

**Degrees of Opportunity:
Broadening Student
Access by Increasing
Institutional
Differentiation in Ontario
Higher Education**

report

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Executive Summary

The primary objectives of this paper were to determine whether there are significant gaps in Ontario's postsecondary education system with respect to education and research activities, with particular attention to activities connoted by the term “polytechnic”, and if so, to consider how to address such gaps. In response to the first part of our task, we identified three major gaps in Ontario's postsecondary education system: a free standing, degree-granting, primarily teaching-oriented institution that concentrates on undergraduate education; an open university that would expand accessibility and enable learners to combine credits from different institutions and different types of learning experiences; and effective pathways for students who start their postsecondary education in a college to attain a baccalaureate degree and be able, if they are so inclined, to continue on to graduate study.

We did not find compelling evidence that there is a shortage of opportunity for polytechnic education in Ontario. Presently students are able to draw upon Ryerson University and the University of Ontario Institute of Technology (UOIT), a modest but growing number of joint university-college programs, and baccalaureate and diploma programs of the colleges. In addition, many students create a polytechnic experience for themselves through transfer from a university to a college or from a college to a university, though more needs to be done to improve opportunities of the latter type.

Also, we think that there are some other good reasons for not designating some colleges as polytechnic institutions. The term polytechnic is fraught with ambiguity, and thus adding a new sector of postsecondary institutions with that name could be more confusing than helpful for prospective students. The institutions in British Columbia and Alberta that use the term polytechnic, either formally or informally, have since their founding been formally differentiated from other college sector institutions in their province and have a history of specialization in technology-based programming. No college sector institutions in Ontario have had a differentiated role like the institutes of technology in British Columbia and Alberta. We are aware also that five colleges in Ontario have been seeking the polytechnic designation. In regard to both labour market needs and practices in other North American jurisdictions, it is hard to see a justification for adding that many polytechnic institutions to the provincial postsecondary education system, especially when four of them would be in the Greater Toronto Area (GTA). We appreciate that many colleges across Canada, including in Ontario, have made valuable contributions to industry through their applied research activities. Our impression is that the expertise and interaction with industry that fosters these contributions is largely situational and contextual related to the existence of particular faculty in particular programs and institutions. Accordingly, we do not believe that designating some colleges as polytechnics is necessary to maintain or enhance the capability of the college sector to make such contributions.

While we do not believe that there are compelling arguments for designating some colleges as polytechnics, we are mindful of the contribution that could be made by enabling at least a few colleges to have a more substantial and broader role in offering baccalaureate programs if they are able to demonstrate that they meet the conditions required for such activity.

Based upon our examination of the issues outlined above, we review a number of possible policy options to address the predicted demand for increased access to university degree programs in the GTA including: 1) creating satellite campuses of existing universities; 2) creating new universities that are of the same type as existing universities; 3) creating new universities of a new type focusing on undergraduate study and with a limited role in research; 4) providing selected colleges with a new substantial role in baccalaureate programming; 5) providing colleges with a greater role in transfer programs in basic university subjects, such as arts and science; and 6) creating an open university. We review each of these options and discuss factors that should be considered by government.

1. Introduction

The Ontario higher education system has been rapidly expanding to address increasing demands. Beginning in the late 1990s, Ontario's universities and colleges, with the financial support and encouragement of the provincial government, began a process of expansion designed to meet the short-term demands associated with the "double-cohort" and the longer-term demands associated with the baby-boom echo. Ontario's universities are currently expanding their graduate programs with targeted financial support from the provincial government in order to address the growth in anticipated demand. There is now evidence that the demand for higher education in the GTA, especially for baccalaureate degree programs, will continue to increase (Anonymous, 2007), and there appears to be a consensus among educational leaders that Toronto's universities may not be able to meet all of the growing needs of the region.

The expansion of higher education in Ontario has largely been accomplished by expanding enrolment in the existing network of institutions that comprise Ontario's two major higher education sectors: a public university sector composed of 20 institutions, and a college sector composed of 24 colleges of applied arts and technology (CAATs). To date, Ontario's approach to expansion has largely focused on doing more of the same, supporting increased enrolment within the context of existing institutional types and mandates, with the only notable exception being the establishment of new applied degree programs in the college sector, an experiment that has had somewhat mixed results.

The objective of this paper is to determine whether there are gaps in Ontario's postsecondary education system, and to review a number of different ways of addressing these gaps. We focus particular attention on three issues that emerged from our analysis of the Ontario context: (1) whether there is a need for any new postsecondary institutions, either newly created or resulting from modifications in the mandate of existing institutions, to cope with the anticipated growth in the demand for spaces in baccalaureate programs, particularly in the GTA; (2) whether there is a need for more polytechnic education in Ontario, and if so, how to meet that need; and (3) whether it would be helpful to establish more explicit and formal differentiation among institutions within Ontario's college sector.

Approach and Limitations:

Our approach to addressing the goals of this study employed a mixed methodology that included international and inter-provincial comparative analysis; historical analysis; systems analysis; and critical analysis rooted in our understanding of the scholarly literature in several realms of higher education organization, including system organization and design, institutional differentiation and articulation, policy analysis, governance, and the responsiveness and evolution of higher education systems. The principal data for this study was obtained from relevant higher education literature; policy reports and documents in Ontario and other jurisdictions that relate specifically to the issues that frame the research. Both authors have conducted previous studies of higher education policy in Ontario and were already familiar with the historical evolution of the Ontario system (see Jones, 2006; Shanahan, & Jones, 2007; Skolnik, 2004).

In order to increase our understanding of system-level arrangements and the experience of polytechnic institutions in other provinces we conducted a number of site-visits and interviews. We conducted interviews on-site at the Southern Alberta Institute of Technology (or SAIT Polytechnic) in Calgary, Alberta; the British Columbia Institute of Technology in Burnaby, British Columbia; and Kwantlen Polytechnic University in Surrey, British Columbia. We conducted additional interviews, in-person or by telephone, with senior officials from other relevant institutions. We also developed an inventory of applied degree programs in the colleges that are currently approved and running. Finally we reviewed relevant documents and conducted an interview with a senior official in order to learn about the evolution and development of Ryerson University, given its historic role in polytechnic education in Ontario.

As we will note in more detail in the text, there are many limitations associated with this study. We did not conduct new empirical research on the demand for higher education in Ontario, and our assumptions on this point are based on prior research. As we note in detail within the report, there are huge methodological challenges associated with any attempt to measure or assess gaps within an educational system, and we rely heavily on previous studies and analysis. Finally, it was not our mandate to solicit opinion or input from Ontario stakeholders on these issues; we did not interview the executive heads of Ontario colleges or universities, or seek input from other interested parties. Instead, our emphasis has been on analyzing the higher education system in the context of its historical evolution and challenges, and in the context of broader changes and trends in higher education systems.

Organization of the Report:

We have organized this report into five major sections. Following this introduction, we describe the Ontario higher education system and analyse possible gaps in the types of education available in this system. In the third section we discuss non-university postsecondary institutions in other jurisdictions, with a special emphasis on polytechnic institutions (some of which in other jurisdictions are university type institutions). The fourth section focuses on the history and evolution of polytechnic education and polytechnic institutions in Ontario, including a discussion of current opportunities to access polytechnic education in the province. In the final section of the paper we review a variety of policy options based on our analysis.

2. Gaps in Ontario's Postsecondary Education System

The purpose of this section is to identify and describe possible gaps in the types of education available in Ontario's postsecondary education system. There is a relationship between institutional types and types of postsecondary education offered, though there is not an exact match between type of institution and type of education. To the extent to which there is a relationship between institution and type of education, a discussion of the institutional types that characterize Ontario postsecondary education provides a good framework for identifying possible gaps with respect to types of education. Polytechnic institutions are not one of the types of postsecondary education considered in this section, as the question of whether the Ontario system provides sufficient opportunity for polytechnic education is addressed later in the document. However, some of the discussion in this section is relevant to that question.

Ontario's postsecondary sector consists primarily of the 18 publicly assisted universities that are full members of the Council of Ontario Universities, the new Algoma University, and the 24 CAATs that are members of Colleges Ontario. The other postsecondary institutions in Ontario are: one public or quasi-public postsecondary institution; private institutions that award degrees, almost all of which award only religious degrees; and private vocational schools of which there are a great variety¹. The only other public degree-granting institutions are the Royal Military College of Canada, which is under the jurisdiction of the Department of National Defense, and the Ontario College of Art and Design, both of which are associate members of the Council of Ontario Universities. While there is no public postsecondary institution that offers programs of two or more years like the colleges, the Michener Institute for Applied Health Sciences is a quasi-public institution in that it receives the bulk of its operating funding from the Ministry of Health and Long Term Care. In this discussion we will concentrate on the publicly assisted universities and the CAATs.

Each of the 18 universities is an autonomous, not-for-profit corporation that has its own establishing act. In almost all cases, these Acts give the university the authority to grant any and all degrees, including graduate degrees, in all branches of learning. All the universities offer master's programs, and all but two offer doctoral programs. There are differences in the numbers of graduate programs among the universities, related mainly to the size and age of the institutions. There are also differences in program mix among institutions; indeed, that is the main type of differentiation within the university sector. The missions of the universities are stated in the Acts in very broad terms and are quite similar from one institution to another. A typical statement of the objects of a university include the advancement of learning and the intellectual, and spiritual, social, moral, and/or physical development of the members of the university and of society.

The statements of the objects of a few of the most recently established or most recently designated universities include additional aspects of the institution's mission. *The Ryerson University Act* refers to "the

¹ Ontario based private institutions and out-of-province institutions may apply to offer degree programs under the Postsecondary Education Choice and Excellence Act. As of October 26, 2008, the list of such institutions with currently approved programs on the web site of the Postsecondary Education Quality Assessment Board included four private and six out-of-province institutions. It is difficult to draw conclusions about gaps in Ontario's postsecondary education system from this list, because in most cases the programs are highly specialized and have small enrolments. Several were established as a result of special circumstances. Further, there has been no research in which students were asked why they attend these institutions. Two of the private institutions are religious colleges that offer secular degrees. One is a chiropractic college, and the other is a small technical institute the majority of whose students are in non-degree programs. Of the out-of-province institutions, half are offering programs in Education. The programs of the others are in nursing, aviation management, computer gaming technology, leadership, and business. In one of these cases, an approval was required because part of the program of a university in another province involves the students doing an internship in Ottawa. Some employ a cohort model in which the students take all their courses together and form a learning community. The business program was designed to enable graduates of college diploma programs to complete a baccalaureate with full credit for their diploma courses. Several universities in Michigan and New York offer similar degree completion opportunities for graduates of Ontario colleges, but require students to come to them rather than setting up shop in Ontario. Although it is difficult to generalize from such a diverse set of programs, a few themes that stand out are generous credit recognition, flexible scheduling, and employment of faculty who concentrate on teaching. Also, the total enrolment pales in significance compared to the number of Ontario residents who are enrolled in the online courses of Athabasca University, a phenomenon that is discussed later in this document.

advancement of applied knowledge and research in response to existing and emerging societal needs”, and to the provision of programs that “provide a balance between theory and application and that prepare students for careers in professional and quasi-professional fields” (Ryerson University Act, 1977). The phrases cited continued to be included in the institutional mission statement after the word “polytechnic” was dropped from the name of the university in 2002.

The *University of Ontario Institute of Technology Act* (UOIT Act) states that “it is the special mission of the university to provide career-oriented university programs.” The Act goes on to say that the university should be responsive to “the market-driven needs of employers”, have a particular focus on the needs of the county in which the university is located, and “facilitate” student movement between college and university programs (University of Ontario Institute of Technology Act, 2002). In spite of the institution’s name however, the UOIT Act neither restricts the focus of the institution to, nor directs it to concentrate on, technology programs. Still, the Ryerson and UOIT Acts indicate a focus on applied, career-oriented study, and in the case of Ryerson, an explicit concern for blending applied and theoretical learning, that is consistent with the concept of polytechnic education.

Other than the statements from the Ryerson and UOIT Acts cited above, none of the university acts evoke an image of a polytechnic or technical university mission, though a substantial proportion of the programs in all the universities have titles that relate to various professional and career fields. Only two other university acts describe a special mission for the institution.

