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Outcomes-Based Education Initiatives in Ontario Postsecondary Education: Case Studies

Qin Liu, University of Toronto



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1 Yonge Street, Suite 2402
Toronto, ON Canada, M5E 1E5

Phone: (416) 212-3893
Fax: (416) 212-3899
Web: www.heqco.ca
E-mail: info@heqco.ca

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Executive Summary

The development of outcomes-based educational (OBE) practices represents one important way in which a learning outcomes approach to teaching and learning can be applied in the postsecondary sector. This study adopts a multiple case study design and profiles seven OBE initiatives being implemented in Ontario's colleges and universities to better understand the scope of outcomes-based educational practices in the province's postsecondary sector. 'OBE initiatives' are defined as purposeful actions undertaken by postsecondary providers directed at defining, teaching toward and assessing learning outcomes in their educational practice (modified from Jones, Voorhees & Paulson, 2002).

The seven OBE initiatives considered in this study include:

- 1) A new program development process at a college
- 2) A program review process at a college
- 3) A curriculum mapping process at a college
- 4) A technology-supported curriculum mapping process at a university
- 5) An interdisciplinary science program at a university
- 6) Outcomes-oriented policy and practice at a university's arts and social sciences faculty
- 7) Senate-approved university learning outcomes at a university

Though none of the cases are framed explicitly in the language of OBE, each illustrates an example of an active implementation taking place along OBE lines. These cases also reflect certain recent educational changes that have taken place over the past few years in Ontario postsecondary institutions. Each case also involves different levels of learning outcomes, ranging from project-based outcomes and course-level outcomes to program-level outcomes and university-level outcomes. They also reflect certain fundamental features of OBE implementation, particularly the use of articulated learning outcomes and the employment of various strategies to enable student achievement of those learning outcomes.

The following research questions guided the inquiry of this study:

- How is outcomes-based education implemented in Ontario's postsecondary institutions?
- What factors have contributed to the active implementation of OBE?
- What practical challenges have been encountered in the process of OBE implementation?

To address these questions, this report consists of five sections. In the first section, I introduce briefly the origins of the outcomes-based education model and identify a shift in the perception of OBE from a pedagogical model to a policy concern. I then discuss the situation of OBE-oriented practices and policies in the Ontario postsecondary sector and reveal a gap in the literature documenting outcomes-based practices in Ontario. In the second section, I present the research design for this study, including the conceptual framework, case selection and data collection processes, and data processing methods.

I report the findings from my case studies from two perspectives. In the case descriptions in section 3, I narrate the process and related procedures within each case and highlight certain observations. In section 4, I discuss the findings of cross-case analysis to address directly the three research questions cited above. I have also extended the discussion in certain cases to touch on related policy issues. The report ends with concluding thoughts.

In summary, the data gathered for this study point to the following conclusions:

- The implementation of OBE at Ontario postsecondary institutions has been integrated into on-going practices such as program development and review, and curriculum mapping and renewal. The scope of application is wide, regardless of discipline.
- The focus of active OBE implementation is currently on defining learning outcomes and developing strategies to ensure students achieve them. Criteria and methods for the assessment of learning outcomes are not as well-developed.
- The roles of leadership figures within institutions and of academic units, teaching and learning centres and institutional culture are identified as factors that have contributed to the active implementation of OBE.
- Major challenges encountered during implementation include faculty buy-in and the time commitment required of faculty members to get involved in OBE-related practices.
- Faculty members' educational beliefs about OBE can act as an enabler or a challenge for OBE implementation.
- There are various sources of influence on OBE implementation. In addition to faculty teaching beliefs, student characteristics and disciplinary features, the institutional environment, including the tradition, the mandate, the leadership and centralized support for teaching and learning also play a role, as do external stakeholders, such as the government and quality assurance agencies.
- OBE implementation in Ontario is intertwined with the quality assurance requirements and policies for postsecondary education within the province. This study has corroborated that in the current postsecondary environment, OBE implementation can be pedagogy-driven and/or policy-driven.
- This study does not support others' observation that OBE implementation only served an instrumental purpose to fulfill accountability requirements. Instead, evidence in this study demonstrates that accountability and continuous improvement can go hand in hand and complement each other within a given initiative.

Acknowledgements

The author extends her sincere gratitude to all the people who shared their experiences and insights about the outcomes-based educational practices at various colleges and universities in the past year, particularly those involved in the seven cases included in this study. Without their generous support, this study would not have been possible.

1. Introduction

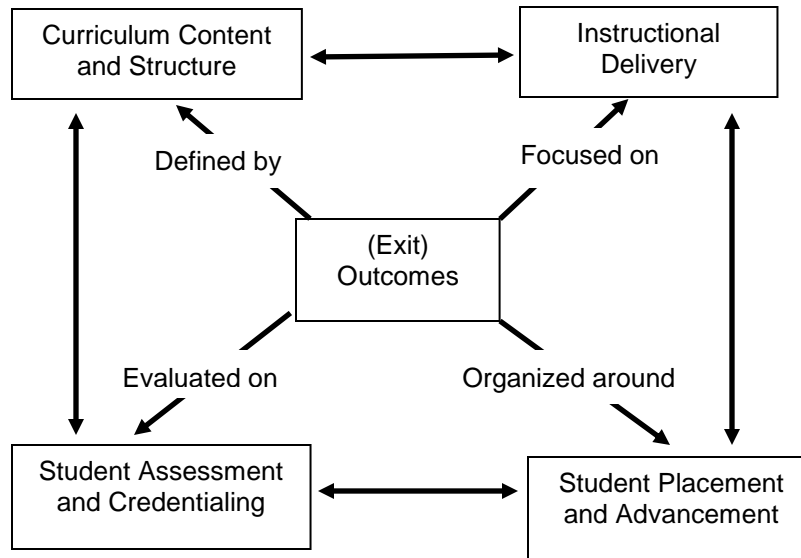
Postsecondary enrolment can contribute to students' achievement of various kinds of outcomes (Astin, 1993; Ewell, 2001; Jacobi, Astin & Ayala, 1987; Pascarella & Terenzini, 1991, 2005). 'Learning outcomes' are one type of outcome that reflects student learning at the end of a particular course of study. According to Ewell (2005), learning outcomes "are properly defined in terms of the particular levels of knowledge, skills, and abilities that a student has attained at the end (or as a result) of his or her engagement in a particular set of teaching/learning experiences" (p. 4). Suskie (2009) defines learning outcomes as "the knowledge, skills, attitudes, and habits of mind that students have and take with them when they successfully complete a course or program" (p. 23). Learning outcomes are also defined as "statements of what a learner knows, understands and is able to do after completion of learning" (European Centre for the Development of Vocational Training, 2009, p. 18). In practice, learning outcomes are often formulated as a set of statements.

The term *learning outcomes* has its origins in outcomes-based education (Ewell, 2001; Nusche, 2008). Outcomes-based education (OBE) is not a novel idea in higher education but is couched in other terms such as competency-based education and competence-based education. While the term 'competency' has traditionally been associated with vocational education (Melton, 1996), the use of 'learning outcomes' is often considered to be applicable to a broader range of educational settings. Yet the definition of the term 'competency' is changing as well, moving away from behaviour-oriented skills and toward an understanding denoting a more integrated approach of developing clusters of knowledge, skills and attitudes (Mulder, Gulikers, Biemans & Wesselink, 2009). This broader meaning is reflected in the literature. One Dutch study understands competencies as "integrated capacities" that consist of clusters of knowledge structures and cognitive, affective and psychomotor capabilities required to carry out tasks or function in a certain professor or position (Biemans, Nieuwenhuis, Poell, Mulder & Wesselink, 2004). In an American project, a competency is defined as "a combination of skills, abilities, and knowledge needed to perform a specific task" (Jones, Voorhees & Paulson, 2002, p. vii). In order to avoid being constrained by traditional connotations of competency and to encompass various types of education, this study has purposefully chosen to focus on practices of outcomes-based education (rather than competency-based education).

