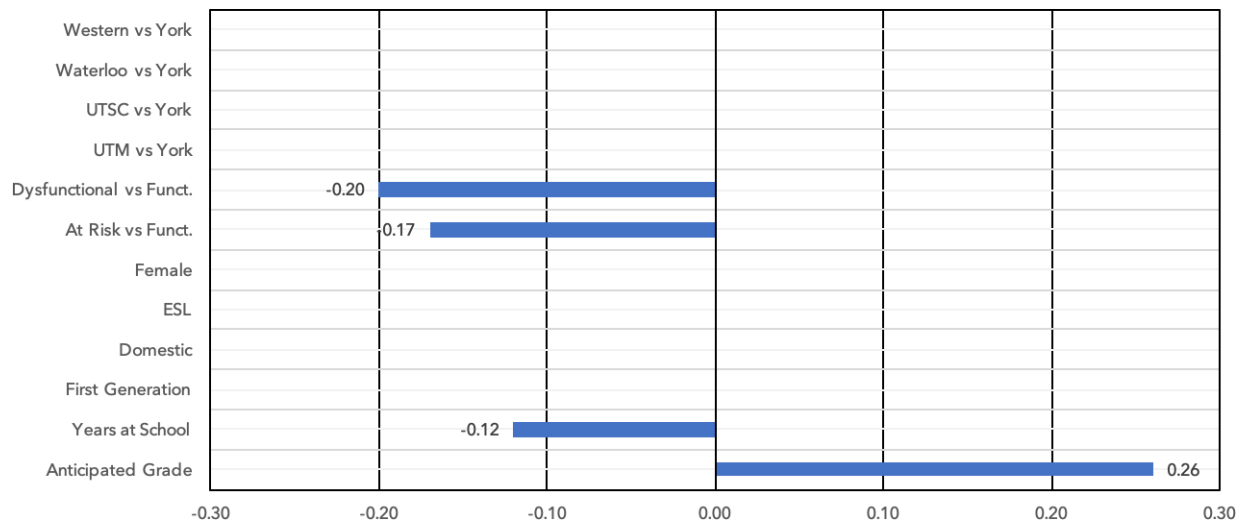
The latter is another important finding. Surveys such as the NSSE, used to rank Canadian universities, also ask questions relating to satisfaction with the university experience. Needless to say, they find differences, and many universities are sensitive to their standing. Unfortunately, when presenting their findings, reports based on surveys like those carried out by NSSE do not control for important variables such as those included in this study. Were they to do so, *it is highly likely that they too would see differences disappear in satisfaction among universities.* The practical implications of findings such as these would include: less revenue for NSSE, less anxiety for university administrators fearful of low satisfaction ratings, and reduced pressure on students to gain admission to "desirable" (as identified by NSSE) universities (to the extent that students pay attention to such measures).

The curricular implications of these findings are consistent with those presented previously. *Increasing students' academic skill levels would contribute to undergraduate's overall satisfaction with their university experiences.*

Which Skills Are Most Important for Key Outcomes?

We have seen from the foregoing sections that skill-level group placement has clear implications for the outcomes under consideration. It is important to remember, however, that assignment to these groups is based on seven related yet different measurement scales. As a result, it is helpful to determine the impact of each scale.

In Graph 10, the results of separate regressions for (1) anticipated grades, (2) thoughts of leaving campus prior to degree completion, and (3) satisfaction with the university experience are presented with the seven skills measurement scales as independent variables (numeracy, time and group management, presentations, research, analysis, writing, and ability to study for and write tests). Note that on the graph, as in previous graphs, betas have been identified only if they are statistically significant.

Graph 10: Regressions for Outcomes
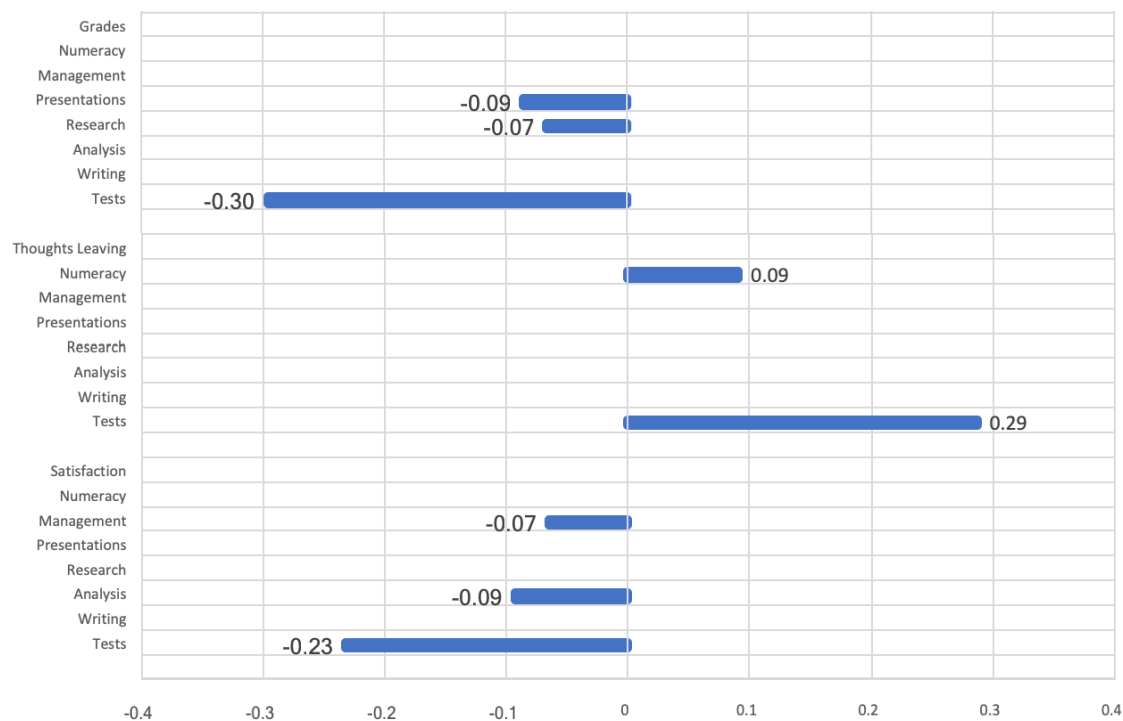
For all three regressions, it is clear that the ability to study for and write tests (the scale "tests") is the skill with the greatest impact on grades, thoughts of leaving prior to degree completion, and satisfaction. The less the perceived difficulty with tests, the higher the expected grade (beta = -0.30); the greater the difficulty with tests, the more likely the student will have thoughts of leaving campus before getting a degree (beta = 0.29); and the greater the problems with tests, the lower the satisfaction with the university experience (beta = -0.23).

