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Engagement, Satisfaction, and Positive Student Outcomes: The Most Prevalent Factors at Canada's Public Universities

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By

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ABSTRACT

Research suggests that higher levels of student engagement are positively correlated with higher levels of student satisfaction. The National Survey of Student Engagement (NSSE) benchmark measures have been found to be significantly correlated with institutional outcomes related to student satisfaction, such as graduation rates and retention. Although there has been an extensive amount of research conducted on ranking HEIs, student satisfaction, and student engagement, there remained a noticeable gap in the literature: the examination of the ranking of Canadian institutions' student satisfaction, student engagement and positive student outcome variables. As such, we offer a novel study in the context of Canadian universities (N = 49) that examines *Maclean's* magazine rankings of Canadian universities based on the analyses of data obtained from student satisfaction indices (as published by *Maclean's Magazine University Rankings*) and NSSE (as reported by macleans.ca) concurrently to examine (1) if NSSE engagement indicators can predict *Maclean's* student satisfaction at public institutions across Canada and (2) whether there are significant differences between (a) higher versus lower ranked universities, (b) universities with good reputations versus universities with poor reputations and (c) larger enrolment versus smaller enrolment universities. Canonical correlation analyses identified significant predictors of student satisfaction, although predictors differed based on academic year (i.e., first- versus senior-year students). The significant predictors were then utilized in Mann-Whitney U Tests for comparisons between universities. Results revealed that universities based on overall rank yielded the most difference followed by the size of institution (i.e., enrolment), whereas there was little difference between universities based on their reputation.

DEDICATION

In memory of Dennis and my cadre of guardian angels. Thank you for your continual protection − you will never be forgotten.

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LIST OF ABBREVIATIONS/SYMBOLS

ARWU	Academic Ranking of World Universities
C	Comprehensive
EI	Engagement Indicator
HEI	Higher Education Institution
FTE	Full Time Equivalent
M/D	Medical Doctoral
NSS	National Student Survey
NSSE	National Survey of Student Engagement
PCA	Principal Components Analysis
QS	Quacquarelli Symonds
ROI	Return on Investment
THE	Times Higher Education Ranking
U	Primarily Undergraduate
USNWR	U.S. News and World Report

CHAPTER 1

INTRODUCTION

Since 1991, *Maclean's* magazine has been publishing rankings of Canadian universities. Currently *Maclean's* best-selling issue, the magazine has become increasingly popular over the years as a means for consumers to access information about higher education institutions (HEIs) in Canada and determine the most optimal option (Axelrod, 2010; Cramer & DeBlock, 2020; Cramer et al., 2016; Cramer & Page, 2005, 2007; Page & Cramer, 2004; Page et al., 2009, 2010). At the same time, the National Survey of Student Engagement (NSSE) annually collects information from hundreds of thousands of students at various institutions across North America (National Survey of Student Engagement [NSSE], n.d.). Past research shows that student engagement and student satisfaction are strongly and positively correlated, meaning students who are more engaged are also more satisfied. To date, however, no studies exploring the relationship between student engagement, student satisfaction, and positive student outcomes as put forth by both NSSE and *Maclean's* exist.

Maclean's University Rankings and NSSE are perhaps the most renowned tools used to easily access information about academic institutions among students, their families, and the general public in Canada. When *Maclean's* indices are considered together with the NSSE data (which is based upon the engagement of current students), more informed decisions could be made by prospective students. Informed by past research, the current study will (a) provide a history of the exercise of ranking; (b) present findings of past analyses of *Maclean's* Magazine University Rankings, NSSE, and the ranking of HEIs internationally as well as their approaches of disseminating information and associated implications; (c) empirically analyze factors that have been found to be related to universities' academic excellence and levels of engagement and

satisfaction of Canadian university students; (d) conduct comparative analyses of NSSE student engagement indicators and *Maclean's* student satisfaction index; (e) explore the differences in student engagement and satisfaction between high- versus low-ranking institutions, institutions with good reputations versus institutions with poor reputations, and larger enrolment versus smaller enrolment institutions.

The Exercise of Ranking

Today, countless consumer products, goods, and services are ranked according to various (and oftentimes inconsequential) criteria. In fact, a quick Google search of "world's best" will provide seekers with an abundance of ranked entities including the world's best cities, countries, restaurants, islands for beaches, and even COVID resilience. It is no surprise then that large organizations and HEIs around the world are similarly ranked, and the information made just as easily accessible. Much like the publication *Consumer Reports*, which ranks a plethora of everyday products, *Maclean's* uses a ranking method in which universities are allocated comparative rank standings based on their appointed scores from various indices.

As prospective students decide to pursue higher education and thus select an appropriate institution, they are predominantly the consumers of this market. Since ranking HEIs occurs globally, it is important to note that the implications discussed here may not be unique to Canada or *Maclean's* since analyses in other countries have derived similar results (see Aghaz et al., 2015; Huang et al., 2015). One noteworthy exception is a recent investigation of Times Higher Education (THE) Japanese University Rankings whose findings suggest marginally better psychometric results than those produced in Canada (Cramer et al., 2019). They found that overall institutional rank correlated with more individual index ranks, high-ranking universities

ranked significantly better on more indices, and universities were empirically grouped into more meaningful clusters based on comparable index results than observed in Canada.

The exercise of ranking the dimensions of any entity has become common stance but not without limits. Although popular, very important information can be lost when ranks are used (Field, 2018). There is also some debate regarding how to manage tied ranks – different approaches can be used which contribute to inconsistencies as the average of scores can be taken, all tied ranks can be labelled the same, or ranks can be provided as if there were no ties. Whereas ranking eliminates the effect of outliers, there may be a large or small number of data points between two scores that are not reflected when using ranked data (Aghaz et al., 2015; Amsler & Bolsman, 2012; Huang et al., 2015; Page & Cramer, 2001, 2004; Page et al., 2009, 2010). Consider the three largest institutions in Canada as per full-time student enrolment: Toronto, UBC, and York. There are a large number of data points between 83,629 and 47,695, and a small number of data points between 47,695 and 47,396 yet these would be ranked 1, 2, and 3, respectively; even though the differences between the ranks are not adequately represented (Field, 2018; *Maclean's*, 2020).

The U.S. News and World Report (USNWR) began ranking U.S. colleges in the early 1980s and like *Maclean's* in Canada, their "Best Colleges" issue is among the most popular of their publications (Meredith, 2004). Other popular ranking methods around the world include but are not limited to THE Ranking, the Shanghai Jiao Tong University's Academic Ranking of World Universities (ARWU), Leiden, Quacquarelli Symonds (QS), The Independent's 'The Complete University Guide,' and U-Multirank in which universities are ranked against others in the same country and against other institutions from nearly one hundred countries around the world (Johnes, 2018; Moed, 2017). However, they use different approaches: THE, USNWR, and

Maclean's utilize percentile ranks; ARWU and QS normalize to the maximum; and U-Multirank utilizes distance to the mean – all which employ unique indicators and each claim to provide valid and useful determinants of academic excellence (Moed, 2017). National rankings have been found to include a larger number of indices and emphasize education and institution variables whereas global rankings tend to have a much smaller number of indices and emphasize research performance (Çakır et al., 2015). Consequently, when national ranking practices have been compared to global ranking practices, global rankings have not predicted national rankings (Çakır et al., 2015).

No approach has escaped criticism; however, these exercises of rankings can impact various institutions differently. Enrolment, with implications toward tuition revenue, and socioeconomic and racial demographics of universities can be affected by the ranking method (Meredith, 2004). The *Shanghai ranking*, published annually by the ARWU, has received a lot of admiration for its ranking of 500 global institutions and its ability to withstand a plethora of criticisms from extraordinary media coverage, academic literature, and other relevant reports, such as HEFCE (2008) and special issues of *Higher Education in Europe* in 2002, 2005, 2007, and 2008 (Billaut et al., 2010). The Shanghai method was developed as a tool to understand the gap between Chinese universities and world-class universities from other countries; however, the authors of the *Shanghai ranking* have been criticized for collecting data exclusively from the internet, not publicly sharing their data or methodology, and only counting the number of published papers as per *Thompson Scientific* with no regard for their impact (Billaut et al., 2010). Additionally, the *Shanghai* method has been disparaged for providing a narrow view on academic excellence. The authors purportedly ignore relevant inputs, other than the number of full time equivalent (FTE) academic staff, and past research has found that the ARWU utilizes

irrelevant and outdated criteria, and the factors identified within each the ARWU, THE, and QS have been either negatively correlated or not correlated at all indicating issues with internal consistency (Billaut et al., 2010; Moed, 2017; Soh, 2015).

One issue with ranking HEIs is that students' selection of an institution is largely a matter of personal preference and choice. Some students may choose a regional institution over one that is more competitive in the national rankings in an effort to minimize costs associated with moving and higher tuition rates for out-of-province enrolment. Personal preferences and university selection decisions may have been more deeply impacted during the years 2020 through 2022 due to travel restrictions imposed by the Canadian government, the termination of in-person visits to campuses, and a lack of available residences. That said, there are many variables that can accompany a student's university selection, whether amidst a pandemic or not. Regional students may have very different experiences than international students and new students may have very different experiences than returning students. Nevertheless, such contrasting experiences could have been broadened even more so because of the pandemic restrictions. For example, students in the online learning environment are less engaged and are more likely to cyberslack than students in face-to-face learning environments because of a lack of peer collaboration and community support as well as a greater need for self-discipline to study and manage their learning schedule (i.e., learning management; Koay & Poon, 2022). This is problematic to students' well-being as classroom engagement mediates academic grit and, ultimately, students' well-being; students with higher levels of grit are more likely to achieve better academic goals and be more productive, more engaged in academic and non-academic settings, and show deeper interest in learning − all which contribute positively to well-being (El Ansari et al., 2018; Kareem et al., 2022; Seligman, 2013). First-year international students could

be more at risk of ill effects than their domestic counterparts due to low peer collaboration and community support as they likely have not met any of their peers, and some may have not even have had a chance to visit the country that their university is located in.

Another issue with the ranking of HEIs concerns the ethical practices of institutions. Many universities have been subject to media scrutiny and legal action for making publicly available outdated or fabricated data for consideration in ranking publications; for example, Columbia University and the University of Southern California to the USNWR (Fox Business, 2022; Khaki Sedigh, 2016; Moshtaghian, 2022). Due to the damage unethical practices can have on students, institutions, and their surrounding communities, it has been reasoned that ethics should be added as a dimension into university ranking systems (Khaki Sedigh, 2016). However, ethics remains a component that is not included in any university rankings in any country worldwide.

As with other products or services in the consumer goods market, students and families carefully select, from various institutions, what they consider the most optimal option (Stephenson et al., 2016). However, if a consumer is using just one source as their only means to determine the most optimal university, there may be an absence of adequate information to facilitate informed decision-making. As a result, the consumer may be led to believe that certain universities are inferior to others when, in reality, higher- and lower-ranking universities may not be so distinct.

Pertinently, it may be detrimental for prospective students to base their university selection exclusively on the rank and reputation of a university. As per social identity theory, a student's self-concept and self-esteem derive not only from personal identity and

accomplishments, but also from the status and accomplishments of the university that they attend (Gilovich et al., 2018). To illustrate, a student may have applied to a number of universities yet only received acceptance from one of them. If the student were accepted to only a low-ranking university, they could feel shame and low self-concept and self-esteem, whereas if they were accepted to only a high-ranking university, they could feel pride and high self-concept and self-esteem. Likewise, a student that attends a university with a good reputation or a high rank may be more apt to 'bask in reflected glory,' or take pride in the accomplishments of their university instead of their own individual accomplishments (Cialdini et al., 1976). Simply being a student of a high-ranking or low-ranking university can impact one's identity and esteem, based on the social identity theory, because their identity and self-esteem become rooted with both the successes and shortcomings of their university. The social identity theory may thus help explain why students are more motivated to attend a university with either a good reputation or a high rank.

Maclean's Magazine University Rankings

Maclean's Magazine University Rankings include universities that are members of the national association representing Canada's universities (called *Universities Canada*), that have more than one-thousand students, are not newly designated, and have no religious or specialized mission restrictions (Dwyer, 2020). *Maclean's* divides Canada's public universities into three categories, ranking them in accordance with each of the category's relevant indices, apart from reputation scores. Reputation scores use the indices of best overall, highest quality reputation, most innovative reputation, and leaders of tomorrow and combine all three categories of universities when ranking. The 49 public institutions that *Maclean's* features are divided into: Medical/Doctoral universities (N = 15), which offer an extensive range of Ph.D. programs and

research, all of which have medical universities; Comprehensive universities (*N* = 15), which offer a significant degree of research activity and numerous undergraduate and graduate level programs, including professional degrees; and Undergraduate universities (*N* = 19), which are often smaller institutions with a limited number of graduate programs. *Maclean's* ranks the institutions in five broad areas based on 13 performance indicators, assigning a weight to each indicator. The five broad areas include: students, faculty, resources, student support, and reputation; accounting for 28%, 20%, 22%, 15%, and 15% of the overall score, respectively (Dwyer, 2020). *Maclean's* obtains the majority of their data from publicly available sources, such as Statistics Canada, as many institutions have withdrawn their cooperative participation and no longer voluntarily contribute information to *Maclean's* (Alphonso, 2006; Cramer et al., 2016; Dwyer, 2018; Trilokekar et al., 2018).

Maclean's has been severely critiqued for relying too heavily on subjective rankings of reputation and employing primarily input measures (Cramer et al., 2016). Moreover, past analyses of *Maclean's* ranked indices (beginning in 1993) have largely produced findings that are either nonsignificant or difficult to interpret. Consistent through the years, analyses have found that (a) individual indices correlated with overall rank approximately one-third of the time, (b) high versus low-ranking universities have been significantly different on only approximately one-quarter (or ten) of the forty total indices, and (c) cluster analyses produced largely meaningless and unintelligible (although empirically similar) families of institutions (see Cramer et al., 2016; Cramer & Page, 2007; Page & Cramer, 2001, 2004; Page et al., 2009, 2010). *Maclean's* rankings do not always reflect the true student experience and as demonstrated above, often produces inconsistent and uninterpretable relationships between rank standings and other indices (Brooks, 2005; Cramer et al., 2016; Page et al., 2010). The issues within these previous

findings concerning the practice of institutionalized rankings are extensive as *Maclean's* continues to rank according to largely the same indices that they have now, annually, for over thirty years. Previous research has found that *"Canada's Most Trusted Resource for Students and Parents for 30 Years"* ranking system has continually proven to be uninformative and unsupported (Cramer & DeBlock, 2020; Cramer et al., 2016; Cramer & Page, 2007; Page & Cramer, 2001, 2004; Page et al., 2009, 2010). Specifically, challenges concerning categorical indexing, negative student and institutional impact, reputational subjectivity, and organizational imaging have run rife throughout many institutions, their surrounding communities, and even entire countries around the world (Cramer & DeBlock, 2020; Cramer et al., 2016; Cramer & Page, 2007; Page & Cramer, 2001, 2004; Page et al., 2009, 2010). As previously mentioned, similar challenges have emerged in the exercise of ranking post-secondary institutions across countries and over time. University rankings have been subject to criticism since their inception; however, some have been found to be superior to others. In particular, an analysis of *THE* rankings of Japanese universities following the same statistical protocol utilized in Canadian studies, found that (a) the correlation between index rank and final rank was significant for most indices, (b) correlations in the Japanese data were all positive, and (c) cluster analyses produced meaningful and distinct groups of universities (Cramer et al., 2019). These findings were an improvement from the typical statistics found among Canadian data provided by *Maclean's*.

Maclean's has historically overlooked and excluded important features that could undoubtedly change the rankings, and the current system remains biased towards wealthy Western values (Axelrod, 2010; Bellantuono et al., 2022; Hyslop, 2016; Stack, 2016). Universities that are included in *Maclean's* annual ranking exercises, and the data that informs these rankings, are biased to and drawn from a Western, educated, industrialized, rich, and

democratic (WEIRD) population (Muthukrishna et al., 2020). The biased system of rankings can contribute to a "Matthew effect" by which high-ranking institutions receive more funding − further contributing to widening gaps in research opportunities and scholarships between high- and low-ranking institutions (Bellantuono et al., 2022; Pusser & Marginson, 2013; Way et al., 2019). Furthermore, Bellantuono et al., (2022) found that universities in territorial networks, or a similar geography, tend to achieve comparable scores in the rankings. Perhaps *Maclean's* would do well to consider the effect of territorial networks and wealth distributions and provide separate rankings not only by university category, but also geographical location.

It costs a considerable amount of money to be a high-ranking university and, expectedly, smaller universities generally do not have as much money as larger universities due to several factors, including geographical location and categories of degrees offered. Likewise, high-ranking universities with higher reputation scores tend to have higher tuition fees. Consider 2019−2020 tuition for a year of full-time studies in an arts and humanities program as an example. At the Medical/Doctoral University of Toronto (‘best overall’ reputation but low student satisfaction) tuition cost $6,100 − $11,760 for Canadian students and $41,540 − $61,360 for international students, whereas it cost Canadian students $5,781 and international students $21,000 at the Primarily Undergraduate Nipissing University (low rank but high student satisfaction; Universities Canada, n.d.). As Hyslop (2016) states, top-ranked universities generally have more money but do not necessarily spend it where it is most serviceable or profitable; for example, making sure their campuses are fully accessible to students with disabilities or promoting events that encourage engagement within their surrounding and supportive communities. In addition, if university administrators become preoccupied with their institutions’ rankings, and other extraneous criteria, difficulties can arise because attention is

taken away from more meaningful issues that could have greater emphasis and focus (Hyslop, 2016). One more meaningful issue that could have greater emphasis and focus is the growing segment of international students. Canadian universities have become increasingly reliant on international student fees as a source of income over the past fifteen years, evidenced by an increase in revenue from $1.5 billion to $6.9 billion (Usher, 2020). As per the Postsecondary Student Information release, the number of international students is rising and so are their tuition fees (Statistics Canada, 2022). *Maclean's*, however, only reports information on the percentage of international first-year students and international graduate students. Thus, vital information about the experiences specific to international students remains unknown.

The self-fulfilling prophecy posits that people, as consumers, tend to value things that cost more, and can help explain the expectation students may have relative to the cost of tuition. The self-fulfilling prophecy is the tendency for people to act in a certain way that brings about what they expect to happen (Gilovich et al., 2018). In the realm of higher education and tuition costs, students could expect that the more they pay for tuition, the better the education they will receive. On the other hand, if one does not pay a lot for tuition, they may have negative expectations that will influence their behaviour in such a way that their expectations become a reality. In other words, students may have heightened expectations if they pay a lot of tuition; for example, they may expect their professors, courses, and services to be of higher quality than they are at universities with lower tuition fees (Jussim & Harber, 2005). Nevertheless, there is no clear evidence that the more a student's education costs, the more satisfied they will be while attending the institution or with the job market and their post-graduate wages (Clemes et al., 2008). This is problematic because the beliefs are erroneous and the potential for destructive self-fulfilling prophecies is great (Jussim & Harber, 2005).

Continually, there are still more troubling inconsistencies, particularly between some of the largest and smallest institutions included in *Maclean's* rankings (Belanger & Davidson, 1997). As one may expect, the larger and more established universities tend to do better on *Maclean's* survey. However, those universities ranking high in the overall categories do not always rank as high in the reputational survey pertaining to highest quality, most innovate, leaders of tomorrow, and best overall – a trend that has persisted for twenty years (Belanger & Davidson, 1997; Cramer & DeBlock, 2020). Theoretically, a close relationship between national ranking and reputation would be expected. That said, it is important to note that smaller institutions oftentimes have more satisfied students than the larger and more prestigious institutions, regardless of their overall rank and reputation. Sherbrooke, for example, ranked highest in student satisfaction yet was second last overall whereas Toronto ranked third from last in student satisfaction but second overall (Macleans, 2018). In 2007, *Maclean's* reviewed their student satisfaction survey, NSSE, and the Canadian Undergraduate Survey Consortium (CUSC) and found that smaller universities often reported higher rates of student satisfaction than larger, research-based universities ("Students Happier," 2007). In 2007, *Maclean's* managing editor stated that most institutions have made their NSSE and CUSC results public since *Maclean's* began asking for them. However, that stance is more tenuous now as many institutions either no longer participate in *Maclean's* annual ranking exercises or do not make their results of private surveys, such as NSSE, public (Alphonso, 2006; Cramer et al., 2016; Dwyer, 2018).

This brings forth another issue, namely that the specific indices used by *Maclean's* may not reflect true reasons behind students' university selection (Cramer et al., 2016; Page et al., 2009). The institution that may best suit one individual may not best suit another; moreover, each individual's selection is based on various and unique reasons that *Maclean's* does not report.