OBE's precursors can be found in the earlier objectives movement, as represented by Tyler's (1949) *Basic Principles of Curriculum and Design*, Bloom's (1956) *Taxonomy of Educational Objectives*, and Mager's (1962) *Preparing Instructional Objectives*, as well as in mastery learning (Block, 1971; Gusky, 1985), criterion-based assessment (Masters & Evans, 1986) and competency-based education (France, 1978). From these sources, it becomes apparent that OBE stemmed from and is rooted in efforts to address pedagogical concerns.

The idea of OBE was first theorized in Spady's (1988) article "Organizing for Results." Spady proposed a framework of outcome-based education (see Figure 1) to address the problems associated with a "calendar-defined model" of education, the prevalent instructional model in schools that emphasizes curriculum coverage over student learning. His OBE framework was represented graphically as a reverse cycle of the dominant practice, in which the desired exit outcomes serve as a critical factor in designing the curriculum and steer the directions of all other levels of outcomes in an instructional system – program outcomes, course outcomes, unit outcomes and, ultimately, lesson outcomes. As such, OBE means "organizing for results: basing what we do instructionally on the outcomes we want to achieve, whether in specific parts of the curriculum or in the schooling process as a whole" (p. 5). This model, Spady argued, "represents a dramatically different way of thinking about the design, delivery, and documentation of instructional programs and learning results" (p. 8). Thus, OBE is presented as a transformation of educational practice.

Figure 1: Spady’s (1988) Outcome-Based Education Model



In their influential article “Beyond Traditional Outcome-based Education,” Spady and Marshall (1991) presented four key principles of OBE: (a) ensure clarity of focus on outcomes of significance; (b) design down from ultimate outcomes; (c) emphasize high expectations for all to succeed; and (d) provide expanded opportunity and support for learning success. Contrasting with “traditional” and “transitional” OBE, Spady and Marshall proposed “transformational OBE,” which is a result of “fully embracing and embodying the spirit and substance” (p. 70) of those four operational principles and would arguably bring to schools “a profoundly different means for restructuring themselves” in terms of curriculum, instructional delivery, assessment and credentialing (p. 72).

It merits attention that OBE has recently been extended beyond its original formulation as a pedagogical concern to become a policy concern as well. This shift has much to do with discussions about educational quality. When quality is defined in terms of outcomes rather than resources (Terenzini, 1989), and once the learning outcomes approach has been recognized as a way to improve quality of learning (Biggs & Collins, 1982; Biggs, 2003), the assessment of learning outcomes is treated as a primary means of improving institutional quality (Nettles, Cole & Sharp, 1997). In Australian higher education, learning outcomes are considered to be the most important of all the quality indicators (Coates, 2010). In the United Kingdom, explicit learning outcomes are one of two dimensions required in a quality assurance framework (Jackson, 2002). In the European context, OBE is believed to fit well with the policy discourse of employability and lifelong learning (Biemans, Wesselink, Gulikers, Schaafsma, Verstegen & Mulder, 2009). In North America, series of case studies have been conducted on the competency-based education model with a view to promoting quality and productivity (see examples in Abner, Bartosh, Ungerleider & Tiffin, 2014; Jones et al., 2002). Together, these developments illustrate that OBE has become part of higher education policy discourse in many parts of the world.

In Ontario, a similar outcomes-oriented trend has emerged in policy discourse. ‘Learning outputs’ and ‘final outcomes’ are important components in Finnie and Usher’s (2005) proposed conceptual framework intended to guide thinking about measurement of quality in postsecondary education, thereby basing the framework on graduates’ attainment of learning outcomes. Assessment of student outcomes is also seen to be an indicator

to provide insight into teaching quality (Office of the Auditor General of Ontario, 2012). A continued focus on learning outcomes as a means of fulfilling a vision for Ontario postsecondary education was proposed in a discussion paper released by the Ontario Ministry of Training, Colleges and Universities (OMTCU, 2012). In the premier's 2014 Mandate Letter to the new Minister of Training, Colleges and Universities¹, assessment of student outcomes is identified as part of the priorities for the Ministry. These examples demonstrate how the use of learning outcomes has come to play an increasingly prominent role in the policy agenda for postsecondary education in Ontario.

Despite these recent movements, learning outcomes are not new to Ontario's postsecondary sector, especially to the colleges, whose academic programs have been mandated to follow the outcomes-based Provincial Program Standard since the 1990s. The Program Standard is a MTCU document that "sets out the essential learning that a student must achieve before being deemed ready to graduate" (OMTCU, 2003, p. 3) and represents a standard for coherence for similar programs offered by different colleges within the province. Academic programs offered by Ontario colleges are required to include the vocational outcomes pertinent to certain industries, fields of study or professions, and outcomes for generic employability skills and general education as outlined in the Credentials Framework (OMTCU, 2003).

Within the university sector, the relatively recent introduction of a system-wide quality assurance policy has played a considerable role in pushing Ontario universities toward OBE by requiring that academic programs align with the Undergraduate and Graduate Degree Level Expectations (Ontario Universities Council of Quality Assurance, 2014), which outline a broad set of desired learning outcomes for undergraduate and graduate programs offered by Ontario universities. In response, universities have begun to develop various initiatives that will help satisfy the system-wide policy requirements.

In addition, the array of learning outcomes for credentials ranging from certificates to doctoral degrees is laid out in the Ontario Qualifications Framework (OMTCU, n.d.).² The Framework describes the generic knowledge and skills each credential is intended to achieve and the degree level standards within the Framework serve as a standard for quality assurance for degree programs.³

With all this in mind, the following observations can be made about Ontario's postsecondary system with respect to the use of an outcomes-based approach. First, as alluded to earlier, various policy documents have laid down explicit learning outcomes statements for college and university programs. Within postsecondary institutions, there is general support from teaching and learning centres to help faculty members and academic programs develop learning outcomes and related teaching strategies, as documented by Dawson, Borin, Meadows, Britnell, Olsen and McIntyre (2014).

Second, there is increasing interest in learning outcomes assessment in Ontario postsecondary institutions. For example, Ontario institutions participated in international projects related to the assessment of learning outcomes, with three reports published last year detailing the lessons learned (Lennon, 2014; Lennon & Jonker, 2014; Lennon, Frank, Humphreys, Lenton, Madsen, Omri & Turner, 2014). A practitioner's handbook on learning outcomes assessment (Goff et al., 2015) has become available recently. Other outcomes assessment activities continue to take place at various institutions, and conferences and a consortium have been organized in Ontario to capture the rising interest in learning outcomes assessment (Weingarten, 2013).

¹ This letter is publicly available at <http://www.ontario.ca/government/2014-mandate-letter-training-colleges-and-universities>

² The Ontario Qualifications Framework can be found on the OMTCU website: <http://www.tcu.gov.on.ca/pepg/programs/oqf/oqf.pdf>

³ The degree level standards in the Ontario Qualifications Framework overlap with the Degree Level Expectations and are used by the Postsecondary Education Quality Assessment Board (PEQAB) to assess applications to offer degree-granting programs in Ontario. See the details about the degree level standards at <http://www.peqab.ca/DegreeLevelStandards.html> and the details about their uses for quality assurance in the Handbooks and Guideline for public organizations, private organizations and Ontario colleges on the PEQAB website: <http://www.peqab.ca/Handbooks.html>

Third, while processes and practices exist to enable the implementation and achievement of learning outcomes, these have been poorly documented and thus have not been shared widely within Ontario's postsecondary education communities. Further, there has been little systematic effort in Canada compared to other jurisdictions to examine OBE practices. There is a gap in the literature when it comes to understanding how the learning outcomes approach has been implemented into practice in Ontario postsecondary education.