The Nipissing University Act (1992) and the *Algoma University Act* (2008) assign special roles to these institutions. After stating that the objects of these universities are “the pursuit of learning through scholarship, teaching and research within a spirit of free enquiry and expression”, both Acts assign these institutions a special mission to:

be a teaching-oriented university that provides programs in liberal arts and sciences and professional programs, primarily at the undergraduate level, with a particular focus on the needs of northern Ontario.

In addition, the *Algoma University Act* (2008) assigns the new institution a responsibility to:

cultivate cross-cultural learning between aboriginal communities and other communities, in keeping with the history of Algoma University College and its geographic site (*Algoma University Act*, 2008).

Consistent with the mission statement cited above, in its original Act Nipissing’s degree-granting authority was limited to baccalaureate degrees and the Master of Education. However, the Act was amended in 2001 to give the institution the authority to grant “any and all degrees in all branches of learning”. Besides the Master of Education, the University now offers a Master of Arts and indicates on its web site its intention to expand its graduate programs.

Algoma University would not even need an amendment to its act in order to follow the same path as Nipissing to unlimited degree-granting authority. Initially, the University is limited to awarding bachelor’s degrees in arts and sciences. However, a clause in the Act gives the Lieutenant Governor discretionary authority to replace the initial degree-granting authority with the same broad degree-granting powers as the other universities have, which would include the ability to award graduate degrees. Thus, although established as a primarily undergraduate teaching institution, the Act makes provision for the institution at some later date to become more like its peer institutions. Thus, it is not clear that the Nipissing University and Algoma University Acts reflected an attempt to establish a different type of university in Ontario, one whose mission is primarily that of teaching undergraduates. Rather, this mission seems to be, or has been, only a starting point in an anticipated evolution toward a mission comparable to that of the other provincial universities.

The reason why we started this discussion of institutional differentiation among universities with reference to the university acts is because legislation is probably the most effective, and perhaps the only, way of directing a university to concentrate on certain activities and not others. There seems to be an inevitable tendency for

universities to gravitate toward a common ideal that has the following characteristics: considerable effort goes into the development of graduate programs, including doctoral programs; the norm for faculty is that of scholar-teacher and the expectation is that faculty will divide their time approximately equally between teaching and research; and theoretical knowledge is more highly valued than applied knowledge. The conclusion of much of the research on institutional differentiation in postsecondary education is that universities evolve in the direction of this ideal “unless clear and overt policy intervention is enacted to prevent it” (Codling & Meek, 2006; a similar conclusion was reported earlier by Rhoades, 1990).

An example of such clear and overt policy intervention is the Master Plan for postsecondary education in California which was adopted in 1960. Under the California Master Plan, the right to offer doctoral programs is restricted to a particular set of universities (the University of California system) the members of which also are mandated to be more research intensive than the other public universities (the California State University system). A very recent example is the creation of a state college system in Florida that consists of a group of community colleges that are authorized to award both associate’s and bachelor’s degrees, but not graduate degrees.

The power of academic drift is so strong that sometimes even with legislation, it is impossible to resist. In California, it has taken constant vigilance by the executive and legislative branches of government to maintain the system of institutional differentiation specified in the Master Plan. In Ontario, institutional Acts are written in sufficiently general language as to allow each university to do whatever it wants. From 1972 to 1989 the Ontario government prohibited funding for new doctoral programs at the universities that had emerged in the late 1960s (Royce, 1998), but over the last two decades governments have made no attempt to rein in the ambition of any university to in effect become a research university. The consequence is that the most expensive institutional model has been employed for the teaching of all undergraduates in Ontario. As a result, the greatest gap in institutional types in Ontario postsecondary education may be that of a university level institution that concentrates on undergraduate education and on the teaching function. Such an institution would provide students an opportunity for a type of education that presently does not exist: the opportunity to be taught by professors whose primary responsibility is teaching and in an institutional environment that unequivocally places student learning first.

Looking at the Ontario university system in comparison with those of other jurisdictions suggests a few other possible gaps, not all of which might be important to address. These include institutions that are differentiated by: the predominant clientele that they serve; the fields or disciplines in which they offer programs; and educational philosophy and corresponding admission and program delivery practices.

Some of the most significant differences between postsecondary education in Ontario (and Canada) and the United States pertain to a mix of the characteristics of the groups that control universities and/or whom universities serve. In the United States, a substantial proportion of universities are church-controlled institutions that offer secular programs of study. Several Ontario universities started out in this manner, but at present there are only two small independent degree-granting institutions of this type in Ontario (Redeemer University College and Tyndale University College). Where there is a large enough number of people who want to pursue postsecondary education in this type of milieu, it is possible for educators from different religious traditions to apply under the Postsecondary Education Choice and Excellence Act to offer programs to serve such interest.

Another type of postsecondary institution that has been increasing in number in the United States, and in some Canadian provinces, is one that is controlled by Aboriginal groups, is oriented toward meeting the needs of Aboriginal students, and is concerned with the teaching of indigenous knowledge. A discussion of the pros and cons of relying on existing postsecondary institutions as opposed to creating new Aboriginal-controlled institutions for serving Aboriginal students and advancing indigenous knowledge is beyond the scope of this paper. However, when considering possible gaps in the types of educational opportunities presently provided in Ontario’s postsecondary education sector, it is important to consider the situation and needs of Ontario’s Aboriginal populations.

One other variable related to predominant characteristics of clientele that is relevant to the discussion of institutional types is that of language. How to ensure that there is sufficient opportunity for study in both official languages has been a major issue in designing the postsecondary education system. As with Aboriginal education, assessing the postsecondary educational needs of different language communities is a highly specialized endeavour for which there are other provincial mechanisms for developing policy advice. For our purposes it is important to note that language of study is an important dimension of any inquiry into possible gaps in regard to types of postsecondary education offered in Ontario.

A type of postsecondary institution that is common in some jurisdictions but rare in Ontario is one that covers only a single discipline or field or a relatively small range of disciplines or fields. The most common areas for such institutions are engineering and technology; medicine and/or some set of health sciences; music; art; agriculture and business. At one time, Ontario had many specialized institutions, for example, teachers' colleges, nursing schools, a fine arts institute, and colleges of agricultural technology. The institutes of technology that preceded the CAATs tended to concentrate on a relatively narrow range of areas, one on mining, and one mainly on textiles. Since the 1960s, there has been a push toward comprehensive colleges and universities that cover a broad spectrum of disciplines and fields. Presently the only exceptions among public or quasi-public institutions are the Ontario College of Art and Design and the Michener Institute for Applied Health Sciences. In contrast, the specialization model predominates in the private vocational school sector. For the degree sector, the single discipline model was examined in some depth in a discussion paper by the former Ontario Council on University Affairs, and the idea was explicitly rejected (Ontario Council on University Affairs, 1991).

Although the single discipline model may have some potential benefits in the way that division of labour and specialization promote efficiency, it is difficult to make a compelling case for this model in general. For that reason the absence of single discipline institutions does not constitute a significant gap in Ontario higher education. However, as we note later, restriction to a limited set of fields that involve particular technologies is inherent in some ideas of a polytechnic institution. Limiting the range of fields covered in this way can provide clarity of institutional identity and enable the institution to exploit potential complementarities among the specific disciplines and subjects covered.

Within the realm of degree-granting education, perhaps the biggest gap in Ontario's postsecondary system is the absence of any institution that plays the role of an open university. Although today open universities deliver much if not all of their courses online or through other electronic media, it is not the technology through which courses are offered that defines an open university. Rather, it is an educational philosophy. A key element of that philosophy is open admissions, i.e., admission to programs and courses is not based upon prior academic achievement, but on learners' needs and aspirations. Further, an open university provides the flexibility to enable learners to utilize its resources and infrastructure in whatever way will best meet the learner's needs. This may involve taking courses from an open university that can be used for credit in the learner's home institution; or finding creative ways to allow learners to transfer in courses from other institutions to be used toward a degree from an open university. Some of the arrangements through which such credit transfer may be provided are: block-transfer agreements with other institutions, comprehensive credit recognition, credit banking which allows learners to draw upon the courses of several institutions in effectively designing their own degree programs, and blending course credits with credit for prior experiential learning. Other features of an open university are continuous admission, 24 hour learning, and affordability. Today, an open university is also a specialist in electronic distance education and maintains state of the art technology, infrastructure, and processes for the delivery of this form of education.

Although all Ontario universities offer online courses, they do not adhere to the policies and practices of an open university, nor are all courses necessarily offered within the framework of consistent policies, protocols, approaches, and expertise in the delivery of online education. Most importantly, no institution offers the open admissions or flexible credit recognition features of open education that are central to the idea of an open university. The problem is not so much that many Ontario learners do not have access to a traditional campus, but that they are denied access because of inflexible admissions policies, inconvenient scheduling of courses, lack of credit transferability, and unavailability of programs that match the student's interest.

Some indication of the interest that Ontario learners have in this form of education can be gleaned from data on the participation by Ontario residents in the programs and courses of Athabasca University, a publicly chartered university in Alberta which describes itself on its web site as “Canada’s Open University”. In Athabasca University’s submission to the Rae Review, it noted that in the period of 1994-2004, the University admitted 29,274 students in Ontario to its undergraduate and graduate programs (Athabasca University, 2005a). In 2003-04, 6,689 individuals in Ontario were pursuing studies at Athabasca University, and the annual rate of growth in course registrations in Ontario was exceeding 15%.

A 2001 survey by the Ontario College University Consortium Council (CUCC, 2002) showed that 19 colleges in Ontario had degree completion agreements with Athabasca University. There were 190 agreements in total covering different subjects. No other university in Ontario or elsewhere had degree completion agreements with as many Ontario colleges. It was estimated that program registrations of Ontario residents in Athabasca included about 700 from the CAATs who were utilizing the articulation agreements between Athabasca and their college. The fields of study that were most attractive to graduates of the CAATs were Business, Communications, Justice Studies, and Science. Nursing used to be one of the Athabasca programs in greatest demand among Ontario students until collaborative nursing programs between CAATs and Ontario universities became widespread.

In a later section, we describe the limited version of an open university that was recommended by the Vision 2000 Review of the Mandate of the CAATs and the subsequent Task Force on Advanced Training. The provincial institute recommended by those bodies would be empowered to organize degree programs that consisted of courses offered by colleges and universities and its own courses, and it could facilitate degree completion programs for graduates of the colleges. An open university could incorporate these functions into the broader mission connoted by the term open university and thereby increase access to degree programs in multiple ways for Ontario learners.

An alternative to Ontario creating its own open university is for the province to help Ontario learners make more substantial use of Athabasca University for this purpose. In a background paper for the Rae Review, one of the authors of this report recommended that Ontario seek an agreement with Athabasca University under which that University would perform the role of Ontario’s open university (Skolnik, 2004). This recommendation assumes that the economies of scale for an institution like Athabasca University are so great that it is uneconomical for a country the size of Canada to have more than one such institution – except for a second one that operates in Canada’s other official language, as the Télé-Université in Quebec does. Such an agreement² might include the provision of some funding from Ontario in return for a say in the management of programs offered in Ontario and a guaranteed number of places for Ontario residents. Consideration could also be given to helping Ontario students cover the difference in cost between Athabasca University’s out-of-province tuition fees and the typical fees of an Ontario university. An agreement might also include provision for special treatment of Athabasca University under the Postsecondary Education Choice and Excellence Act, which would enable the University to provide local support for Ontario residents who are registered with Athabasca without the enormous cost and effort required for the normal review of a large number of programs by the Postsecondary Education Quality Assessment Board (PEQAB). While this recommendation was not commented upon in the Rae Report, it was acknowledged approvingly in Athabasca University’s *2005-2009 Business Plan* (Athabasca University, 2005b, p. 21).

Thus far our examination of possible gaps in the types of education provided by Ontario’s postsecondary education system has been limited to the degree-granting sector, or more accurately, it has excluded the sector that consists of institutions that offer predominantly non-degree programs. There is a good reason for this. While the government tightly regulates degree-granting, there is far less regulation in the non-degree sector and a large number of private schools and career colleges have emerged. In this environment, market forces may serve to fill any possible gaps in the non-degree sector. The great variety of private vocational schools and private training agents that exist in that sector, as well as the rapid entry into (and exit from) that sector, are testimony to the working of the market in that realm of postsecondary activity. A segment of the

² There are existing agreements, for example in Atlantic Canada, where a province purchases seats in a specific postsecondary program in a university in another province for its residents.

non-degree sector that could be underserved involves activities that might not generate a profit, in particular, adult upgrading and remediation for the educationally disadvantaged, who are often economically disadvantaged as well³. However, this activity is part of the mission of the colleges, so in that sense it does not constitute a gap in our system of postsecondary education. On the other hand, colleges are probably not receiving sufficient funds for this important work. Further, there is some question whether assigning this function to colleges that have a wide range of other functions is the most effective way of addressing this need, compared for example to the way that the Alberta system allocates different functions among its postsecondary institutions. That issue, however, is beyond the scope of our study.