Such reasons may include financial opportunities while obtaining their education, parking for those who do not live on campus, childcare availability for those with children, crime rates in the surrounding area, unique or specialized courses or programs and/or desirable research opportunities, and the reputation of potential supervisors. As such, it can be stated that *Maclean's* intentions to provide useful guidelines for informed decision-making may actually have little practical use in the selection of universities. Whereas some students may be extremely satisfied with their education after selecting a university based exclusively on *Maclean's* rankings, that may not be the case for everyone.

All universities in Canada and the students who attend them are reasonably equivalent in relation to the level of education offered and that in which students receive. Labelling universities with slurs such as 'Last Chance U' (a direct result of being a low-ranked HEI) can be extremely harmful and misleading (Tam, 2006), especially when all public Canadian universities in *Maclean's* "each have a unique history, a distinct mission, and its own particular strengths" (Maclean's, 2020, p.120). The ranks merely encourage the creation of a hierarchy, or more accurately, a competition between already respectable institutions. Additionally, ranking HEIs can spur the belief that the students' level of intellect reflects where their university ranks on the hierarchy. Research suggests that the exercise of rankings continues because the elitism, hierarchy, inequality, and competition that uphold them have grown increasingly more naturalized (Amsler & Bolsmann, 2012). These hierarchical standings can lead to a self-fulfilling prophecy if students from lower-ranked universities perceive their own institution as inadequate compared to higher-ranked institutions (Amsler & Bolsmann, 2012). Ranking may be especially detrimental for low-ranking institutions' monetary circumstances because they could be more affected by a decrease in enrolment coinciding with increased costs associated with services

essential to enhance their students' well-being. Unfortunately, when ranks are assigned according to extraneous indices, they may be misinterpreted and consequently problematic to students, institutions, graduates, and their supportive communities. Financial endowments at Canadian universities vary by institution, with the University of Toronto having the largest endowment ($3.2 billion) for a single university (University of Toronto, 2022). Since few universities in Canada have endowments of over $1 billion (the majority have less than $250 million), universities with smaller endowments could be more at risk of ill effects (Dehaas, 2014). To provide context and comparison of Canadian versus U.S. universities, Harvard's endowment is approximately $64 billion, the University of Texas System is approximately $53 billion, the University of Michigan is approximately $21 billion, and Michigan State is approximately $4 billion (University of Toronto, 2022).

On a positive note, *Maclean's* asserts that the student voice plays a critical role in their student satisfaction indices. In the 2021 issue alone, nearly 14,000 students responded to their online survey and in the 2022 issue nearly 19,000 responded to their exclusive student satisfaction survey (Maclean's, 2020; Maclean's Education, 2021). The results of their exclusive student satisfaction survey are published amidst their definitive university rankings each year. At the same time, students from Canadian and U.S. institutions are often encouraged by their institutions to participate in the NSSE survey.

The National Survey of Student Engagement (NSSE)

Since its inception in 2000, NSSE has surveyed more than five million students in Canada and the U.S. and is considered one of the most popular surveys of undergraduate students (NSSE, n.d.). Nearly 1,700 universities in North America have used NSSE to measure student engagement in effective educational practices (NSSE, n.d.). NSSE began with the support of a

grant from The Pew Charitable Trusts (1948 - present) to use data to make a difference that leads to tangible progress (NSSE, n.d., Pew, 2023). However, NSSE has been funded solely by institutional participation fees since 2002 (NSSE, n.d.).

Each year, although dependent on the institution, first- and fourth-year students are invited to take part in the 15-minute NSSE survey, known as *The College Student Report*, for the purpose of providing institutions data on student participation and engagement activities that support learning and personal development (NSSE, n.d.). The University of Windsor, for example, releases this survey to its students once every three years, having done so most recently in 2020 (University of Windsor, n.d.). In 2017 and 2020, 417,840 students responded from 636 U.S. and 72 Canadian institutions, and 484,242 students responded from 521 U.S. and 63 Canadian institutions, respectively (NSSE, 2017; NSSE, 2020).

The survey utilizes (a) four engagement theme indicators (EIs): academic challenge, learning with peers, experiences with faculty, and campus environment and (b) six high-impact practices (HIPs): service learning (taking courses that include a community-based project), learning community (or another formal program where groups of students take two or more classes together), research with faculty, internship or field experience, study abroad, and culminating senior experience, such as a thesis or comprehensive examination (NSSE, n.d.). To measure overall satisfaction, the following two summative questions are asked:

1. How would you evaluate your entire educational experience at this institution?
2. If you could start over, would you go to the same institution you are now attending?

Results of NSSE's survey are disseminated as a summary report on participating institutions' websites. Engagement theme indicators are provided in either a summary or in a

figure that displays percentages and mean scores. The results from the year prior are often included along with a comparison against other universities in the same category. For example, the University of Windsor is compared against other Comprehensive universities, such as Brock, Carleton, Ryerson (Toronto Metropolitan University [TMU] as of 2022), Guelph, Waterloo, Wilfrid Laurier, and York. Institutions also indicate whether the current year's engagement theme indicators were significantly higher or lower than the previous year the survey was administered. HIPs are presented as a measure of participation and provided as percentages (percentage done/percentage in progress), although EIs are more commonly reported by the institutions than HIPs. The overall satisfaction questions from the abovementioned universities are presented in a figure that offers the first- and final-year percentages from previous years, the current year, and other Ontario Comprehensive universities. Responses to the first question are selected from "excellent," "good," "fair," or "poor," and responses to the second question from "definitely yes," "probably yes," "probably no," and "definitely no."

Like *Maclean's*, a number of studies have examined whether NSSE data are suitable for use when it comes to institution- and group-level decision making (Kuh, 2001; Ouimet et al., 2004; Pascarella et al., 2009; Pike, 2006). Although those examinations have yielded mixed results, many institutions have utilized NSSE data to identify areas of improvement (Kuh, 2003). Kuh (2001) notes that the benchmark measures were designed to represent clusters of student behaviours and institutional actions that represent good educational practices to summarize those practices and ultimately improve undergraduate education; they were not intended to represent underlying theoretical constructs. As NSSE utilizes institutions and students as units of analysis, it is important to note that variation in student engagement is greater within than between

institutions, and thus caution must be urged due to small differences and over-interpretation of benchmark scores (Kuh, 2007).

In the U.S., NSSE is considered a rival against the USNWR for assessing institutional effectiveness, although NSSE has been criticized for failing to meet reliability and validity criteria (Campbell & Cabrera, 2011; Porter, 2011). NSSE was found to have high intercorrelations among the five benchmarks (viz. level of academic challenge, active and collaborative learning, student-faculty interaction, enriching educational experience, and supportive campus environment), low item loadings, and low reliability scores when its construct and predictive validity were investigated. The five benchmarks were also not found to be a valid predictor of cumulative grade point average (GPA) with the exception of at one research-extensive institution (Campbell & Cabrera, 2011).

In addition, as Pike (2013) notes, studies examining the validity of the NSSE survey have also been criticized for failing to provide support for its adequacy and the appropriateness of the interpretation of benchmark scores related to institutional-level measures of academic success and its dependability for use for institutional and group-level decision-making. This study found that the NSSE benchmarks were valid student engagement measures and were significantly related to institutional outcomes associated with student satisfaction (i.e., retention and graduation rates) and good educational practices. Pike (2013) also notes that since NSSE benchmarks were valid measures of student engagement, they should be predictive of student satisfaction across a variety of institutional types and student populations. In other words, NSSE benchmarks should predict student satisfaction in Canada across the three university categories.

Variables Related to Student Satisfaction

Alves and Raposo (2007) investigated whether certain factors and behaviours related to education (e.g., performance, expectations, and quality of received education) can successfully predict student satisfaction. They found that institutional reputation was the strongest predictor of student satisfaction, even more so than the value of education and teaching quality. This could be due to the self-fulfilling prophecy as students that attend universities with good reputations often perceive their institution as being of higher quality (Amsler & Bolsmann, 2012). Based on Alves and Raposo's (2007) findings, and findings of studies exploring similar variables, it can be concluded that students are satisfied when they receive good quality teaching at a respectable institution (Senior et al., 2017). Additionally, satisfaction produced loyalty to the institution and satisfied students were more likely to participate in alumni activities after they graduated (Alves & Raposo, 2007). The most common way that satisfaction with and loyalty to an institution is spread is by word-of-mouth among students (Santini et al., 2017). Expectations including both global quality of education and an institution's capacity to prepare one for a career were found to negatively influence student satisfaction as students often reported very high expectations.

Past research suggests that institutional loyalty includes such factors as willingness to refer the institution to others and likeliness that students would return for additional study. Institutional image was found to be most influential towards students' perceived value, satisfaction, and loyalty (Brown & Mazzarol, 2009; Stephenson et al., 2016). Duarte et al. (2010) found that institutional, academic, social, and individual factors may all be considered components of university image as university image can be any combination of beliefs one has towards the university.

Similarly, Clemes et al. (2008) investigated a range of institutional factors and their relation to student satisfaction. Results revealed a significant relationship between satisfied students and teaching quality; service quality, image, and satisfaction; and satisfaction and favourable future outcomes post-graduation (i.e., speaking highly of the university and recommending the university to employers as a good means to recruit future employees). Although image was a significant predictor of satisfaction, service quality was the strongest predictor of satisfaction (Clemes et al., 2008). The sub-dimensions of service quality from most important to least important were academic development, career opportunities, and personal development, respectively. These findings contradict studies that found institutional reputation to be the strongest predictor (Alves & Raposo, 2007; Brown & Mazzarol, 2009; Dean & Gibbs, 2015; Stephenson et al., 2016).

Student satisfaction is also associated with students' perceptions of their return on investment, or ROI. Students want to know what they are getting for the tuition they pay, capitalize on career goals, and have a better income and more opportunities after they graduate. In other words, they want to know that the money they are investing will be worth it and returned in some way; and most students believe that their investment in higher education will pay off once they graduate (Khan & Hemsley-Brown, 2021). Studies on the role of student-consumer expectations have yielded mixed results, however. Some have found that students paying increased fees in exchange for services are more likely to complain and be dissatisfied with their institution (Woodall et al., 2014), whereas others contend increased fees have no negative effects on student satisfaction ratings in the NSS survey (Burgess et al., 2018). While factors involving teaching expectations have had the most impact on student satisfaction, students' perception that

their higher education is a worthwhile investment has also been extremely influential (Dean & Gibbs, 2015).

Relatedly, prior research suggests that student satisfaction in a course can be predicted by comparing their perceptions to their expectations only if the proper method is used at the appropriate time (Appleton-Knapp & Krentler, 2006). When students were asked to recall expectations from the beginning of a semester and were then asked about their current perceptions nearer the end of a semester, the extent to which student expectations were fulfilled predicted satisfaction. On the contrary, when students' expectations were measured at the beginning of a semester, the extent to which student expectations were fulfilled failed to predict satisfaction. It is unclear when *Maclean's* collects their data from students but the release of the NSSE survey is dependent upon the institution. The University of Windsor, for example, administered their most recent survey in early February 2020 (approximately one month into the Winter semester), and students were given a mid-April (end of semester) deadline to complete it. Students, at these different points throughout the semester, would be completing mid-term exams and assignments (one month in) versus final exams and major papers (at the end of the semester). Thus, many students could be more stressed, less satisfied, and perhaps unable to recall their expectations from the beginning of the semester during this time. Since the students at the universities completing the survey one month in would recall their perceptions better than the students completing the survey at the universities at the end of the semester, there is a threat to the validity of the data due to recall bias (Raphael, 1987). Necessarily, marketing educators must consider how their role can affect students' expectations and at which time it is best to administer assessments (Appleton-Knapp & Krentler, 2006).

Since the higher educational environment has become increasingly competitive, Masserini et al. (2019) examined whether the quality of educational services and the university's institutional image can influence students' overall satisfaction and investigated possible reverberations of these relationships on students' loyalty. Teaching and lectures (i.e., qualified teachers, quality of teaching, and quality of research) as well as teaching and course organization (i.e., organization of exams, class schedule, support provided by non-academic personnel, and online services) were the most significant predictors of student satisfaction and loyalty. University image also had direct and indirect effects on students' satisfaction, students' loyalty, and teaching and lectures. Student satisfaction in higher education has a significant impact on student and institutional success and influences one's perceptions of the university, their likelihood to recommend the university, and their loyalty toward the university (Santini et al., 2017). This can be problematic for a number of reasons especially when erroneous information is being disseminated via longstanding and prevalent channels such as national magazines, like *Maclean's,* and other media outlets, like the USNWR (see Ali et al., 2016; Cramer & DeBlock, 2020; Meredith, 2014).

As it relates to university image, there is no specific operational definition (Gutiérrez-Villar et al., 2022; Stern et al., 2001). Image remains an ambiguous concept because the terms: image, corporate image, brand image, product image, brand personality, positioning, identity, and reputation are all used interchangeably (Balmer, 2001; Lee et al., 2014). Nevertheless, both rank and reputation are pivotal factors when measuring a university's image; reputation and image are concepts that remain difficult to define and subsequently measure (Gutiérrez-Villar et al., 2022). Henceforward, university image may be used interchangeably with reputation and

refer to the sum of an individual's beliefs, attitudes, and experiences regarding a specific HEI (Gutiérrez-Villar et al., 2022).

Caskurlu et al. (2020) explored the relationship between student outcomes and teaching presence (composed of three sub-dimensions: design and organization, facilitation, and direct instruction). A moderate positive correlation was found between teaching presence and perceived learning and teaching presence and satisfaction. Course length and course level (i.e., undergraduate, graduate, or mixed undergraduate/graduate) were identified as significant moderators for perceived learning whereas course length, discipline, and teaching presence were identified as significant moderators for satisfaction. There are differences in online courses on account of the customizability and flexibility they permit, but each of the sub-dimensions of teaching presence predicted student outcomes of satisfaction and perceived learning. A stronger moderating effect was found in online undergraduate courses than in online graduate courses; undergraduates reported the most satisfaction and perceived learning followed by those in mixed undergraduate/graduate level courses and then those in graduate level courses.

Alzahrani and Seth (2021) studied factors that influence students' satisfaction in higher education with the ongoing use of online learning management systems (LMS) during the pandemic. They found that information quality of the online LMS (i.e., useful framework and relevance to online issues experienced), or the ease of use, and self-efficacy significantly predicted student satisfaction whereas service quality, or the overall quality of the system, did not. Interestingly, a significant relationship was found between prior experience and social influence on personal outcome expectations but not between self-efficacy and satisfaction on personal outcome expectations. As NSSE invites first- and fourth-year students to participate, it is expected that first-year students will report lower levels of satisfaction based on limited prior

experience. Additionally, many first-year students in 2020 and 2021 commenced their undergraduate careers completely online. It can be expected that many first-year students did not have much social interaction with their peers as a result of the online learning format utilized and pandemic restrictions imposed, and therefore may have felt especially disconnected and unsatisfied if their university's LMS was hard to navigate.

Regarding feedback and assessments, Deeley (2019) found that student dissatisfaction was most often due to either a misunderstanding or miscommunication between faculty and students. This may be especially problematic among traditional first-year students, even more so if they began university during the COVID pandemic without access to the campus, as the first-year university experience is novel and uncharted. This novel situation combined with a lack of access to in-person interactions with professors and peers could easily lead to misunderstandings and miscommunication. Thus, careful research is required to provide more insight into the complexity of these facets so as to identify a viable solution.

With respect to the impact of size-related variables on student satisfaction, results are mixed. Cheng (2011) found that increasing enrolment can have significant negative effects on student satisfaction but that it is largely dependent on the educational department. For example, Sociology, Political Science, and Computer Science and Engineering are significantly and negatively affected by increasing enrolment whereas Psychology, Math, Visual Arts, and Philosophy are not. Wang and Calvano (2022) found that regardless of class size, student involvement was the most influential academic engagement behaviour and teacher interaction was the most influential social engagement behaviour for positive educational outcomes; the only differences in student engagement between class sizes were that students in small classes perceived their instructors as more supportive and there were more opportunities for

instructor/student interactions. Instructor/student interaction was the most influential factor for student satisfaction; thus, students in smaller classes were more satisfied than students in larger classes (Wang & Calvano, 2022). They concluded that it is vital to enhance instructor/student interactions to increase satisfaction, especially in large classes.

Scholarly research investigating the impact of the overall size of the institution on student satisfaction is uncommon; however, Grayson (2020) offers some useful insight. Grayson (2020) investigated results of the NSSE survey, as reported by first-year students only, as published by *Maclean's* in 2018. Large differences between high and low satisfaction groups were found based on the number of full-time undergraduates enrolled at the institution. The mean number of full-time students in the high satisfaction group was 10,830 and the mean number of full-time students in the low satisfaction group was 20,783. There are concerns with Grayson's (2020) study, however: namely, there is some imprecise information in the literature review that is not informed by past research and demographic data (ethnicity, father's education level, entry grades, first-year grades, sex, and domestic versus international student status) were obtained from administrative records nearly a decade old. Nonetheless, as previously mentioned, *Maclean's* has also found that smaller universities generally have more satisfied students ("Students Happier," 2007). Consequently, the current study will investigate whether the size of the institution (considering both full- and part-time enrolment) and student/faculty ratio, among others, are significant predictors of student satisfaction and student engagement and, if so, establish the nature and strength of such relationships.

Similarly, past research has found that full-time students are more satisfied than part-time students, and students in smaller and larger classes report more satisfaction than those in medium-sized classes (El Ansari & Oskrochic, 2006). Based on the perceived differences

between full- and part-time students, it would be expected that full-time students are more engaged in academia/extracurricular activities than part-time students. This is because they are enrolled in more classes and would seemingly spend more time on campus, may be more likely to attend in-person classes during the day versus online or evening classes, and are more intertwined with the campus culture and familiar with services as they would be more likely to live on-campus than part-time students.

Student Satisfaction Around the Globe

In the United Kingdom using data from the National Student Survey (NSS), Bell and Brooks (2019) studied whether students were more satisfied at various universities with highly rated research (akin to *Maclean's* research acquisitions index) or with faculty that held formal teaching qualifications. They found that students were most satisfied at older universities with fewer top-rated research initiatives, and that were not considered elite institutions. Interestingly, less than 40% of students' top-priority was that their instructors needed formal training to teach and only 17% of students' top-priority was an instructor that was currently involved in research (Bell & Brooks, 2019). Elite institutions most often required formally trained lecturers while the smaller institutions prioritized lecturers with relevant industry or professional expertise; but, no relationship was found between student satisfaction and the percentage of faculty holding formal teaching qualifications (Bell & Brooks, 2019). It is important to note that students did feel that additional training for their instructors should be a prioritized expense compared conversely to facility infrastructure, sports, and even social outlets.

Gruber et al. (2010) investigated how German university students perceive the services they were offered as well as how satisfied they are with them. They discovered that students' satisfaction with their institution is largely based on a stable person-environment relationship. In

other words, student satisfaction was determined by perceived quality of offered services and of the wider campus environment (including the quality of the lecture halls and the condition of the university buildings). More specifically, students were generally satisfied with university placements (i.e., practicums and supervisors) and the atmosphere among students, yet they were generally dissatisfied with the condition of the university buildings and quality of the lecture halls. In essence, it could be inferred that it is not the institution itself that predicts satisfaction as students are generally dissatisfied with the wider campus environment, but rather it is the social and hands-on experiences. It should also be noted that the headline "Students happier at small universities: *Maclean's*" is misleading as student happiness and student satisfaction are not the same construct; though, happiness and satisfaction are, expectedly, significantly correlated (Dean & Gibbs, 2015; "Students Happier," 2007). The difference between happiness and satisfaction among university students has been found to come from the loci of control; *happy* students have been found to be more content with engaging educational experiences, such as being part of a study group, having a good support system, avoiding stress, and living a balanced lifestyle (internal loci of control; Dean & Gibbs, 2015). *Satisfied* students, in contrast, are generally satisfied due to external forces, such as a facilitator's delivery of educational material, receiving regular communication, being treated fairly, and their university's reputation (Dean & Gibbs, 2015).

Using the Kano model of satisfaction, Gruber et al. (2012) examined personality characteristics and attributes of professors that contribute to student satisfaction and dissatisfaction in the Midwest United States. They determined that professor attributes were not taken for granted by the students; the relationship between attribute performance and (dis)satisfaction is linear; and professors having expertise in other subject areas, utilizing a

variety of teaching methods, and fostering teamwork pleased students most. Although students do not take professor attributes for granted, they were found to be quite demanding of their professors and to have a fondness for being challenged by a mixture of intellectual and teaching interactions beyond that of just course-related substance. The establishment of a good rapport between students and faculty is vital to have meaningful exchanges that can enhance learning, encourage and challenge students, provide support, and increase student engagement. Beyond rapport, each of empathy, enthusiasm, openness, and humour had the strongest relation to student satisfaction as those attributes helped reduce stress and anxiety experienced by students. Additionally, academic advising played an enormous role in connection between faculty and students outside of a classroom setting; however, it remains one of the most commonly reported services contributing to student dissatisfaction (Allen & Smith, 2008).