In this context, this report is significant for discussions of the outcomes-based approach in Ontario's postsecondary sector in a few ways. It helps fill the gap in the literature by documenting outcomes-based practices at Ontario postsecondary institutions. It will consider how learning outcomes have been embedded into postsecondary educational practices. Further, this report intends to illustrate the interconnection between pedagogy and curriculum on one hand and policy implementation on the other hand. Therefore, the study will reflect the use of the learning outcomes approach to postsecondary education at both the curriculum and policy levels.

Hence, this study focused on outcomes-based education (OBE) initiatives in Ontario. Hereby, *OBE initiatives* are defined as purposeful actions undertaken by postsecondary providers directed at defining, teaching toward, and assessing learning outcomes in their educational practice (modified from Jones, Voorhees, & Paulson, 2002). As such, learning outcomes related educational practice can be reflected in three areas: the definition and articulation of learning outcomes; the creation of teaching and learning activities centred around defined learning outcomes; and the assessment of student learning based on defined learning outcomes. It should be noted that an OBE initiative can exist at the program level or at the institutional level. A program-level OBE initiative is often an academic program that places emphasis on any of the three areas of outcomes-related practice described above. An institution-level OBE initiative often relates to an institutional process that involves a strong emphasis on any of the three areas of OBE practice.

The following three research questions guided the inquiry in this study:

- How is outcomes-based education implemented at Ontario's postsecondary institutions?
- What factors have contributed to an active implementation of OBE?
- What practical challenges have been encountered in the process of OBE implementation?

2. Research Design

This study employed a case study methodology, which is defined by Robert Yin (2014) as “an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident” (p. 16). Case study methodology was deemed appropriate in that it allows the researcher to observe a phenomenon in its context, thereby dealing with the distinctive nature of each situation; to draw from and balance multiple sources of evidence; and to use theoretical propositions, which are outlined in the Conceptual Framework section below, to guide data collection and analysis.

In light of Yin's (2014) framework, I adopted a multiple case study research design to focus on OBE initiatives being implemented at various postsecondary institutions in Ontario. It should be noted that those OBE initiatives were the “cases” in this study although they all took place at different institutions. While the choice to include different institutions added complexity to the study, as each initiative is specific to the institutional environment in which it is created and is thus often also related to other processes and policies at the institution, it also increased the body of evidence for analysis. Also, this study did not include any outcomes-based educational practices specific to graduate education within universities.

Conceptual Framework

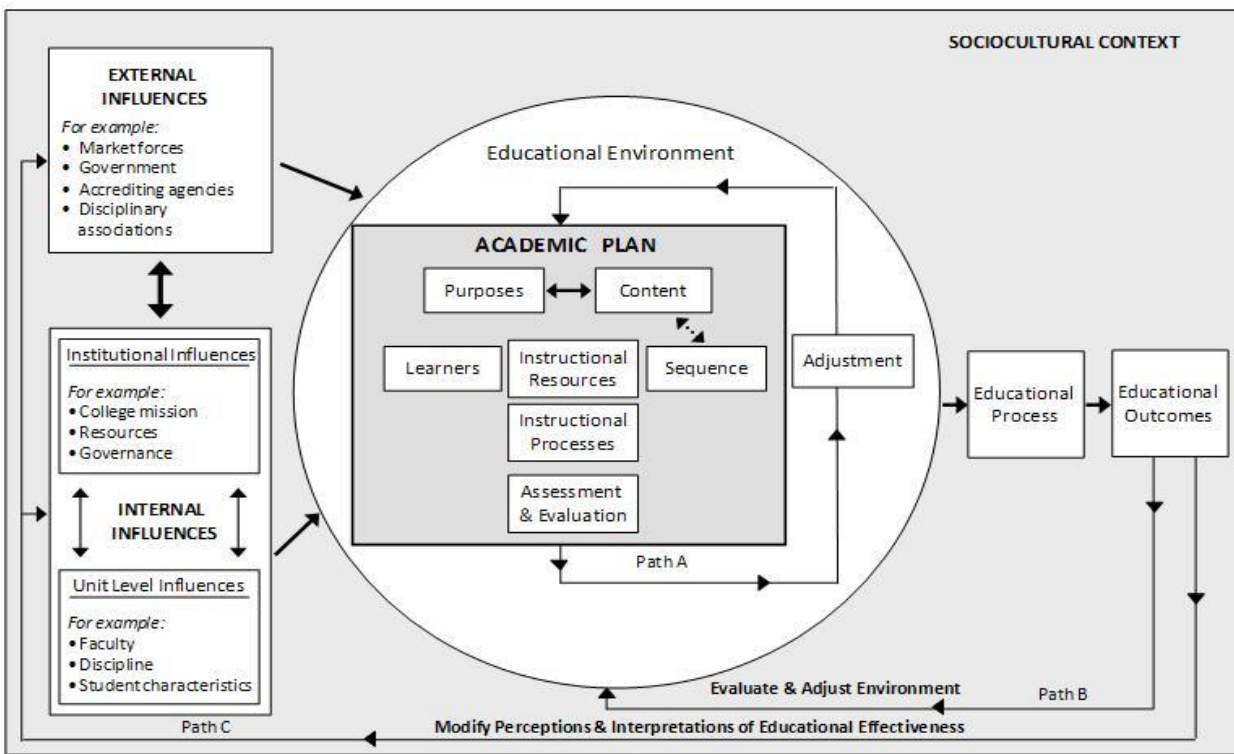
The conceptual framework for this study was informed by literature on the OBE model and by an academic plan model that depicts the process of curriculum development.

In addition to William Spady's transformative OBE model (Spady, 1988; Spady & Marshall, 1991), this study also draws on recent literature on OBE. In Jackson's (2000) outcomes-based model of learning, an outcomes approach to learning has the following three components: (1) an explicit statement of learning intent expressed as outcomes which reflect educational aims, purposes and values; (2) the process or strategy to enable the intended learning to be achieved and demonstrated (curriculum, teaching, learning, assessment and support and guidance methods); and (3) criteria for assessing learning that are aligned with the intended outcomes. Lobst and associates (2010) have identified the key characteristic of OBE in its ability to "explicitly define desired graduate abilities and allow those outcomes to guide the development of curricula, assessment, and evaluation" (p. 652). In other words, OBE does not only require the definition of learning outcomes but also the alignment of these outcomes with the curriculum content, the teaching methods and learning strategies, the assessment and the educational environment (Harden, 2007a, b).

Following in this line of thought, Harden (2007a, b) has employed three analogies to represent three situations of OBE implementation – the ostrich, who believes that OBE is a passing fad and does nothing to move toward OBE; the peacock, who has developed a set of learning outcomes and ostentatiously displayed them, but whose outcomes are ignored by most teachers and students in actual practice; and the beaver, who not only develops a set of learning outcomes but has worked hard to implement OBE, basing curriculum decisions on expected exit learning outcomes. Harden has also proposed an OBE implementation profile as a tool to assess the extent to which OBE has been implemented in practice at a given institution. The inventory consists of the following nine dimensions: statement of learning outcomes; communication with staff/students; educational strategies; learning opportunities; course content; student progression; assessment; and student selection.