For each of the outcomes, the sizes of the betas for tests are more than double the values of the other statistically significant betas combined.

These findings suggest the following. As long as students know how to study for and write tests, they can get good grades. Their writing, analysis, management, and numeracy skills are of far less consequence. How can this finding be explained? There are two possibilities.

First, students may not be given assignments that make use of, for example, their writing, numeracy, management, and analysis skills. Most Canadian professors could likely name some courses in which assessment is based totally on multiple-choice tests. In situations in which this practice is common, it is obvious that even were they to have other academic skills, students would be denied the opportunity to utilize, for example, their analysis or writing skills.

The second possibility is that students are given the opportunity to utilize a number of different skills in addition to test-taking, but those with low levels of skill are not graded accordingly. For example, were instructors to insist that students' essays be grammatically correct, and that they develop sound arguments in their papers, large numbers of these students would receive failing grades. Were this to occur, particularly in an era in which student evaluations are sacrosanct, the ability of the instructor, rather than that of the students, might be questioned. As a consequence, and understandably, students with inadequate skills may be passed on by instructors to the next level of course difficulty.

This problem is likely exacerbated in large classes. In these classes, instructors have little time to deal with students' skill deficiencies. Instead, instructors are usually mandated to deal with disciplinary content (knowledge), not skills. These skills are simply assumed to have been developed in high school. Particularly vulnerable in these circumstances are contract faculty. They are hired on a course-by-course basis. Negative student evaluations could well result in the non-renewal of contracts.

While the relationship will not be pursued in this report, given the findings of our previous analyses, it is likely that the ability to study for and to write tests is the skill most strongly associated with high grades. In turn, as seen in the previous section, academic "achievement" reduces thoughts of leaving and contributes to satisfaction with the university experience. This link will be fleshed out in later analyses.

To summarize, student success is related to skill category placement; however, not all skills are equal in the university context. The ability to study for and pass tests is chief among them. Other skills, such as numeracy, literacy, and the ability to research, are of relatively little consequence.

How Typical Are Our Findings?

Overall, the findings of this study are not very encouraging about the state of Ontario's universities, and perhaps for similar university systems.[50] There is strong evidence that the student bodies in the universities we studied have high levels of skill deficiency. Could we expect the same were other institutions to be investigated? Would our findings also vary across faculties? For example, could we expect the same from science faculties as we found for students in the current study?

Although response rates were less than desirable, given the uniformity of response on the five campuses we studied, and the correspondence between our results and those of less targeted and more abstract research,[51] it is likely that similar problems would be found among students in comparable programs in other universities. As noted above, together, institutions studied here enroll about 41% of Ontario's undergraduates. Should any of the institutions not under consideration doubt this possibility, we would be happy to help them in conducting our survey on their campuses.

We are less sure that findings similar to ours would be found for other faculties, such as science. This said, information collected in the samples from UTM and UTSC leads us to hypothesize that our findings could well cut across disciplines/faculties.

Recall that 208 math and science students were included in the U of T samples. Thus far in this report, these students' responses have not been included in the analyses. However, in this section we will compare the responses of students in math and science to others on the combined U of T campuses. As the main focus of this report is other than math and science students, we will not present our findings in detail. This will come in later reports. Here it will suffice to point to some of the main findings:

1. When individual skills were examined, the only statistically significant difference between math and science students and the overall sample of arts, social science, and professional studies students was in numeracy. The respective deficiency scores were 10% and 18%. This is to be expected given the natures of math and science and other programs.

2. On the overall skill index there were no statistically significant differences between math and science and other students. In other words, overall, weaknesses in some areas of skill were equalized by strengths in others.

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[50] Cf. James E. Côté and Andy Furlong, eds., *Routledge Handbook of the Sociology of Higher Education* (London: Routledge, 2016).