The most striking, and talked about, gap in postsecondary education in Ontario, compared with many other jurisdictions, is one that is at the interface between the degree and non-degree sectors. This is of course, the lack of a formal system of credit transfer between Ontario colleges and universities. This feature of the Ontario system imposes educational and career barriers and extra costs on students who, for various reasons including lack of money, academic qualifications, or academic self-confidence, or unavailability of programs of their choice at their nearest university, must begin their postsecondary studies at a college.

In discussing the transfer issue it is important to distinguish between two uses of that term. One refers to the situation in which colleges offer the first two years of university courses in core arts and sciences subjects. This role was not included in the original mandate of the colleges, and there has not been a significant move to change their mandate in this regard, although some colleges have on their own made relatively small initiatives to provide this opportunity in a quite limited manner. The other use of the term transfer refers to opportunities for students in college career programs to continue on to a university and complete a degree program in a related field of study. The goal of improving transfer opportunities for students in college career programs has been accepted by the government since the mid 1990s, and was endorsed by the Rae Report. In spite of the fact that substantially improving opportunities for this type of transfer has been an accepted goal of government for over a decade, progress toward this goal has been exceedingly slow, and no one in a position to move the ball forward has taken ownership of the issue.

In summary, then, the principal gaps in Ontario's postsecondary system are for postsecondary institutions that: concentrate on the teaching function, and at the undergraduate level; on open education; and on college to university transfer for students in career programs. We will discuss the need for polytechnic education, and whether any or all of these gaps should be filled, in subsequent sections of this report.

³ Another type of program that might not make a profit is one that involves very expensive specialized equipment or facilities.

3. Non-university and polytechnic institutions in other jurisdictions

Our objective in this section is to briefly discuss some key factors associated with non-university and polytechnic institutions in some other jurisdictions in order to provide a broader context for discussing the issue of polytechnic education in Ontario. We will begin by identifying some of the challenges in comparing institutional types and then review the situation in a number of selected European states. We will then turn our attention to North America by discussing polytechnics in American higher education, and then reviewing the role of polytechnics in British Columbia and Alberta.

Most higher education systems are composed of two or more types of institutions, one of which is called a university, but further generalizations on the structure of higher education systems beyond this simple statement are difficult without recognizing three complicated definitional problems. The first definitional problem is created by the fact that there “is no such thing as *the* university in terms of a standardized and universal institutional form” (Jones, McCarney & Skolnik, 2005, p. 7). While most universities share a number of common characteristics, there are major differences in what universities do and how they are defined by jurisdiction, and even important differences in the mission of universities within jurisdictions. Some universities focus only on undergraduate studies, some focus primarily on research and graduate studies, some are specialized in an area of knowledge or pedagogical approach, and some are comprehensive institutions that offer a breadth of programs at multiple levels.

In the context of this paper, it becomes particularly important to note that there are differences by jurisdiction in terms of the role of universities in offering specific types of vocational or professional programming. In some jurisdictions the emphasis within university programs has been on the theoretical, and professional or career-focused degree programs in fields like engineering, agriculture, nursing, business, and teacher education have been the responsibility of the non-university sector. Given this context, it is not surprising that in some systems far more first-year postsecondary students enroll in the non-university sector compared to the university sector, for example 75% of first-year students in the Netherlands enroll in the Hogescholen and only 25% in the universities, and 60% of first-year Finnish students enroll in the polytechnics while 40% enroll in the universities (Machado, Berreira, Santaigo, & Taylor, 2008, p. 250).

The second challenge is that there are no standardized international models, or even terminology, in the “other sector”. Teichler notes that even finding an umbrella term that might accurately describe this sector across jurisdictions has been problematic, and international reports have at various times referred to these institutions as “non-university higher education” or even, in one Organisation for Economic Co-operation and Development (OECD) study, “alternatives to universities”. He notes that “this second type of higher education always had to define its position vis-à-vis its ‘big brother,’ i.e. the university” (2008, p. 1).

The third challenge is that different jurisdictions have defined the boundaries of higher education in quite different ways. While Canadian scholars have tended to use the terms postsecondary education and higher education as synonyms, other jurisdictions have defined a higher education sector in much narrower terms. For example, while the United Kingdom was frequently described as a unified higher education system following the transition of the polytechnics into “new universities,” this conclusion depended on a definition of higher education that would, if applied to the Ontario context, exclude the CAATs. A second, Further Education sector in the United Kingdom offers national certificates in vocational program areas as well as higher education (university-degree level) programming, including the relatively new, two-year, foundational degree.

Polytechnics in Europe:

The *École Polytechnique* was founded in 1794 and it soon became a home for the “greatest mathematicians and theoretical mechanics of that age” (Leinhard, 1998). Following this tradition, the French polytechnique continues to be an elite *grande école* focusing on engineering and applied science. Founded in 1873, the *École Polytechnique Montréal* is clearly associated with this institutional model.

The polytechnic became one of a number of terms used to describe non-university higher education institutions, though some of these institutional types share common elements. Most emerged in the latter half of the twentieth century as a function of the expansion of higher education and the recognition that a second institutional form, in addition to the university, was required in the transition to mass higher education. A second characteristic is that many of these institutional types were created by integrating and merging a collection of existing specialized vocational schools.

A third common characteristic of several of these institutional types, including the Finnish Polytechnic, the Dutch Hogescholen, and the German Fachhochschulen is that they offer high-level technical and applied programming well beyond the diploma-level vocational education associated with community colleges in the United States and Canada. These institutions offer baccalaureate-level degree programs and, in some cases, applied masters programs. For this reason, the English translations of institutional categories frequently signify a university-level institution. The Fachhochschulen of Austria and Germany are frequently translated into English as “universities of applied sciences,” while Norwegian Høgskolen are frequently referred to as “university colleges” (Machado, Berreira, Santaigo, & Taylor, 2008, p. 249).

As already noted, however, the variations in institutional models and differences in the relationship between the university and the non-university sector make generalizations about the non-university sector in different European countries problematic. Generally speaking, these institutions offer degree-level programming in applied, vocational or professional areas of study (though their programs may not always be limited to the applied, vocational or professional) and have a research function, sometimes (though not always) described in terms of applied research.

Polytechnics in the United States:

A 2006 study by a campus of the University of Wisconsin that sought to be, and in 2008 succeeded in being, designated as “Wisconsin’s Polytechnic University”, identified 20 other polytechnic institutions in the United States⁴ (University of Wisconsin-Stout, 2006). Seven of these institutions use the term polytechnic in their names; five are campuses of multi-campus state systems (Arizona, New York, Wisconsin, and two in California), two are autonomous state universities (in Georgia and Michigan); and the others are private, not-for-profits (in California, Illinois, Indiana, Massachusetts, New Jersey, New York, and Rhode Island). The majority started as technical schools in the 19th or early 20th centuries, the oldest being Rensselaer Polytechnic Institute in Troy, New York which dates back to 1824.

The majority of these institutions refer in their mission statements to three characteristics: career-focused education, applied learning, and technology-based fields. For example, Wentworth Institute of Technology “takes pride in educating students in technical disciplines through a nationally recognized model of hands-on, real world problem solving combined with classroom instruction and cooperative work experience” (Wentworth Institute of Technology, 2008). However, not all the institutions reference all three of these characteristics in their mission statements. The mission of Rochester Institute of Technology is “to provide technology-based educational programs for personal and professional development” (Rochester Institute of Technology, 2008). There is no mention of applied learning either in the mission statement of the

⁴ An inspection of the full list of postsecondary institutions in the Carnegie Classification revealed only one other that uses the word polytechnic in its name, Northwestern Polytechnic University (NPU). NPU is in the Silicon Valley region of California and focuses on providing advanced education for adult learners.

Massachusetts Institute of Technology. Rensselaer is unique among the few most well known institutions in this group in referring to its “hands-on” approach to undergraduate education.

In terms of fields, all the institutions offer programs in business, engineering and/or technology, and computer science and/or information technology. Within the engineering/technology domain, several offer bachelor’s degrees only or primarily in engineering technology as opposed to engineering. These include: Arizona State University Polytechnic, Ferris State University, New England Institute of Technology, Southern Polytechnic State University, SUNY Institute of Technology at Utica-Rome, and University of Wisconsin-Stout. Only a few institutions offer associate’s as well as bachelor’s degrees. Most, including the more prestigious institutions like M.I.T., Cal Tech, and Rensselaer, offer only baccalaureate and higher degrees. In looking at the web sites of these institutions, one does not get an impression that there are two types of degrees, even though some of the degrees offered are Bachelor of Technology, Bachelor of Applied Science, or Bachelor of Engineering Technology. Possibly this is because all degree programs in the United States are accredited within the common framework of a regional accreditation agency regardless of the degree title.

In the United States, the term polytechnic seems to have generally positive connotations. For example, according to the documentation on the web site, there was widespread support among faculty for seeking this designation at the Stout Campus of University of Wisconsin. This reaction stands in contrast to the negative reaction of university faculty associations in New Brunswick to the suggestion that their campuses become polytechnics. Of course, in the American cases, the term polytechnic seemed to describe accurately the thrust of activity on these two campuses; whereas this would have been a somewhat new orientation for the St. John campus of the University of New Brunswick. Perhaps another indicator of the difference in the way that the term is perceived in the two countries is that several American universities that had the word polytechnic in their name, or were called institutes of technology, retained their names as their national reputations increased (M.I.T., Rensselaer, Rochester Institute of Technology, and Cal Tech, for example). In contrast, in Canada, Ryerson dropped the term polytechnic from its name as it evolved, and, unlike several cases in the United States, the identity of the former Technical University of Nova Scotia did not survive the transfer of its programs to Dalhousie University.

Another feature of the polytechnics in the United States that might be of interest for Ontario is the geographic distribution. In all cases except one where the polytechnics are part of system of public higher education, there is only one in the state system (Arizona, Georgia, Michigan, New York, and Wisconsin). The exception is California, which has two, over 300 kilometres apart. Three states have two or more private polytechnic institutions (New Jersey, two; Massachusetts, three; and New York, 4). Even taking account of the location of both private and public institutions, in only three cases is there more than one polytechnic institution in the same metropolitan area, and in two such cases they are pretty distant from one another: Boston (Wentworth Institute of Technology in Boston and M.I.T. in Cambridge); Los Angeles (Cal Tech in Pasadena and California Polytechnic University in Pomona); and New York City (New York Institute of Technology in Manhattan and Long Island and NYU-Polytechnic in Brooklyn).

Polytechnics in Other Provinces:

Both British Columbia and Alberta have institutions that refer to themselves as polytechnics, and it is useful to briefly review the structure of these systems and the characteristics of these polytechnic institutions.

British Columbia

As John Dennison has noted, British Columbia had created a fairly integrated “system” of higher education by the mid-1990s (Dennison, 1997). Following some of the recommendations of the Macdonald report of 1962, the province limited the expansion of the university sector to include two new independent universities (Victoria, a former college, and the new Simon Fraser University) but facilitated regional accessibility to higher education by eventually creating a network of new community colleges that would offer the first two years of university transfer programming as well as vocational diploma programs. In 1964 the province created the

British Columbia Institute of Technology (BCIT) which provided two-year diplomas in engineering, health sciences, and business.

In the late 1980s and early 1990s the government took a number of steps to increase accessibility and participation rates in postsecondary education. A Council on Admissions and Transfer was created to facilitate the development of explicit, transparent credit transfer arrangements between institutions. In order to expand access to degree programs, several of the community colleges evolved into university colleges and began to offer degree programs under the supervision of the established universities.

In the early 1990s the British Columbia government passed legislation that dramatically expanded the number of institutions with the independent authority to grant degrees. The new degree-granting institutions included the university colleges, and BCIT.