In Malaysia, Yoke (2018) theorized that university instructors have the power to influence their students' behaviours due to a power imbalance as most students perceive themselves as inferior to their instructors and explored the relationship between perceived instructor power, student dissatisfaction, and student complaint behaviours. They found that university students were more likely to privately complain (even to third parties) when the instructor was perceived to demonstrate legitimate power (i.e., instructor has the power to influence students due to their position as an instructor), whereas students were more likely to complain directly to the institution and third-parties outside of academia when the instructor demonstrated referent power (i.e., when the students identify themselves with the instructor). Reward (the ability to offer positive reinforcement if students comply), coercive (the ability to punish), and expert (due to the instructor's knowledge and expertise) power did not have any impact on students' complaining behaviour; but legitimate and coercive power were significantly

related to student dissatisfaction (Yoke, 2018). Unsurprisingly, student satisfaction is low when instructors are perceived to have misused their power. Students are, however, unlikely to complain to the proper agencies and thus change is unlikely to result. Nevertheless, such complaints can harm the institution's image. They also found that students were more satisfied when professors were reliable and respectable, had strong communication and teaching skills and expertise, covered real-world content, provided feedback in a timely manner, and took and acted on student suggestions. If professors did not do those things and/or possess such attributes, students tended to be dissatisfied with their experience citing unreliability and disrespect of the instructors. Yet, over any other characteristics, humorous and empathetic instructors were found to have the most impact on students' satisfaction (Yoke, 2018).

Bennett and Kane (2014) sought to determine whether students with different personal characteristics ascribe disparate meanings to the wordings of particular items designed to measure certain dimensions of the UK-based NSS. Students were asked about their learning orientation, levels of engagement with their courses, study skills, and family histories, as well as their interpretations of the meanings of the components of the NSS. Results indicated that students with different learning orientations have different levels of engagement with their courses and diverse views regarding the meanings of the various NSS components. Interestingly, students with low engagement were most satisfied when they consider their courses 'fun' versus intellectually demanding, when they were marked leniently and provided encouraging feedback, and when they had excellent social facilities (access to student clubs and societies and opportunities to mix socially with other students). Students with high engagement were more concerned with intellectual stimulation than they were with obtaining a certain grade or potential job prospects upon graduation (Bennet & Kane, 2014). Small correlations were found between

level of engagement and learning orientations − engagement levels can be equivalent regardless of whether students were intrinsically orientated (i.e., desire to learn for enjoyment and interest in a subject) and extrinsically orientated (i.e., desire to obtain a particular outcome, such as an esteemed position post-graduation; Bennet & Kane, 2014). Similarly, studies have found a relationship between engagement, learning strategies, perceived course value, and learning styles (Floyd et al., 2009). Deep learning, or demonstration of higher order thinking and a personal commitment to learn the material for reasons other than only grade obtainment, occur when students are engaged in the learning process and their perceived course value is high, whereas surface learning concerns only a student's desire to earn a certain grade (Biggs & Tang, 2007; Floyd et al., 2009; Rubin et al., 2018). These deep learning approaches are represented in NSSE's Academic Challenge theme via the Higher-Order Learning and Reflective and Integrative Learning items (NSSE, n.d.). It should be emphasized that not only do the interpretations of students with low engagement (i.e., surface learners) differ from students with high engagement (i.e., deep learners), but they are also less likely to complete satisfaction questionnaires (Bennet & Kane, 2014; Howie & Bagnall, 2013). Nonetheless, the results of this study may be indicative of problems with the utility of assigning overall average values of students' assessments for educational management and decision-making purposes.

In 2020, there was a marked shift from traditional to online learning among post-secondary students across the world as a result of the COVID-19 pandemic. Maqableh and Alia (2021) evaluated online learning and student satisfaction as well as the positive and negative aspects of online learning by administering questionnaires (a) directly after the emergency shift to online learning and (b) after students' experienced online learning for three academic semesters. At both points in time, results indicated that students experienced problems associated

with technology (e.g., poor internet connectivity and lack of familiarity with the online learning platform), personal mental health, time management skills, and attempts to maintain an appropriate balance between their academic and non-academic lives. In fact, more than one third of students surveyed in the United Kingdom of Jordan were dissatisfied with the online learning experience due to distraction and reduced focus, psychological issues, time management issues, and financial issues (Maqableh & Alia, 2021). Dissatisfaction with the online learning experience due to the aforementioned variables could also harm institutional image, albeit indirectly and by no fault of the institution (more a result of the COVID-19 pandemic). Indeed, past research has found a significant relationship between overall life satisfaction, subjective well-being, and student satisfaction in that high levels are considered indicative of good quality education (Bini & Masserini, 2016).

Researchers have been interested in comparing the results of national student surveys, although this research is scarce in Canada. In England, the UK-based NSS was designed to inform student choice and drive competition (much like *Maclean's* University Rankings), whereas the US-based NSSE was developed to provide data for institutional enhancement (Kandiko Howson & Matos, 2021). Empirical analyses of these data could be used to provide a more comprehensive understanding that could better inform student consumers' university selection and policy decisions related to institutional enhancement (Kandiko Howson & Matos, 2021). Although its utility was debatable when introduced in 2005, the NSS is now widely accepted in the comparative analysis of UK higher education and many institutions take action as a result of its NSS scorecard (Richardson, 2013).

Research that has examined NSSE and NSS, two of the most well-known higher education student experience surveys in the world, have found high levels of engagement to be

positively correlated with high levels of satisfaction (see Kandiko Howson & Matos, 2021). Social factors (i.e., feeling safe at the university) were also very important for student satisfaction. Some results of NSS studies on student satisfaction contradict others with respect to which variable has the most impact on student satisfaction; many find that variables relating to teaching have the most impact whereas others have found social factors and ROI most influential (Dean & Gibbs, 2015).

Since debate continues regarding the use and interpretation of student surveys (e.g., HEIs allege they collected data to support quality enhancement), Richardson et al. (2007) offered a solution. With the Higher Education Funding Council for England's (HEFCE) approval, Richardson et al. (2007) published data to enable prospective students to make more informed decisions on where to study, and to deter students from only choosing wealthy universities that did not conduct external checks on the quality of teaching and learning. The researchers felt the student survey questions varied significantly across institutions as well as disciplines within the same institutions and were therefore meaningless. Government and task groups that created external mechanisms were needed to avoid an extra burden on institutions as it is critical to gain feedback from students. The HEFCE (1992-2018), a public sector organization, oversaw the distribution of funding for HEIs at the time of this study but has since been superseded by two other non-departmental public sector organizations. The HEFCE and Richardson et al.'s (2007) project sought to identify good practices for obtaining student feedback, provide recommendations to HEIs regarding those practices, and make recommendations for a national survey of recent graduates. The overarching goal of this study was to publish results that would assist future applicants in making more informed decisions. Upon completion of this study, it was deemed that national surveys were feasible and valuable when designed and administered

correctly, and the HEFCE proceeded with full national student surveys early in 2005 and annually thereafter (Richardson et al., 2007).

Theoretical Framework

A number of theories have been proposed that can effectively describe student satisfaction with higher education. One such theory is Rusbult's (1980) investment model which is grounded in traditional exchange theory and utilizes basic principles of interdependence theory (Hatcher et al., 1992; Rusbult, 1980). Traditional exchange theory explains social exchange between individuals stem from either inherent (i.e., esteem) or external rewards (i.e., money) and has successfully predicted how people feel and behave in several situations, including predicting satisfaction, commitment, and turnover within business organizations (Blau, 1964; Hatcher et al., 1992). Interdependence theory, comparably, analyzes relationships between individuals and the ways in which one can influence another's outcomes during the course of interaction (Rusbult & Van Lange, 2008). There are four basic principles of interdependence theory: structure, transformation, interaction, and adaptation (Rusbult & Van Lange, 2008; Thibaut & Kelley, 1959). Structure refers to what the university makes possible for the students; transformation refers to what the students make of their time in university, including the emotional and social rewards and costs of being a student; interaction is an assessment of rewards and costs and students' expectations that determine their commitment level; and adaptation refers to students' commitment and actions in order to reach a desired outcome (Rusbult & Van Lange, 2008; Thibaut & Kelley, 1959). The investment model has also successfully predicted how people feel and behave in a wide range of circumstances. However, a major underpinning of this theory is that it assumes rewards, costs, alternative value, and size of investment is not necessarily meaningful to most individuals. Hence, participants must be taught the meaning of such concepts

before they can accurately be assessed. As participants involved in the surveys of interest are university students, even if considered educated (depending on their year of study), they may not have been (a) provided a definition of the construct of interest, (b) given the opportunity to respond to a number of items that assess actual features of that construct, and (c) allowed to respond to more comprehensive items that may assess the construct in a more general way (Hatcher et al., 1992). A failure, ostensibly, to accurately provide a definition of the construct of interest and give students an opportunity to respond to a number of items that assess actual features of the construct of interest can be extrapolated from the statement below.

> In recognition of the Truth and Reconciliation Commission's Calls to Action, which include several related to educational issues, *Maclean's* included a question asking students to rate how well their university is making Indigenous histories, cultures and languages visible on campus (Maclean's University Rankings, 2020, p. 94).

Maclean's included just a single question to assess how well their university is making visible three aspects (a double-barreled question) with no definition of the constructs of interest. Although, it seems to assess the construct of Indigenous matters in a general way, this item does not meet the criteria to accurately assess the concept. This is just an example of one of the questions *Maclean's* asks, but it is of major concern because international student respondents may not know or understand the place of Indigenous people throughout Canada's history and thus cannot accurately assess the concept.

There are antecedent variables that *Maclean's* incorporates which can, theoretically, affect student satisfaction as per the integration theoretical framework. Tinto's (1975) integration model incorporates academic and social integration, or the extent to which the student has been assimilated into the educational system of the institution and the assimilation into relationships

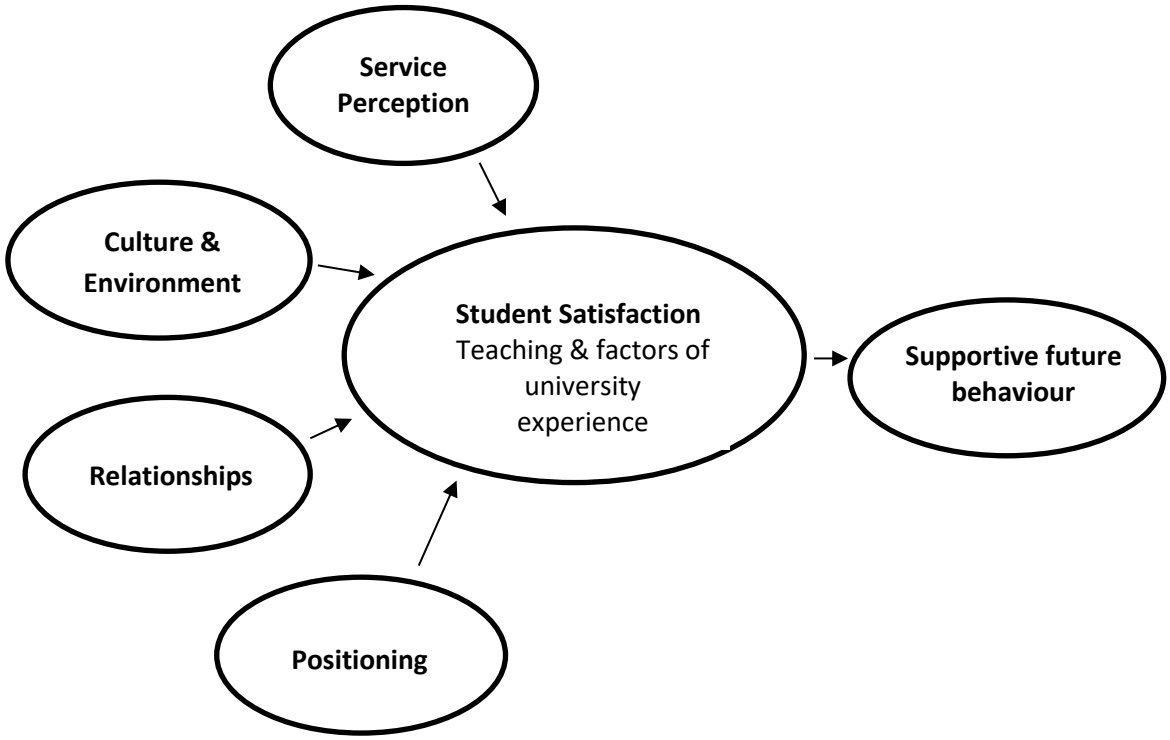
with peers and faculty, respectively, is another widely accepted and relevant model (Hatcher et al., 1992). This integration model has seemingly been adopted by *Maclean's* and NSSE surveys and utilized by a number of studies interested in the student experience. For example, academic development, GPA, and interactions with faculty and peers can affect institutional and graduation commitment, which affect enrolment behaviour and attrition (all of which directly or indirectly influence student satisfaction); but, prior research has found that investment variables have greater validity than integration model variables (Hatcher et al., 1992). Accordingly, future student surveys, whether they are nationally or institutionally administered, could benefit from modernization and restructuration.

Based on the many variables to be explored in the present study, another relevant theory to consider is the Student Satisfaction Model by Jurkowitsch et al. (2006). The conceptual model of the dimensions is shown in Figure 1. According to this model, service perception, culture and evironment, relationships, and positioning are components of student satisfaction identified as teaching and factors of university experience. Student satisfaction then, in turn, functions as a catalyst for supportive future behaviour, or behaviour of alumni (Jurkowitsch et al., 2006). Student satisfaction, and its teaching and factors of university experience contain both insitutional components (such as infrastructure) and personal components (such as the treatment of students and their preparedness for the future). Service perception consists of professor attributes, such as accessibility to and support and treatment of students, teaching skills, and knowledge enhancement, as well as course content and course management (i.e., clarity of tasks, organization of the course, and accessible syllabus). Culture and environment relate to the university's performance and includes infrastructure, social climate, and service quality from administration personnel. Relationships incorporate perceptions of bonding, empathy, and

reciprocity between students and professors, university personnel, and reference groups (i.e., social groups, work groups, and alumni). Positioning contains university standing in terms of prestige, image, and positioning (i.e., promotion tools, standing, resources and services, education, and reputation). Supportive future behaviour includes promotion of the university in terms of trust, commitment, and future intentions of alumni. With the Student Satisfaction Model by Jurkowitsch et al. (2006) considered, the present study's variables and strategic analyses were produced.

Figure 1

Student Satisfaction Model by Jurkowitsch et al. (2006)



Rationale for the Present Study

There has been a considerable amount of research conducted on ranking HEIs, student satisfaction, and student engagement, but there is a noticeable gap in the literature: the examination of the ranking of Canadian institutions' student engagement, student engagement, and positive student outcomes as put forth by NSSE and *Maclean's*. Using a protocol of statistical tools and procedures, the present study will provide an empirical examination of *Maclean's* magazine rankings of Canadian universities based on the analyses of annual overall rankings, overall student satisfaction rankings, and the accompanying indices related to positive student outcomes, including reputation, student retention, proportion who graduate, student/faculty ratio, average class size, student services, and size of the institution in terms of enrolment for the years 2017/2018 and 2020/2021. Additionally, student satisfaction indices (as published by *Maclean's*) and NSSE engagement indicators (as reported by various institutions across Canada) will be examined. As such, we offer a novel study in the context of Canadian universities that examines *Maclean's* university rankings and NSSE concurrently.

Research Questions

RQ1: Can NSSE's engagement theme indicators predict *Maclean's* student satisfaction and related indices?

RQ2: Are fourth-year students more engaged and satisfied than first-year students?

RQ3: Are students more engaged and satisfied at high-ranking institutions (as per *Maclean's*) than students at low-ranking institutions?

RQ4: Are students more engaged and satisfied at universities scoring high on *Maclean's* reputational survey than universities scoring low on *Maclean's* reputational survey?

RQ5: Are students more engaged and satisfied at larger enrolment universities than they are at smaller enrolment universities?

Hypotheses

Based on research by Kandiko Howson and Matos (2021), who found that higher levels of student engagement were positively correlated with higher levels of student satisfaction and Pike (2013) who that found that NSSE benchmark measures were significantly correlated with institutional outcomes related to student satisfaction (i.e., graduation rates and retention), the following hypothesis was generated.

H1: There will be a significant relationship between NSSE engagement theme indicators and *Maclean's* student satisfaction and related indices. Specifically, levels of engagement as indicated by the theme indicators will predict *Maclean's* student satisfaction rankings.

Student dissatisfaction often stems from a misunderstanding or miscommunication between faculty and students (Cheng, 2001; Deeley, 2019). Studies have found differences in student satisfaction based on year of study, particularly among second- and third-year students with the latter more satisfied (Clemes et al., 2008). Based on fourth-year students' educational experience and understanding of higher education operations, freedom to choose courses directly connected to their own interests, enhanced self-efficacy as they near their educational goals of obtaining their degrees, and optimism about their futures and the skills obtained prior to graduation (Bandura, 1977; Deely, 2019), it was hypothesized that:

H2: Fourth-year students will be more engaged and more satisfied than first-year students. Thus, there will be more significant predictors of engagement that correlate with *Maclean's* satisfaction indices for fourth-year students than for first-year students.

The relationship between university image and student satisfaction remains a highly debated topic (Alves & Raposo, 2010). Some studies have found that university image directly influences satisfaction whereas others contend that there is no relationship between image and satisfaction (Alves & Raposo, 2010; Brown & Mazzarol, 2009; Masserini et al., 2019). Duarte et al. (2010) categorized institutional, academic, social, and individual factors as components of university image, but *Maclean's* rankings do not always reflect the true student experience and often produces inconsistent and uninterpretable relationships between rank standings and other indices (Brooks, 2005; Cramer et al., 2016; Page et al., 2010). As such, considering students' perceptions about their ROI and the *famous school complex*, the following hypothesis was generated.

H3: Students at higher-ranking institutions will report significantly higher levels of engagement and satisfaction than students at lower-ranking institutions.

Even though institutional reputation has been found to be the strongest predictor of student satisfaction in some studies (Alves & Raposo, 2007), in view of a twenty-year Canadian trend that high ranking institutions do not always rank high in the reputational survey and the subjective methodology behind *Maclean's* reputational survey (Cramer & DeBlock, 2020), it is hypothesized that:

H4: Students at universities ranking low in the reputational survey will report significantly higher levels of engagement and satisfaction than students at universities ranking high in the reputational survey.

In 2007, a *Maclean's* magazine study of student satisfaction surveys found that smaller universities generally had more satisfied students than larger, research-oriented universities. As such, it is hypothesized that:

H5: Students at smaller enrolment universities will report higher levels of engagement and satisfaction than students at larger enrolment universities.

CHAPTER II

Method

Materials

Data were collected from the public statistical archives of *Maclean's Magazine University Rankings* from the years 2018 and 2021. NSSE 2017 data were collected from *Maclean's* as they publicly published the 2017 NSSE results for Canadian universities (see Dwyer, 2018). NSSE 2020 data were collected from the institutional websites that publicly publish their results. The 2017/2018 analysis includes the measures and 45 universities, as presented in Table 1. The 2020/2021 analysis includes the same measures from the following 11 universities: Brandon, Laurentian, Manitoba, McGill, Memorial, Ryerson, Simon Fraser, Toronto, Victoria, Waterloo, and Windsor. Of the 49 public universities in Canada, only the abovementioned 11 made their NSSE 2020 data publicly accessible. The remaining 38 universities were unable to be included in the supplemental analysis as their data were unavailable because they either (a) do not participate in NSSE at all, (b) did not participate in NSSE 2020, (c) do not report their results externally, (d) do not provide their results in a way that is interpretable for comparative analyses, or (e) provide only a snapshot of their results. For example, Ottawa and Ryerson made their data publicly available, but the mean scores provided were not weighted. To improve population estimates, NSSE scores are weighted according to enrolment status (i.e., full or part time), gender, and institutional size (NSSE, n.d.), which were data that the universities did not provide. Other universities, including but not limited to Wilfrid Laurier and Calgary, provided only a snapshot of their results that too rendered them uninterpretable.