[51] HEQCO, "HEQCO Essential Adult Skills Initiative 2016/2017: Status Report."; Weingarten and Hicks, "On Test: Skills. Summary of Findings from Hecqo's Skills Assessment Pilot Studies."

3. No statistically significant differences were found in the distribution of math and science students in the functional, at-risk, and dysfunctional skill categories.

4. Seventy-eight percent (78%) of math and science students had high school grades greater than or equal to A. The figure for other students was 70%. However, these differences were not statistically significant. Math and science students enter university with grades similar to those of other students.

5. Among math and science students, high school grades did not vary in a statistically significant way by skill category. Among the functional, 82% received grades greater than or equal to A. The figures for the at-risk and dysfunctional were 73% and 77% respectively. In other words, students in math or science could be dysfunctional and still have received very high grades in high school.

6. Similar to students in the main sample, among math and science students, distributions in the functional, at-risk, and dysfunctional categories did not change between Year 1 and Year 4+.

7. In regressions similar to those conducted for students in all five institutions, there were no statistically significant differences between math and science and other students for anticipated grades or thoughts of leaving campus prior to graduation.

8. In a regression analysis for satisfaction with the university experience, differences between math and science and other students were statistically significant. A cross-tabulation revealed that whereas 44% of math or science students were satisfied, the figure for the other students was 54%.

As already noted, the central focus of this report is on students in arts, social science, and professional studies departments/faculties. The intention was not to explore in depth differences between math and science students and those in other disciplines. However, by serendipity, over 200 math and science students responded to our survey. Suffice it to say that in terms of the skills under study in this report, there are no substantively meaningful differences between these two groups of students. Accordingly, we will approach our future studies of disparate programs in other universities assuming the null hypothesis.

Follow-Up Study

So far, analyses of variables like high school grades, skills, and university grades have been based on survey information. As a result, some readers may question the degree to which examinations utilizing 'objective' measures of the same variables would yield similar findings. In order to address this issue a study was conducted at York University in 2020-21.[52] As a first step, a 60-question test was developed that was based on the skills examined in the surveys.

Just prior to the COVID pandemic, this test was completed by students at the beginning and end of the academic year (pre- and post-tests). Information on high school grades, course grades, cumulative grades, number of completed courses, and year of study were obtained from administrative records. In short, all data were 'objective'.

Consistent with survey results:

1. With one exception, there was no increase in skills between the pre- and post-tests completed at the beginning and end of the academic year. While students may have developed their knowledge, there was no improvement in skills.
2. The exception to the foregoing were students who completed a course designed to increase proficiency in the types of skills measured in the surveys. The skills of these students increased considerably.
3. There were no differences in test results based on students' year of study. In other words, university longevity did not equate to skill development.
4. The relationships between high school grades and academic achievement in university were weak. As a result, we cannot assume that students with good high school grades will repeat their performance in university.
5. *The net effect of skills measured in the post-test on variables assessing academic achievement was considerable. Put differently, skill level, not high school grades, was the best predictor of university grades.*
6. A cluster analysis revealed two natural groups: 40% and 60% respectively were high and low achievers.

In essence, the findings of the study based on objective measures paralleled those of the survey-based analyses. This finding points to the validity of the latter.

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[52] J P. Grayson, "Generic Skills, Academic Achievement, and Means of Improving the Former," *GiLE Journal of Skills Development* 1, no. 2 (2021).

Discussion

Remedies

The results of the multi-university study can be acted upon in several ways. First, we can accept the fact that 56% of students in the universities under study have skill deficiencies and carry on as in the past. Second, we can try to remedy skill deficiencies through existing courses. Third, we can ignore the inflated high school grades currently required for entry and introduce the types of entrance assessments that have been useful in other countries. Fourth, we can propose a new means of adapting to the skill deficiencies at the university level. And, fifth, we can urge the provincial government to remedy students' deficiencies before they graduate from high school.

Option 1: The problem with the first option—maintaining the status quo—is fivefold, at the least. First, it is hard to teach students who lack the skills essential to academic success. It takes longer to mark their papers, they need more help than others, and they are less likely than their peers to find their courses interesting. Second, universities granting degrees to students with serious academic skill deficiencies are in effect giving up on the "standards of excellence" that have traditionally been, and continue to be, their masthead and touted in their brand. Third, students with skill deficiencies are more likely than others to perform poorly academically and to leave the university prior to degree completion. This incurs unnecessary costs on publicly funded university systems. Fourth, teaching students lacking basic skills is not very rewarding for instructors. It reduces their morale, and few are likely to attempt to remedy most student skill deficits on their own. Fifth, the dissatisfaction expressed by dysfunctional students is likely to negatively affect the ways in which they assess their courses, instructors, and their overall university experiences.

Option 2: The problem with the second option—try to fix the problem on the fly—is that, given the scope of the difficulties identified in this analysis, it is unlikely that sufficient time would be available in existing courses to give basic skill development the attention it deserves. Decades of underfunding in Ontario's universities have created high student–teacher ratios.[53] The result is large classes in which instructors can often do little more than give multiple-choice examinations that are electronically graded. Were this underfunding to be reversed and class sizes consequently reduced, more could be done to correct some of the deficits, but this would require co-operation from other stakeholders, especially high school feeder systems.