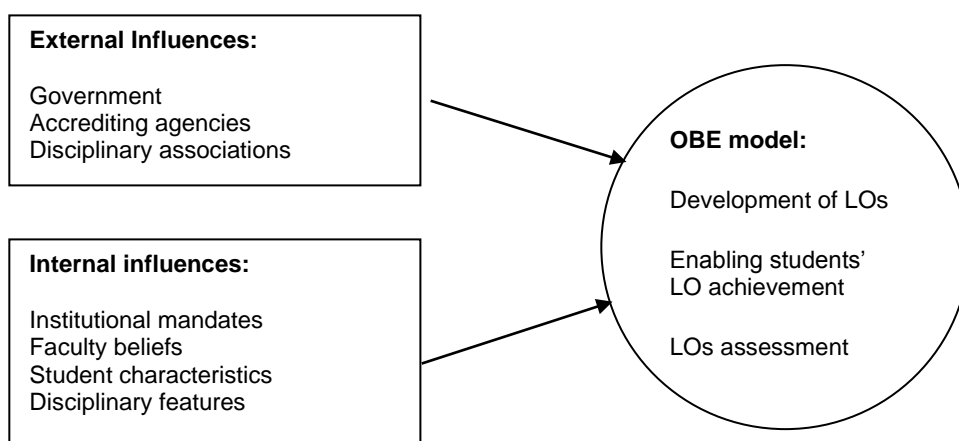
In addition, Lattuca and Stark's (2009) Academic Plan Model sheds light on how we might understand the institutional process of curriculum development in this study. The model sees the curriculum as an academic plan, in which the faculty plays a key role. The academic planning process (Figure 2), which consists of eight decision points (i.e., purposes, content, sequence, instructional processes, instructional resources, and assessment of student learning and evaluation of the course/program), is influenced by a variety of internal and external factors. The influencing factors from outside the institution include the labour market, the government, accreditation standards, etc. The internal influences are further divided into those that function at the institutional level (such as institutional mission, resources and institutional policies) and those that function at the unit level (such as program goals, faculty beliefs and disciplinary characteristics). The Academic Plan Model not only provides an overall picture of the curriculum development process but also underscores the importance of international and external influences on postsecondary education.

Figure 2: Lattuca and Stark's (2009) Academic Plan Model



By combining the two models discussed above, I obtained the conceptual framework outlined in Figure 3. In this light, the implementation of an OBE model consists of the development of learning outcomes (LOs), the formulation of processes to enable student attainment of learning outcomes, and learning outcomes assessment. The model also takes into account the influence of both internal and external factors on OBE implementation. This understanding of the process informed case selection and the interpretation of findings.

Figure 3: Conceptual Framework for this Study



Case Selection Process

The case selection process lasted from mid-July to mid-September 2013 and was restricted to 21 public universities and 22 English-speaking public colleges in Ontario.

To identify learning outcomes-based educational practices, I had personal communications (meetings or email) with at least one academic staff member or administrator from each of nine colleges and thirteen universities in Ontario, which constituted approximately half of my target institutions for this study. Table 1 shows the postsecondary institutions with which I communicated by region. Admittedly, one limitation of this study was the bias in case selection toward the Western and Central regions of Ontario. Although case selection was not intended to yield equal representation by region, this study might have missed initiatives due to the limited number of personal contacts used to identify cases.

Table 1: OBE Initiative Search within Ontario Postsecondary Institutions

Region ¹	Postsecondary Institutions	Colleges ² (C)	Universities (U)	Number of Institutions Contacted
Central	OCAD U; Ryerson U; York U; U of Toronto; Centennial C, Georgian C, George Brown C, Humber C, Seneca C; Sheridan C	6	4	6 (60%)
Western	Brock U; McMaster U; Laurier U; U of Guelph; U of Windsor; Waterloo U; Western U; Conestoga C; Fanshawe C; Lambton C; Mohawk C; Niagara C; St. Clair C	6	7	11 (85%)
Eastern	Carleton U; Queen's U; Trent U; UOIT; U of Ottawa; Algonquin C; Durham C; Fleming C; Loyalist C; Royal Military College; St. Lawrence C;	5	6	5 (45%)

Region ¹	Postsecondary Institutions	Colleges ² (C)	Universities (U)	Number of Institutions Contacted
Northern	Algoma University College; Cambrian C; Canadore C; Confederation C; Lakehead U; Laurentian U; Nipissing U; Northern C; Sault C	5	4	0

1. The categories by region are based on a classification by Colleges Ontario (<http://www.collegesontario.org/images/College%20map.jpg>). Universities are grouped with those colleges in the same region.

2. There are a total of 24 public Ontario colleges. Due to language limitations, my investigation did not include the two French-speaking colleges (Collège Boréal and La Cité collégiale).

I tried to contact two categories of individuals at each institution who were expected to have good knowledge of the OBE initiatives within their own institutions: (1) the vice-president, academic, or someone in a similar capacity; and (2) educational developers working at the institution's teaching and learning centre. To identify initiatives contained within academic programs, I attempted to contact associate deans or those who coordinate quality assurance within those programs. To facilitate the search, I used two instruments I had designed for my search purposes: (1) an information request form; and (2) the OBE Implementation Inventory, which was constructed on the basis of Harden's work (2007a, b) (see Appendices 1 and 2). The first document served as an exploratory tool to identify OBE initiatives, whereas the second turned out to be more effective for program-level OBE initiatives than for institutional-level ones.

The selection process also included a systematic web search of the institutional websites of all public, English-speaking colleges and universities. I searched for keywords such as "quality assurance" and "learning outcomes" on the institutional websites of the 43 postsecondary institutions considered for this study. For universities, I also used "Institutional Quality Assurance Process" or "IQAP." Two sources posted on the Ontario College Quality Assurance Service website – a list of contact persons for the Program Quality Assurance Process Audit (PQAPA) at all Ontario colleges and a list of PQAPA "best practices"⁴ – were very helpful for my search in the college sector.

The selection process proved to be challenging. Within the college sector, some people I spoke with found it difficult to identify one or two particular OBE initiatives as the whole quality assurance process and the standards it uses are heavily outcomes-based. Others commented that the outcomes approach was so deeply embedded in the routine educational practice of the institution that individual initiatives were difficult to identify. Within the university sector, it was hard to identify one or two OBE initiatives that were implemented across the university.

Still, the consultation process yielded some valuable information. I learned about OBE practices and initiatives that had not been documented on institutional websites, and which I would therefore have missed were it not for my contacts. Many of the OBE initiatives in Ontario are hidden stories, so to speak.

After the case search process, I identified a total 26 OBE initiatives, including nine within the college sector and 17 within the university sector. They focused on a variety of areas, including learning outcomes development, learning outcomes implementation, learning outcomes assessment, quality assurance (QA) process, QA support process, QA support tools and program-level initiatives.

From those 26 identified initiatives, I selected the seven included in this study. As shown in Table 2, these cases include three from Ontario colleges and four from universities; and five institutional-level initiatives, one

⁴ Retrieved from <http://www.ocqas.org/pqapa-best-practices.pdf>

faculty-level initiative and one program-level initiative. It should be noted that even though most of the cases selected function on the institutional level, I also investigated how the initiative had impacted different programs through interviews with individual faculty members and staff.

Initiatives were selected for inclusion in this study on the basis of the following considerations. First, the selected initiatives would somehow represent “best practice” in outcomes-based education in Ontario. By “best practice,” I mean that they are what Harden (2007b) called “the beaver” – those who not only develop the learning outcomes but have put considerable effort into implementing OBE. Second, each case would represent a distinct aspect of how OBE could be implemented within Ontario postsecondary education. It was my hope that each case would offer something that could be generalized to similar processes or activities in other institutions. This was to follow the logic of “analytical generalization” in case study methodology (Yin, 2014). Third, I intentionally included those “hidden stories” that might not have been reflected in institutional documents available publicly on institutional websites. In addition, I excluded those initiatives that were still in their infancy in favour of practices that were better established. Lastly, I intentionally included those initiatives located in arts and sciences disciplines, as professional programs tend to be more outcomes-based than non-professional programs due to the influence of accreditation agencies, which often operate under a set of competency-based criteria.