Table 1

Maclean's University Categories and Institutions

Medical Doctoral (N=15)	Comprehensive (N=15)	Primarily Undergraduate (N=19)
Alberta	Brock	Acadia
Calgary	Carleton	Bishop's*
Dalhousie	Concordia	Brandon**
Laval	Guelph	Cape Breton
Manitoba**	Memorial**	Lakehead
McGill**	New Brunswick*	Laurentian**
McMaster	Regina*	Lethbridge
Montreal*	Ryerson**	Moncton
Ottawa	Simon Fraser**	Mount Allison
Queen's	Victoria**	Mount Saint Vincent
Saskatchewan	Waterloo**	Nipissing
Sherbrooke	Windsor**	Ontario Tech
Toronto**	Wilfrid Laurier	Saint Mary's
UBC	York	St. Francis Xavier
Western	UQAM	St. Thomas
		Trent
		UNBC*
		UPEI
		Winnipeg

Note. *Regina and UNBC did not participate in NSSE 2017; and Montreal, New Brunswick, and Bishop's did not provide their data to *Maclean's*.
** Included in 2020/2021 analyses.

Variables

Reports of *Maclean's* student satisfaction indices are separated by Canadian university category (Medical Doctoral, Comprehensive, and Primarily Undergraduate), with the exception of reputation, and each university is allocated an overall student satisfaction rank standing as well as an index score in each of the following: course instructors, student life staff, administrative staff, academic advising staff, mental health services, extracurricular activities, experiential learning, residence living, bureaucracy (least red tape), promoting Indigenous visibility, and steps to prevent sexual assault. All of *Maclean's* student satisfaction indices correspond, ostensibly, to NSSE's engagement theme indicators. NSSE EIs include *Campus Environment* comprised of two variables: quality of interactions (with other students, academic advisors, faculty, student

services staff, and other administrative staff and offices) and supportive environment; *Academic Challenge*; *Learning with Peers*; and *Experiences with Faculty*; as well as the two summative questions that measure overall satisfaction. A more comprehensive breakdown of NSSE's engagement theme indicators and items can be found in Appendix A. Additionally, *Maclean's* indices that are not part of the student satisfaction index but were considered related indices, based on previous research exploring similar variables, were used for hypothesis testing. These indices include student retention, proportion who graduate, reputation, student services, student/faculty ratio, and overall rank. Enrolment numbers as offered by *The Maclean's Directory* were used to determine enrolment, or size of the institution, by adding together the number of both full- and part-time students. Predictor variables and outcome variables are illustrated in Table 2.

Maclean's reputational survey is completed by university faculty and senior administrators, high school guidance counsellors, and a variety of businesspersons from across Canada (Dwyer, 2020). Respondents rate their opinions regarding how well universities meet the needs of students and the readiness of graduates to have successful careers to determine rank standings in the indices of highest quality, most innovative, and leaders of tomorrow (Dwyer, 2021). The national reputational ranking combines all three university categories and universities are ranked based on their sum of the three aforementioned indices.

All *Maclean's* indices provide a rank standing but then many indices provide supplementary information as well. For example, a rank standing plus either a monetary amount and/or a proportion per is provided for student/faculty ratio and student services. The indices of student retention and proportion who graduate provide readers with a rank and a percentage.

Table 2

Predictor Variables and Outcome Variables

Predictor Variables (NSSE Engagement Indicator Component Items & Satisfaction Items)	Outcome Variables (*Maclean's* Indices)
X_1: Higher-Order Learning (AC)	Y_1: Course Instructors
X_2: Reflective & Integrative Learning (AC)	Y_2: Student Life Staff
X_3: Learning Strategies (AC)	Y_3: Administrative Staff
X_4: Qualitative Reasoning (AC)	Y_4: Academic Advising Staff
X_5: Collaborative Learning (LwP)	Y_5: Mental Health Services
X_6: Discussions with Diverse Others (LwP)	Y_6: Extracurricular Activities
X_7: Student-Faculty Interaction (EwF)	Y_7: Experiential Learning
X_8: Effective Teaching Practices (EwF)	Y_8: Residence Living
X_9: Quality of Interactions (CE)	Y_9: Bureaucracy (Least Red Tape) Y_9: Promoting Indigenous Visibility*
X_{10}: Supportive Environment (CE)	Y_{10}: Steps to Prevent Sexual Assault
X_{11}: Would Return	Y_{11}: Overall Student Satisfaction
X_{12}: Overall Satisfaction	Y_{12}: Student Retention (1^{st} year analysis/1^{st} year returning for 2^{nd} year) Y_{12}: Proportion who Graduate (4^{th} year analysis)
	Y_{13}: Reputation
	Y_{14}: Student Services
	Y_{15}: Student/Faculty Ratio
	Y_{16}: Overall Rank
	Y_{17}: Enrolment

Note. Engagement Theme Indicators: Academic Challenge (AC), Learning with Peers (LwP), Experiences with Faculty (EwP), and Campus Environment (CE); Least Red Tape dropped from Maclean's after 2018 and replaced with Promoting Indigenous Visibility in 2019.

Procedure

NSSE 2018 data for a number of both private and public institutions across Canada were provided as mean scores by *Maclean's* (see Dwyer, 2018). For the purpose of this study, only public institutions that are also reported in *Maclean's University Rankings* were of interest and incorporated into the dataset. In the case of UBC, NSSE provided separate figures for two different campus locations' − Victoria and Okanogan. As *Maclean's* does not separate or distinguish between different campus locations in their rankings, the NSSE mean scores were combined and then averaged to create a single score. High mean scores are indicative of high engagement and low mean scores are indicative of low engagement. Mean scores were then ranked, with the highest score assigned as the highest rank (#1 is best) and the lowest score assigned as the lowest rank (i.e., the worse the rank the higher the number) in the standings.

NSSE 2020 data were gathered from each institution's website. Similarly, mean scores were provided and then ranked following the same procedure as noted above, when possible. Two universities had publicly available data (University of Ottawa and Carleton University), but the mean scores provided were not weighted and thus could not be used. According to NSSE (n.d.):

> For each institution, sets of weights are computed separately for first year and senior students using gender and enrolment status information taken from submitted population files. Since two categories exist for each key background characteristic (e.g., male/female and full-time/part-time students), NSSE calculates specific weights for four types of students: (1) full-time males, (2) full-time females, (3) part-time males, and (4) part-time females.

NSSE outlines, in detail, how they compute weights but since not enough information to follow their weighting procedures was provided by the institutions, their scores were uninterpretable and excluded from the dataset (see "An Explanation of Weighting in the NSSE Institutional Report" for full details). Moreover, while many universities participated in NSSE, some only provided their results for the two summative questions (Université de Montréal) whereas several others provided only the NSSE Snapshot. As a result, their data too were uninterpretable and could not be included in the analyses.

CHAPTER III

RESULTS

Data Preparation

Data were analyzed separately for 2017/2018 (45 universities) and for 2020/2021 (11 universities). For consistency, NSSE mean scores were ranked for each university in their respective categories (i.e., Medical/Doctoral, Comprehensive, and Undergraduate). The significance level used for all SPSS (v.29) analyses was alpha = .05.

2017/2018 Data Preparation and Analysis

Prior to analysis, the aforementioned variables, or variates, were examined for accuracy of data input then screened through IBM SPSS protocol for missing values and assumptions of multivariate analysis. To begin, canonical correlation analyses require at least an interval or ratio data level; ranks were treated as interval level data as, empirically, no significant difference has been found when interpretating statistical analyses that utilize rank (ordinal) and interval scales (Dowling & Midgley, 1991; Jamieson, 2004; Kerlinger & Lee, 2000).

A number of assumptions needed to be evaluated to determine whether data were suitable for canonical correlation analyses, including missing data, normality, linearity, and homoscedasticity; power consideration with respect to ratio of cases to independent variables; and absence of outliers, multicollinearity, and singularity (Tabachnick & Fidell, 2019). A screening procedure found missing values for average class size (both $1^{st}/2^{nd}$ year and $3^{rd}/4^{th}$ year) within seven universities. With values missing for nearly 15% of cases (more than the recommended cut-off of 5%; Tabachnick & Fidell, 2019), the variable of 'average class size' was deleted from further analysis.

When assessed for normality, data were deemed normally distributed as evidenced by each of the following: visual inspection of histograms, skewness and kurtosis statistics falling between ± 2, and for skewness and kurtosis z-statistics below 1.96 (George & Mallery, 2010). Further, as the data were already ranked, both outliers and their influence were eliminated from the dataset (Field, 2018). Inspection of the points on the normal P-P plot of regression standardized residuals for each dependent variable did not indicate significant deviation from the diagonal line as they fell close to the fitted regression line. Moreover, Durban-Watson values were in an acceptable range, between 1.5 and 2.5, indicating no autocorrelation among variables (Field, 2018). Homoscedasticity was satisfied because, after inspection of the regression standardized predicted value versus regression standardized residual scatterplots for each dependent variable, the distance that data points varied (were dispersed) along the fitted line were approximately the same. Multivariate normality was also satisfied with Mahalanobis maximum value of $43.02 \leq \chi^2_{CRIT}\ (43) = 59.30$.

Although some behavioural statisticians recommend 10 cases (i.e., universities) for every predictor variable (or $N = 120$ given 12 NSSE variables), this sample will yield adequate power as it includes 45 of the possible 49 universities, over 90% of institutions reported by *Maclean's* (Cohen et al., 2003; Tabachnick & Fidell, 2019). Additionally, SPSS (V.29) protects against multicollinearity and singularity by not permitting the canonical correlation analysis to proceed if there are logically redundant variables, often due to small sample sizes coupled with multiple variables.

Canonical Correlation Analyses

Canonical correlation analyses were selected because this technique makes simultaneous comparisons among the variables, rather than requiring multiple statistical analyses, which

reduces the overall risk of Type I error (Sherry & Henson, 2005). Multiple regression, discriminant analysis, and multivariate analysis of variance (MANOVA) are considered special extensions of canonical analysis, but canonical analysis is a general multivariate technique that is appropriate to conduct when the underlying dimensions representing combinations of variables are unknown (Tabachnick & Fidell, 2019).

Canonical correlation analyses were conducted using 12 NSSE variables as predictors of the 17 *Maclean's* variables to evaluate the multivariate shared relationship between the two variable sets (i.e., NSSE EIs and *Maclean's* student satisfaction) as reported by first- and senior-year students in 2017/2018. A statistically significant relationship was found between NSSE EI component and satisfaction items and *Maclean's* student satisfaction and related indices for both first- and senior-year students. The first canonical function in the first-year analysis was significant, Wilks's $\lambda = .000$, F (204, 185) = 1.37, $p = .014$ and accounted for all of the variance. The first three canonical functions in the senior-year analysis were statistically significant, Wilks's $\lambda = .000$, F (204, 185) = 1.96, $p < .001$; Wilks's $\lambda = .000$, F (176, 78) = 1.69, $p < .001$; and Wilks's $\lambda = .001$, F (150, 169) = 1.40, $p = .016$. As Wilk's lambda (λ) represents the variance unexplained by the model, its complement (1 - λ yields) the full model effect size in an r^2 metric (Sherry & Henson, 2005). The r^2 type effect size was .999 across the three significant canonical functions. Thus, the full model explained approximately 99.9% of the variance shared between the variable sets. The canonical solutions for the first canonical (first-year) and three canonical functions (senior-year) are presented in Tables 3 and 4, respectively.

First-Year: Function One

Table 3 illustrates the predictor variable set (covariates) in Function 1 (all pairs taken together). Underlined are the most salient predictors, with a canonical loading cut off of .30.

Maclean's rankings were most strongly positively correlated with quality of interactions and evaluating entire experience as excellent or good, and moderately correlated with supportive environment, student-faculty interaction, effective teaching practices, and whether students would definitely or probably return to that institution for additional study.

Similarly, *NSSE* scores were most strongly positively correlated with student life staff and satisfaction and negatively correlated with enrolment (i.e., size of institution), and moderately positively correlated with mental health services, student/faculty ratio, and least bureaucratic. Squared canonical correlations (R_c^2 or the effect sizes for discriminant functions) of the first-year analysis are $(.949)^2 = .901$, meaning 90% of shared variance was explained by the two variable sets (Sherry & Henson, 2005).

Table 3

Canonical Solution for NSSE Predicting Maclean's for Function 1, First-Year 2017/18

Variable (Set 1)	Standardized Canonical Function Coefficient Std R_c	Canonical Loading/Structure Coefficient r_s	Squared Structure Coefficient and Communality Coefficient r_s^2 (%) & h^2 (%)
Higher-Order Learning (AC)	-.394	-.180	3.24
Reflective & Integrative Learning (AC)	-.073	.062	0.38
Learning Strategies (AC)	-.016	-.026	0.07
Qualitative Reasoning (AC)	-.309	-.211	4.45
Collaborative Learning (LwP)	-.403	.054	0.29
Discussions with Diverse Others (LwP)	.107	-.235	5.50
Student-Faculty Interaction (EwF)	.095	.313	9.80
Effective Teaching Practices (EwF)	-.017	.363	13.18
Quality of Interactions (CE)*	.744	.720	51.84
Supportive Environment (CE)*	.340	.471	22.18
Overall Satisfaction*	.543	.681	46.38
Would Return	-.467	.373	13.91
Squared Canonical Correlation (Rc^2)			90.1%
Variable (Set 2)			
Overall Rank	-.095	-.086	0.74
Satisfaction*	.276	.594	35.28
Student/Faculty Ratio	.058	.303	9.18
Course Instructors*	.207	.629	39.56
Student Life Staff*	1.581	.620	38.44
Administrative Staff*	-.471	.590	34.81
Academic Advising Staff*	-.023	.521	27.14
Mental Health Services	-.089	.390	15.21
Extracurricular Activities*	-.629	.461	21.25
Experiential Learning*	.266	.503	25.30
Residence Living	-.265	.146	2.13
Least Red Tape	.063	.437	19.10
Prevent Sexual Assault	-.256	.249	6.20
Student Retention	-.476	-.284	8.10
Student Services	-.130	-.091	0.83
Reputation	.094	-.111	1.23
Enrolment*	-.225	-.526	27.67

Note. Most salient predictors (>.3) underlined. Asterisk denotes strongest predictors (>.45).

Senior-Year: Function One

The predictor variable set (covariates) in Function 1 (all pairs taken together), with a canonical loading cut off of .30 (underlined in Table 4's r_s column), reveals *Maclean's* ranked scores were moderately positively correlated with both discussions with diverse others and qualitative reasoning and modestly negatively correlated with supportive environment; whereas NSSE's scores were strongly positively correlated with reputation and overall rank, and moderately positively correlated with enrolment and residence living.

Senior-Year: Function Two

With the first and most important pair canonical covariates removed, the second functions' coefficients table reveals that *Maclean's* ranked scores were strongly positively correlated with overall satisfaction, supportive environment, and whether students would definitely or probably return to that institution for additional study, moderately correlated with student-faculty interaction, quality of interactions and reflective and integrative learning; and weakly correlated with collaborative learning and higher-order learning. NSSE was strongly positively correlated with course instructors, satisfaction, student life staff, and extracurricular activities; moderately positively correlated with administrative staff, academic advising staff, least bureaucratic, residence living and moderately negatively correlated with enrolment; and weakly positively correlated with both steps to prevent sexual assault and experiential learning.

Senior-Year: Function Three

Lastly, with the first and second pairs removed, the third function reveals that *Maclean's* was negatively moderately correlated with both collaborative learning and qualitative reasoning, and positively but moderately correlated with both learning strategies and reflective and integrative learning. The NSSE variables were moderately positively correlated with student

services, and negatively weakly corelated with student/faculty ratio. However, although Function 3 is a significant function, the practical significance of interpreting it is of little value as variables do not contribute heavily to the shared variance; thus, only the first two functions will be retained and subsequently interpreted.

R_c^2 for Functions 1 and 2 of the senior-year analysis are $(.952)^2 = .906$ and $(.943)^2 = .889$, indicating 90.6% and 88.9% shared variance between variable sets, respectively. The conclusions for each function in the senior-year analysis were supported by the squared structure (rs^2) and communality coefficients (h^2). The aforementioned variables also had large canonical function coefficients and, with the exception of enrolment, all of these variables' structure coefficients pointed in the same (positive) direction. Enrolment, however, was inversely related to student engagement and student satisfaction. The canonical solutions for the senior-year functions are shown in Table 4.

Table 4

Canonical Solution for NSSE Predicting Maclean's for Functions 1, 2, and 3, Senior-Year '17/18

Variable (Set 1)	Function 1			Function 2			Function 3			
	Std R_c	r_s	r_s^2 (%)	Std R_c	r_s	r_s^2 (%)	Std R_c	r_s	r_s^2 (%)	h^2 (%)
Higher-Order Learn.	.092	.096	0.92	.173	.315	9.92	.034	.019	.04	10.88
Reflective & Integrative Learning*	.113	.200	4.00	.039	.525	27.56	.355	.374	13.99	45.55
Learning Strategies*	.189	.185	3.42	-.181	-.117	1.37	.550	.455	20.70	25.49
Qualitative Reasoning*	.477	.462	21.34	.074	.245	6.00	-.126	-.453	20.52	47.86
Collaborative Learning*	.299	-.100	1.00	.049	.329	10.82	-.578	-.595	35.40	47.22
Discussions with Diverse Others*	.307	.476	22.66	-.277	-.138	1.90	-.110	.128	1.64	26.20
Student-Faculty Interaction*	-.072	-.017	0.03	.371	.565	31.92	.062	-.195	3.80	35.75
Effective Teaching Practices	.114	-.010	0.01	-.228	.409	16.73	-.839	-.230	5.29	22.03
Quality of Interactions*	-.563	-.282	7.95	-.462	.553	30.58	.019	-.228	5.20	43.73
Supportive Environment	-.869	-.333	11.09	.431	.772	59.60	.412	-.009	0.01	70.70
Overall Satisfaction*	.277	.162	2.62	.272	.810	65.61	-.243	-.018	0.03	68.26
Would Return*	.678	.154	2.37	.551	.757	37.30	.329	.157	2.46	62.13
Rc^2			90.6			88.9			77.6	
Variable (Set 2)										
Overall Rank*	.607	.614	37.70	-.432	.152	2.31	.178	-.224	5.02	45.03
Satisfaction*	1.008	.022	0.05	-1.292	.713	50.84	-1.453	.016	0.03	50.92
Student/Faculty Ratio	-.164	-.269	7.24	-.018	-.057	0.32	-.395	-.345	11.90	19.46
Course Instructors*	.410	.165	2.72	.886	.776	60.22	.495	.062	0.38	63.32
Student Life Staff*	-.313	-.073	0.53	.169	.700	49.00	.980	.030	0.09	49.62
Administrative Staff*	-.793	-.147	2.16	-.265	.636	40.45	-.704	-.169	2.86	45.47
Academic Advising Staff*	-.179	-.104	1.08	.176	.563	31.70	-.814	-.264	6.97	39.75
Mental Health Services	-.092	-.287	8.24	-.050	.214	4.58	-.012	.020	0.04	12.86
Extracurricular Activities*	-.943	.035	0.12	.627	.680	46.24	1.097	.146	2.13	48.49
Experiential Learning	.148	.102	1.04	-.248	.311	9.67	.338	-.060	0.36	11.07
Residence Living*	.430	.371	13.76	.395	.538	28.94	-.226	-.149	2.22	44.92
Least Red Tape*	-.093	.003	0.00	.470	.551	30.36	.617	.089	0.79	31.15
Prevent Sexual Assault	.222	.016	0.03	.393	.345	11.90	.179	.172	2.96	14.89
Proportion who Graduate	.046	.166	2.76	-.173	.254	6.45	-.434	-.242	5.86	15.07
Student Services	.284	.256	6.55	-.349	-.071	0.50	-.022	.380	14.44	21.49
Reputation*	.166	.626	39.19	.474	.172	2.96	-.611	-.230	5.29	47.44
Enrolment*	-.048	.418	17.47	-.503	-.481	23.14	.191	.192	3.61	44.42

Note. Salient predictors (>.3) are underlined. Asterisked predictors >.45.

The degree of explanation of the change in two canonical correlation pairs for first- and senior-year students are shown in Tables 5 and 6, respectively. These tables indicate that the first and second canonical correlation pairs in the first-year analysis were most convincing because their values were the highest (greater than 0.1), whereas the second canonical correlation pair was most convincing in the senior-year analysis (greater than 0.2). A redundancy analysis for first-year students (Table 5) shows that canonical variables CV3-CV12, with the exception of CV5, explain 32.7%, 38.1%, and 26.7% of the variance and total redundancy of 29.4%, 32.1%, and 15.5%, respectively. The results suggest that together the first, second, and fifth pair of canonical variables extracted 97.5% of the variance and are strongly related.