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[53] E.g., David Lindsay (January 17, 2019). "COU Response to Ontario Government Announcement on Postsecondary Sector Tuition," Council of Ontario Universities, January 17, 2019; Higher Education Quality Council of Ontario, *Second Annual Review and Research Plan* (Toronto: Higher Education Quality Council of Ontario, 2008); Association of Universities and Colleges of Canada, Trends in Higher Education (Ottawa: Association of Universities and Colleges of Canada, 2002); Sean Junor and Alex Usher, *The Price of Knowledge 2004: Access and Student Finance in Canada* [Montreal: Canada Millennium Scholarship Foundation, 2004]

Option 3: A problem with option three—replace grades as a screening mechanism—is that any screening process would likely be politically unacceptable in certain circles, and it would require time and a political consensus to implement. However, the merits of exploring this option are supported with the finding that the beta between high school grades and anticipated university grades is only 0.23 (controlling for other factors, Graph 7).

For the past several decades, universities have simply increased the GPA required for admission. This has resulted in the institutions studied in this report having "high," but slightly different admission standards (i.e., requiring different high school GPAs in the B+ to A range, with York requiring the lowest and Western the highest GPAs). However, any further attempt to enrol students with higher entrance grades will be ineffective because, as our results show, grades are poor predictors of skill acquisition (they are compressed at the higher-grade levels, reducing their discriminant validity). In other words, increasing admission grades would not ensure the entry of students with functional academic skills: many dysfunctional students are admitted with high secondary school grades. Once in university these students can receive passing grades throughout their university careers.

Our results suggest that high school grades might be downplayed or ignored in favour of a form of multi-faceted matriculation assessment that draws on key academic skills. As noted above, many countries successfully employ these assessments. Perhaps Finland provides a gold standard with its National Matriculation Examination. This instrument is part of a high-quality, equitable educational system from preschool through primary, secondary, and tertiary levels.[54] If such assessments were put in place, high schools would become obligated to focus on their students' skills acquisition and to stop awarding misleading grades in an attempt to boost students' self-esteem (i.e., making them feel better about themselves by rewarding them with high grades even if those grades do not reflect actual skill levels).[55] Schools that have few students who do well on these exams would feel pressured from various sources—especially parents—to reform their curriculum and performance assessments, and to improve the development of academic skills.[56]

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[54] Finnish Ministry of Education, "Education System in Finland," http://www. minedu.fi /OPM/Koulutus/koulutusjaerjestelmae/?lang=en. Critics of these types of examinations should study the Finnish example before dismissing this suggestion. In other words, as we tell our students, they should do some research and analysis before passing judgment. Two excellent sources are Ari Antikainen, *transforming a Learning Society: The Case of Finland* (Bern: Lang, 2005); and Pasi Sahlberg, *Finnish Lessons: What Can the World Learn from Educational Change in Finland?* (New York: Teachers College Press, 2011).

[55] See Côté and Allahar, *Ivory Tower Blues*, for a discussion of the "cult of self-esteem" that has overtaken many school systems.

[56] There appears to be some support for bringing back the OAC year (previously Grade 13), but Ontario was an anomaly, with most secondary schools ending after Grade 12. Nonetheless, many Ontario high school graduates now spend an extra year taking further secondary level courses, which is called the "victory lap," and the Ministry of Education limits how many of these courses students can take. However, there appears

Option 4: The difficulty with the fourth option—universities themselves dealing with skill deficiencies—is that it would require a rethinking of departmental priorities and a reorganization of degree requirements. Again, serious underfunding of the system makes this course of action unlikely. In addition, it is improbable that current faculty have sufficient expertise to effectively deal with students' skill deficiencies while still delivering a curriculum worthy of the designation "higher education." This sort of surrender would send Ontario's universities in a direction that is likely to reduce their reputation worldwide and contribute to a further reduction in the production of higher forms of human capital. At the same time, our results suggest universities are currently doing this surreptitiously to a degree by graduating large numbers of low-skilled students. (As noted above, Statistics Canada research also confirms this.)

This said, it is clear that students in the sample support some form of option four. All were asked this question:

> Do you think it would be a good use of time or a waste of time if [your] faculty had a compulsory, first-year credit course that would cover subjects such as university standards, criteria, and procedures; critical thinking; effective studying; time management; improving writing; and jobs in the field in which you are majoring?

In response, 69% indicated that it would be a good or very good use of time![57]

We must emphasize that a course of this nature—by itself—would be insufficient to deal with the problems identified in this report. The skills learned would need reinforcing through assignments and grading schemes in other courses during first year and beyond. Without this reinforcement, skills learned in the course would simply atrophy.

Option 5: The problem with the fifth and final hypothetical solution—that the provincial government take steps to ensure that graduating high school students are prepared for university—is that there is widespread denial at the policy level that there is a problem that needs to be addressed,[58] even though a concern with this issue is expressed in some provincial policy documents. Even under the best of circumstances, change would take years to implement. In the meantime, universities themselves would still need to remedy the skills shortcomings of many students.

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to be merit in starting university at a later age. In Finland, for example, the average age of university matriculation is 20. See Côté and Allahar, *Lowering Higher Education*.

[57] In the mid-1990s, the same question was asked at York of a large number of arts students in surveys connected with program reviews. At that time, 62% responded either good or very good use of time. In the intervening 20 years, support for the course described in the survey has increased.