Table 2: Selected OBE Initiatives by Sector and Level

Level	Colleges	Universities	Total
Institutional-level	Program review process; New program development process; Curriculum mapping process	Technology-supported curriculum mapping process; Senate-approved university learning outcomes	5
Faculty/School-level	-	Outcomes-oriented policy and practice at an arts and social sciences faculty	1
Program-level	-	an interdisciplinary science program	1
Total	3	4	7

Data Collection Process

The data for this study came from two sources: (1) individual interviews with academic administrators (including educational developers) and faculty members; (2) institutional documents related to those cases. As shown in Table 3, I interviewed a total of 61 people between September 2013 and May 2014 from those seven cases, 49% of whom were faculty members. The number of interviewees varied from case to case.

The length of the interviews ranged from half an hour to two hours. The interviewees were mainly asked about their involvement in the OBE initiative, the impact of their involvement on their own educational practice, and their perceptions of the strengths and challenges associated with the initiative. Interview questions were based on case study questions, which were mainly concerned with the following areas:

- What is the OBE initiative? What are the major components? Who is typically involved?
- How is the initiative implemented?
- What works well? What does not work so well? What could be done for improvement?
- What do you think of the outcomes-based approach embedded in the initiative?

I obtained research ethics approval prior to conducting any interviews. In addition to obtaining ethics clearance from the University of Toronto (my affiliated institution), I also consulted with the research ethics boards of all seven institutions in which my seven cases are housed and obtained ethics clearance from six institutions.⁵

In each case, I first obtained the administrative consent from a senior academic administrator to conduct the case study. I usually interviewed the senior administrator. The names of other interviewees were either provided by the senior administrator or as referrals from previous interviewees. The following factors shaped my considerations for recruiting potential interviewees. First, they had to have intimate knowledge of the OBE initiative being investigated. Second, they had to represent the voices of various stakeholders that had participated in the initiative. Third, they had to come from diverse fields of study at the research site.

Table 3: Overview of the Data Sources

Cases	Descriptions	Interviewees		Related Documents
		Academic administrators (including educational developers)	Faculty members	
1	New program development process at a college	4	2	6
2	Program review process at a college	6	3	4
3	Curriculum mapping process at a college	5	6	4
4	Technology-supported curriculum mapping process at a university	2	3	5
5	An interdisciplinary science program at a university	2	4	4
6	Outcomes-oriented policy and practice at an arts and social sciences faculty of a university	3	4	4
7	Senate-approved University Learning Outcomes of a university	9	8	6
	Total	31	30	33

Data Processing Methods

The vast majority of the interviewees allowed digital recording of the interviews. The recordings were transcribed into text. A full transcription or a summary of the key points from the transcriptions were emailed to most of the interviewees for review. For those few with whom the interviews had not been recorded, the interview notes were sent to the interviewees for their review the day after the interview.

⁵ One ethics board confirmed that they would not need me to go through another ethics review application.

All the data files were reviewed and different sources of information for each case were compared for what Patton (2002) calls data triangulation and theory triangulation. Interviewee answers and key themes were then tabulated, including those addressing my case study questions and additional themes that emerged from interviews.

Following Yin's (2014) suggestion, I compiled a description of each case based on the data collected. Each case description incorporated the "story" in the case and some key features I identified from each case, and was sent to the key informant in each case for review. I then conducted cross-case analysis in light of the theoretical propositions articulated in the conceptual framework of this study to identify the shared themes that emerged from the seven cases.

Validity and Reliability

Yin (2014) uses construct validity, internal validity, external validity and reliability to evaluate the quality of a research design. In this study, I based case selection on a well-articulated definition of "outcomes-based education initiative" adopted from a similar study (Jones, Voorhees & Paulson, 2002) and two literature-based instruments (Appendices 1 and 2), which helped identify operational measures that match the definition. Construct validity has also been strengthened by using both interview and documentation as sources of evidence; maintaining a chain of evidence through the connections among interview questions, case study questions, themes that had emerged from data, and the case study report; and having the draft case description reviewed by the key informant of each case.

Internal validity mainly applied to addressing the second research question in this study. The explanation was built by identifying some shared themes that fit all or some of the cases on one hand and by relying on theoretical propositions contained in the literature, such as Lattuca and Stark's (2009) Academic Plan Model.

Yin (2014) has distinguished analytical generalization in a case study from statistical generalization in sample-based quantitative research. In that light, the seven selected cases in this study were not 'sampling units' that could represent all the OBE initiatives in Ontario postsecondary education. However, they provided seven opportunities to shed empirical light on some theoretical principles as defined in the earlier conceptual framework section. One of the goals in my data analysis was to find out whether the seven cases could corroborate, modify, reject or advance those referenced principles. This is the process of making the analytical generalization and achieving external validity.

The reliability of this study was established by creating case study questions and interview questions for each case on the basis of research questions and by being well-prepared prior to each interview to ensure that those questions had been addressed during the interview.

3. Findings: Case descriptions

In the following two sections, I will first present the findings from the seven case studies, first as case descriptions (Section 3) and then using cross-case analysis to address the three research questions (Section 4).

Each case description in Section 3 is presented in a linear-analytic structure (Yin, 2014); that is, it starts with a case study narrative and is followed by some observations I would like to highlight about the case. In addition to telling the "stories" in those cases, the case descriptions were intentionally structured to embed the responses to the three research questions into the narratives as well.

In compliance with my research protocol, no institutional names are included in this report.

Case 1: New program development process at a college

Background

The current new program development process has been utilized at the college since 2011. The previous process had four phases, which were streamlined into two major internal phases to make the process more transparent and adaptable to various needs across the college.

The college already has a good proportion of degree programs and is rapidly developing more. As a result, the major external influences on the new program development process were the program requirements established by the Postsecondary Education Quality Assessment Board (PEQAB)⁶ and those from the Credentials Validation Service (CVS) under the Ontario College Quality Assurance Service.⁷

The current model

Under the model, new program development starts with a concept paper, which may originate from a variety of sources: sometimes from a faculty member or administrator and sometimes from the professional advisory committee for the current program. The faculty member who has championed the idea drafts the concept paper with support from the associate dean and sometimes from the college's teaching and learning centre.

The concept paper goes to the Dean's Council, which consists of all the deans and the provost/vice president academic. The Dean's Council will decide whether the idea is worth moving to a feasibility study, which involves an environmental scan and aims to demonstrate that there is student demand for the program and that jobs will be available for graduates. The results of this research stage go back to the Dean's Council, which will then decide whether the idea will move forward in the process.

Successful ideas proceed to Phase 1 of program development, of which an important part is called "ideation," that is, focusing on "the big picture" (i.e., the vision for the program) and asking what attributes graduates will be expected to achieve (i.e., graduate attributes). The program vision is determined collaboratively by those who proposed the program, working with the ad hoc Program Advisory Committee and a support person from the teaching and learning centre. Once drafted, the vision will inform the program's critical performance statement and the graduate attributes will be translated into the program learning outcomes. The program learning outcomes need to be able to support the critical performance statement. An initial program framework is drafted for feedback. Also engaged at this stage are stakeholders within the college, such as the co-op office, the library, the applied research office, and the international office if the program involves international students. A subcommittee under the academic governance body of the college, called the Program Quality Assurance Committee (PQAC) and consisting of representatives from each faculty, provides extensive peer review of the proposed program. Phase 1 is very iterative and involves many changes to the original proposal. The end result of Phase 1 is a completed program proposal.