BCIT is one of two institutions in British Columbia that uses the term polytechnic. Advertising itself as “Canada’s Premier Polytechnic,” BCIT offers a range of technical and vocational programs ranging from trades to baccalaureate degree programs (including Bachelor of Engineering programs), and it aspires to eventually offer master’s programs. Considerable emphasis has been placed on developing program ladders so that graduates can return for continuing professional education. Generally speaking, BCIT offers a wide range of programs in a focused range of technical, vocational, and business fields. It is not an open-access institution, but rather a highly selective institution with a strong reputation for providing technical and vocational programs that will lead directly to employment. Many of its students are working professionals who enrol in diploma and degree programs on a part-time basis. BCIT began to use the term “polytechnic” as a means of differentiating it from other British Columbia institutions, and it came to assume a leadership role in Polytechnics Canada.

The second institution is Kwantlen Polytechnic University which received its new name in the summer of 2008. Kwantlen is a former university college but while these institutions were recently redesignated as universities under provincial legislation, Kwantlen was the only institution to emerge as a “polytechnic university.” Kwantlen operates on four campuses, one of which houses a major new facility for its trades programming. The institution offers a breadth of programming at the associate degree (two-year level) and selected four-year degree programs. Given the recent nature of its change in status, Kwantlen is just beginning to develop a strategic plan that will incorporate and address its new designation and a policy infrastructure that will support its research mandate.

BCIT and Kwantlen are dramatically different institutions. While both institutions have strong trades programs, BCIT has always been part of the technical/vocational sector, and its degree programming, which is a modest component of its overall enrolment, emerged as a natural extension to its technical diploma programs. Kwantlen is a dual sector institution that has long been a member of the Association of Canadian Community Colleges (ACCC) and is currently being considered for membership in the Association of Universities and Colleges of Canada. The vast majority of its students are enrolled in degree-stream (Associate or Bachelor’s) programs and they will either complete their degrees at Kwantlen or transfer to one of the other provincial universities.

Alberta

By the late twentieth century the postsecondary system in Alberta had come to be characterized by considerable institutional differentiation, as described by Andrews, Holdaway, and Mowat (1997). Degree-granting institutions included three provincial universities that were comparable to Ontario’s universities; Athabasca University, which described itself as “Canada’s Open University”; and several private colleges which had been accredited for awarding degrees by a private colleges accrediting board. The non-degree sector included community colleges which offered university transfer programs and career education programs in selected fields; two institutes of technology which concentrated on career programs primarily in technology and business related fields, and on apprenticeship and trades programs; and vocational colleges that were responsible for adult upgrading, English language training, and short term vocational training.

A comparison of the college sectors in Edmonton and Toronto in the mid-1990s is instructive. Edmonton, had three non-university institutions that were highly differentiated from one another: a community college that combined a substantial university transfer program in arts and sciences with a number of career programs mainly in applied arts and business; an institute of technology that combined long and short term technology-oriented programs with one of the largest, if not the largest, apprenticeship program[s] in Canada; and a vocational college that concentrated on adult upgrading, second language training and short term vocational training. In contrast, Metro Toronto had four colleges, and the GTA six colleges, each of which incorporated all of the functions that were divided among the Edmonton colleges except the university transfer function – though the latter function was provided on a tiny scale by a few Toronto colleges without officially being part of their mandate.

In 1995-96, Alberta colleges were given the authority to offer “applied degree” programs. These were not referred to as baccalaureate programs, and in fact, the structure of the programs was quite different from that of baccalaureate programs given by universities. The format for the applied degree programs was six semesters of on-campus study plus two semesters of paid work experience. The applied degrees were intended to serve a primarily vocational purpose, and the government indicated that students should not expect the degrees to facilitate admission to graduate programs. Administrators in Alberta colleges have told us that some applied degree graduates have been accepted into master’s programs in Canadian universities, but generally these are not considered to be equivalent to university bachelor’s degrees.

Within the past four years the Government of Alberta has given four non-university institutions the authority to award “regular” baccalaureate degrees as distinct from the applied degrees. Mount Royal College in Calgary and Grant MacEwan College in Edmonton are now classified as “Baccalaureate and Applied Studies Institutions”, and Southern Alberta Institute of Technology (SAIT) in Calgary and Northern Alberta Institute of Technology (NAIT) in Edmonton are now classified as “Polytechnical Institutions” (Alberta, 2007).

In Alberta, all proposals for degree programs, from the universities and from the colleges and institutes, must be reviewed by the Campus Alberta Quality Council (CAQC). Mount Royal is now offering a Bachelor of Arts with seven distinct majors; a Bachelor of Science with four distinct majors, and Bachelor’s degrees in Business Administration, Nursing, Communications, and Criminal Justice. It has more than a dozen applied degrees, but some of these are no longer taking new students. MacEwan is offering a Bachelor of Arts with eight majors, and Bachelor’s degrees in Commerce, Nursing, and Child and Youth Care. It has only four applied degrees. Northern Alberta Institute of Technology is offering a Bachelor of Business Administration and a Bachelor of Technology as well as three applied degrees. Southern Alberta Institute of Technology has four applied degree programs and has applied to offer a Bachelor of Science program.

Southern Alberta Institute of Technology now uses the name SAIT Polytechnic and is a member of Polytechnics Canada. Northern Alberta Institute of Technology does not use the term polytechnic and is not a member of Polytechnics Canada. However, the program profiles of the two institutions are similar in their emphasis on programs related to technology and business; and programs at all levels including baccalaureate, certificate, diploma and their large enrolments in apprenticeship programs (16,000 at NAIT and 12,000 at SAIT Polytechnic according to figures that we were given).

In the context of this study, two features in Alberta stand in contrast to Ontario. First is the mandated differentiation of SAIT and NAIT from Mount Royal and MacEwan Colleges, and of both pairs of institutions from the other colleges in the province. In particular, it is easy to see how the differentiated mandate and programmatic concentration of the two institutes of technology provided a foundation for classifying them as polytechnical institutions. Second, the fact that proposals for bachelor’s degrees from the four institutions are reviewed by the same body, the CAQC, that reviews proposals from the universities may help the bachelors’ degrees of the two colleges and the two institutes to be viewed as equivalent to those of the universities.

4. Polytechnic Education and Polytechnic Institutions

In a 1991 report, the former Ontario Council on University Affairs (OCUA) remarked that: “there is no more ambiguous term in the lexicon of higher education than polytechnic. Its meaning has remained clouded despite repeated attempts at precise definition” (Ontario Council on University Affairs, 1991). In the 17 years since OCUA made that statement, the term has perhaps acquired even more diverse connotations, thus making it even less likely that one can produce a definition of polytechnic education that would satisfy all interested parties.

Nevertheless it is possible to identify some characteristics of polytechnic education that are common to most uses of the term in Canada in recent years. This would include the notion that polytechnic education: (a) is employment- or career-focused; (b) involves a blend of theoretical and applied learning; and (c) is at a fairly high level of study, i.e., that of a baccalaureate or close to a baccalaureate. For example, a recent newspaper article on polytechnic education in Canada asserts that “what sets polytechnics apart from community colleges is that they offer applied degrees . . .” (Church, 2008).

An important issue pertaining to the second of these characteristics is exactly how theoretical and applied learning are conceptualized and combined, for example, the extent to which they are integrated as opposed to existing as separate components of the educational experience. A related issue involves the relative status of theoretical and applied knowledge. A defining characteristic of polytechnic education is that these two types of knowledge are equally valued rather than one type being held in substantially higher esteem than the other. A major consideration related to the third characteristic noted in the previous paragraph involves the determination of just what constitutes a baccalaureate-worthy educational program in a career-oriented area of study that includes a substantial applied component. Further, in the context of this discussion, the meaning of the words theoretical and especially, applied, also are at issue.

There is an important distinction between polytechnic as a type of education, and polytechnic as a type of postsecondary institution. It is conceivable that an individual could obtain a polytechnic education without attending a polytechnic institution by attending, in parallel or in sequence, both an institution that concentrates on theoretical study and one that concentrates on applied study. Indeed, in some views of polytechnic education, it is a “third option which would combine the job-ready, career-oriented education of the community college with the liberal studies and general education of the university . . .”(Smith, 1989, p. 1).

It could be assumed that a polytechnic institution would offer polytechnic education, but there may be a question as to whether all of its programs are polytechnic in nature. If being at or near the baccalaureate level is deemed to be an essential attribute of polytechnic education, then by definition, shorter duration programs would not be polytechnic. On the other hand, it is possible to imagine that all or most of an institution’s programs, perhaps even apprenticeship programs, could involve the blending of theoretical and applied learning that is one of the defining characteristics of polytechnic education.

Thus, a possible defining characteristic of a polytechnic institution could be (d) the proportion of the institution’s programs that meet the definition of polytechnic education. However, there are different views as to whether a relatively high or low value for this percentage would be necessary for an institution to be regarded as a polytechnic institution. Some ideas of a polytechnic institution require the institution to have a substantial involvement in sub-baccalaureate level programs including apprenticeship programs. Other ideas of a polytechnic institution assume that the preponderance of programs are at the baccalaureate or higher level. In any case, another defining characteristic of a polytechnic institution would relate to (e) the mix of different levels of programs.

Additionally, (f) the range of programs might also be an important defining characteristic. Some views of a polytechnic institution assume a concentration on programs related to technology or of a technical nature as

opposed to programs in the applied arts or that rest on soft disciplines. In some jurisdictions, Engineering is regarded as a core discipline of a polytechnic institution, and individuals in those jurisdictions might have a difficult time viewing an institution that does not offer an Engineering degree as a polytechnic. Not all the polytechnic institutions in the United States offer degrees in Engineering, but those that do not offer the Bachelor of Engineering Technology or the Bachelor of Technology.

Further, it should be noted that while being employment- or career-oriented may be an essential characteristic of polytechnic education, having a preponderance of such programs is not a sufficient condition for being a polytechnic institution. In most Canadian universities today a great many undergraduate programs are career-oriented, but they would not necessarily, or likely, be thought of as polytechnic institutions.

In order to grasp how the term polytechnic is understood, it is useful to look at how some institutions or groups of institutions use the term. Polytechnics Canada is a national alliance of seven Canadian postsecondary institutions that are committed to the polytechnic ideal. All refer to themselves as polytechnic institutions, some with formal recognition of that designation from their provincial government, some without. These are the only postsecondary institutions in Canada presently that describe themselves as polytechnics except for École Polytechnique Montréal, which focuses on engineering education (including certificate, undergraduate and post-graduate studies) and research, and Kwantlen Polytechnic University in British Columbia which was given both the designations polytechnic and university quite recently. Another institution, Northern Alberta Institute of Technology, was designated by the Alberta Government a member of the category of postsecondary institutions called polytechnics, but does not use that term in referring to itself. Polytechnics Canada (2008) identifies four defining characteristics of a polytechnic institution:

- providing career-focused and community responsive education developed in partnership with employers.
- committing to a wide range of credentials including bachelor degrees, diplomas, apprenticeships, certificates, post-graduate offerings, continuing education and corporate training, spanning many fields.
- combining theoretical and applied learning, relevant work experience, and the opportunity to participate in applied research and commercialization projects.
- offering pathways that allow students to build on their credentials; and recognizing previous learning.

These four institutional characteristics are listed right under the heading, “What is polytechnic education?” It is perhaps noteworthy that Polytechnics Canada does not define polytechnic education independently of defining what a polytechnic institution is. In regard to the discussion above about possible defining characteristics of a polytechnic institution, two other features of the Polytechnics Canada definition are also of note: no reference is made to any specific subjects or disciplines covered, just that there are many; and while the definition refers to offering a range of credentials, no mention is made of the relative magnitude of different credentials. Thus, one might wonder if an institution that has only a few per cent of its enrolment in baccalaureate programs would be a polytechnic, or one that has say, 80%, of its enrolment in baccalaureate programs.

The term polytechnic is used differently in some other countries than the way that Polytechnics Canada uses it. As we noted in an earlier section, we identified eight postsecondary institutions in the United States that use the term polytechnic in their names. Rather than the range of credentials that is part of the Polytechnics Canada definition, all of the U.S. institutions concentrate on baccalaureate and in some cases graduate degrees. What the U.S. institutions have in common with the Polytechnics Canada members are: respect for applied learning and the integration of theory and practice; in most cases, emphasis on career-oriented programs; and in some but not all cases, collaboration with industry. Whereas Polytechnics Canada refers to “applied bachelor’s degrees” that are awarded by their members, none of the U.S. polytechnics suggests that their degrees are of a special type that is distinct from those awarded by other degree-granting institutions even though some of the degrees awarded by a few of the U.S. institutions contain the word “applied” or are in Engineering Technology as distinct from Engineering.