[58] Côté and Allahar, *Lowering Higher Education*.

Clearly, each solution has its attendant drawbacks. However, it can be argued that an approach to students' skill deficiencies that involves solutions three, four, and five, makes the most sense. In the short run, universities themselves should undertake the task of ensuring that entering students have the skills requisite to post-secondary success. In the meantime, the government should initiate measures at the high school level assuring that in the long run university-based remediation would become redundant. High schools would be expected to provide students with the skills necessary for university success. Post-secondary education could then build on this skill base and ensure that graduates meet human capital competency requirements for employment and informed democratic citizenship.

Limitations

As noted earlier, recent research suggests that, given the large number of respondents, our results are unlikely to be biased *statistically*.[59] Given that respondents were primarily graduates of the same post-secondary educational system, one possible manifestation of *sampling bias* would have been differences between the largest and smallest subsamples drawn from the four universities. However, it appears that sampling bias is not a problem, given that the results varied little by university.

All of this is reassuring. However, we still regard response rate as the greatest limitation of the current study. Our study was unfunded. Achieving a higher response rate would likely require a substantial amount of funding support in order to use some of the techniques implemented in larger surveys such as the NSSE. Higher response rates would also benefit from incentives for students to respond, an internal media campaign focusing on maximizing response rates, encouragement from instructors in their classes to complete the survey, and identification of the research by the university as important. Unfortunately, these types of support were unavailable when we collected our data.

Yet, low response rates are now the norm in studies of students. For example, NSSE reports institutional response rates for its 2016 surveys varying from 5% to 77%.[60] Fortunately, in the current endeavour, at York, we determined that the number of years students had been at York and the gender of the sample did not deviate to an alarming extent from the Liberal Arts and Professional Studies faculty population.

Because of the uniformity of responses across universities, and the fact that in the outcomes analyses institutional affiliation was virtually of no consequence, we are confident that our

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[59] Fosnacht et al., "How Important Are High Response Rates for College Surveys?."

[60] NSSE, "Nsse Response Rate Frequently Asked Questions," (http://nsse.indiana.edu/pdf/Resp_Rate_FAQ.pdf).

results are valid. The fact that the findings of the study based on objective measures of skills are comparable to those of the surveys contributes to that assurance. In addition, our results are consistent with the non-university targeted and abstract studies conducted by Statistics Canada and HECQO. On the other hand, *if the universities under discussion, or any other universities (or community colleges) are of a differing opinion, we invite them to conduct their own data collection, and, as mentioned above, we are more than willing to assist with this task!*

A second limitation of the study is that students are not always aware of what they do not know. For example, reference to the illiteracy of students is found in academic articles, Statistics Canada reports, conversations with other faculty, and the comments of employers. Despite these observations, in the current study, while students reported problems with writing in general, only 17% of the sample was concerned with its use of English grammar.[61]

There are at least two possible explanations for the difference between the perceptions of "experts" and students of this issue. First, perhaps many instructors pay little attention to poor grammar and do not bring it to the attention of students. Clearly, if instructors make few demands, there is little incentive for students to remedy any potential deficiencies in their use of the English language. Second, perhaps students involved in the surveys were anomalous and, independent of any other skill deficiencies, were in command of English grammar. While possible, this explanation is unlikely. It is more probable that many instructors have simply given up correcting grammar because they do not have the time and they feel their corrections will either be ignored or would evoke negative reactions among students who may take revenge on teaching evaluations.

If this type of reasoning can be applied to some other potential deficiencies studied in this report, as noted above, it is possible that the findings underestimate some areas of deficiency.[62] This said, as noted above, the analysis of objective measures of skills led to conclusions comparable to those based on the surveys.

Although not an issue in the study based on objective data, a third limitation was the inability to link completed questionnaires to administrative data. Had this been possible we would have been able to use students' actual prior and current grades in analyses. Nevertheless, in the United States, a meta-analysis involving 12 samples, found a correlation of .90 between self-

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[61] Although not reported above, international students in our sample were significantly more likely to report a concern about their English grammar (32% vs. 15% of domestic students). Perhaps international students are simply more aware of this deficit because, if English is not their native language, they are more often reminded of errors.

[62] People who are low in an area of knowledge or skill tend to overestimate their abilities in that area: Kruger and Dunning, "Unskilled and Unaware of It."

reported and actual GPAs of college students.[63] In addition, self-reported past post-secondary grades have a strong relationship with future university grades.[64] Both of these findings, as well at those of the study based on objective data at York, lend credibility to the results of the current study.

A fourth limitation of the study is that it focused on humanities, social science, and some professional studies students in four universities. Would similar patterns be observed in other areas of study? Would they be observed in other institutions in the province?

The answer to the first question is that we do not know. However, as noted above, our examination of a serendipitous subsample of math and science students from the University of Toronto suggests that significant proportions of undergraduates in most faculties will report skills deficiencies. Hopefully, further research will include undergraduate students from all faculties.

The answer to the second question regarding generalizability to other universities is, "most likely." The institutions included in this study account for 41% of Ontario's undergraduates. In these universities, as in others, the vast majority of students are graduates of the province's secondary school system. As a result, they would bring to their university careers the same strengths and weaknesses as students currently under study.

Who Is to Blame?