Table 5

Proportion of Variance Explained, First-Year 2017/2018

Canonical Variable	Set 1 by Self	Set 1 by Set 2	Set 2 by Self	Set 2 by Set 1
1	.143	.129	.184	.165
2	.199	.168	.182	.153
3	.069	.048	.065	.046
4	.038	.024	.022	.014
5	.134	.078	.133	.077
6	.037	.015	.063	.025
7	.101	.032	.018	.006
8	.043	.012	.046	.013
9	.063	.017	.024	.006
10	.064	.010	.046	.008
11	.068	.008	.041	.005
12	.042	.001	.013	.000

As presented in Table 6, the redundancy analysis for senior-year students (Table 6) show that canonical variables CV2, CV4, and CV10 explain 50.1%, 25.7%, and 16.6% of the variance and total redundancy of 44.6%, 19%, and 3.8%, respectively. The results suggest that together

the second, fourth, and tenth pair of canonical variables extract 92.4% of the variance; the second and fourth canonical variables are strongly related whereas the tenth is only minimally related.

Table 6

Proportion of Variance Explained, Senior-Year 2017/2018

Canonical Variable	Set 1 by Self	Set 1 by Set 2	Set 2 by Self	Set 2 by Set 1
1	.064	.058	.083	.075
2	.266	.237	.235	.209
3	.091	.071	.038	.030
4	.078	.058	.179	.132
5	.073	.051	.087	.061
6	.061	.035	.029	.017
7	.083	.040	.054	.026
8	.039	.014	.050	.017
9	.057	.017	.018	.006
10	.130	.030	.036	.008
11	.031	.003	.020	.002
12	.027	.001	.029	.001

Mann-Whitney U Tests

Higher Versus Lower Ranked Universities

Mann-Whitney U tests (equivalent to the Wilcoxon rank-sum test and both essentially non-parametric independent *t*-tests; see Field, 2018) were conducted to compare higher-versus lower ranked universities based on significant predictor variables from the canonical correlation analyses. Universities, as they are classified by their respective categories (i.e., Medical/Doctoral, Undergraduate, and Comprehensive), were halved and split into subgroups that designated them as either a high-ranking (n = 21) or low-ranking (n = 24) institution. Variables from the canonical correlation analyses with canonical loadings above .45 (i.e., at least moderate canonical correlation) were considered the strongest predictors and entered into the following analyses (Pituch & Stevens, 2016).

As illustrated in Table 7, higher-ranking (i.e., #1 is best) universities had significantly lower mean ranks than lower ranking universities for 14 of the 21 (67%) significant predictors entered into the analysis. Of the 21 indices, eight were drawn from the *Maclean's* student satisfaction variables and six were drawn from the NSSE EIs. Lower mean ranks are indicative of better performance as ranked data were used. Higher-ranking universities had significantly better supportive environment for first-year students; and significantly better satisfaction, instructors, student life staff, administrative staff, advising staff, extracurricular activities, experiential learning, reputation, qualitative reasoning, discussions with diverse others, quality interactions, and likelihood to rate their overall experience as excellent or good and return for additional study among senior-year students.

Table 7

Index Comparison of Universities with a High versus Low Rank using Mann-Whitney U-Test

Variable	Mean: High Rank (n = 21)	Mean: Low Rank (n = 24)	z	p
Year1 Supportive Environment	17.00	28.25	2.87	.004*
Satisfaction	17.55	27.77	2.61	.009*
Instructors	16.57	28.63	3.08	.002*
Student Life Staff	18.69	26.77	2.06	.039*
Administrative Staff	17.17	28.10	2.36	.005*
Advising Staff	18.07	27.31	2.36	.018*
Extracurricular Activities	17.10	28.17	2.83	.005*
Experiential Learning	18.57	26.88	2.12	.034*
Reputation	13.79	31.06	4.41	<.001*
Senior Qualitative Reasoning	15.57	29.50	3.56	<.001*
Senior Discussions with Diverse Others	18.69	26.77	2.06	.039*
Senior Quality Interactions	18.60	26.85	2.11	.035*
Senior Excellent/Good Overall Experience	17.52	27.79	2.62	.009*
Senior Would Return	17.98	27.40	2.41	.016*
Year 1 Quality Interactions	19.19	26.33	1.82	.068
Year 1 Excellent/Good Overall Experience	20.79	24.94	1.07	.287
Enrolment	21.90	23.96	0.52	.600
Senior Reflective & Integrative Learning	19.19	26.33	1.83	.068
Senior Collaborative Learning	21.79	24.06	0.58	.561
Senior Student/Faculty Interaction	19.43	26.13	1.71	.087
Senior Supportive Environment	20.43	25.25	1.23	.218

Note. Lower mean ranks are indicative of better performance.
* denotes significant test.

Universities with Good Reputations Versus Universities with Poor Reputations

Next, Mann-Whitney U tests were conducted to compare universities with a high reputation score versus universities with a low reputation score based on significant predictor variables from the canonical correlation analyses. As classified by their respective categories (i.e., Medical/Doctoral, Comprehensive, and Undergraduate), universities were halved and split into subgroups using a median split that categorized them as either a university with a high reputation score (n = 20) or a university with a low reputation score (n = 25). As illustrated in Table 8, universities with a high reputation had significantly lower (i.e., better) mean ranks than universities with a low reputation for 5 of the 21 (24%) significant predictors entered into the analysis. There were no significant differences between universities with good reputations versus universities with poor reputations for first-year students. However, among senior-year students, universities with a good reputation had significantly higher extracurricular activity, enrolment, and qualitative reasoning, discussions with diverse others, and likelihood that students would return than universities with a poor reputation.

Table 8

Index Comparison of Universities with Good versus Poor Reputations using Mann-Whitney U-Test

Variable	Mean: Good Reputation (n = 20)	Mean: Poor Reputation (n = 25)	z	p
Extracurricular Activities	18.30	26.76	2.15	.032*
Enrolment	17.75	27.20	2.40	.016*
Senior Qualitative Reasoning	17.83	27.14	2.37	.018*
Senior Discussions with Diverse Others	18.68	26.46	1.98	.048*
Senior Would Return	18.63	26.50	2.00	.045*
Year 1 Quality Interactions	22.45	23.44	0.25	.801
Year 1 Supportive Environment	18.85	26.32	1.90	.058
Year 1 Excellent/Good Overall Experience	24.43	21.86	0.66	.512
Satisfaction	19.35	25.92	1.67	.095
Instructors	19.52	25.78	1.59	.112
Student Life Staff	19.80	25.56	1.46	.143
Administrative Staff	20.08	25.34	1.34	.181
Advising Staff	20.88	24.70	0.97	.331
Experiential Learning	19.15	26.08	1.76	.078
Senior Reflective & Integrative Learning	20.43	26.06	1.18	.238
Senior Collaborative Learning	22.25	23.60	0.34	.731
Senior Student/Faculty Interaction	22.15	23.68	0.39	.697
Senior Quality Interactions	22.58	23.34	0.20	.846
Senior Supportive Environment	22.85	23.12	0.07	.945
Senior Excellent/Good Overall Experience	19.80	25.56	1.47	.143
Rank	26.60	20.12	1.65	.099

Note. Lower mean ranks are indicative of better performance.
* denotes significant test.

Large Versus Small Universities

Lastly, Mann-Whitney U tests were conducted to compare larger versus smaller enrolment universities based on significant predictor variables from the canonical correlation analyses. As classified by their respective categories (i.e., Medical/Doctoral, Comprehensive, and Undergraduate), universities were halved and split into subgroups that categorized them as either a large (n = 20) or a small (n = 25) university. Medical/Doctoral universities with fewer than 35,000 students, Comprehensive universities with fewer than 29,750 students, and Undergraduate universities with fewer than 4,850 students were classified as small. As illustrated

in Table 9, smaller universities had better mean ranks than larger scores for 8 of 21 indices, or 38% of predictors, whereas large universities performed significantly better than small universities in 2 of 21 indices (or 9%). Smaller universities had significantly better quality of interactions, supportive environments, and overall experience among first-year students; student-faculty interaction, quality interactions, supportive environment, and overall experience among senior-year students; and rank than larger universities; whereas larger universities had significantly more discussions with diverse others and better reputation scores than did smaller universities.

Table 9

Index Comparison of Large versus Small Universities using Mann-Whitney U-Test

Variable	Mean: Large Universities (n = 20)	Mean: Small Universities (n = 25)	z	p
Year1 Quality Interactions	27.78	19.18	2.19	.029*
Year 1 Supportive Environment	28.30	18.76	2.43	.015*
Year 1 Overall Experience	28.90	18.28	2.71	.007*
Senior Discussions with Diverse Others	18.10	26.92	2.24	.025**
Senior Student-Faculty Interaction	30.63	16.90	3.49	<.001*
Senior Quality Interactions	27.78	19.18	2.19	.029*
Senior Supportive Environment	30.48	17.02	3.42	.001*
Senior Overall Experience	28.15	28.88	2.36	.018*
Rank	27.93	19.06	2.25	.024*
Reputation	18.70	26.44	1.98	.049**
Satisfaction	25.88	20.70	1.32	.188
Instructors	25.65	20.88	1.21	.225
Student Life Staff	25.88	20.70	1.32	.188
Administrative Staff	26.90	19.88	1.78	.074
Advising Staff	25.78	20.78	1.27	.204
Extracurricular Activities	25.13	21.30	0.97	.331
Experiential Learning	22.23	23.62	0.36	.723
Senior Reflective & Integrative Learning	25.60	20.92	1.19	.234
Senior Qualitative Reasoning	24.18	22.06	0.54	.591
Senior Collaborative Learning	26.73	20.02	1.71	.088
Senior Would Return	25.05	21.36	0.94	.348

Note. Lower mean ranks are indicative of better performance.

* denotes significant test.

** denotes large universities outperformed small universities.

Cluster Analysis

Additionally, a cluster analysis was used to examine patterns of interrelationships among the universities. Using algorithms outlined by Ward (1963; see also Everitt, 1993; Gordon, 1987), squared Euclidian distances (as estimates of distance between universities) were calculated for the 45 universities based on their scores per significant predictors (*r*s >.30) as well as the strongest predictors (*r*s > .45) from the canonical correlation analyses. Unique clusters of universities were identified, in which the similarity of each member's corresponding profile was maximized, and intercorrelations among members were high. Universities were thus highly similar within a given cluster, but dissimilar to universities outside their designated clusters. See Table 10 and Table 11 for the results of the cluster analysis for 2017/2018.

Visual inspection of the dendrogram revealed four unique clusters, sorted as groupings of empirically similar universities, as shown in Figure 2 and Figure 3. The cluster composition of clusters from two analyses were examined: (1) cluster membership based on significant predictors (*r*s > .30) and (2) cluster membership based on the most salient predictors (*r*s > .45) from the canonical correlation analyses. These clusters were nearly identical, apart from the movement of Memorial and Moncton to a different cluster when the significant predictors versus the most salient predictors were utilized. A one-way analysis of variance (ANOVA) with the Games-Howell multiple comparison test was used to identify the unique characteristics of the clusters. Table 12 shows the means, standard deviations, and Welch statistics by index for each cluster. The clusters appear as follows:

a) Consisting of 13 universities, ***Cluster-1*** institutions were smaller universities that had high scores across variables but did not have the best reputations.

b) Consisting of 9 universities, ***Cluster-2*** institutions were smaller and lowest performing universities on each variable, generally with a poor reputation.

c) Consisting of 9 universities, ***Cluster-3*** institutions had the poorest reputations and smallest enrolment, but performed better than Cluster-4 on a majority of indices.

d) Consisting of 14 universities, ***Cluster-4*** institutions had the best reputations and had the highest enrolment, but otherwise did not perform as well as Cluster 3.

Table 10

Cluster Membership Based on Significant Predictors (> .30)

Cluster-1	**Cluster-2**	**Cluster-3**	**Cluster-4**
Acadia (U)	Brandon (U)	Brock (C)	Alberta (MD)
Carleton (C)	Lakehead (U)	Cape Breton (U)	Calgary (MD)
Guelph (C)	Laurentian (U)	Dalhousie (MD)	Concordia (C)
Laval (MD)	Manitoba (MD)	Mount Saint Vincent (U)	Lethbridge (U)
McMaster (MD)	Memorial (C)	Nipissing (U)	McGill (MD)
Mount Allison (U)	Moncton (U)	Saskatchewan (MD)	Ryerson (C)
Queen's (MD)	Ottawa (MD)	St. Thomas (U)	Saint Mary's (U)
Sherbrooke (MD)	UPEI (U)	UNB (C)	Simon Fraser (C)
St. Francis Xavier (U)	Winnipeg (U)	Windsor (C)	Toronto (MD)
Trent (U)			UBC (MD)
UQAM (C)			UOIT (U)
Western (MD)			Victoria (C)
Wilfrid Laurier (C)			Waterloo (C)
			York (C)

Table 11

Cluster Membership Based on Most Salient Predictors (> .45)

Cluster-1	Cluster-2	Cluster-3	Cluster-4
Acadia (U)	Brandon (U)	Alberta (MD)	Brock (C)
Carleton (C)	Lakehead (U)	Calgary (MD)	Cape Breton (U)
Guelph (C)	Laurentian (U)	Concordia (C)	Dalhousie (MD)
Laval (MD)	Manitoba (MD)	Lethbridge (U)	Memorial (C)
McMaster (MD)	Ottawa (MD)	McGill (MD)	Moncton (U)
Mount Allison (U)	UPEI (U)	Ryerson (C)	Mount Saint Vincent (U)
Queen's (MD)	Winnipeg (U)	Saint Mary's (U)	Nipissing (U)
Sherbrooke (MD)		Simon Fraser (C)	Saskatchewan (MD)
St. Francis Xavier (U)		Toronto (MD)	St. Thomas (U)
Trent (U)		UBC (MD)	UNB (C)
UQAM (C)		UOIT (U)	Windsor (C)
Western (MD)		Victoria (C)	
Wilfrid Laurier (C)		Waterloo (C)	
		York (C)	

Figure 2

Cluster Analysis Dendrogram 2017/2018 (predictors >.3)

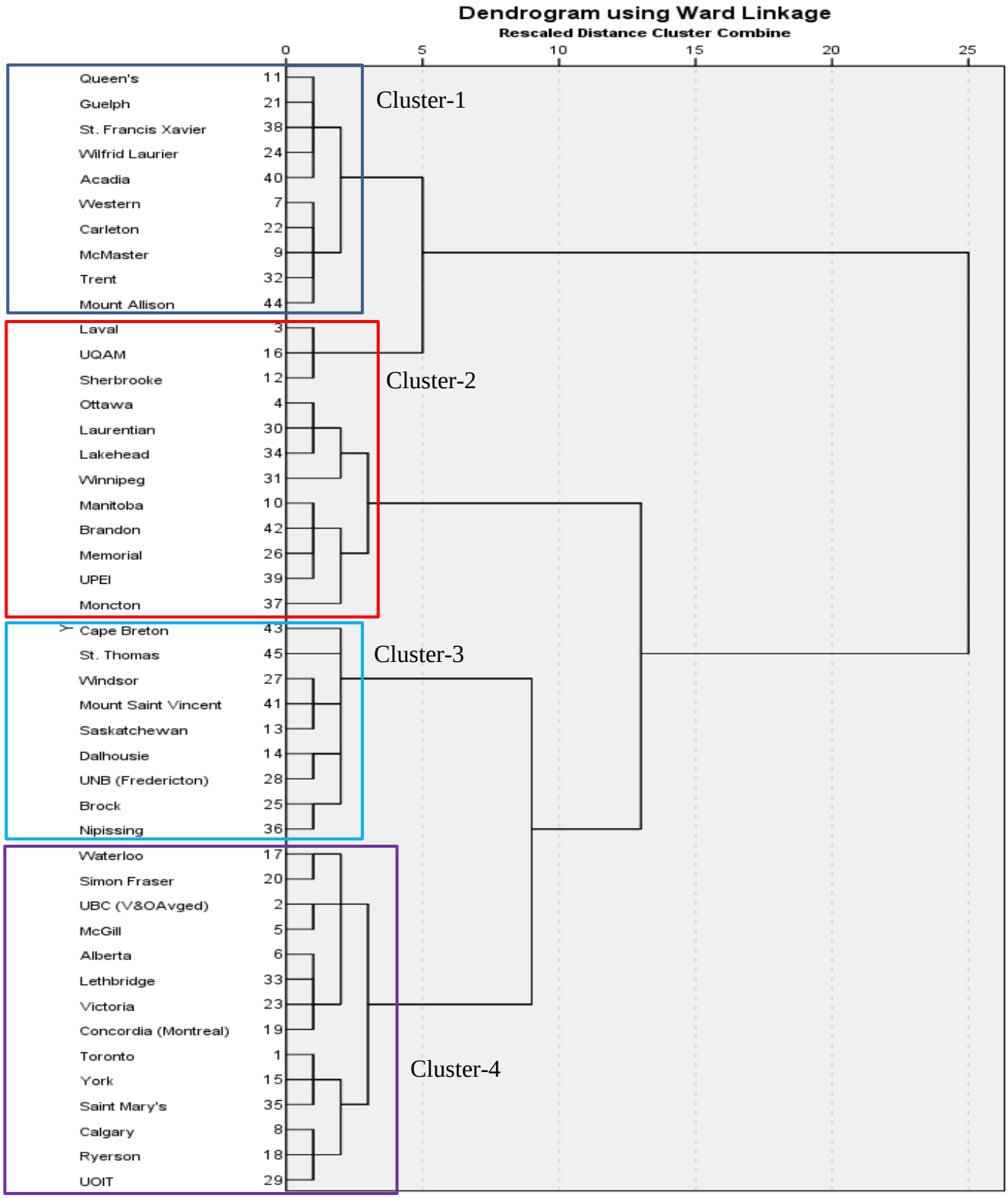


Figure 3

Cluster Analysis Dendrogram 2017/2018 (predictors >.45)