⁶ PEQAB is an arm's-length advisory agency that makes recommendations to the Ontario Minister of Training, Colleges and Universities on applications for ministerial consent. Ontario colleges are required to seek or renew the ministerial consent if they would like to offer degree-granting programs. The Board has published its criteria and procedures for assessment in its Handbooks and Guidelines, which can be found at <http://www.peqab.ca/handbooks.html>

⁷ The Ontario College Quality Assurance Service (OCQAS) is a quality assurance agency that works with Ontario's public colleges. The agency is becoming an accreditation body in 2015. The Credentials Validation Service was one of the quality assurance processes under the model for the college sector as of December 2014. It provides validation of academic programs offered by Ontario colleges in conformity with the Credentials Framework.

Phase 2 leads to the creation of all course outlines for the program and requires more extensive involvement from faculty members. Developing these course outlines involves working out many of the details of the program, such as figuring out the timing of the co-op placement and creating pathways for degree students to move on to graduate work. The full proposal and outlines then go back to the Local Academic Council, which ensures that the new program fits in with existing programs in the unit. The program proposal is then returned to the Dean's Council, which reviews the resourcing end of the program, such as the availability of faculty, space and resources, and the linkages between the proposed program and other programs to identify any interdisciplinary opportunities. Then it comes back to the PQAC again for a final quality check. It should be noted that at this stage, the role of PQAC has changed from peer review to recommendation for approval. The PQAC is familiar with the CVS and PEQAB standards to make sure that the new program will meet their requirements. At the end of Phase 2, a full program proposal has been developed.

Once the program proposal has been approved by the academic governance body of the college, it is reviewed by a subcommittee of the board of governors (called the Student Success and Academic Excellence committee), which is very much interested in institutional-level issues such as reputation. After the approval of the board of governors, all the documentation proceeds to the quality review process implemented by either the CVS or the PEQAB⁸, depending on the credential of the proposed program.

Overall, the program development process is intended to ensure that the program is closely aligned with PEQAB or CVS requirements as well as the college's institutional strategy. It attaches equal importance to both degree and non-degree programs.

Strengths and Challenges

One of the strengths of the process is its division into discrete phases. This breakdown makes the whole process less intimidating for faculty members. The "ideation" component in Phase 1 is perceived as being very valuable to build a solid foundation upon which the details of the program's courses might be developed. Another identified strength is that the formalized new program development process offers an opportunity to engage the academic community in a collegial, respectful and supportive environment and to enhance the capacity within faculties.

On the other hand, the division into phases has made it a challenge to align all the steps with each other, such that it may take longer than planned to complete the process. Some programs face challenges meeting certain components in the degree level standards in the Ontario Qualifications Framework, which are also outlined in the PEQAB handbook⁹, particularly "conceptual and methodological awareness/research and scholarship" and "awareness of limits of knowledge," as these go further than an average college program normally would. Another challenge is meeting the internal requirements of the college and those requested by the PEQAB process. To do so, some programs end up preparing two sets of documents, which they feel should be unnecessary.

Key Observations

The following features of this program development process need to be highlighted. First, as noted earlier, the role of the PQAC is twofold. On one hand, it provides generous support and cross-disciplinary peer review when the new program proposal is under development in Phase 1. On the other hand, in Phase 2, it becomes an approval body that recommends the proposal for approval before it goes to the college's governing body.

⁸ The proposals of degree-granting programs first proceed to a unit under the Ministry for review; and based on the review results, the unit, on behalf of the Ministry, refers the application to the PEQAB for quality assessment.

⁹ The handbook for Ontario public colleges can be found at <http://www.peqab.ca/Publications/HNDBKCAAT2014.pdf>

As the PQAC is familiar with the CVS and PEQAB requirements, it plays a critical role in ensuring that the new program is aligned with the standards required for quality assurance purposes.

Second, the teaching and learning centre provides support throughout the whole process. At the beginning of the process, the associate dean of the faculty proposing the new program works with the associate dean of the teaching and learning centre to establish a timeline and set out a service agreement. A curriculum development consultant from the teaching and learning centre is then assigned to the project to provide dedicated support and to help project members navigate the program development and approval process. The curriculum development consultant works very closely with the program team, answering their questions and providing feedback along the way, and is considered to be the expert on the quality assurance requirements and is instrumental in keeping the project on track and in helping the program team understand the process.

Finally, the program approval process emphasizes the importance of creating a critical performance statement both for the program as a whole as well as for each of the courses contained in it. A critical performance statement is an overarching statement that represents the vision of the program and portrays a summary of what students need to be able to achieve by the end of the program. By definition, it is “the overall culminating performance that students demonstrate/perform by the end of the program. The critical performance should be broad in scope, summative and cumulative in nature and observable and measurable.”¹⁰ The statement directly informs both the program and course learning outcomes. The college has used the critical performance statement for more than ten years. It has been found to be very helpful at an early stage in the development process for engaging the faculty in thinking about their program as a whole rather than the courses within it. It is critical to the process that faculty members understand and agree on the critical performance statements and related program learning outcomes. Some compare the critical performance statement to an anchor that holds the program together and a compass that orients the program, and consider it a good test for whether appropriate program decisions have been made. Others find the statement valuable for planning student assessment. Still others see the statement as enhancing the constructive alignment and congruency within courses and among courses to create the program, and helping to foster dialogue about course design among faculty members.

Case 2: Program review process at a college

Background

The current program review process began operation at the college in 2010. It was revamped after the first Program Quality Assurance Process Audit¹¹ (PQAPA) in 2008 and was piloted in 2009. Modifications to improve the process have been made every year since. The current process is officially stipulated in the college’s policy for program review and a handbook has been created for use college-wide to facilitate the process.

The Current Process

The process is designed to strike a balance among MTCU’s requirements, the college’s requirements and the interests of stakeholders. The model has been working well to serve those needs. According to the college’s policy for program review, the formal program review process consists of the following eight steps:

¹⁰ Cited from an internal document titled “The Degree Phase 1 Template, November 2013.”

¹¹ The PQAPA is the other process that operates under the Ontario College Quality Assurance Service. Under the quality assurance model as of December 2014, the PQAPA process involves the regular review of each Ontario college’s quality assurance processes every five years.

1. Program identified for formal review
2. Process orientation meeting
3. Program mapping
4. Review of program data and internal assessment report
5. External focus group meeting
6. Final report creation
7. Presentation of report to the governing body
8. Action and follow-up

In the first step, the chairs of the schools and the deans of the faculties are notified of the programs that will be reviewed in the upcoming year.

In Step 2, a curriculum consultant is assigned to each of the programs to be reviewed. The consultant will make contact with the faculty dean, the school chair and the program coordinator to set up an orientation meeting. During the meeting, the whole review process will be discussed and tentative dates will be set for the following steps.

In Step 3, the faculty members involved in the program are invited to attend curriculum mapping sessions facilitated by the curriculum consultant. The purpose is to stimulate conversation to ensure that there is a better alignment of learning between the program and course outcomes, and between the course outcomes and evaluation methods, and to increase connectivity among courses. The vocational outcomes and essential employability skills are used as the program-level learning outcomes, with which all of the courses within a program are aligned. There are two phases to the curriculum mapping. Phase I focuses on the creation of mapping matrices for each of the courses. During Phase II, the mapping results will be discussed among faculty members and findings will be prepared, along with a copy of any amendments to the mapping matrices. Individual faculty members review the learning outcomes on the course information sheet to determine whether the courses they have taught support the program vocational outcomes at an introductory, intermediate or advanced level. They will also determine whether they have taught, reinforced and/or evaluated the program's essential employability skills in their courses. These sessions will also serve as an educational opportunity to faculty members as they learn more about learning outcomes when they go through this phase.