At the risk of being repetitive, we must emphasize that the issues we have identified are systemic, not individual, problems. As a result, our findings should not be used as a rationale to cut budgets or to single out groups for not doing their jobs.

As we noted, Ontario's secondary school objectives are laudable. Just the same, our research suggests that the objectives of the Ministry of Education are not being achieved. In accounting for this reality, we must point to the fact that, in addition to articulating secondary school objectives, *the ministry also mandates how student success is to be measured*.

By and large, it is up to teachers in individual high schools to determine the degree to which their students have progressed in their studies. Obviously, even with the best of intentions, assessments of this nature would vary from one teacher to the next. In addition, as noted in previous sections, it would be naïve to think that in making their determinations teachers are

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[63] Nathan R. Kuncel, Marcus Credé, and Lisa L. Thomas, "The Validity of Self-Reported Grade Point Averages, Class Ranks, and Test Scores: A Meta-Analysis and Review of the Literature," *Review of Educational Research* 75, no. 1 (2005): 73.

[64] Ibid., 76.

totally immune from the criticisms of students, their parents, others employed in the educational system, and school trustees. In this type of environment, teachers, rather than students themselves, may be held accountable for low grades (i.e., they are vulnerable to the charge that they don't know how to teach). Under these conditions, there may be little incentive to grade in ways consistent with ministry objectives. A clear way around this possibility would be to institute a system in which teachers' assessments were supplemented by forms of arms-length evaluations. As noted earlier, Finland is one constituency in which a system such as this has been introduced.

Were a comparable system to be introduced in Ontario, it would be essential to avoid a practice whereby schools were ranked, and rewarded, in terms of the number of those achieving certain grades. An incentive system such as this ignores the fact that pupils enter schools with different cultural and financial resources. For example, the educational outcomes of students in relatively poor areas of cities are unlikely to equal those in upper-middle class neighbourhoods. Many of the former are not able to acquire the type of cultural capital consistent with academic success. If anything, relatively poor scores might suggest that more, rather than fewer, resources should be allocated to certain areas. Differential expenditures could contribute to offsetting any educational handicap accruing to disadvantaged groups.

At the university level, professors are not mandated with the responsibility, nor do they have time, to instill skills that should have been mastered in high school. Their task is to build on these skills in the pursuit of higher learning. Unfortunately, without these skills, undergraduates are not likely to do well in their studies.

A considerable amount of research shows that in circumstances such as these many of the unsuccessful will blame their professors rather than themselves for their shortcomings. This blame can become manifested in complaints and poor teacher evaluations. As a result, departments could well attribute students' failure to the inability of professors rather than to that of students. Given this possibility, professors may well turn a blind eye to students' skill deficiencies. The consequence is that students leave the university with the same skill deficits with which they entered.

In short, blame for the skill problems we identified cannot be laid at the feet of secondary school teachers or university professors. The problems are part of a systemic product of a secondary school system with praiseworthy goals that lacks the means to assess the achievement of these goals, and a post-secondary system in which penalties may be incurred by those who hold students accountable for important academic skills.

In addition to the foregoing systemic factors, blame for the deficiencies noted in this report also lies with *credentialism*. Credentialism has been studied since the 1970s,[65] and since that time has worsened.[66]

Credentialism is based on the belief that job preparation is best provided through formal education. This is obviously true to an extent, but a consequence of this belief is that it has become increasingly difficult to secure most jobs without some sort of formal credential. More direct and coherent ways of entering the labour force, such as apprenticeships and on-the-job training, have become less common, even in low-skilled jobs. Because the high-school diploma has become the basic requirement for these lower-tier jobs, high schools have been pressured to graduate as many students as possible, but this has been achieved by lowering academic standards and inflating grades, rather than ensuring the skill levels of all graduates. In turn, universities have been admitting increasing numbers of students who in the past would not have graduated high school because of skill deficiencies.

To solve these systemic problems, the co-operation of all stakeholders is required (especially governments, businesses, and employers of all types). We hope that the results of this study will prompt an open discussion among all of these groups of possible solutions.

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[65] Randall Collins, *The Credential Society: A Historical Sociology of Education and Stratification* (New York: Academic, 1979).

[66] Côté and Allahar, *Ivory Tower Blues*; David Walters, "The Relationship between Postsecondary Education and Skill: Comparing Credentialism with Human Capital Theory," *Canadian Journal of Higher Education* 34, no. 2 (2004).

Conclusions

Concern has been expressed with the academic skills levels of Canadian undergraduates by professors, the press, and business leaders. Their concerns have been confirmed by sound research conducted by agencies such as Statistics Canada, various think tanks, and the Higher Education Quality Council of Ontario. Similar problems have been uncovered in the United States,[67] the United Kingdom,[68] and other countries following the Anglo-American model of higher education.[69] Despite the credibility of these endeavours, the methodology employed generally precludes insight into how skill deficiencies might be addressed through curricula.

In view of this lacuna, our intent in the current study was fourfold. First, we wanted to confirm the specific skills usually associated with university-level learning. Second, we were interested in measuring the degree to which students felt that they had developed these skills. Third, we were concerned with the extent to which such skills had implications for positive outcomes. Fourth, with this information we intended to suggest steps that could be taken to deal with the detected deficiencies.