The Emergence and Growth of Interest in Polytechnic Education and Polytechnics

Neither the term polytechnic nor the concept of polytechnic education appear in the May 21, 1965 statement in the Ontario Legislature in which the Minister of Education described the Government's plans for the creation of a system of colleges of applied arts and technology (Davis, 1965). Rather than suggesting that the new colleges would combine the type of education provided by the universities with a more applied type of education, the Minister's emphasis was on how the education provided by the colleges would be distinct from that provided by the universities. In this connection it is noteworthy that just two years before the Minister's statement, the institution that had been founded in 1948 as Ryerson Institute of Technology had been renamed Ryerson Polytechnical Institute. Thus, the Government must have been aware of the term polytechnic, and probably had some understanding of the concept of polytechnic education, yet did not associate it with the new colleges at the time they were founded.

It appears that the first major burst of interest in whether there was sufficient breadth and depth of polytechnic education in Ontario was in 1980 with the publication of a Green Paper on the subject by the Ministry of Colleges and Universities (Ontario Ministry of Colleges and Universities, 1980), and also a paper commissioned by the Ministry and prepared by a member of the staff of Ryerson that compared polytechnic education in Ontario with polytechnic education in England and Wales (Wilkinson, 1980). It is not clear exactly what the stimulus was for these initiatives. The Green Paper states that "in recent years, it has been suggested that polytechnic education in Ontario be expanded" (p. 1), but it does not say who made this suggestion or what they had in mind by the term. There is some hint in the report that concern about shortages of skilled workers in some occupational fields may have been one of the factors that motivated the undertaking of the study.

After discussing several possible characteristics of polytechnic education, the Green Paper tended in its analysis of needs to equate polytechnic with career-oriented. It concluded that as a result of the many career-oriented programs offered by the universities, the colleges, and Ryerson, there was an abundance of polytechnic education in the province; and because the demand for and supply of workers in most career fields for which such education was provided was in approximate equilibrium, the province had a sufficient amount of polytechnic education. The document invited interested parties to address the question of whether the polytechnic education that did exist was of sufficient depth and scope. Almost every respondent answered this question in the affirmative (Ontario Council of Regents, 1981, p. 29).

The Green Paper made two comments that seem of particular interest in today's context. It suggested that even though there were programs with various combinations of theoretical and practical emphases, there was still for many graduates a "quantum leap between the practical and the theoretical" and some bridging mechanisms were needed to help those who had mastered practical studies make the leap to theoretical studies, and thus move from being a paraprofessional to being a professional (p. 54). The Green Paper went on to observe that there was much higher representation of lower socioeconomic families in the colleges than in the universities, and it speculated that perhaps the more practical orientation of the colleges made them more attractive to youth from lower socioeconomic groups. It then asked whether having programs that provided more opportunity for students in practical programs to get a stronger grounding in theoretical studies might increase social equality (p. 54).

In Ryerson's response to the Green Paper, it offered a definition of polytechnic education as "... career-oriented education at an advanced level" (Ryerson Polytechnical Institute, 1981, p. 4). The definition also included reference to blending theoretical knowledge with practical experience, and to the salience of the humanities and liberal arts. One of the themes of the Ryerson response was that the development of a rationalized polytechnic sector in Ontario, with Ryerson playing a central role, would be a more effective way of providing polytechnic education than "simply coupling parts of university and CAAT programs, which it was alleged would not produce "true polytechnic education" (p. 7).

Polytechnic education came onto the radar again nearly 10 years later during the Vision 2000 review of the mandate of the CAATs. Through the wide participation of internal and external stakeholders that the Vision 2000 process employed, postsecondary education of a more advanced level than was then being provided by the CAATs – referred to simply as “advanced education” – emerged as a topic of interest. In this connection, Vision 2000 produced two reports that addressed polytechnic education: one by Dr. Stuart L. Smith, who among other positions held had been Chairman of the Science Council of Canada, that discussed Ontario’s need for polytechnic education and different options for meeting that need (Smith, 1989); and another by one of the authors of this study that looked at polytechnic education as one element of possible college advanced education initiatives (Skolnik, 1989). Because Smith’s report provided such a robust discussion of polytechnic education and the problems of providing it, it is worth summarizing some of his observations.

Smith defined polytechnic education as baccalaureate level education that was not traditionally regarded as being within the “province of the university” (p. 1); produced immediately job-ready graduates; and included communications skills and understanding of the global and social context in which the job skills are to be exercised. He observed that at the time, Ryerson was the only polytechnic institution in the province, and that it had been “an exemplary institution and a resounding educational success” (p. 3). However, he said, Ryerson was moving toward becoming more like the other universities, because neither the government nor the private sector had adopted policies to recognize and support its unique mission. In the absence of such support, he argued, as a single institution of its type it could not ensure that its graduates would attain the professional standing that their education warranted. He intimated that this problem of isolation that Ryerson experienced might not have occurred had there been a sector consisting of several polytechnic institutions, but he did not see that as an available option. It may be relevant to note here that subsequent attempts in Canada to sustain a polytechnic or technical university level institution that was highly differentiated from the universities have failed, i.e., the Technical University of Nova Scotia, and the short lived Technical University of British Columbia.

As for evidence of the need for more polytechnic programs, Smith referred to indications that: Ryerson’s programs were “oversubscribed”; that its graduates quickly found employment; and that many university graduates subsequently attend colleges, and vice-versa. He also suggested that the need could be determined more precisely through market research, though later attempts to do so showed how difficult that would be.

The bulk of Smith’s report is devoted to assessing various options for providing polytechnic programs. He rejected the idea of some of the colleges becoming polytechnics because their degrees might be perceived as second class, and because there may be difficulties for an institution in combining bachelor’s programs with trades training. His primary recommendation was for a government agency to promote joint programs between colleges and universities through a mix of exhortation, technical advice, modest financial incentives, and most important of all government giving strong indication of its commitment to such programming. He was less enthusiastic about the idea of a college without walls having the authority to award degrees for combinations of courses taken in colleges and universities, an option that drew more favour in the other Vision 2000 report. In the end, Vision 2000 recommended Smith’s preferred joint program approach, with the proviso that it establish a college without walls that would have degree-granting authority if the parties didn’t make sufficient movement to advance polytechnic education on their own.

In December, 1991, the Government established the Task Force on Advanced Training to consider the recommendations of Vision 2000 pertaining to advanced education. The Task Force, chaired by Walter Pitman, a former president of Ryerson, made a valiant effort at producing data that would indicate the extent of demand for advanced, or polytechnic type, education in Ontario. More than revealing the extent of this demand, however, the Task Force Report showed how difficult it is to measure the demand for a type of education that eludes precise definition and exists only in limited amount if at all. The conceptual and methodological problems of measuring demand notwithstanding, the Task Force concluded that there was a substantial need for more polytechnic like programs, though it didn’t use that term (Pitman, 1993).

One of the key recommendations of the Task Force was for the establishment of an institute without walls, the Ontario Institute for Advanced Training (OIAT). The job of the OIAT would be to “initiate, negotiate,

coordinate, promote, and allocate funds for new advanced training programs at the first degree level” (p. 150). It would also have its own degree-granting power, so that it could award degrees for programs that it could not persuade other institutions to offer. The institute for advanced training that was recommended by both Vision 2000 and the Pitman Report was in effect an open university, only in this case one with its mandate limited to or emphasizing the facilitating of degree programs that involved courses taken in both colleges and universities.

Both Vision 2000 and the Task Force on Advanced Training recommended that an attempt be made to persuade an existing university or group of universities to take on the role of the institute for advanced training, but that if none stepped forward then a new institution be chartered for this purpose. Just over a year after receiving the report of the Task Force, the Minister of Education and Training, the Hon. Dave Cooke, asked the universities to form a consortium that would implement the recommendations of the Task Force on Advanced Training. The Government offered to provide an initial annual budget of \$750,000 to cover the costs of a secretariat for the consortium, and to fund selected projects between colleges and universities (Cooke, 1994). Initially, five universities had expressed an interest in developing the kind of arrangements suggested by the Task Force. However, the Council of Ontario Universities ultimately decided that all the universities should be involved, and as a result the original idea got somewhat watered down. The result was the establishment of an agency that represented all the universities and colleges, the College University Consortium Council (CUCC). The mandate of the CUCC was limited to encouraging and supporting collaboration between sectors and providing information and advice in support of that goal, as well as seed funding. It was not given degree granting, or any other, authority, and thus it has not been able to play the role of an advanced training institute that was recommended by Vision 2000 and the Pitman Report.

One other recommendation of the Pitman Report merits some attention. This was the first recommendation in the report, and it provided the foundation for all the others: “that the equal value of vocational and academic education be recognized by all the partners engaged in Ontario’s postsecondary system” (Pitman, 1993, p. 142). The report suggested that the lack of appreciation of the value of vocational education was responsible for the difficulty that students from colleges had in getting “fair recognition for previous study” from universities.

The observer of postsecondary education who has elaborated in the greatest detail on the relative value attached to different types of education is Gilles Paquet, most recently in a background paper for the Campus 2020 Review of Postsecondary Education in British Columbia (Paquet, 2006; see also Paquet, 1989a; 1989b; 1990). Paquet argues that all postsecondary education institutions are concerned to varying extents with three goals which he terms: Education, Training, and Personal Development, and which he shows schematically as apexes of a triangle. Any higher education program or institution may be characterized by locating it at a point within this triangle that corresponds to the relative prominence that is given to each of the three goals. In Paquet’s framework, Education is defined in terms of the development of the mind and the ability to reason; Training as pertaining to the acquisition of skills and practical knowledge; and Personal Development as broadly embracing components of both, but also development of character, self-awareness and interpersonal/communication capabilities and competence. Much of Paquet’s writing about higher education is devoted to explaining how the predominant understanding of the Education apex of the triangle has evolved through the late 19th and 20th centuries particularly as a result of positivist influence. What he calls the Education function has come to be construed almost exclusively in terms of the development of the capability to analyze and reason through content-neutral curricula and emphasis on theory and especially on methodology, with a corresponding lessening of or abandoning interest in the local, the particular, and the contextual.

In parallel with the rise of a reductionist understanding of Education, there has been a tendency toward uncoupling the three major goals of postsecondary education institutions from one another, and their compartmentalization into different institutional realms. Paquet focuses mainly on two of these realms and describes the consequences of a situation in which universities concentrate on Education, while colleges

concentrate on Training.⁵ As specialization has proceeded among the providers of programs that correspond to each of the three goals, the corresponding status hierarchy that has developed among the different providers has become sharper and more rigid. The rigidity of this status hierarchy, in which Education stands well above Training, has worked against the development of programmatic arrangements that serve to integrate the two, including, as Paquet argues in some detail, professional programs in universities (Paquet, 1989a). Two implications for the organization of polytechnic education can be drawn from Paquet's analysis, which has been summarized here in extreme brevity. One is that a polytechnic university that concentrates on only degree programs might be a contradiction in terms, or at least it might have a very difficult time maintaining the integration of Education and Training. The experience in trying to sustain this type of institution in Canada somewhat supports that proposition. The other is that the institutional model that is embraced by Polytechnics Canada, with its emphasis on offering the full range of credentials, may provide the most viable way of fostering career-focused programs that really integrate applied and theoretical knowledge.

The Present Status of Polytechnic Education in Ontario

To identify the extent and nature of polytechnic education in Ontario at present, one would need to look at four possible ways in which it might be provided or accomplished: (1) by colleges on their own; (2) by universities on their own; (3) by students creating a polytechnic experience on their own by attending a college (university) and university (college) in sequence, or less often simultaneously; and (4) by colleges and universities collaborating in concurrent, joint, and integrated programs. Below, we offer some perceptions of the present situation regarding polytechnic education in Ontario.

(1) Polytechnic Education in the Colleges

The college curriculum is strong in applied education, so determination of the extent of polytechnic education in the colleges hinges on perceptions of the level of education and of the strength of the academic, particularly the liberal arts, component of the educational experience and the way that it is integrated with the applied component.