Step 4 is an opportunity for program self-assessment. It is driven by the internal stakeholders of the program, including the faculty members, the program coordinator, the chair of the school and student success advisors, co-op consultants and general education specialists. Some programs also collect feedback from student focus groups. An internal assessment report template is available to guide and support the process. The tool has intentionally embedded the PQAPA requirements, as well as relevant college policy and strategic goals, so that the whole review process can reflect those requirements. In the self-assessment process, the internal data related to the program (such as applicant data and key performance indicators data) will be analyzed and both the program map that was completed in Step 3 and the Provincial Program Standards¹² or program descriptions¹³ will be considered. At the end of Step 4, a self-assessment report will be generated. The report will include the program's strengths, issues and recommendations for improvement.

¹² These Provincial Program Standards are developed, reviewed and approved by the Ontario Ministry of Training, Colleges and Universities in consultation with the colleges and external stakeholders. Each standard include three components: vocational learning outcomes, essential employability skills and general education requirement. The published ones are available at <http://www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/>. Academic programs at Ontario colleges are mandated to meet the learning outcome requirements defined by those program standards.

¹³ As not all college programs have the Provincial Program Standards in place, program descriptions are used instead. The provision of the description is required by the Credentials Validation Service under the Ontario College Quality Assurance Service. The program

In Step 5, various community partners are invited to attend a focus group meeting. The participants include employers in the field, pathway partners and regulatory or association partners, as well as graduates from the program. The meeting is usually chaired by someone external to the program to obtain the most objective and meaningful input from the participants. The main purpose is to identify employer expectations of an entry-level practitioner in the field, ensuring that the program stays current and relevant to the labour market, and to determine the trends for the next five years in the field. Step 5 can also occur before Step 4 if the program team chooses to reflect upon the recommendations made by the external stakeholders during the self-assessment stage.

In Step 6 of the process, the program review coordinator assembles the issues identified and the recommendations made through the self-assessment and the external panel into a final report. The document will be circulated to the entire program team, the school chair and the faculty dean for comments. A final program review report will then be created, including summaries of internal and external issues and recommendations, and implications and action plans for the next five years.

In the last step, the final report is presented to the college's senior leadership and governing body for approval. For accountability purposes, a follow-up report is required one year after the approval of the final report to monitor the progress on the items in the action plan.

The whole review process typically takes 10 months to complete. The college is in the process of adjusting the start date for the review from September to January so that the process can be completed in time to implement changes to the curriculum before the next academic year begins.

Challenges

As with any program review process, certain challenges exist. One is faculty buy-in. The process is also resource-intensive and involves a lot of work. These two factors are related. While faculty members often know that the process will involve a lot of work before beginning, they end the process seeing its value and satisfied with the result. To minimize the workload issue, templates have been redesigned to reduce the number of sections that require narratives and replace them with yes/no answers. Time is another challenge, as is lack of organization in some programs. There can be lack of communication among faculty members regarding the responsibilities for program review. In other cases, it is difficult to accommodate everyone when scheduling meetings. Each of these tends to slow down the process.

Key Observations

The following significant aspects of the program review process need to be highlighted. First, the three core steps in the process, Steps 3 to 5, are outcomes-based. In curriculum mapping and self-assessment, the Provincial Program Standards act as an important reference point, while employer expectations of graduates, as collected in the consultations with community stakeholders, inform the exit outcomes as well as any adjustments made to the program.

Second, while the process is driven by accountability requirements to the provincial quality assurance processes for the Ontario college sector, it has evolved far beyond that. The whole process is deliberately aligned with the PQAPA requirements: the review timeline reflects the five-year cycle under PQAPA and aims

description includes the occupational areas in which graduates are anticipated to find employment, and vocational program learning outcomes that are consistent with the requirements of the Credentials Framework for the credential offered by the program.

to meet the six PQAPA criteria¹⁴ for college program quality assurance processes. As a direct outcome of the program review process, the college satisfied all criteria in its recent PQAPA audit and was highly commended for many aspects of its quality assurance processes, including the program review. In terms of learning outcomes, the process has incorporated the learning outcome requirements (i.e., vocational learning outcomes and essential employability skills) outlined in the Provincial Program Standards or program descriptions as program-level learning outcomes for all programs and ensures that those requirements are met in academic programs.

On the other hand, the program review process is homegrown and addresses the needs of the college's academic programs. After being streamlined and refined in its pilot stage, the current process is considered to be well-structured, in-depth and easy to follow. The process is also evidence-based, thus assisting with decision making. It brings the internal and external lens together to critically examine the program. It has provided a forum to raise issues and obtain feedback from various community partners about the program under review. The formalized one-year follow-up procedure is considered to be key to continuous program improvement.

Third, the process plays an important role in introducing and reinforcing the use of the outcomes-based approach to teaching and learning in the college. Even though the Ontario college sector is mandated to adopt an outcomes-based approach to instruction, not all faculty members are familiar with it. New hires and part-time instructors in particular are less likely to understand the importance of learning outcomes, while some program coordinators are unaware of the existence of certain learning outcomes. As such, the process is educational for them in that it keeps the learning outcomes defined in the Provincial Program Standards front and centre in program delivery. The cyclical program review process has become a mechanism that helps faculty members understand and build the link between learning outcomes and their teaching practice.

Finally, the teaching and learning centre of the college is instrumental in providing guidance and support to the entire program review process. According to the college's policy, the director for the teaching and learning centre is responsible for providing coordination and support for each formal program review. Thus the teaching and learning centre has become a centralized office for program review and development. This is a shift from the previously decentralized structure, which saw quality assurance processes housed in each school of the college. The centre provides curriculum consultation, such as assistance developing course learning outcomes and curriculum mapping, as well as overall administrative support, including coordination throughout the process and compilation of the final review report. The centre is recognized as having done a superb job in facilitating the whole process and in engaging faculty in conversations about learning outcomes and teaching and learning. The centre plays a significant role in operationalizing the quality assurance policy at the college.

¹⁴ Criterion 1. Program-level learning outcomes for all programs of instruction are set, are consistent with the college mission and the programs' intended purpose, and are appropriate for the credential offered upon successful completion of the program.
 Criterion 2. Admission, credit for prior learning, promotion, graduation, and other related academic policies support program development and student achievement of program learning outcomes.
 Criterion 3. Programs conform to the *Framework for Programs of Instruction* and the Credentials Framework, are consistent with accepted college system nomenclature / program titling principles, and maintain relevance.
 Criterion 4. Methods of program delivery and student evaluation are consistent with the program learning outcomes.
 Criterion 5. Human, physical, financial, and support resources to support student achievement of program learning outcomes are available and accessible.
 Criterion 6. Regular program quality assessment that involves faculty, students, industry representatives, and others as appropriate for the purpose of continual improvement is in place and happens (OCQAS, 2014, pp. 8-9).

Case 3: Curriculum mapping at a college

Background

The current curriculum mapping process at the college started in the 2010-2011 academic year. Curriculum mapping has become a mandatory component in preparation for a program's cyclical review. In addition, curriculum mapping is an important part in the new program development and program revision processes.

The Current Process

The mapping process typically proceeds in steps. First, all the instructors in a program are requested to match each of the learning outcomes in their course outlines to the vocational learning outcomes specified by the Provincial Program Standard that is related to the program. A curriculum development consultant facilitates this process by referring faculty members to the related program standards and by providing a workbook.

In the second step, each course outcome listed in a course online is analyzed semantically and the expected level of student performance is identified using as a reference an expanded list of verbs attached to each of the six learning objectives in the cognitive domain of Bloom's taxonomy – knowledge, comprehension, application, analysis, synthesis and evaluation. The level of performance can also be identified from the affective or psychomotor domain. The list of outcomes-related verbs keeps the analysis systematic and helps create a sense of consistency across all courses in a program and across the college.