Consistent with these objectives, we were able to identify that less than half of the students who entered the institutions under study were prepared in significant ways for the demands of university learning. Moreover, the skill levels of the student body did not improve over the course of their university careers. These findings give credence to concerns of employers that many university graduates are not prepared for the workforce in certain ways.

Of particular concern to us was the finding that students with low basic skill levels were still able to attain reasonable grades in both their high school and in their university courses. How was this possible?

One possible explanation for this type of grade inflation is that in high schools, if teachers were to apply marking standards consistent with more objective standards (e.g., ministry standards) and award lower grades, they would likely face serious pushback from students, their parents, other teachers/principals, and school trustees.[70] The concern among parents with high expectations for their children is that low grades will jeopardise the opportunity of their

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[67] Arum and Roksa, *Academically Adrift*.

[68] Bahram Bekhradnia, *The Academic Experience of Students in English Universities: 2009 Report* (Higher Education Policy Institute, 2009), http://www.hepi.ac.uk/466/Reports.html; "Students in England 'Work Less,'" BBC News, September 24, 2007, http://news.bbc.co.uk/2/hi/uk_news/education/7011121.stm.

[69] Côté and Furlong, Routledge Handbook of the Sociology of Higher Education.

[70] Cf. Laurie, *Setting Them Up to Fail?* Although some critics may question the existence of objective grading standards in some disciplines (e.g., humanities), the standards associated with the skills we have measured are more clear-cut, and the students answering the questions had no problem in assessing themselves.

daughters and sons to enter university. One consequence in a highly politicized system is that the ability of the teacher rather than that of the pupil may be called in question. In short, there is no incentive to ensure that ministry standards are realized. In light of this situation, it is no coincidence that grade inflation in Ontario's high schools dates back to the elimination of departmental exams in 1969.[71]

A similar dynamic is possible in universities. There is strong evidence that in post-secondary settings the problem of grade inflation is exacerbated by course evaluations. These vehicles are frequently used when assessing the suitability of instructors to their jobs. Historically, departmental chairs and faculty deans approved grades as a way of maintaining standards, although this practice is apparently becoming less common. In the current era of grade inflation, should an instructor put his or her foot down, and, for example, penalize students for illiteracy, he or she, rather than the student, might be viewed as the problem[72] and receive poor teaching evaluations.[73] This would be a difficulty particularly for contract faculty, who are hired on a course-by-course basis and may not have their contract renewed if their evaluations are deemed too low.

Indeed, an increasing body of knowledge indicates that many undergraduates attribute success to their own efforts, and their failure to their instructors.[74] As a result, course evaluations are, in effect, disincentives to an objective awarding of grades.

Even in a permissive environment for skill deficiencies, it is clear that a firm academic skill foundation is of benefit to students. More specifically, functional undergraduates anticipate higher grades than other students. Independent of anticipated grades, they also are less likely to think of leaving prior to degree completion and more likely to express satisfaction with their university experience. As noted above, the realization of these outcomes is of benefit to institutions as well as to individual students.

In view of the information collected in this study, it can be argued that the provincial government should take steps to ensure that the post-secondary system produces students

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[71] Côté and Allahar, *Ivory Tower Blues*; *Lowering Higher Education*.

[72] Valen E. Johnson, *Grade Inflation: A Crisis in College Education* (New York: Springer, 2003).

[73] Some universities have an informal policy known as the "DFW metric." If the number of D and F grades awarded, along with the number of withdrawals, in a given course exceeds 25%, the instructor may be deemed ineffective and subject to dismissal. Colleen Flaherty, "Savannah State Professors Object to New, Unwritten Policy Linking DFW Grades to Teaching Effectiveness," *Inside Higher Ed*, May 31, 2018, https://www.insidehighered.com/news/2018/05/31/savannah-state-professors-object-new-unwritten-policy-linking-dfw-grades-teaching.

[74] Grayson, "Repeated Low Teaching Evaluations: A Form of Habitual Behaviour?."; Côté and Allahar, *Ivory Tower Blues*; *Lowering Higher Education*.

with the skills embodied in its laudable objectives. By and large, these are the skills discussed in this report. Unfortunately, the realization of this goal would take considerable time. In the meantime, steps could be taken by individual universities to remedy students' skill deficiencies, and we have suggestions for doing so.[75]

Finally, it must be stressed that it is not the researchers who are passing judgement on students' skills. Undergraduates themselves are identifying specific weakness and asking for help. It behooves us to respond to their needs.

We must also emphasize that, although the focus of this report has been on undergraduates with problems, we have some excellent students. Their abilities are equal to those of their peers anywhere in the world and in the past at Canadian universities. Accordingly, we must ensure that we provide them with intellectually challenging environments, lest they take their brilliance elsewhere.