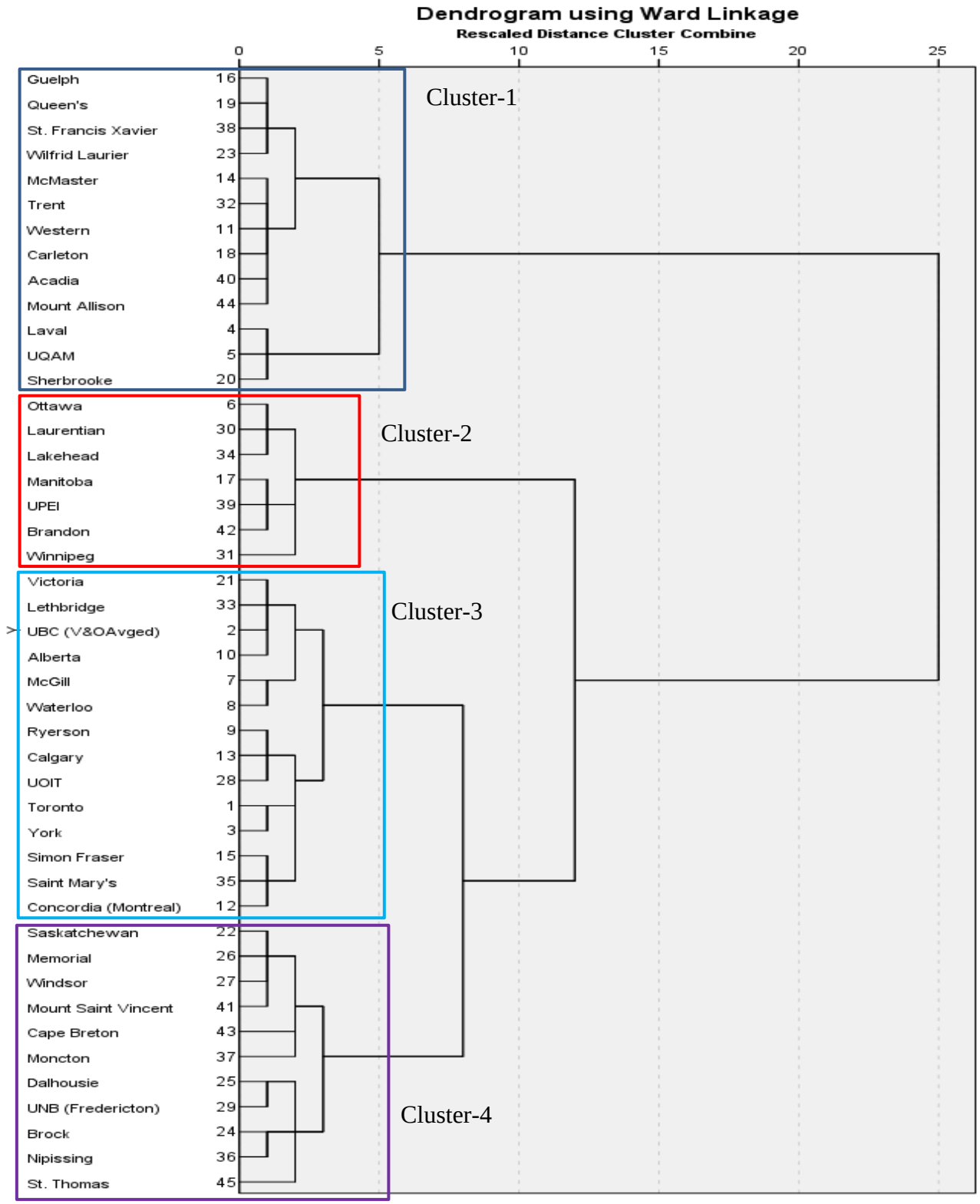


Table 12

Cluster Means and Standard Deviations

Index	Cluster-1 (n = 13) *M (SD)*	Cluster-2 (n = 9) *M (SD)*	Cluster-3 (n = 9) *M (SD)*	Cluster-4 (n = 14) *M (SD)*	F_W
Year1 Qualitative Reasoning	6.77 (5.05)$_{ac}$	11.89 (3.59)$_{b}$	7.44 (4.19) $_{ac}$	7.00 (3.57) $_{b}$	3.90
Year1 Supportive Environment	4.46 (3.38) $_{a}$	13.22 (2.82)$_{b}$	7.33 (3.74) $_{ac}$	8.57 (3.48)$_{ac}$	14.01
Satisfaction	3.31 (1.75)$_{a}$	15.89 (1.76)$_{b}$	8.33 (3.04)$_{a}$	10.14 (2.25)$_{c}$	87.16
Instructors	3.85 (2.08)$_{a}$	15.11 (2.57)$_{b}$	8.44 (3.28)$_{c}$	10.07 (3.45)$_{c}$	39.45
Student Life Staff	3.23 (1.79)$_{a}$	15.00 (2.55)$_{b}$	9.44 (4.00)$_{c}$	10.00 (2.99)$_{c}$	51.01
Administrative Staff	3.62 (2.18)$_{a}$	15.11 (1.97)$_{b}$	8.78 (4.12)$_{ac}$	10.36 (2.65)$_{ac}$	53.02
Advising Staff	3.62 (3.07)$_{a}$	15.33 (2.35)$_{b}$	9.00 (2.96)$_{c}$	10.36 (2.74)$_{c}$	32.62
Extracurricular Activities	3.23 (1.69)$_{a}$	15.11 (2.26)$_{b}$	10.22 (3.56)$_{c}$	9.21 (3.12)$_{c}$	60.58
Experiential Learning	6.23 (4.11)$_{a}$	15.11 (2.93)$_{ab}$	8.67 (2.69)$_{ac}$	7.86 (4.72)$_{ac}$	13.61
Reputation	6.85 (3.89)$_{a}$	12.22 (3.60)$_{b}$	14.22 (2.64)$_{ab}$	4.36 (2.76)$_{a}$	26.85
Senior Qualitative Reasoning	6.23 (4.69)$_{a}$	11.56 (3.56)$_{b}$	8.56 (4.77)$_{a}$	7.14 (3.74)$_{a}$	3.86
Senior Discussions with Diverse Others	8.23 (4.68)$_{a}$	10.89 (4.20)$_{b}$	9.56 (3.40)$_{c}$	4.86 (3.26)$_{d}$	5.85
Senior Quality Interactions	3.85 (2.91)$_{a}$	12.67 (4.42)$_{b}$	7.00 (3.39)$_{ab}$	9.57 (2.38)$_{b}$	13.47
Senior Overall Experience	3.85 (2.76)$_{a}$	12.33 (3.87)$_{b}$	7.00 (4.21)$_{ac}$	9.36 (3.18)$_{bc}$	12.93
Senior Would Return	3.69 (2.63)$_{a}$	11.44 (4.61)$_{b}$	8.44 (3.50)$_{c}$	9.14 (3.68)$_{bc}$	10.93
Year1 Quality Interactions	4.23 (2.89)$_{a}$	12.78 (3.83)$_{b}$	6.11 (3.59)$_{a}$	9.57 (3.20)$_{ab}$	14.25
Year1 Overall Experience	4.23 (3.30)$_{a}$	11.11 (4.62)$_{b}$	5.33 (3.08)$_{a}$	9.83 (3.28)$_{a}$	9.23
Enrolment	8.54 (3.97)$_{a}$	7.89 (4.29)$_{b}$	13.11 (2.52)$_{a}$	4.50 (2.62)$_{b}$	19.42
Senior Reflective & Integrative Learning	5.23 (4.05)$_{a}$	12.22 (3.44)$_{b}$	7.00 (3.87)$_{a}$	8.36 (4.29)$_{ab}$	6.12
Senior Student/Faculty Interaction	6.08 (4.56)$_{a}$	11.67 (3.78)$_{b}$	5.33 (3.97)$_{a}$	8.93 (3.39)$_{ab}$	4.93
Senior Supportive Environment	3.54 (2.33)$_{a}$	12.78 (2.82)$_{b}$	6.56 (3.01)$_{a}$	9.86 (3.37)$_{b}$	23.93

Note. Row means with identical subscripts are not significantly different.

* Welch F-statistics significant at $p < .05$.

2020/2021 Data Preparation and Analysis

SPSS (v.29) protects against multicollinearity and singularity by not permitting the canonical correlation analysis to proceed if there are logically redundant variables. It became evident that the data were problematic for the 2020/2021 analyses as there were only 11 universities and 29 variables (12 predictor variables and 17 dependent variables). The sample size for the 2020/2021 data was not adequate for the number of variables to be entered into the analyses. As a result, dimension reduction techniques were conducted, where appropriate, and bivariate non-parametric correlation analyses were used when the principal components analyses were unable to extract factors from the variables.

Principal components analyses (PCAs) were conducted to examine how many components there are among the NSSE variables. After visual inspection of the scree plots, the Kaiser-Guttman rule (i.e., retain components with eigenvalues greater than 1), and consideration of the total variance explained by each component (i.e., the 80% rule), two principal components were kept for first-year and three principal components were kept for senior-year. The total variance explained by the two components was 74.64% for first-year and 79.86% for senior-year. Data were initially assessed via direct oblimin rotation to determine whether the variables might be correlated. The component correlation matrix suggested the components were uncorrelated (rs < .3), so varimax with Kaiser normalization was used as the rotation method. The number of variables were reduced to avoid redundancy for both first- and senior-year analyses; each PCA extracted two and three factors, respectively, albeit a different composition of factors for each analysis that were also different from their theme placement as per NSSE.

The rotated component matrix for first-year students is shown in Table 13. The first component consisted of higher order learning, reflective and integrative learning, qualitative

reasoning, collaborative learning, and discussions with diverse others (renamed: Learning Constituents); and the second component consisted of learning strategies, student/faculty interaction, effective teaching practices, supportive environment and quality of interactions (renamed: Teaching Tools).

Table 13

Rotated Component Matrix First-Year

	Component	
	1	2
Higher Order Learning	**.871**	.187
Reflective & Integrative Learning	**.676**	-.386
Qualitative Reasoning	**.927**	.128
Collaborative Learning	**.853**	.289
Discussions with Diverse Others	**.929**	-.063
Learning Strategies	.087	**.804**
Student/Faculty Interaction	.486	**.753**
Effective Teaching Practices	-.057	**.943**
Supportive Environment	.023	**.910**
Quality of Interactions	.073	**.555**

Note. Rotation converged in 5 iterations.

The rotated component matrix for senior-year students is shown in Table 14. The first component consisted of qualitative reasoning, collaborative learning, and discussions with diverse others (renamed: Diversity and Application); the second component consisted of higher order learning, reflective and integrative learning, effective teaching practices, and quality of interactions (renamed: Interactive Learning); and the third component consisted of learning strategies, student/faculty interaction, and supportive environment (renamed: Learning Environment).

Table 14

Rotated Component Matrix Senior-Year

	Component		
	1	2	3
Qualitative Reasoning	**.843**	.193	-.285
Collaborative Learning	**.841**	-.263	.369
Discussions with Diverse Others	**.957**	-.070	.109
Higher Order Learning	.154	**.688**	.386
Reflective & Integrative Learning	-.253	**.528**	.492
Effective Teaching Practices	-.066	**.993**	-.038
Quality of Interactions	.005	**.763**	.150
Learning Strategies	-.193	.478	**.697**
Student/Faculty Interaction	.125	.083	**.947**
Supportive Environment	.527	.157	**.714**

Note. Rotation converged in 6 iterations.

Once the number of components were determined, factor analysis regression scores were produced which created three variables for first-year students and three variables for senior-year students as a regression score variable is created for each component. These variables were then utilized in the subsequent analyses as dependent variables to determine whether any of the *Maclean's* variables were significant predictors.

Linear Regression Analyses

For the purpose of exploratory model building, multiple regression, stepwise method, was used to determine which *Maclean's* variables might be (due to the lack of power with so few universities) good predictors of NSSE's First-Year Components 1 and 2 (Learning Constituents and Teaching Tools, respectively). In SPSS, the stepwise and forward methods are similar, but the stepwise method conducts a removal test and reassesses continuously to avoid retaining redundant predictors in the model(s). The variables in the final model were reduced to retention and enrolment for First-Year Component 1. The overall regression was statistically significant (R^2 = .843, F (1, 9) = 48.15, p < .001). Retention (β = .547, p <.001) contributed positively to

Component 1. The final regression equation was Component 1 = -1.491+ .547 (retention). No variables were entered into the equation for Component 2, meaning no *Maclean's* variables were deemed to be good predictors of NSSE's Component 2 (i.e., Teaching Tools) among first-year students.

Multiple linear regression, stepwise method, was used to test each model to determine which *Maclean's* variables might be good predictors of NSSE's Senior-Year Component 1 (renamed: Diversity and Application). The *Maclean's* variables were reduced to four: proportion who graduate, student services, mental health, and academic advising staff. These four predictors account for nearly 100% of the variance in Component 1 Senior-Year.

For Senior-Year Component 1, SPSS performed four steps, adding one predictor in each. The final model for Senior-Year Component 1 (or Y') = -1.521 + .515*(proportion who graduate) + 0.080*(student services) - 0.074*(mental health) + 0.044*(academic advising staff) where Y' is Component 1 (renamed: Diversity and Application). It was found that proportion who graduate ($\beta = .865$, $p < .001$), student services ($\beta = .370$, $p < .001$), mental health ($\beta = -.350$, $p < .001$), and academic advising staff ($\beta = .162$, $p < .001$) were significant predictors. The proportion of students who graduate ($\beta = .865$) contributes over twice as much as student services ($\beta = .370$) and mental health ($\beta = -.350$) and over five times as much as academic advising ($\beta = .162$). Importantly, one predictor (mental health services) contributes negatively to Component 1. The overall regression model for Senior-Year Component 1 was statistically significant ($R^2 = .999$, $F(4, 6) = 1762.59$, $p < 0.001$).

It was found that experiential learning ($\beta = -.866$, $p < .001$) and enrolment ($\beta = -.477$,

p = .013) were significant predictors of Senior-Year Component 2. The final regression model was statistically significant (R^2 = .827, F (2, 8) = 19.14, p < .001). The fitted regression model was Component 2 Senior = 2.339 - .141*(experiential learning) - .284* (enrolment). Experiential learning contributes to the model almost twice that of enrolment, and both significant predictors contribute negatively to Component 2 (Interactive Learning).

Senior-Year Component 3 (learning strategies, student/faculty interaction, effective teaching practices, and supportive environment/ learning environment) reduced *Maclean's* steps to prevent sexual assault as a good predictor (β = -.709, p = .015). The final regression model was statistically significant (R^2 = .503, F (1, 9) = 9.11, p = .015). The fitted regression model was Component 3 Senior = 2.339 - .133*(steps to prevent sexual assault), whereby steps to prevent sexual assault contributed negatively to the model.

As this is an exploratory approach, results cannot be interpreted in the same manner as other methods of multiple linear regression analyses, it is recommended that significance values be interpreted with caution as they were included in analyses for the sole purpose of identifying themes (Pituch & Stevens, 2015). Consequently, exploration of these predictor variables in future studies is recommended.

Yet, to further identify possible themes due to the lack of statistical power in the 2020/2021 analyses, the 11 universities that published their data publicly in 2021 were compared with their 2017 results to determine whether they were statistically different, and in which areas they may have differed. Results of the Wilcoxon Signed Rank Test (as shown in Table 15) suggest that the universities differed significantly on nine variables; eight variables were based upon a negative rank and one variable was based upon a positive rank. Negative rank indicates

that 2020 had significantly higher rankings than 2017, whereas positive rank indicates that 2020 had significantly lower rankings than 2017.

Table 15

Comparison of 2017 and 2020 Universities (n=11) using Wilcoxon Signed Rank Test

Variable	Positive, Negative, or Tied Rank	Test Statistic *(z)*	*p*
Negative Rank			
Year1 Quality Interactions	2020 < 2017	2.95	.003*
Year 1 Supportive Environment	2020 < 2017	2.81	.005*
Overall Student Satisfaction	2020 < 2017	0.14	.888
Instructor	2020 < 2017	0.57	.569
Administrative Staff	2020 < 2017	0.34	.733
Academic Advising Staff	2020 < 2017	1.14	.256
Senior Qualitative Reasoning	2020 < 2017	2.94	.003*
Senior Collaborative Learning	2020 < 2017	2.94	.003*
Senior Discussions with Diverse Others	2020 < 2017	2.81	.005*
Senior Reflective & Integrative Learning	2020 < 2017	2.94	.003*
Senior Supportive Environment	2020 < 2017	2.94	.003*
Senior Student Faculty Interaction	2020 < 2017	2.81	.005*
Senior Quality Interactions	2020 < 2021	2.95	.003*
Enrolment	2020 < 2017	2.81	.005*
Positive Rank			
Rank	2020 > 2017	1.34	.180
Reputation	2020 > 2017	2.81	.005*
Student Life Staff	2020 > 2017	0.14	.888
Experiential Learning	2020 > 2017	0.43	.666
Extracurricular Activities	2020 > 2017	0.10	.917

Note. < indicates negative rank; > indicates positive rank; = indicates tied rank.
* denotes significant test.

CHAPTER IV

DISCUSSION

Summary of Major Findings

The current study aimed to determine a) whether NSSE engagement theme indicators (EIs) predict *Maclean's* student satisfaction indices, and b) whether there are differences between 1) first- and senior-year students' levels of engagement and satisfaction, and 2) universities' levels of engagement and satisfaction based on rank, reputation, and enrolment (i.e., size) for the 2017/2018 year of data collection at Canadian universities. Given that high levels of student engagement have been positively correlated with high levels of student satisfaction, and so too NSSE measures have been found to be significantly correlated to student satisfaction outcomes (Kandiko Howson & Matos, 2021; Pike, 2013), we hypothesized a significant relationship between NSSE EIs and *Maclean's* student satisfaction indices. To test this hypothesis, canonical correlation analyses identified the relationship between NSSE engagement theme indicators and *Maclean's* student satisfaction indices (and which contributed to student satisfaction). There was a significant relationship among many (but not all) variables. This partially supported the first hypothesis.

Our results are similar to those of Clemes et al. (2008) who found future attendance (would return), interaction quality (quality of interactions), outcome quality (satisfaction), academic staff (course instructors, student life staff, administrative staff, academic advising staff), academic development (academic challenge), and image (reputation) were amongst the significant predictors of satisfaction. More engaged students are more satisfied, and more satisfied students are more engaged (Pike, 2013), however, our findings are not entirely synonymous with others' as only three engagement variables from the first-year analysis were

significant predictors of the satisfaction variables. In addition, the proportion of students who graduate was not a significant predictor of satisfaction in either of our canonical correlation analyses whereas it was in Pike's (2013) study. Furthermore, studies agree that image and institutional reputation are significant predictors of satisfaction, but the strength of the relationship is inconsistent. Many contend that institutional reputation is the strongest predictor of student satisfaction (Alves & Raposo, 2007; Brown & Mazzarol, 2009; Dean & Gibbs, 2015; Stephenson et al., 2016), whereas others (alike us) contend it is significant but not the strongest (Masserini et al., 2009; Santini et al., 2017).

Canonical Correlation Analyses

As anticipated, the significant predictors varied for first-year and senior-year students. It was hypothesized that fourth-year students would be more engaged and thus more satisfied than first-year students based on the notion that student dissatisfaction often stems from misunderstanding or miscommunication between faculty and students. Based on fourth-year students' educational experience and understanding of higher education operations, and their enhanced self-efficacy as they near their educational goals of obtaining their degrees and optimism about their futures and the skills obtained prior to graduation, it was hypothesized that they would be more satisfied (Bandura, 1977; Deely, 2019). Although the first hypothesis was only partially supported, the second hypothesis was fully supported with more NSSE variables identified as significant predictors for senior-year than first-year students. These results suggest that senior-year students are more engaged and satisfied as more predictors of engagement correlated with *Maclean's* student satisfaction variables than they did in the first-year analysis. Our findings are, again, comparable to Clemes et al. (2008) who found variation in student

satisfaction dependent on year of study − third-year students being more satisfied than second-year students.

Since third- and fourth-year courses often have fewer students than first- and second-year courses, class size could be related to student satisfaction. However, the debate remains as to whether or not class size has an impact on student satisfaction among Canadian students as, unfortunately, class size was dropped from these analyses due to missing and out-of-date data (Cheng, 2001).

In the first-year analysis, results identified one significant canonical function. A summary of the most salient predictors from the first-year canonical correlation analysis is provided in Table 16. The most important predictors of *Maclean's* student satisfaction variables were quality interactions and evaluating their entire educational experience as good or excellent; however, student-faculty interaction, effective teaching practices and likelihood that students would return to the same institution for additional study were moderate predictors of *Maclean's* rankings. The most important predictors of *NSSE* scores were student life staff and overall satisfaction, both negatively correlated with enrolment (i.e., size of institution) and moderately positively correlated with mental health services, student/faculty ratio, and bureaucracy. These results suggest that good quality interactions combined with students' perceptions that their experiences at the institutions of higher learning were good or excellent are the most important predictors of overall satisfaction. Student-faculty interactions, effective teaching practices, and likelihood that students would return to the same institution for additional study were also correlated with each of satisfaction with mental health services, student/faculty ratio, and institutions with little bureaucracy, but to a lesser extent (canonical loading/structure coefficients < .45). Since levels of student engagement have been found to correlate positively with higher levels of student

satisfaction, one would expect these and related variables to be similarly correlated (Kandiko Howson & Matos, 2021).

Table 16

Summary of Most Salient Predictors, First-Year Canonical Correlation Analysis

Variable (NSSE)	Canonical Loading/Structure Coefficient r_s	Squared Structure Coefficient and Communality Coefficient r_s (%) & h^2 (%)
Quality of Interactions	.720	51.84
Supportive Environment	.471	22.18
Overall Satisfaction	.681	46.38
Variable (*Maclean's*)		
Satisfaction	.594	35.28
Course Instructors	.629	39.56
Student Life Staff	.620	38.44
Administrative Staff	.590	34.81
Academic Advising Staff	.521	27.14
Extracurricular Activities	.461	21.25
Experiential Learning	.503	25.30
Enrolment	-.526	27.67

Two canonical functions from the senior-year students were retained. A summary of the most salient predictors from the fourth-year canonical correlation analysis is provided in Table 17. In the first function, the most important NSSE predictors towards *Maclean's* overall rank and reputation were discussions with diverse others and qualitative reasoning. The second function, with qualitative reasoning, discussions with diverse others, overall rank, and reputation removed, suggested that *Maclean's* ranked scores were strongly positively correlated with NSSE's overall satisfaction, supportive environment, and likelihood that senior-year students would return to the same institution for further study; but, moderately correlated with student-faculty interaction, quality of interactions, and reflective and integrative learning. The aforementioned NSSE variables were highly positively correlated with *Maclean's* indices of course instructors, satisfaction, student life staff, and extracurricular activities; moderately positively correlated with

administrative staff, academic advising staff, least bureaucratic, and residence living, and moderately negatively correlated with enrolment. These results support the hypothesis that senior-year students would be more satisfied than first-year students. NSSE's supportive environment, overall satisfaction, and willingness to return to the same university for additional study, and *Maclean's* overall satisfaction, course instructors, student life staff, and extracurricular activities were the most relevant variables.