There are two issues pertaining to level of education. One is whether, as some definitions suggest, education must be at the level of a baccalaureate in order to qualify as polytechnic. However, given the level of sophistication and complexity of the curriculum of many three-year diploma programs, it would be difficult to argue that they do not constitute polytechnic education.

Colleges obtained authority to award baccalaureate degrees in applied fields of study through the Postsecondary Education Choice and Excellence Act, 2000. Under this legislation, a college that wishes to offer a degree program must submit a proposal to the PEQAB which in turn makes a recommendation to the Minister of Training, Colleges and Universities after conducting a program assessment. In order for a program to be offered, the college must receive prior consent from the Minister.

We estimated that as of September 29, 2008, there were 51 degree programs being offered by 15 colleges under ministerial consents.⁶ Over 40% of the programs were being offered by two institutions (Humber, 12 and Seneca, 10). The five Ontario members of Polytechnics Canada accounted for about 70% of the

⁵ The personal development function of postsecondary education seems to have been dropped from the mix except in the rhetoric of postsecondary leaders. An indicator of the central place that this function once occupied is the fact that the institutional embodiment of Newman's idea of the university was once described as the "personality model" of the university (Gellert, 1991, p. 34). Now personal development is left to adult educators or purveyors of various psychological therapies, perhaps implying that there is something pathological about the quest for personal development.

⁶ There does not appear to be a single registry of baccalaureate programs that are actually being offered by the colleges. Our figures were obtained by tracking program approvals to individual college web sites. In two cases, programs were being offered jointly by two colleges, and we counted each of these as single programs. We found some cases where programs had been cancelled and these are excluded from our numbers.

programs. Data obtained from the Ontario College Applications Service revealed that in 2007 there were 1,450 registrants in these programs.

To put this number in some perspective, it is interesting to compare the situation in Ontario with that of Florida. Florida gave community colleges the opportunity to offer baccalaureate programs a few years earlier than Ontario and has been the most active of all U.S. states in promoting the baccalaureate for community colleges (Floyd, Skolnik, & Walker, 2005). A 2007 study prepared for the Board of Governors of the State University System of Florida reported that enrolment in baccalaureate programs in community colleges was 3,059 out of nearly 300,000 students (Pappas, 2007). Undaunted by the apparently slow rate of expansion of these programs, or perhaps in order to accelerate the growth of enrolment in these programs, the state government recently enacted legislation to create a new tier of the state's postsecondary system, a state college sector that will consist of a group of community colleges that are to offer associate and baccalaureate, but not graduate, degrees (Florida Laws, 2008).

According to the standards for baccalaureate degrees awarded by the colleges that were developed by PEQAB, the curriculum of the degree programs justifies the awarding of the baccalaureate. However, questions persist as to the recognition of these degrees in the labour market and by university graduate schools. Partly, this issue may be the result of the unfortunate practice by which the degrees have come to be popularly referred to as "applied degrees" rather than as they are referred to in the legislation, "baccalaureate degrees in applied areas of study". The latter description is shared with a great many degrees offered by universities, whereas the former description fits the degrees that Alberta colleges received authorization to award in 1995. The Alberta degrees consist of six semesters of classroom study and two semesters of work experience, whereas the Ontario degrees require eight semesters of on-campus study and a work experience term of at least 14 weeks.

It has been suggested to us that students would respond more positively to new baccalaureate programs if the institution that offered them had the word university in its name than if it did not. This may be true, but we know of no evidence that addresses this question. It may be that the reputation of an institution for the type of baccalaureate programs that it offers matters as much or more than the institution's name. For example, there is considerable variation in the responses of students to new baccalaureate programs offered by different colleges. Programs in some institutions have had to turn away students, while programs in some institutions could not attract sufficient numbers of students

Perhaps if, in addition to the universities, degrees were awarded only or mainly by institutions in a relatively small new sector that shared some of the characteristics of the universities, the status of the degrees would be less of an issue. The status issue might be helped too if some of the degrees awarded by the new sector had the same nomenclature as some degrees awarded by universities. For any new sector of degree-granting institutions to be a viable alternative to the universities, it is essential to overcome the perception that there are two different kinds of degrees, applied and academic (or worse yet, applied degrees and "real" degrees). The degrees awarded by the institutions in any new sector need to be regarded as of equivalent rigour to those in the universities, differing only in regard to the fields in which many are offered, and perhaps in some pedagogical aspects.

Another characteristic of polytechnic education, as was noted by Ryerson in its response to the 1980 MCU Green Paper, is the existence of complementary education in the liberal arts, including the humanities, of appropriate breadth and rigour. It would be necessary to examine the liberal arts capacity and offerings at the colleges to determine how well this condition is satisfied. It follows also that strength in the liberal arts should be a criterion for an institution to be designated a polytechnic, or to be given more substantial or broader authority to award degrees.

(2) Polytechnic Education in the Universities

The 1980 Green Paper that was summarized earlier tended to view all university programs with names that sounded as if they were career-oriented as polytechnic education. This approach is likely to lead to a gross over-estimate of the magnitude of polytechnic education, for not all such programs may include sufficient hands-on experience for students to warrant the polytechnic label. Perhaps, the programs of only those universities that refer in their missions to the value of applied or experiential learning (e.g., Ryerson, UOIT, and Waterloo) should be included in a list of polytechnic programs. However, as not only Paquet, but others such as Schon (1983), has argued, the paradigm of career-oriented programs in most universities is a linear one that assumes an asymmetric relationship between theory and practice, and thus works against effective blending of academic and applied learning. In this respect, polytechnics, with their particular appreciation of the role of hands-on learning in the development of practitioner knowledge and skill may have a unique contribution to make to the postsecondary system. It is because of the capability of colleges to provide students something of a quite different educational experience than universities that observers like Smith viewed the blending of these two types of educational experiences as a third type of postsecondary education.

(3) Polytechnic Education Created by Student Choices

Students in Ontario and other jurisdictions generally were way ahead of educators and planners in discovering the value of combining the strengths of the colleges in hands-on learning with the strengths of the universities in academic education. Originally, the transfer arrangements that were developed by postsecondary education systems in North America (excluding Ontario) were only for students in the arts and sciences (they were also known as “academic” programs). It was anticipated that occupational programs in the colleges would be “terminal”. It was only when a substantial number of students who completed the occupational, or applied, programs sought to continue on to complete a baccalaureate program in a university that educators and governments began to make efforts to create transfer opportunities for students in college occupational programs. Still, the rates of transfer from applied programs are far lower than for academic programs.⁷ Part of the difference in transfer rates is due to differences in student aspirations. A higher proportion of those who enroll in general arts and sciences programs in the colleges do so with the intention of transferring to a university than is the case for students in most occupational programs. However, the difference in transfer rates is accounted for also by the much greater difficulty that students in occupational programs experience when they attempt to transfer to a university.

The graduate of a college occupational program will already have taken courses of a highly specialized nature, including many hands-on courses, relating to the career field. In regard to the requirements for a baccalaureate and to complete a polytechnic education, what the graduate likely needs most are more and more challenging complementary liberal arts and sciences courses. However, the idea of proceeding from more specialized to more general courses goes against the prevailing curriculum philosophy of the contemporary university which assumes just the opposite type of progression. In order to be more accommodating of students who transfer from college career programs, some American universities have introduced the “upside-down degree” model (Townsend, 2004), but this has yet to become widely adopted. In the upside-down degree, students take more liberal arts and sciences courses in third and fourth year at university after having taken many specialized occupational courses in first and second year at college. This is one way that students create a polytechnic education for themselves.

It was estimated that of those who graduated from Ontario colleges in 2004, over seven per cent were attending a university within six months, and that percentage had been rising since 2000 (ACAATO, 2005, p. 6). This percentage corresponds to over 4,000 college graduates moving on to a university within six months, about 85% attending university full-time. The vast majority of these students were graduates of occupational programs in the colleges, though one would need to examine the precise match between the college

⁷ For example, in British Columbia it is estimated that the transfer rate is over 40% for arts and sciences but less than 10% for students in career programs (ACAATO, 2005, p. 17). Similar differences in transfer rates between these two types of college programs exist in the United States.

programs and the university programs that these students enrolled in to determine whether the combination qualified as polytechnic.

The numbers of university graduates who subsequently attend a college is also substantial, and probably larger than the number that go from college to university. The ACAATO study estimated that over seven per cent of university graduates in the class of 2002 enrolled in a college within two years (p. 14). Data from the MTCU Student Satisfaction Survey indicated that of students enrolled in the colleges in 2006-07, 8.2% had a university degree. In response to the demand from university graduates for career focused programs that would build on their university experience, several colleges have developed programs that are specifically designed for university graduates. The combination of these job- or career-specific college programs with a more general university degree would seem to fit the definition of polytechnic education very well.

In a study of students who followed this educational route in one Ontario college, Meek (2002) found that in comparison with other students, the post-baccalaureate students were more sure of what they would be doing after completing their program, more likely to have chosen their program with a particular career in mind, and more sure how their program was related to their career. As has been reported in other jurisdictions, Meek noted that students in her study believed that the combination of the more academic education that they obtained at university and the more job-focused program that they were doing at the college would significantly enhance their career prospects.

(4) Concurrent, Joint and Integrated Programs

The largest number of collaborative programming agreements between Ontario's colleges and universities pertain to student mobility - from colleges to universities (233 agreements), or from universities to colleges (14 agreements).⁸ Some of these programs are in the area of general arts and sciences and thus would not facilitate polytechnic education. A major question about these agreements is whether they provide a sufficient amount of credit transfer to make them attractive to students to pursue.

Besides these 247 agreements, there were as of September 18, 2008, 37 agreements in which students take some courses in both types of institution before completing their program(s) of study. These agreements are called "concurrent" if the student obtains a credential from each institution at the end of their studies, and "joint/integrated" if a credential is obtained from only one institution. These two categories of agreements would seem to fit Smith's idea of a polytechnic program as discussed earlier. For example, the web site of one such program says that it "combines solid academic education" of the participating university with the "technical and practical skills" provided by the college partner.

The majority of these programs, 29 of the 37, are of the concurrent type, in which the student receives a credential from each institution. Twenty of the 29 concurrent programs are with one university, Brock; four are with Windsor; and five other universities have a single agreement each. More than half the agreements are in the social services, only two are in telecommunications or information technology, and only two others are in any kind of technology (lasers and geomatics). Although the definition of concurrent refers to the idea that the student pursues both credentials simultaneously, in many cases the program descriptions give the impression that the coursework in the partner institutions is sequential.

Of the eight programs in the joint/integrated category, four are in journalism/media; and one each is in geographic information systems, paramedicine, environmental science, and industrial microbiology. It is debatable just how much progress is represented by the existence of these two sets of programs nearly two decades after Vision 2000 and Smith argued for the importance of programs of this type, particularly in technology related fields. Accordingly, it is difficult to offer a judgment about the adequacy of the scale and range of polytechnic programs in which the student draws upon both the college and university simultaneously. On the other hand, the programs that perhaps best embody the Vision 2000 and Smith ideal

⁸ The numbers reported here were taken from the Ontario College University Transfer Guide (OCUTG, 2008) on October 2, 2008. Six of the 14 agreements in the latter category are in the category of "accelerated/intensive" which could include some college to college agreements. The CUCC relies on institutions to provide the data voluntarily, and the Transfer Guide may not include all agreements.

are not listed in the Transfer Guide. These are the programs at the University of Guelph-Humber that “combine the rich academic tradition of the University of Guelph and the professional, training excellence of Humber College” (University of Guelph-Humber, 2008). These programs are in Business, Computing, Early Childhood, Family and Community Social Services, Justice Studies, Kinesiology, Media Studies, and Psychology. Still, those who have studied the development and administration of such programs have reported that they are very labour intensive, time-consuming, and difficult to establish and maintain (Stanyon, 2003; Ellis, 2005). Thus, although some might regard such programs as the gold standard of polytechnic education, this approach may not be sufficiently flexible and responsive to meet many of the needs for polytechnic education.

Polytechnic Education and Polytechnics: Is there a Gap?