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[75] https://www.youtube.com/watch?v=RnNtcbNRpjE&feature=youtu.be

Appendix A: Survey Respondents' Majors

Table A1: A Compilation of Survey Respondents' Majors in Four Universities

	Frequency	Percent
Social Sciences		
Anthropology	20	0.9
Arts, Culture, and Media	12	0.5

Communication	29	1.3
Communication, Culture, Information, and Technology (CCIT)	17	0.8
Criminology	3	0.1
International Relations	3	0.1
Critical Development Studies	5	0.2
Digital Enterprise Management (DEM)	8	0.4
Economics	5	0.2
Environment Programs	85	3.8
Equity	13	0.6
Film Studies	2	0.1
Gender Studies	10	0.4
General Social Science (e.g., First Nations Studies)	2	0.1
Geography	12	0.5
Global Business and Digital Arts	9	0.4
Historical and Cultural Studies	6	0.3
Historical Studies	10	0.4
History	50	2.2
Human Geography	4	0.2

Media, Information, and Technoculture	8	0.4
Peace and Conflict	2	0.1
Political Science	113	5
Psychology	68	3
Public Policy	6	0.3
Religious Studies	1	0
Sexuality, Marriage, and Family Studies	3	0.1
Social Science	65	2.9
Social Development Studies	48	2.1
Social Sciences (Co-op)	18	0.8
Social Sciences	32	1.4
Social Work	40	1.8
Sociology	124	5.5
Arts and Humanities		
Classical Studies	5	0.2
English	88	3.9
English and Drama	12	0.5

Fine Arts	3	0.1
French	11	0.5
French and Linguistics	6	0.3
French Studies	2	0.1
Humanities	35	1.6
Info Tech	17	0.8
Interdisciplinary Centre for Health and Society	7	0.3
Language Studies	16	0.7
Legal Studies	12	0.5
Liberal Studies	12	0.5
Music	1	0
Philosophy	33	1.5
Spanish	2	0.1
Visual Arts	4	0.2
Visual Studies	7	0.3
Writing	12	0.5

Business/Professional Studies		
Accounting	19	0.8
Administrative Studies	136	6.1
Human Resources (HR)	36	1.6
Management (Co-op)	42	1.9
Management and Organizational Studies	33	1.5
Management	56	2.5
Professional Writing and Communication (PWC)	2	0.1
Speech Communications	2	0.1

Math and Science		
Biological Science	75	3.3
Biological Science (Co-op)	16	0.7
Chemical and Physical Sciences	9	0.4
Computer and Mathematical Science (Co-op)	22	1
Computer and Mathematical Science	14	0.6
Forensic Science Program	15	0.7
Mathematical and Computational Sciences	26	1.2
Physical and Environmental Sciences (Co-op)	8	0.4
Physical and Environmental Sciences	15	0.7
Other Responses		
Don't Have One Yet	132	5.9
Other Faculty	19	0.8
Other	268	12
Total	2063	92.1
System Missing	176	7.9

Appendix B: Sample of Students' Comments

As well as answering fixed questions, at the end of the survey, students were invited to express their own thoughts on the issues raised in the survey. The following quotations are a brief, *verbatim*, sample of these comments.

Comments

- I arrived at university not really prepared for it. I think it would be beneficial to show students the basics, such as writing essays, managing their time, effective reading strategies. I continue to struggle with these things myself. I think, overall just ingraining into students the realities and rigours of uni. must be done on day one, and some kind of mentorship.

- There is a lack of opportunities in classes to build essentials skills such as: critical thinking, speaking concisely and effectively in discussions, giving effective presentations (how to utilize tools such as powerpoint to create a professional presentation), time management, learning strategies, how to read journal articles and textbooks, very important skills that are utilized in graduate studies as well as professional settings that students do not get opportunities to build in undergraduate years.

- High school did not prepare me for university. The transition was very difficult and my expectations were completely different. It would be great to have a mandatory course/workshop(s) in first year to prepare the incoming students about what university is.

- The transition from high school to university was drastic, many professors expected for us to know things/have specific skills already. No one has the same learning strategies. It would have been nice in first year for professors to show us resources to work on our learning skills.

- I think a prep course that teaches you how to succeed in the humanities especially is very much needed. High school prep for this is abysmal and pretty much useless and counter productive. high school was practically useless in terms of preparation for University level academic standards and that this has not been addressed yet by either Universities or High schools.

- I find the lack of classical education to be abhorrent. To be fair, this is a problem across much of worldwide academia. I have not come across one course so far at this school that has taught me how to think critically; rather, these courses are attempting to teach me WHAT to think. As just a student, there\'s little I can do about this in this \"postmodern\", subjectivist nightmare that is Canada.

- University is supposed to be the place where we are taught how to think, not what to think. My experience while enriching and valued in one aspect, has also been one of an attempted indoctrination by ideologues in another aspect.

- time management is a huge problem, for me. Extremely paper/ assignment heavy terms are hard to manage.

- There is little room for ingenuity, creativity, or diversion from the norm in the undergrad experience. Much likened unto swallowing the bias of instructors and textbooks alike (many of which are outdated). The expectation is to regurgitate, and that strips the experience of pleasure, particularly when you are full of valid arguments of a different viewpoint. Short answer questions on exams are expectations of regurgitation. and multiple choice are stressful beyond imagination because of really attractive distractors, multiple multiples, and a range of other issues all of which violate good test creation.

- …no real application to the real world. There needs to be more of a connection between academics and work. For example, Rotman trains students in Microsoft Excel …skills would be to bring actual business scenarios into the classroom for students to solve. Practical skills such as the ones listed above are very important and are quite underdeveloped at this university.

- As funny as this sounds, a course dedicated towards careers (similar to careers and civics in grade 10 of high school) would help a lot. A lot of job skills I\'ve developed (soft skills, teamwork, counseling) were learned OUTSIDE of the university setting.