Table 17

Summary of Most Salient Predictors, Fourth-Year Canonical Correlation Analysis

	Function 1		Function 2	
Variable (NSSE)	Canonical Loading/Structure Coefficient r_s	r_s (%) & h^2(%)	Canonical Loading/Structure Coefficient r_s	r_s (%) & h^2(%)
Qualitative Reasoning	.462	21.34		
Discussions with Diverse Others	.476	22.66		
Reflective & Integrative Learning			.525	27.56
Student-Faculty Interaction			.565	31.92
Quality of Interactions			.553	30.58
Supportive Environment			.772	59.60
Overall Satisfaction			.810	65.61
Would Return			.757	37.30
Variable (*Maclean's*)				
Overall Rank	.614	37.70		
Reputation	.626	39.19		
Satisfaction			.712	50.84
Course Instructors			.776	60.22
Student Life Staff			.700	49.00
Administrative Staff			.636	40.45
Academic Advising Staff			.563	31.70
Extracurricular Activities			.680	46.24
Residence Living			.538	28.94
Least Red Tape			.551	30.36
Enrolment			-.481	23.14

Mann-Whitney U Tests

Mann-Whitney U tests assessed (a) whether students were more satisfied at high-ranking institutions, (b) whether students were more satisfied at universities with a better reputation, and

(c) whether students were more satisfied at larger enrolment universities. To examine the following hypotheses, only significant predictors from the canonical correlation analyses were included in the Mann-Whitney U tests. First, as per Huang et al.'s (2014) *famous-school complex* in which students prefer to attend the best universities, it was hypothesized that students at higher-ranking institutions would report significantly higher levels of satisfaction than students at lower-ranking institutions. Results showed that high-ranking universities had significantly higher mean ranks than lower-ranking universities on 67% of the variables included in the analysis. Higher-ranking universities had significantly better reputations, satisfaction, instructors, student life staff, administrative staff, advising staff, extracurricular activities, experiential learning, and reputations than lower-ranking universities. First-year students reported more supportive environments at higher-ranking universities, and senior-year students reported better qualitative reasoning, more discussions with diverse others, higher quality interactions, a greater likelihood to rate their overall experience as good or excellent, and that they would very likely return to the same institution for additional study. Although one may expect higher-ranking universities to outperform lower-ranking universities on more than two-thirds of the indices, these results are somewhat promising considering past studies have found uninterpretable relationships between rank standings and other *Maclean's* indices (i.e., high versus low-ranking universities only significantly differ on approximately one-quarter of the total indices) and *Maclean's* rank standings are typically ineffective at reflecting results of available studies of student satisfaction (Brooks, 2005; Cramer et al., 2016; Page et al., 2010).

Next, it was hypothesized that students at universities with a poor reputation would report significantly higher levels of satisfaction than students at universities with a good reputation. This reasoning was based on a twenty-year trend that high-ranking institutions do not always

rank high in the reputational survey, including the subjective methodology behind *Maclean's* reputational survey − even though some studies around the world have found institutional reputation to be the strongest predictor of student satisfaction (Alves & Raposo, 2007; Cramer & DeBlock, 2020). Universities with a good reputation had significantly better extracurricular activity, qualitative reasoning, discussions with diverse others, and likelihood that students would return than universities with a poor reputation. Universities with a good reputation also, unsurprisingly, showcased larger enrolments. Interestingly, overall rank was not significantly different between institutions with good versus poor reputations, and no significant differences were found between universities based on reputation on any of the first-year NSSE variables. These results are consistent with Duarte et al. (2010) categorization of the many caveats that comprise university image. It can be contended that the significant outperformance indices integrate all the different factors: enrolment (an institutional factor), extracurricular activity, and discussions with others (a social factor), qualitative reasoning (an academic factor), and likelihood that they would return to the same institution (an individual factor). Nevertheless, one would expect more than one or two variables from each factor to be significantly different since the reputation of an institution has been the strongest predictor of student satisfaction in most studies (Alves & Raposo, 2007).

Lastly, considering *Maclean's* magazine (2007) study of student satisfaction surveys which found that smaller universities generally had more satisfied students than larger, research-oriented universities, it was hypothesized that students at smaller universities would report significantly higher levels of satisfaction than students at larger universities. Smaller-enrolment universities performed significantly better than higher-enrolment universities in terms of quality interactions, supportive environment, and overall experience among first-year students, and

student-faculty interaction, quality interactions, supportive environment, and overall experience among senior-year students. Surprisingly, smaller universities had a better rank than larger universities, and, unsurprisingly, larger universities had significantly more discussions with diverse others and better reputations than smaller universities. This hypothesis was supported since smaller universities had significantly better performance on more variables than did larger universities.

Exploratory Cluster Analysis

Additionally, an exploratory cluster analysis examined patterns of interrelationships among the universities. This analysis was conducted post-hoc, thus no hypotheses were generated. The cluster analysis was difficult to interpret, so a one-way ANOVA was then conducted to identify the unique characteristics of the clusters. Cluster 1 consisted of 13 mid-size universities with high scores across all indices; Cluster 2 consisted of 9 smaller and low-performing universities; Cluster 3 consisted of 9 universities that were the smallest with the poorest reputations but performed better than Cluster 4 on the majority of indices; and Cluster 4 consisted of 14 universities that had the best reputations and highest enrolment, but otherwise did not perform as well as Cluster 3. Group sizes were fairly equivalent, and each cluster contained a mix of Medical/Doctoral, Comprehensive, and Undergraduate universities which suggests that universities across university categories are not so different in terms of engagement and satisfaction. These findings are consistent with other studies that utilize *Maclean's* data and persistently find that universities of different types turn out to be empirically similar in terms of their scores on various indices (Cramer et al., 2016; Cramer & Page, 2007; Page & Cramer, 2001, 2004; Page et al., 2009, 2010).

2020/2021 Analyses

The current study also aimed to comparatively analyze the 2020/2021 NSSE results following the same statistical protocol as the 2017/2018 analyses; but, due to a lack of interpretable data, the same procedure could not be followed. Consequently, the 2020/2021 analyses were included for exploratory and thematic identification purposes only.

Principal Components Analyses

First, to overcome the multicollinearity/singularity issue that inhibited canonical correlation analyses, PCAs examined how many components appeared among the NSSE variables. The first-year PCA extracted two components, renamed *Learning Constituents* and *Teaching Tools*. *Learning Constituents* was comprised of engagement indicators from NSSE's Academic Challenge and Learning with Peers themes, and *Teaching Tools* was comprised of engagement indicators from NSSE's Experiences with Faculty and Campus Environment, with the inclusion of learning strategies (from the Academic Challenge theme).

The senior-year PCA extracted three components, renamed *Diversity and Application*, *Interactive Learning*, and *Learning Environment*. *Diversity and Application* was comprised of qualitative reasoning, collaborative learning, and discussions with diverse others; *Interactive Learning* was comprised of higher-order learning, reflective and integrative learning, effective teaching practices, and quality of interactions; and *Learning Environment* was comprised of learning strategies (from NSSE's Academic Challenge theme), student/faculty interaction (from NSSE's Experience with Faculty theme), and supportive environment (from NSSE's Campus Environment theme).

Multiple Linear Regression

The abovementioned components were then utilized for exploratory model building by conducting linear regression (multiple regression stepwise method) analyses. Retention, or the proportion of students who graduate, contributed positively to *Learning Constituents* (i.e., higher order learning, reflective and integrative learning, qualitative reasoning, collaborative learning, and discussions with diverse others) among first-year students. As retention was the only variable that contributed to the two components in the first-year analysis, further exploration of this variable is warranted. For senior-year students, further exploration of the influence that retention, student services, mental health, and academic advising staff has on diversity and application; experiential learning and enrolment has on interactive learning; and steps taken to prevent sexual assault has on the learning environment is recommended.

Wilcoxon Signed Rank Test to Compare 2017 and 2020

Lastly, a Wilcoxon Signed Rank Test was conducted to identify any differences between the 2017 and 2020 timepoints for Brandon, Laurentian, Manitoba, McGill, Memorial, Ryerson, Simon Fraser, Toronto, Victoria, Waterloo, and Windsor. We found statistically significant differences with 2017 having significantly higher mean scores according to: quality of interactions and supportive environment among first-year students and qualitative reasoning, collaborative learning, discussions with diverse others, reflective and integrative learning, supportive environment, student faculty interaction, and quality of interactions among senior-year students. Enrolment also differed by year, which indicated that there were more students enrolled in 2017 than 2020, and in 2020 we observed improved reputation scores. Further exploration of these variables and their influence on senior-year students, if a more comprehensive dataset becomes available, is recommended.

Implications

Whereas there is some debate whether university image directly impacts satisfaction, the results of the canonical correlation analyses suggest that reputation indeed plays a significant role, but only among senior-year students. This could be due to high expectations and the *famous school complex* whereby senior-year students could ultimately be more satisfied if they attended the *best universities* and thus graduated among the best, and senior-year students' perceptions of their return on investment as they near graduation and prepare for entry into the workforce (Huang et al., 2015; Khan & Hemsley-Brown, 2021). Reputation was also significant when comparing high- versus low-ranking universities and when comparing smaller versus larger enrolment universities. Higher-ranking universities had better reputations than lower-ranking universities, but when larger and smaller universities were compared, there was an inverse relationship between rank and reputation. Smaller universities had better overall ranks than larger universities, but larger universities had better reputations than smaller universities. The results were fairly consistent with Alves and Raposo's (2007) findings that institutional reputation was the strongest predictor of student satisfaction; reputation was the strongest predictor, followed closely by rank, but only for senior-year students. Yet in terms of significant differences between universities when compared based on their overall rank, reputation, and size, high- versus low-ranking universities differed on the most indices and universities with a good reputation versus universities with a poor reputation differed the least. As such, further investigation of the causal relationship between rank and satisfaction is advised. These findings are, however, consistent with the twenty-year trend that rank and reputation are not reliably correlated as one would expect similar scores across rank and reputation (Cramer & DeBlock, 2020).

In addition to examining high-versus low-ranking universities, we also examined universities based on both size and reputation. Unsurprisingly, like Belanger and Davidson (1997), our results suggest that larger universities have more diverse campus environments and better reputations. Likewise, students at smaller universities are more engaged and satisfied ("Students Happier," 2007) and have more support from their instructors (Wang & Calvano, 2022); but, our index comparison of small versus large universities only indicated that students from small universities are more engaged. No *Maclean's* student satisfaction variables (including course instructors) were significantly different between small and large universities although the educational environment was more supportive. These results indicate that larger universities could benefit from either allocating more resources toward staff services or better promoting the availability of such services and perhaps mass marketing of events given the number of students they should reach. The most curious finding, however, may be that universities with a good reputation and universities with a poor reputation differed the least. Interestingly, whereas overall student satisfaction was a significant predictor of engagement in our study, the only significant difference in overall student satisfaction was found between high- and low-ranking universities. These results suggest that students from small versus large universities and students from universities with good versus poor reputations are reasonably equivalent in their overall satisfaction and engagement, but students are indeed more engaged and satisfied at high-ranking institutions than they are at low-ranking institutions.

As a result of examining both the nationally renowned *Maclean's* magazine and NSSE concurrently, some useful discoveries were made that could be more reflective of an authentic student experience in a Canadian context and on a national scale. The results of this study can be utilized to provide valuable insight into variables that influence student satisfaction at the

selected 49 public institutions in Canada as reported by *Maclean's*. It would be interesting to comparatively analyze two timepoints if results were to be shared again by an outlet like *Maclean's* (as they did in 2017/2018) because, as we encountered, obtaining a dataset that has an adequate sample size and enough statistical power is nearly impossible otherwise. Further investigation could enhance institutional responses and improve student recruitment, loyalty, retention, and the institutions' image. Moreover, the results of this study could help lead to greater accountability and persuade against deceit from occurring by making aware the salient predictors of student satisfaction and differences between universities to better inform prospective students' university selection.

Organizational Branding

A good organizational brand is crucial for any successful organization, and a poor organizational image may be tremendously hard to rebound from (Aghaz et al., 2015). To become and even remain successful, organizations must manage their public images effectively (Polat, 2011). Attempts to maintain a good organizational image may be of considerable concern now as many businesses suffered hardships throughout the pandemic. Relatedly, if *Maclean's* ranks an institution low then it may be more difficult to rebound from negative consequences exacerbated by the pandemic, especially for universities that do not have an abundance of funds to do so. As a result, universities may be tempted (as some have done) to provide misleading or inaccurate information in order to increase their standing and entice prospective students (Fox Business, 2022). Low rankings and poor reputations could also lead institutions to raise their tuition fees in order to produce more resources to promote their organizational image – a response that would not likely please the students but an outcome the institutions may desire (Meredith, 2014). Consider Laurentian University's financial mismanagement as an example.

Laurentian has historically been a lower-ranking university with a poor reputation with among the least satisfied students, but since their insolvency was announced in 2021, they have fallen to the lowest ranking university in the Primarily Undergraduate category with the worst reputation and the least satisfied students. Insolvency (Lysyk, 2022) combined with *Maclean's* rankings, national media coverage, and declining enrolment may be impossible to recuperate from, so it will be especially interesting to observe Laurentian's evolvement in forthcoming years. As a result of the insolvency, Laurentian's students may be at great risk for issues with self-esteem and perceived intellectual ability as per Huang et al.'s (2014) "famous school complex" as students not only prefer to attend the best universities, but also be among the best in that university. Attending this now "famous school" could be especially problematic for students when grade distributions are considered as those with lower grades would be at an even heightened risk of ill effects than students with higher grades. Self-esteem, perceived intellectual ability, and grade distributions, in turn, could also be influenced by the implications the financial crisis has had on Laurentian's faculty and student services staff. Consequently, it would be advantageous to include not only updated grade distribution figures but also students' perceptions of and satisfaction with their grades along with their expectations of achievement to better understand this link in future years.

Correspondingly, there are also issues when national ranking practices are compared to global rankings (Çakır et al., 2015). Consider that Canadian and American institutions are ranked against Chinese institutions in global ranking exercises as an example. American institutions, especially Ivy League universities, such as Harvard, Princeton, and Yale, have exemplary organizational images and have spent hundreds of years branding, but are falling in the national rankings because some countries are able to conduct innovative research without ethical

restrictions that exist in North America (Chang, 2022). Chinese institutions are increasing their standings in global rankings because global rankings tend to favour science and technology, and researchers in China are able to conduct experiments that researchers elsewhere would not be able to conduct due to ethical restrictions and potential hazards to participants. Thus, global rankings ultimately provide capricious and uninformative evaluations since the institutions included cannot be practically compared based on the country's ethical boundaries.

Effects of the COVID-19 Pandemic

Although desired, a comparison of pre- and mid-COVID19 pandemic could not be adequately conducted as too few institutions were included in the 2020-2021 NSSE dataset due to a lack of publicly available information. Further, as there is no standardization of survey administration, it would be advantageous for institutions to release the surveys at the same time and release their results publicly, so prospective students could make a more informed choice. Standardization of survey administration would also be advantageous for administrators as they could better determine whether there were any effects brought forth by the pandemic as it relates to satisfaction, engagement, and wellness of their students in virtual educational environments, which could prove beneficial given the future's uncertainty. More specifically, indices such as extracurricular activities, experiential learning, residence living, and campus environment would have been significantly impacted by the pandemic because campuses were closed, albeit for different lengths dependent on the province, throughout the pandemic. Unfortunately, this study could not investigate the impact of the pandemic because too few institutions reported their 2021 NSSE results publicly or in an interpretable manner. Likewise, *Maclean's* did not incorporate COVID-related indices in their 2021 or 2022 rankings and 2020 NSSE surveys were at various points of data collection depending on the institution's release date as the sudden shift to online

learning occurred. For example, students at Brock University had until late May to complete *Maclean's* student satisfaction survey whereas students at York had until September (Titone, 2021; York University, 2021). Had the results been reported, they would have helped inform this study and provided valuable insight. Findings then could have been considered by administrators and contributed to a more thorough understanding of their students' needs and, if required in the event of another health crisis, additional and innovative supports to nurture their students' wellness could have resulted. We note, however, that with the small sample and lack of uniformity in institutional reporting, inferences from 2021 cannot adequately be drawn. Nonetheless, it remains a worthwhile consideration since student satisfaction can differ based on the data collection method used and the time at which the data were collected (Appleton-Knapp & Krentler, 2006). It is recommended that survey administration become more standardized, and institutions (made aware of this) aim to administer their surveys, especially those that are used for comparisons, at approximately the same time.

Cautions and Considerations

Recently, Columbia University (an ivy league university) and the University of Southern California made headlines and are subjected to legal action for submitting outdated statistics and doctoring their institutional rankings in a subversive effort to lure students (Fox Business, 2022; Khaki Sedigh, 2016; Moshtaghian, 2022). Obviously, fabrication of data by institutions has several consequences. First, national and international media coverage of such events would negatively influence the institutions' rankings and reputations and the well-being of the students who attend them. The *famous school complex* in which students want to attend the best universities, but said students come to find out it may have been the *best* only because of years of dishonesty could lead to negative well-being among many. The social identity theory states

students' self-concept and self-esteem derive not only from personal identity and accomplishments or failures, but also from the status and accomplishments or failures of the university in which they attend (Haslam et al., 2009; Jackson & Smith, 1999). Students who may have 'basked in reflected glory' of their prestigious university's accomplishments could quickly turn from experiencing feelings of pride to feelings of shame (Cialdini et al., 1976). This sudden shift could have consequences for students' identity and esteem if greater emphasis was placed on the accomplishments of the university than on one's personal achievements. In terms of the self-fulfilling prophecy and expectations, students that attend these institutions could immediately expect that their professors, courses, and services are of lower quality, even when that may not necessarily be accurate (Jussim & Harber, 2005).

Another consequence of institutions providing misleading information is that integrity in academia is compromised. Universities expect their students to abide by Senate Bylaws with respect to Academic Integrity and Student Codes of Conduct. When universities themselves participate in dishonest practices, it sets an example for their students and their students too may become dishonest. This is especially concerning given the newly released artificial intelligence chatbot, ChatGPT, which makes it harder to detect plagiarism and could jeopardize academic integrity at institutions around the world (Fazackerley, 2023). Although this surfaces as a new concern, students who attend institutions that fabricate their statistics may be more apt to alter their own work and submit plagiarized documents. Due to the self-fulfilling prophecy, and the relationship between prior experience and social influence, if students expect that their university participates in dishonest practices, they may believe that this is common and therefore acceptable behaviour (Alzahrani & Seth, 2021; Jussim & Harber, 2005). These beliefs tend to compound

over time; so, if a student alters their work as a first-year student, they will be strongly influenced to also do so as a fourth-year student.

Consistent with past research, our findings support the notion that institutional image is more important to students than measured qualities of university employees and university endowment (Stephenson et al., 2016). These findings also support the notion that the indices *Maclean's* uses are not most accurately geared towards student consumers' true satisfaction. That said, university experiences are highly individualistic; so too, no student has all positive or, contrastingly, all negative experiences. Regardless of *Maclean's* rankings or NSSE results, a student could still be highly satisfied with their choice, but, unquestionably, in order to best choose the most suitable university, prospective students must consult a number of sources (Axelrod, 2010). These findings provide valuable insight, however, because student consumers may not have the resources, ambition, or time to explore what is truly important (it could be that they do not quite yet know what is important to them) and are thus reliant on such things as *Maclean's University Rankings*, high-school teachers and guidance counsellors, and what they read online and hear from other people about certain institutions. These individuals that prospective students consult may not understand the methodology behind *Maclean's* ranking system or have the statistical knowledge necessary to read and interpret the tables. Similarly, students in their first and second year may not yet know or realize what is truly important to them as they may be primarily concerned with navigating academia and obtaining a certain GPA.

Further, participant demographics could influence satisfaction scores and levels of engagement; thus, demographic information should be provided or accessible because gender differences have been found and non-traditional, or mature/returning, students may have much different experiences than their traditional-aged counterparts. Dean and Gibbs (2015) advise that

the student experience must not be deemed a homogenous concept and policy should be addressed to specific groups. Each year NSSE provides a 'Canadian Respondent Profile' which offers some insight about participants' demographic information, such as the participating institutions location and response rate, and the gender, age, and ethnocultural information of respondents. It may also be worthwhile to note that instead of relying on *Maclean's* or others to provide them with information, prospective students should visit the institutions and talk to faculty and current students at open houses or recruitment fairs in order to get a feel for the campus and surrounding community to determine their best option. However, since in-person open houses and recruitment fairs were stalled during the pandemic, many prospective students may have been left to rely on *Maclean's* rankings and limited to online open houses. Many students may have made uninformed and disadvantageous decisions as a result, and the availability of such data could bring rise to potential issues associated with the wrong choice and help safeguard any ill effects that may have arisen from occurring in the future.