Previous attempts to determine whether existing opportunities for polytechnic education in Ontario are sufficient to meet the demand or need for such education have not been able to answer that question, and for good reasons. Polytechnic education is difficult to define, and there are so many different interpretations and variations of it that it is impossible to measure its supply. Getting a handle on the demand side is even more inherently problematic. Employers have a difficult time specifying the kind of education that is needed in their workers. When they do respond to questions about their educational needs, often there are contradictions in what they say they want; and their preoccupation with short term skill needs may obscure what workers need in the long run for promotion and mobility and will bring the most benefit to society (Grubb, 1996, pp. 28-29). Students have a hard enough time making choices among programs for which they are able to obtain information, let alone express preferences regarding educational options that do not even exist.

While it is not possible to measure the supply of and demand for polytechnic education, we can offer some impressions pertaining to factors that influence supply and demand. In spite of the considerable amount of career-focused education that is being provided by Ontario universities, the colleges have something important to bring to polytechnic education, either in combination with what the universities have to offer, or on their own. The colleges’ facility with hands-on learning and their correspondingly strong connections with industry provide a valuable dimension of career-focused education, in a wide range of fields, including technology and applied arts. The substantial numbers of university graduates who subsequently enroll in a college is an indicator of the value that students place on obtaining a college experience. The colleges offer post-diploma programs that provide a career-focused education to the graduates of university degree and other programs, a curricular approach that appears to successfully and efficiently link the strengths of a university undergraduate education with the career-focused education of the colleges.

Whether there are sufficient opportunities, and sufficiently systematic and efficient opportunities, for Ontario residents to obtain a college experience in the course of completing a baccalaureate while preparing for a career is something that can best be determined empirically, by improving and expanding these opportunities incrementally and watching to see how students and employers respond. Encouragement should continue to be given for the development of new joint/integrated and concurrent programming, as the government has been doing through the CUCC. However, because of the difficulty in establishing and sustaining inter-institutional initiatives, it is not realistic to expect this type of programming to expand as much as could baccalaureates offered by colleges that are given a mandate to expand their offerings in career-focused education at the baccalaureate level. Much of the growth in demand for places in baccalaureate programs will be for career-focused programs. Thus, depending upon how students respond to the improvement and expansion of opportunities for baccalaureate programs that are delivered in whole or in part by colleges, these programs could make at least a modest contribution toward meeting the demand for baccalaureates in Ontario.

Earlier in this paper, we noted that polytechnic could be looked upon as either a type of education or a type of institution. When looked at as a type of postsecondary institution, there are three possible ways in which the creation of a polytechnic sector in Ontario postsecondary education could contribute something that presently is lacking or could be improved upon. These same advantages are also associated with creating a third

sector of institutions composed of select colleges that are assigned a new mandate for offering baccalaureate degree programs.

First, as we note in the section on gaps in Ontario's postsecondary education system, the most striking gap is the absence of an institution that is substantially involved in the provision of undergraduate education that is not also involved in graduate studies and has a major involvement in research. Many jurisdictions have recently reformed their postsecondary systems in such a way as to create more institutions that concentrate on baccalaureate education or combine baccalaureate education with sub-baccalaureate education. Creating a set of polytechnic institutions in Ontario, one of whose major responsibilities would be offering career-focused baccalaureate programs, would be one way of expanding baccalaureate enrolment in a different type of institution than presently exists in Ontario. Alternatively, such a set of institutions might be former colleges that give more emphasis on offering baccalaureate programs in a wide range of fields without being called polytechnics. In either case, the benefits of employing this approach relative to those of other approaches, such as creating an undergraduate, teaching-focused university, and/or an open university need to be considered. Using all three approaches might be better than concentrating only on one or two of these options, because the combination of approaches could best address the diversity of student needs and improve pathways for degree completion.

Creating a third sector in Ontario higher education would also be a way of achieving institutional differentiation within the present college system. While there is no virtue in creating differentiation for the sake of differentiation, the differentiation achieved by assigning a special role to a select group of institutions with concrete changes in mandate, governance, and finance, could enhance opportunities for baccalaureate education in the province. An attempt to introduce some formal differentiation into the college sector was made in 2002 when some colleges were given the designation, Institute of Technology and Advanced Learning (ITAL). However, our understanding is that this designation carries little with it in the way of privileges or obligations, other than these institutions being allowed to have a higher proportion of their activity in baccalaureate programs (15%) than other colleges (5%). It is not clear what benefits would result from another name change for some institutions that is unaccompanied by concrete measures to differentiate them from the rest of the colleges, especially the adoption of a name that is as laden with such ambiguity as polytechnic.

Concentrating new baccalaureate programs in the non-university sector in a smaller set of institutions that would have greater recognition and appropriate funding and governance arrangements could enhance the quality and stature of these programs, and possibly serve to break down the status gap that exists presently between the degrees of the two sectors.

Along with the greater concentration of baccalaureate programs in a new sector, it would be appropriate for these institutions to play a modest role in research. Although all faculty in these new institutions need not be involved in research, and the proportion of faculty time spent in research would normally be significantly less for the new institutions than for the universities, research should be one of the designated objectives of the new sector. This would be in contrast to the present situation wherein applied research is not one of the objectives of the colleges, though it is listed as one of the possible means for colleges to achieve their objectives (Ontario, 2002).

Advocates for applied research in polytechnics argue that the applied research done in a polytechnic institution fills a gap between what the universities contribute and what industry does in the innovation process, and thus exploiting the applied research potential that resides in polytechnics would enhance innovation and improve productivity in Canada (Bialski, n.d.). According to Polytechnics Canada, some of the important contributions that polytechnics could make through their applied research are said to be in the areas of: proof of concept, prototyping, design, testing, product development, and pre-commercialization, and their web site gives numerous specific examples of such contributions (Polytechnics Canada, 2007; 2008). Most of what has been written about the unique contributions that polytechnics and colleges can make to the innovation process has come from the sector itself, especially Polytechnics Canada and the ACCC. While this material is engaging and somewhat persuasive, it is important to keep in mind that this is largely a body of advocacy literature rather than the findings of empirical research on and critical analysis of the role of

colleges and polytechnics in the innovation process. It is most likely that there are cases where colleges or polytechnics can make the kinds of contributions that Polytechnics Canada describes, and the fact that colleges already have industrial partners for all of their applied research projects is evidence of industry interest. However, at present there is insufficient evidence to warrant suggesting that all faculty in a new sector that is charged with expanding education at the baccalaureate level should be expected to have a major involvement in applied research, though a modest involvement in some type of research may be appropriate for those teaching in baccalaureate programs.

5. CONCLUSIONS AND CONSIDERATIONS:

There are two inter-related but distinct key issues that will be addressed in this concluding section of our report. The first is whether there is a need to establish a new sector of polytechnic institutions in the province of Ontario. The second key issue is whether new institutions and/or modifications to the roles of existing institutions would be helpful in meeting the anticipated future demand for baccalaureate enrolment in the GTA, and the broader needs of the province. In addressing this second, broader issue, we will review a number of policy options and some of the factors that should be considered in assessing the potential of each option.

Given the limited time and resources that we have been able to devote to these issues, we offer conclusions and considerations that are both tentative and not as well anchored in data and detail as we would wish. On the other hand, we are confident that our observations are well-grounded in an understanding of the design of Ontario's system of postsecondary education and the strengths and weaknesses of that design; its historical evolution; and the dialogue of the past three decades regarding possible changes in that design.

Should Ontario Establish a New Sector of Polytechnic Institutions?

There seems to be a great deal of interest in the question of whether Ontario should establish a new Polytechnic sector, and we have devoted considerable attention in this paper to reviewing the definitional challenges of polytechnic education and the history and evolution of polytechnic education and polytechnic institutions in Ontario and other relevant jurisdictions. However, we note that answering this question is bedeviled by the ambiguity surrounding the term polytechnic and by the impossibility of coming close to being able to forecast the likely demand for and supply of polytechnic education based upon current patterns of provision. Even with full appreciation of those conditions, we simply do not find sufficient evidence of an emerging excess demand for polytechnic education of such magnitude as to warrant creating new institutions called polytechnics. There are two other considerations that reinforce this conclusion. One is that our impression is that the greatest excess demand for places in bachelor's programs is likely to be in areas other than those related to technology, i.e., the social sciences and humanities and business. The other is that Ontario's college sector does not include institutions with the differentiated mandates like the institutes of technology in Alberta and British Columbia that provide such an obvious foundation for building a polytechnic institution. The polytechnic designation may be appropriate in signaling the way in which these three institutions are differentiated from other college type institutions in their provinces. Ontario does not have colleges that are differentiated from the others in the same way as are the institutes of technology in BC and Alberta. This difference, plus the ambiguity of the term, makes the polytechnic designation for any Ontario colleges inappropriate.

As we will note below, we believe that expanding the role of selected colleges in baccalaureate programming should be given serious consideration, but we believe that these benefits can be obtained without using a designation that seems ill-suited to the history of the Ontario colleges and the enormous breadth and comprehensiveness of their activities.

Would the creation of new institutions and/or modifications to the roles of existing institutions be helpful in meeting the anticipated future demand for baccalaureate enrolment in the GTA?

One of the key assumptions underscoring this report is that there will be a substantial excess demand for spaces in university undergraduate programs in the GTA during the coming decades. While conducting independent demographic and enrolment projections was beyond the scope of this study, there is evidence that the demand for higher education in the GTA will continue to increase (Anonymous, 2007) and there appears to be a consensus among educational leaders that Toronto's universities are already stretched and would find it very difficult, if not impossible, to meet the growing needs of the region. According to some of the forecasts that we have seen, the excess demand for degree programs in the GTA will be in the order of 25,000 full-time places.

There are a variety of policy options available to government to meet this demand including: 1) creating satellite campuses of existing universities; 2) creating new universities that are of the same type as existing universities; 3) creating technical universities; 4) creating new universities of a new type focusing on undergraduate study and with a limited role in research; 5) providing selected colleges with a new substantial role in baccalaureate programming; 6) providing colleges with a greater role in transfer programs in basic university subjects, such as arts and science; and 7) creating an open university. We will review each of these options and discuss factors that should be considered by government.

1) Create Satellite Campuses of Existing Universities:

One way of expanding the number of spaces in degree programs in the GTA is to invite universities to establish a satellite campus that would serve the GTA. Developing a new university campus on the foundation of an existing institution would allow expansion to take place under the umbrella of an established administrative infrastructure and reduce some start-up costs, though it will be important to ensure that the government grants and tuition revenues are fully directed towards the activities of the campus and not used to subsidize the other programs or research activities of the parent institution. There are certainly administrative challenges associated with satellite campuses, and developments at the new campus would undoubtedly be impacted by the existing policies, collective agreements and programmatic structures of the parent, but students would benefit from the academic legitimacy and name recognition associated with a "known" university.

2) Create New Universities That are of the Same Type as Existing Universities:

A second approach to expansion would involve creating one or more new universities that would have the same mandate and objectives as other universities in the province. We believe that there are few advantages, and several important disadvantages, associated with creating a university that would simply be a newer version of its peers. Toronto is well served by its three existing universities, and by the programs offered in the GTA by other comprehensive universities, but there is no need to create yet another comprehensive institution or research intensive university that would unnecessarily duplicate the professional and graduate programming already available. Creating yet another comprehensive university would be the most expensive and least efficient option for meeting the demand for undergraduate degree programs.

3) Create New Technical Universities:

Another approach to expansion would involve creating one or more new universities that would have a distinctive mandate and objectives with respect to technology-related programming. The disciplinary focus of

a technical university would be sciences, technology, mathematics, engineering, resource management and business, with some core offerings in the liberal arts. The core academic offering would be four-year baccalaureate degrees, but such a university might also offer two-year certificates and/or graduate degrees in technical fields, depending on the province's needs.

Creating a new technical university would be another expensive option for meeting the demand for additional undergraduate education given the high capital and operating costs associated with offering engineering and other technical programs. This specialized type of institution would not address the anticipated needs for additional undergraduate programming in the social sciences, humanities and applied arts. Finally, it would be difficult to articulate a unique role for a new technical university given the strengths of existing institutions in the region, especially Ryerson University, the University of Toronto, York University, the new University of Ontario Institute of Technology, and the University of Waterloo.