All the aforementioned considerations should be concerning due to the negative effects rankings can have on students' well-being and overall educational experience considering psychological theories and concepts, such as the self-fulfilling prophecy, self-efficacy, the *famous school complex*, and social integration (Bini & Masserini, 2016; El Ansari et al., 2018; Haslam et al., 2009; Jackson & Smith, 1999; Kareem et al., 2022; Seligman, 2013). As of late, the potential negative effects may be particularly alarming since Canada experienced halted in-person visits to university campuses as a result of the health restrictions put in place by the government to stop the spread of COVID-19. As a result, it can be presumed that even more prospective students relied on *Maclean's* university rankings and virtual recruitment methods recently, than they did in years past, to make their selection as most would not be aware of the

existence of NSSE. Even if prospective students were aware of the NSSE data, they would have been limited to merely one quarter of Canada's public universities. From 2020 throughout 2022, university recruitment methods were principally virtual. On a positive note, the Ontario Universities Fair held in Toronto, as an example, welcomed universities and visitors back to in-person recruitment efforts for 2022 after holding the fair virtually for two years.

Lastly, considering the significant components of student engagement and student satisfaction and similarities and differences between student engagement and satisfaction at the various institutions in Canada, subsequent research that leads to the development of theoretically sound and empirically based policies could enhance students' experiences. Similarly, results of this study could be considered in conjunction with findings from previous research to be used to inform the enhancement and advancement of problematic, ambiguous, and irrelevant ranking indices.

Limitations

To obtain data for the analyses, there was complete reliance on *Maclean's* University Rankings and *Maclean's* reporting of the 2017 NSSE results as well as each institution's website for 2020 NSSE data. Although some universities in 2020 (i.e., Carleton and Ottawa) provided unweighted means, it was insufficient to include in the analyses. With respect to missing data, some universities did not provide figures: Guelph, UOIT, Ottawa, Ryerson, Toronto, and Waterloo for average class size as an example, and thus average class size was left out of the canonical correlations. Moreover, the figures that *Maclean's* provided were not always up to date or accurate; for example, with the exception of one university, the 2022 issue features average class size figures for undergraduate classes from the fall of 2018 − in other words, *Maclean's* has provided the same figures for that index for the past five years. Outdated data are a common

problem in Canadian analyses, as evidenced by Grayson's (2020) study. Since research shows significant differences in student satisfaction and engagement dependent on class-size (El Ansari & Oskrochic, 2006), it may have been fruitful to examine this in a Canadian context because there is no general consensus on the impact of class size (Cheng, 2011).

While there was a complete dataset for 2017, there were missing data and a lack of uniformity with institutional reporting in 2020. The 2020/2021 dataset only included 11 universities because that is all that post their results publicly on their institutional websites or in a manner that is appropriate to interpret statistically and comparatively. Ottawa and Ryerson, for example, provided uninterpretable mean scores as they were not weighted. Weighted scores could not be calculated because not enough information was provided by the institutions for us to do so. Other institutions offered only a snapshot of their results which too could not be utilized in this study. Consequently, statistical stepwise regression, which is a controversial method with debated utility, was used as it is deemed useful when employed to develop a subset of independent variables for the purpose of predicting the dependent variables (Tabachnick & Fidell, 2019). In this case, statistical regression was regarded as appropriate since it offered a solution to the problems encountered with the 2020/20201 dataset.

Additionally, a major problem recognized by ranking researchers in the United States of America that can be applicable to Canada as well, and likely a number of institutions around the world, is that many universities have a number of campuses, and it is not always clear which campus(es) were included to inform the ranks (Moed, 2017). As it is not explicitly stated, institutions may combine scores and average them, collect data from only one campus, and/or provide results from the better performing campus. This is problematic as it may provide inaccurate information to prospective students, and it is a limitation to this study as which

campus or the methodology for reporting, for the most part, were not specified. Consider Western University as an example. Western has the large main campus with more than 35 000 students enrolled annually as well as the smaller affiliates Brescia University College and King's University College. Students at Brescia and King's would likely be enrolled in smaller classes and get enhanced student experiences than they would at the main Western campus, but it is unclear which campus(es) inform Western's ranked scores. As a result, and to remain consistent, even when campuses were specified, they were combined and averaged, and the communal score was utilized in our analyses.

Another limitation of this study is that it was restricted to public institutions in Canada that possess certain characteristics as required by *Maclean's* for inclusion in their annual ranking exercise. As NSSE is not limited to public institutions, it could be beneficial to include private universities (such as Quest, Saint Paul, Ambrose, and Trinity Western) in order to compare public to private educational engagement and satisfaction of students − but this would be limited to NSSE scores as *Maclean's* does not report on or provide rankings for private universities. Perhaps this feat could be accomplished via a special issue that includes similar variables or a nation-wide study that explores similar and relevant variables.

A special issue or national study could explore demographic characteristics, such as student age, student status (i.e., domestic versus international), and enrolment status (i.e., full versus part-time students), and investigate the interactions they have on engagement and satisfaction. Until institutions are committed to being fully transparent and there is standardization with survey administration though, this seems like an impossible undertaking. The development of a mixed-methods survey would permit students to respond in their own words and not select from closed-ended responses and as a result could offer a much richer set of

data and ultimately a better understanding of true student satisfaction. We recommend a mixed-methods survey be administered to only a few Canadian institutions initially due to the time and resources needed to construct the survey, interview participants, code the data, and ensure it is a psychometrically sound measure. Once such a survey has been deemed reliable and valid, it should be publicly available and allow nationwide participation to ensure the voices of all student consumers are afforded the opportunity to be heard. Furthermore, longitudinal studies that survey students upon entering university and then again before they graduate could be beneficial − although there is a greater risk of attrition with these surveys. This would also permit cross-sectional analyses in which junior students (first and second year) are compared with senior students (third and fourth year). These suggestions would offer more transparency as rankings in and of themselves are often not all too informative.

Also, there are many potential confounding variables that there is no way of measuring given the current methods of data collection employed by *Maclean's* and NSSE or describing using the correlations or associations found in this study. As an example, the conclusion that senior-year students are more satisfied than first-year students could be due to the fact that they are happier that they are nearly finished university, more satisfied as they do not need to worry about student life anymore as they near graduation, and they have years of education behind them in which they have learned how education works, what is required of them, and how to best get the most out of their experiences each day. It is also worth mentioning that the majority of fourth-year students are a subset of those who started out in the first year and did not drop out, 'fail', or transfer, but this is not necessarily true for all students. Thus, including an item on the survey asking fourth-year students if they completed their entire degree at their current institution and, if applicable, a question asking why they transferred could be advantageous. Although first-

and senior-year students both face stressors, the stressors they face can be vastly different from one another. More transparency and uniform institutional reporting along with the addition of relevant survey items could permit further examination of pertinent constructs that may not otherwise be clear.

Future Directions

Current surveys could benefit from a re-evaluation and possibly a reconstruction as it is anticipated that some items would be kept, others would be dropped, and new items would be created. This would result in either a brand-new student satisfaction survey or a heavily revised version. New questions could pertain to students' perceptions of the value of the education that they were expecting compared to what they are receiving and information about their university's rank and their anticipated ROI. Questions about a university's rank and reputation and how influential they are towards students' satisfaction would permit further investigation of the causal relationship between rank and satisfaction and reputation and satisfaction. Students could be provided several variables and asked to rank them in order of most important to least important towards their overall satisfaction, with an opportunity to provide a write-in response if something important to them is not on the list provided. Further, more demographic information could be collected as there are likely similarities and differences that are not well-represented using the current surveys, for example, full-time versus part-time students. As such, it is recommended that the new survey invite all students to respond. Inviting all students to respond would provide a better understanding of engagement and satisfaction of students based on their student status as well as enrolment status. This is particularly important because student satisfaction is recognized as a critical factor in attracting and retaining students; and part-time students in Ontario have been documented as a growing segment of the post-secondary population, and barriers, such as a

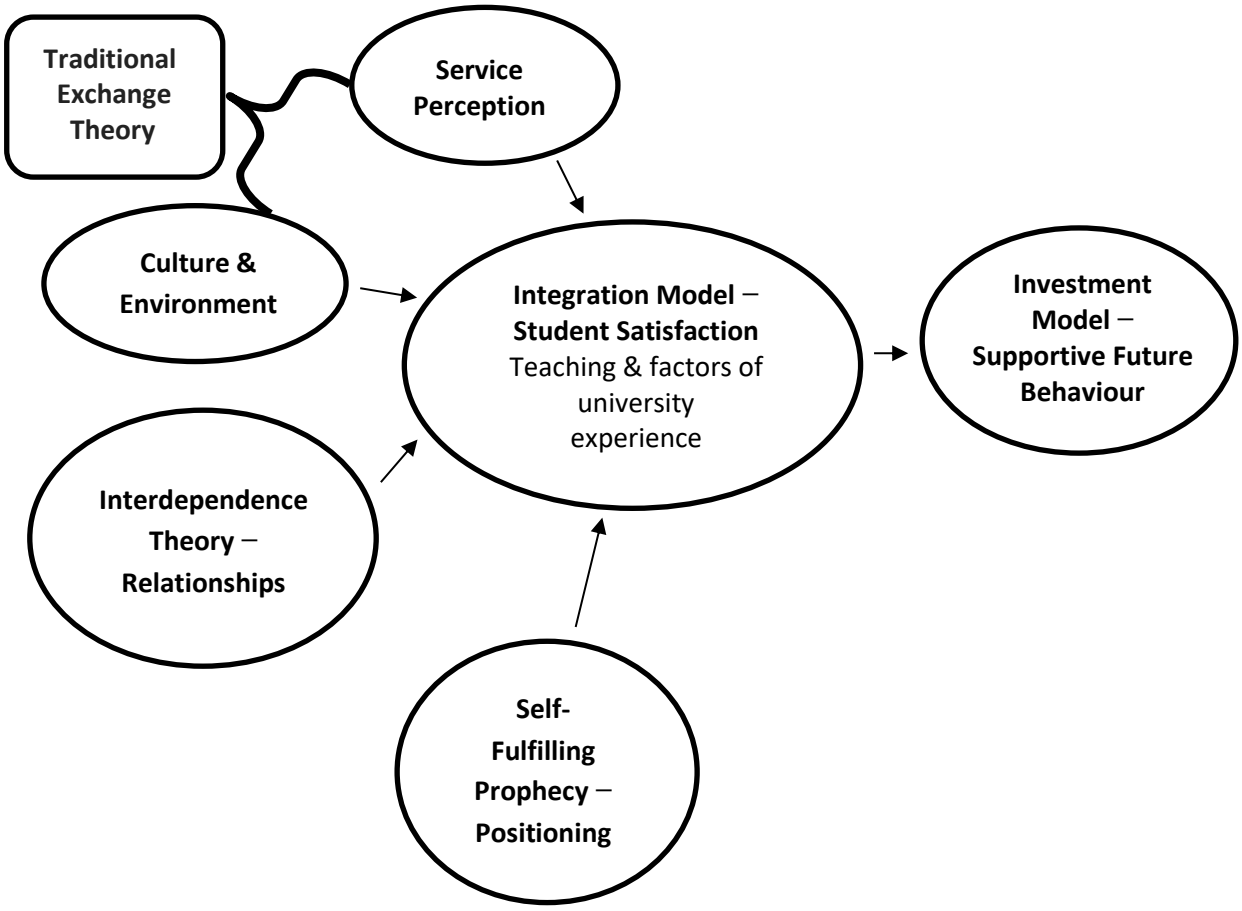
lack of access to financial aid opportunities, inadequate support services, and the inability to integrate with their campus communities leave them underrepresented and often overlooked (Santini et al., 2017; Seston et al., 2018). Lastly, questions about students' perceptions of teaching and research quality and course organization (including class offerings and schedule) could offer students an occasion to provide a glimpse of their global experience, not limited to an evaluation of each individual instructor near the conclusion of a course, as they may not get an opportunity to do so otherwise.

Future research could build upon the present findings and address questions that remain unanswered in a number of ways. Data reduction techniques could be used to analyze 2017/2018 data as there is a full dataset available. This could be accomplished by conducting principal components analyses (as was done with the 2020/2021 data in this study). Doing so would reduce the number of variables without losing too much information from the large dataset. This could permit the inclusion and investigation of the relationship between more *Maclean's* indices (not included in this study) and student satisfaction, as there are so many. Significant findings from various data reduction techniques could also offer researchers a new direction.

We propose a new direction, as depicted in Figure 4: an adapted model of Jurkowitsch et al.'s (2006) student satisfaction integrating psychological theories. Investigation of and survey questions that repose upon Traditional Exchange Theory to students' perceptions of services and the university's culture and environment; the Interdependence Theory and relationships; self-fulfilling prophecy and the reputation (or positioning) of the university; the Integration Model on student satisfaction; and the Investment Model towards supportive alumni behaviour.

Figure 4

An Adapted Model of Student Satisfaction Integrating Psychological Theories



The findings of this research can be a basis for forthcoming studies, whether investigations of interinstitutional or intrainstitutional student engagement and satisfaction. It would be beneficial and virtuous for *Maclean's* to make publicly available NSSE results as they did for 2017/2018 every five or ten years and not limit the release to a single instance (as it is currently). Regardless, future research would do well to concentrate on operationally defining and measuring student engagement and satisfaction constructs in a consistent manner. If NSSE results from more Canadian universities become available, future research could build upon this

framework in a new context and compare student engagement and satisfaction across years. This would also permit examination of indices pre- and mid/post-pandemic. As Bennet and Kane (2014) caution, students' interpretation of questionnaires, the likelihood of participation in such studies, and the WEIRD factor (Muthukrishna et al., 2020), there remains a problem with the utility of student assessments without standardized language and proper understanding. Moreover, as there have been concerns with the utility and validity of student surveys and marketing literature in the past, this research could provide a foundation for supplemental cognizance that could assist with solutions to the momentous consequences that may arise from ranking exercises and contribute to student satisfaction (Deeley, 2019).

As previously stated, NSSE results for this study were obtained via *Maclean's* website for the 2017/2018 year. Among these *Maclean's* data, results of NSSE's survey for some of Canada's public and small universities (that are not part of *Maclean's University Rankings* nor included in this study) were incorporated. In the future, a comparative analysis could be conducted that compares a more diverse HEI population by replacing *Maclean's* Rankings with another outcome variable, such as data obtained from the *Rate My Professors* webpage. This would, although not without limitations, permit study of variables in which students anonymously rank both public and private universities in areas including but not limited to overall quality, safety, location, facilities, happiness, and reputation, and post reviews about professors and courses for other students.

Students at large universities reported significantly higher discussions with diverse others than small universities, but surprisingly, promoting Indigenous visibility was not significant. Possible reasons for this could include students' knowledge of Indigenous affairs, their awareness of Indigenous events, activities, or celebrations on and around campus, or perhaps the province in

which university is located. As of 2021, to graduate with a Bachelor of Arts at the University of Manitoba, it is mandatory for students to take a course with Indigenous content to better understand the place of Indigenous people throughout Canada's history ("Faculty of Arts," 2021). Hopefully, that same strategy will be implemented nation-wide and become compulsory at not only post-secondary university institutions, but all of Canada's public institutions. These results also suggest that students from small and large universities and students from universities with good and poor reputations are rather equivalent in their overall satisfaction and engagement, but students are more engaged and satisfied at high-ranking institutions than they are at low-ranking institutions − future research would do well to explore this.

Since NSSE is administered in the United States as well as Canada, future studies could address the same research question(s) in a different location. Results from the NSSE survey could be comparatively analyzed against the university rankings from the USNWR. Likewise, the UK-wide NSS could be comparatively analyzed against the university rankings from THE. Although it would not pertain to Canadian universities, conducting the same research in new contexts and locations would address and overcome the sample size limitation we experienced in our 2020/2021 analyses. A study with the same research questions could be conducted with a larger sample size as there are far more universities in other countries across the globe, such as China, Japan, the United Kingdom, and the United States, than there are in Canada. A total of 531 U.S. universities were invited to participate in NSSE 2020, and four-hundred institutions are eligible to take part in the UK-wide NSS, compared to just 65 in Canada (National Student Survey, 2023; NSSE, 2020).

Conclusion

This study examined whether (1) NSSE's engagement theme indicators can predict *Maclean's* student satisfaction and indices related to positive student outcomes, and (2) the nature by which significant differences exist between high- and low-ranking universities, universities with a good reputation and universities with a poor reputation, and smaller and larger enrolment universities. We found that there was a significant relationship among many (but not all) variables, and as anticipated, the significant predictors varied for first-year and senior-year students. Moreover, students at high-ranking institutions were more engaged and more satisfied than students at low-ranking institutions; fourth-year students at universities with a good reputation were more engaged and more satisfied than fourth-year students at universities with a poor reputation; and students at smaller-enrolment universities were more engaged and more satisfied than students at larger-enrolment universities. These findings are important for a number of reasons, including the effects on students' health and wellness, ethical issues that have arisen due to fabrication of statistics from university administrators, and the decline of integrity in academia that can ensue. Since the findings suggest that first-year students are rather equivalent, but more differences exist between senior-year students at the various public institutions across Canada, further exploration of satisfaction variables among third- and fourth-year students is necessary to understand these differences. Lastly, universities across Canada have recently welcomed back faculty and students in-person and without COVID restrictions; consequently, the need for precise and pertinent data vis-à-vis each institution is imperative for the reason that detrimental effects on students, institutions, and their surrounding communities could emanate and endure. University administrators should take note as contained herein is what really seems to satisfy their consumers − Canada's students.

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APPENDICES

Appendix A: NSSE Engagement Theme Indicators and Items

Academic Challenge

Higher-Order Learning

During the current school year, how much has your coursework emphasized the following:

- Applying facts, theories, or methods to practical problems or new situations
- Analyzing an idea, experience, or line of reasoning in depth by examining its parts
- Evaluating a point of view, decision, or information source
- Forming a new idea or understanding from various pieces of information

Reflective & Integrative Learning

During the current school year, how often have you

- Combined ideas from different courses when completing assignments
- Connected your learning to societal problems or issues
- Included diverse perspectives (political, religious, racial/ethnic, gender, etc.) in course discussions or assignments
- Examined the strengths and weaknesses of your own views on a topic or issue
- Tried to better understand someone else's views by learning how an issue looks from his or her perspective
- Learning something that changed the way you understand an issue or concept
- Connected ideas from your courses to your prior experiences and knowledge

Learning Strategies

During the current school year, how often have you

- Identified key information from reading assignments
- Reviewed your notes after class
- Summarized what you learned in class or from course materials

Quantitative Reasoning

During the current school year, how often have you

- Reached conclusions based on your own analysis of numerical information (numbers, graphs, statistics, etc.)
- Used numerical information to examine a real-world problem or issue (unemployment, climate change, public health, etc.)
- Evaluated what others have concluded from numerical information

Learning with Peers

Collaborative Learning

During the current school year, how often have you

- Asked another student to help you understand course material
- Explained course material to one or more students
- Prepared for exams by discussing or working through course material with other students
- Worked with other students on course projects or assignments

Discussions with Diverse Others

During the current school year, how often have you had discussions with people from the following groups:

- People from a race or ethnicity other than your own
- People from an economic background other than your own
- People with religious beliefs other than your own
- People with political views other than your own

Experiences with Faculty

Student-Faculty Interaction

During the current school year, how often have you

- Talked about career plans with a faculty member
- Worked with a faculty member on activities other than coursework
- Discussed course topics, ideas, or concepts with a faculty member outside of class
- Discussed your academic performance with a faculty member

Effective Teaching Practices

During the current school year, to what extent have your instructors done the following:

- Clearly explained course goals and requirements
- Taught course sessions in an organized way
- Used examples or illustrations to explain difficult points
- Provided feedback on a draft or work in progress
- Provided prompt and detailed feedback on tests or completed assignments

Campus Environment

Quality of Interactions

Indicate the quality of your interactions with the following people at your institution:

- Students
- Academic advisors
- Faculty
- Student services staff (career services, student activities, housing, etc.)
- Other administrative staff and offices (registrar, financial aid, etc.)

Supportive Environment

How much does your institution emphasize the following:

- Providing support to help students succeed academically
- Using learning support services (tutoring services, writing center, etc.)
- Encouraging contact among students from different backgrounds (social, racial/ethnic, religious, etc.)
- Providing opportunities to be involved socially
- Providing support for your overall well-being (recreation, health care, counseling, etc.)
- Helping you manage your nonacademic responsibilities (work, family, etc.)
- Attending campus activities and events (performing arts, athletic events, etc.)
- Attending events that address important social, economic, or political issues

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