4) *Create New Universities of a New Type Focusing on Undergraduate Study and With a Limited Role in Research:*

A fourth approach would involve creating a new type of university focusing on undergraduate study. As we have noted, this is not an uncommon institutional model in some other jurisdictions, but it would be a new type of university for Ontario. A specialized, undergraduate institution in the GTA could play a unique role in a region characterized by comprehensive universities that offer a broad range of undergraduate, professional, and graduate programming. Consideration should be given to creating an institution with a primary mandate to provide students with an excellent undergraduate experience. Faculty would be expected to devote far more time to teaching than to research and the institution would not have a mandate to compete with existing universities for major research funding. We would envision an institution that would require substantive start-up support, but where enrolment is funded under the existing Ontario university funding formula. The institution would have a distinct mandate for undergraduate programming, and innovations in teaching practices and curriculum design would be encouraged.

Given its focus, a new undergraduate university could play a distinct role within the Ontario higher education system and support a culture and reward structure that would reinforce excellence in undergraduate teaching and place an important, though lesser, emphasis on scholarly research. However, it is important to note that the benefits of this distinctive role would be lost if the initial mandate of the new university is simply regarded as a stepping stone towards the more comprehensive status of the other universities. Consideration could be given to creating legislation that would define an undergraduate sector, and creating more than one undergraduate university (justified by the level of anticipated demand) in order to avoid the challenges associated with a single institution functioning as a unique institutional type within a complex higher education system.

5) *Providing Selected Colleges With a New Substantial Role in Baccalaureate Programming:*

The Province of Ontario took a step towards expanding the role of colleges during the last decade by approving legislation creating a review mechanism under which CAATs could grant degrees in applied fields of study. Some of these institutions have the breadth and the strength in the liberal arts to venture a bit beyond this starting point and offer some bachelor of arts, bachelor of science, and/or bachelor of business administration degrees. These degrees would be mostly but not necessarily exclusively in career-focused programs. Offering such degrees might enhance the stature of their degrees in applied fields and thereby make the latter degrees more attractive to both students and employers.

Given the prevailing view in the literature on the organization of higher education that institutional differentiation enables systems to respond more effectively to changing societal needs, it would seem that a plausible argument could be made for more meaningful differentiation within the college sector than the ITALs have provided. The difficulty though is in translating this idea from the abstract to the concrete in determining just what type of institutional differentiation might be most useful. In this regard, the absence of mandated differentiation among the colleges heretofore has in some ways worked against development of the foundation that could justify some of the options that we might like to consider. The Alberta case is instructive

in this regard. There, as we have noted, the institute of technology model created the foundation for a polytechnic for one type of institution; and the experience of having a substantial mandate for university transfer in some of the colleges created the foundation for them to become, in effect, undergraduate arts and sciences colleges. In contrast, Ontario chose to make all its colleges comprehensive ones, with none specializing in technology or transfer. Nevertheless, the breadth of high quality career-focused programs that some Ontario colleges have developed, along with the development of strength in the liberal arts both to support other programs and to offer modest scale programs in general arts and sciences, could provide the basis for more substantial involvement in baccalaureate programs to meet some of the need for expansion of enrolment in baccalaureate programs. In Ontario, it is not functional or programmatic differentiation that should determine membership in a new sector, but capability and readiness to offer a range of high quality baccalaureate programs.

As we noted earlier, career-focused programs in the colleges may provide more hands-on learning experience and a different approach to the integration of theoretical and applied learning than career-focused programs in the universities, and the college approach may appeal more to some students. Also, given that the colleges have had more success than the universities in attracting students from lower socioeconomic groups, giving some colleges a greater role in baccalaureate programming may help to make access to the baccalaureate more equitable.

To move in this direction, the government would need to clearly articulate the characteristics of a third institutional sector, perhaps a broader sector of undergraduate-focused institutions that could also include new undergraduate universities, that will differentiate selected institutions from colleges and existing universities and allow them to fulfill a unique role within Ontario postsecondary education. It should also determine which colleges will be included in that sector. Based upon the demographics, the priority should be on addressing the needs in the GTA. Probably it would be sufficient to give this broader authority for bachelor's degrees to two or at most three institutions.

These institutions would need to have a mandate and legislative foundation that clearly articulates their unique role as members of a third sector, and creates institutional governance arrangements that reflect the sector's ability to grant degrees by assigning authority over the determination of curriculum, program requirements and standards to an academic council or senate. We believe that such institutions could play an important role in Ontario's postsecondary system, but the institutions that are selected to be members of this sector would need to be assigned a clear mandate and provided with the funding, tools and governance arrangements so that they could successfully fulfill this new role. The new sector's role and mandate would need to be clearly communicated to the general public, especially potential students.

The legal foundation for this new sector could provide these institutions with the authority to grant baccalaureate degrees in applied fields, though all proposals for all new degree programs should be reviewed and approved by the province before they are offered. In general, degree designations should represent the nature of the program being offered rather than the sector of the institution that offers the program.

We believe that it would be important for institutions in this sector to offer programs at a range of levels from certificate and diploma programs, to four-year baccalaureate degree programs. It is the integration of programs offered at all of these levels within the same institution that will differentiate these institutions from both the universities and their college peers. At the same time it would be important for institutions within the sector to maintain an appropriate balance among different types of programs, for example, between certificate and diploma programming on the one hand, and degree programming, on the other. An institution that focuses too heavily on degree programming risks creating the culture of a university. A CAAT with only a few dozen degree students will still have a culture dominated by diploma and short-cycle programming.

The process of choosing institutions for transition to the new sector would not be easy, but we believe that some key factors could be taken into consideration. First, a number of institutions already closely resemble the types of institutions that we have described. Second, it might be important to consider geography and to select a group of institutions that would be able to serve the different needs of different regions within Ontario. Third, institutions would need to demonstrate the requisite strengths in the liberal arts necessary to support

credible and effective baccalaureate programs. Fourth, each institution's experience with, capacity to engage, and plans to fulfill its modest role in research would need to be considered. Finally, it would be important to review each applicant's prior experience in degree granting and their programming plans in order to assess their prior success and their potential role within the new sector.

There are some potential problems associated with pursuing this option. It may take some time before the baccalaureate degrees offered by the new institutions gain acceptance by other institutions or the labour market. It will also take time for the general public, and potential students, to come to understand the role and mandate of these new types of institutions. On the other hand, these institutions could potentially play an important role in addressing at least some of the demand in the GTA, perhaps by enrolling two or three thousand students in new baccalaureate programs.

However, while the emphasis in this paper is on identifying ways of addressing the increasing demand for baccalaureate degrees, we are also mindful of the extremely important functions that the CAATs currently fulfill within the Ontario higher education system in terms of offering employment focused, quality, relevant postsecondary diploma and certificate programs, and trades/apprenticeship, adult upgrading and short cycle vocational programs that meet the needs of students, industry and communities. In order for this job to be done well, most colleges should not have a substantial role in baccalaureate programming and it will be important to reaffirm the continuing importance of the colleges, while perhaps selecting a small number to be part of a possible third sector.

6) *Assigning Colleges the Role of Offering the First Two Years of University Courses in Core Arts and Sciences Subjects:*

Another option for increasing the supply of baccalaureate programming would be to assign all or some colleges the traditional university transfer role, offering the first two years of university courses in core arts and sciences subjects. In some provinces, such as British Columbia and Alberta, most colleges were clearly assigned such a role in providing undergraduate transfer courses. The Ontario CAATs were never assigned a university transfer function, and the issue of student mobility between sectors has been a concern since the CAATs were created, a point we will discuss in more detail below. If the colleges were given a traditional university transfer role, students could begin their degree studies at a local college, and then transfer to a traditional university to complete their studies. Students would have a wider range of institutional options to choose from in terms of deciding where to begin their postsecondary education.

While there are clearly some advantages associated with this option, we believe that it would be too difficult and expensive at this stage in the development of the CAATs for transfer programming to be pursued at anywhere near the level that is common in Western Canada and American community colleges (roughly 30 to 50% of total college enrolment). Many colleges have developed small General Arts and Sciences (G.A.S.) programs which usually serve other purposes in addition to or instead of providing an opportunity for relatively small numbers of students to make the transition to university. For example, the main role of many G.A.S. programs is to prepare students for entry into the college's career programs. To develop a substantial university transfer stream would be a challenging transition for the college sector. The success of this option would also be highly dependent on the acceptance of new transfer courses and programs by universities, and some mechanism would need to be developed to facilitate agreement on transfer arrangements. However, a modest increase in transfer programming through their G.A.S. programs by some colleges might be possible and appropriate where the colleges already have a strong base of liberal arts and sciences courses.

The idea of assigning colleges the role of offering the first two years of university courses in core arts and sciences subjects should not be confused with efforts to improve the opportunities for students who do career programs in the colleges to subsequently complete a university degree program in a related discipline or field. The latter type of student mobility, which is also referred to as transfer for students in college career programs, has been a goal of public policy in Ontario but has proven difficult to achieve. The next option would contribute to this goal as well as other societal goals.

7) Create an Open University:

The final option for increasing the supply of undergraduate degree programming is the creation of an open university. An open university could play an important role in facilitating access to postsecondary education, especially for non-traditional populations, provide comprehensive recognition of prior learning (including credits obtained from CAATs and other postsecondary institutions), and offer flexible, affordable distance education programming.

Issues of student mobility within Ontario higher education, especially mobility between sectors and questions concerning the appropriate recognition of credits, have been identified in numerous government documents and reviews. The Ontario CAATs were never assigned a mandate to offer university transfer programs, and concerns about the recognition of college credits and frustrations over the challenges of moving between colleges and universities began to arise soon after the new colleges were created in the 1960s. Over time the number of articulation arrangements and joint program initiatives between colleges and universities have steadily increased, but, as Mr. Rae noted in his review of the provincial system, more work needs to be done: “We need to recognize the value of student experience, give credit for work that has been done, and establish clear and transparent equivalency standards so that there is recognition for what each student has accomplished” (p. 14). The creation of a new institution with a special mandate to recognize prior learning in developing flexible degree programs could be one way of addressing this important problem, in fact the Vision 2000 review of the CAAT sector recommended the creation of an “Institute Without Walls” to address this problem almost 20 years ago. In the absence of an Ontario institution to fulfill this role, many CAATs have entered into articulation and transfer arrangements with universities in other provinces and countries.

An open university could also fulfill an important role in providing access to postsecondary programs for working adults and other non-traditional populations. It could play a special role in increasing accessibility for Ontario’s Aboriginal peoples⁹ and for students with learning disabilities. It could facilitate the return to postsecondary education for adult workers who need to further their education, and provide a second chance to those who were unable to complete a degree program in their youth and have been reluctant to enrol in a more traditional institution. Alberta’s Athabasca University is a successful example of an open university, and the fact that over one-third of Athabasca University’s undergraduate students live in Ontario¹⁰ provides some evidence of the need for a university with an open access mandate in this province.

An open university could complement and supplement the special access initiatives and distance education programs currently operated by existing universities. It would be clearly differentiated from its peers by its distinct, focused mandate. It would develop the infrastructure and expertise necessary to assess prior learning and offer accessible, flexible, on-line programming while maintaining high academic standards.

If the government was interested in pursuing this option, it could create a small task force to study existing models in other jurisdictions and provide advice on the mandate for and funding of an Open University in Ontario. As we noted earlier in our report, one approach that should be considered is whether the needs of Ontario could be served by entering into a special relationship with Athabasca University.

Our objective in this paper has been to review a number of ways of addressing the increasing demand for postsecondary education in Ontario, and to consider the question of whether the province should create a polytechnic sector. Following an extensive review of polytechnic education and the history and development of polytechnics in Ontario and other jurisdictions, we have concluded that there is little evidence to support the development of a new polytechnic sector in Ontario. However, we do believe that there are a number of innovative options for expanding baccalaureate programs that should be considered, including establishing

⁹ For example, an open university could play a special role in delivering customized educational programming to isolated communities, working with elders to address community needs, and recognizing indigenous learning and Aboriginal-focused programming.

¹⁰ According to the Athabasca University website, 36% of all undergraduates enrolled in 2006-07 resided in Ontario. Over 34,000 undergraduate students were registered in 2006-07, which means that over 10,000 Ontario students were enrolled in this one open university. Retrieved on September 17, 2008 from: <http://www.athabascau.ca/newsroom/press/facts.php>

new institutional types, such as an undergraduate university and an open university, and assigning selected colleges with a new role as part of a third sector in Ontario's higher education system.

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