Then the identified level of performance is entered into the Course Outcome Chart, which lays out the titles of all the courses in the program, the course outcomes for each course, the corresponding vocational learning outcomes specified by the Provincial Program Standard, the level of performance identified for each course outcome, and any concerns or proposed changes to a course outcome. The level of performance is color-coded, with higher cognitive skills in darker shades. If the level of performance for a certain course outcome is considered to be at the lower level of the cognitive skills, it needs to be reframed to reflect a higher level of skills before it can be included in curriculum mapping. Course outcomes not written in a language that represents measurable learning outcomes are flagged for improvement. Any concerns about course outcomes and any suggested changes will be marked on the Course Outcome Chart as well.

Finally, the highest level of performance for each provincial vocational outcome is transferred from the Course Outcome Chart to a curriculum mapping chart, which is presented as a matrix between all the courses in the program and all the vocational learning outcomes in the Program Standard. Thus, the chart demonstrates visually how each course in the program is mapped against vocational learning outcomes in the Program Standard, as well as the level of performance in Bloom's taxonomy that is expected of students for each learning outcome. Through an analysis of the curriculum map, redundancy or over-teaching and gaps that exist in the curriculum can be identified.

An "ideal" curriculum map of a program should have the following features. Courses at the lower level of the program should develop students' cognitive skills on a lower level and courses at the higher level should address those cognitive skills on a higher level. There should be at least one course mapped to each learning outcome so that all the pre-defined learning outcomes for the program have been addressed. However, if more than two courses are addressing the same learning outcome on the same level of cognitive skills, that learning outcome may be over-taught in the program, which should be avoided in a well-structured program.

If an academic program is subjected to an external accreditation agency, the program may create two curriculum maps: one mapping the learning outcomes in the Provincial Program Standard and the other

mapping the accreditation criteria. If the alignment between those two sets of criteria can be established, the mapping chart will accommodate both sets of learning outcomes.

A separate mapping chart can also be created for existing programs to map the courses in the program to various evaluation tools they have used. This chart shows how students in the program are being evaluated in a given term and therefore suggests students' workload over a certain period of time in their studies. The evaluation map helps instructors diversify their evaluation methods and may also create opportunities for integrated evaluation, where two instructors collaborate and use a common assignment to evaluate two areas of outcomes using two evaluation rubrics. This would help students see the connections between the two courses and motivate them to produce higher-quality work.

Strengths and Challenges

The benefits of the curriculum map are multiple. As a visual tool that contains color-coded schemes, the map is instrumental in identifying gaps and duplication in the curriculum. It fosters the creation of proper course sequencing, whereby the courses in the program are structured in ways to reflect a progression of student learning from a lower level of cognitive skills to a higher level. In some cases, the map affirms the strengths of the program, while in others the entire program has to be restructured when too many gaps are identified. The map presents an excellent view of the "big picture" of the curriculum. Internally, it provides a great foundation upon which a curriculum can grow and it presents a solid structure for the curriculum that essentially prevents the program from drifting over time in directions other than the defined learning outcomes. Externally, it is a tool to demonstrate to program reviewers and accrediting bodies that learning outcomes have been met and the level of excellence has been achieved.

On the other hand, the mapping process tends to be labour intensive. When the mapping was first introduced, it often took the curriculum development consultant and faculty members considerable time to enter manually all the information required for the curriculum mapping process. Once the initial mapping has been completed, it does not require much of faculty time.

Key Observations

The following observations should be highlighted about the curriculum mapping process at the college. First, the caveat for conducting the curriculum mapping is the availability of all course outlines for a program and of program learning outcomes. While the course outlines are made available through the college's academic logistic system, the program learning outcomes have been either specified in the Provincial Program Standard or in the national competencies required by the accreditation body related to the program. Also, the mapping is based on the contents of course outlines, which have been standardized to articulate learning outcomes. The availability of all these components has facilitated the mapping process at the college.

Second, the success of curriculum mapping is dependent on trust between faculty members and the curriculum development consultant. In Step 1, the consultant relies on the level of care, accuracy and professionalism of each faculty member to pinpoint which learning outcomes each course has addressed. In Step 2, faculty members need to place their trust in the expertise of the curriculum development consultant who is evaluating the level of performance in each course outcome.

Similarly, the expertise of the curriculum development consultant is critical to the process. The conversations that take place between faculty members during the curriculum mapping process can be more valuable than the mapping document produced. The curriculum mapping process engages the associate dean and the faculty members teaching in the program. The curriculum development consultant is there to facilitate the

mapping process so that the team is brought together. S/he also provides constructive feedback to improve the quality of the curriculum.

Third, the curriculum mapping process is *de facto* educational to faculty members. With the assistance of the curriculum development consultant, faculty members learn to write appropriate learning outcomes for their courses. They take time to reflect on their own teaching. The map is seen as a teaching and a self-monitoring tool that aids in faculty development in the curriculum. The process guides faculty members to strive for excellence and impacts their teaching beliefs.

Fourth, the curriculum map is not a static piece of paper but a living document. More than an administrative process, mapping is about achieving a higher level of curriculum understanding. The process should not be viewed as a desk review but as a sharing exercise and a collaborative tool through which a team of faculty members work together to achieve a common goal. Thus the curriculum map should not be shelved after the program review or accreditation process is finished; instead, it should be incorporated into the routine practice of a program, such as hiring new faculty, faculty development activities and curricular revisions.

Finally, the curriculum mapping process both fulfills accountability requirements and creates possibilities for continuous improvement of the program. It is a compliance tool, designed to align the courses in a program with the learning outcomes prescribed in the Provincial Program Standards and/or accreditation criteria. It is instrumental in ensuring that the program has satisfied the pre-defined learning outcomes required by those standards or criteria. In addition, curriculum mapping serves the continuous improvement of the program. The initial curriculum map reflects the actual practice at the time when the process is first initiated. When the mapping process is completed, any concerns identified have been addressed and improvements made. Thus, the final map reflects an enhanced curriculum. Through the mapping process, faculty members and the program coordinator have not only developed a better understanding of the strengths and weaknesses of the program but also addressed the identified issues in the curriculum.

Case 4: Technology-supported curriculum mapping at a university

Background

The web-based curriculum mapping tool was introduced to the university in 2011 in direct response to a requirement of compliance with the Degree Level Expectations¹⁵ (DLEs) as mandated by the Institutional Quality Assurance Process under the Ontario Quality Assurance Framework. The tool was intended to facilitate departmental engagement with the learning outcomes approach to curriculum analysis, in particular during program review, and to enhance efficiency in engaging faculty members in the process.

Technology was introduced to curriculum mapping because of some limitations identified in the previous, usually manual, labour-intensive process, in which information was collected and compiled in a paper-based format and administrative assistance was needed to enter the information for departments. To streamline the process, software was developed to act as a simple and straightforward interface that would create a less steep learning curve and less cognitive load on the part of its end-users.

¹⁵ The Degree Level Expectations describe what students should know, and be able to do, after successful completion of a degree program at the bachelor's, master's and doctoral degree levels. They were developed by the Ontario Council of Academic Vice-Presidents and subsequently endorsed by the Council of Ontario Universities in December 2005. The Ontario Quality Assurance Framework that has governed the quality assurance processes within the Ontario university sector since 2011 mandates that each proposal for a new program must identify learning outcomes, which should be consistent with the DLEs and the university's mission (COU, n.d.).

The tool has become an effective way of establishing the alignment of the program curriculum with the DLEs as part of the cyclical program review process. In the program review manual for conducting a self-study report, curriculum mapping is required in the form of a courses-to-program goals matrix and a course methods and assessment matrix. The tool is also used in curriculum renewal at some departments and for new program development, though to a limited extent.

The Current Process

During the mapping process, faculty members match each of the courses they teach with the pre-defined program learning outcomes and identify whether the course has introduced students to a particular learning outcome or has reinforced it, and whether students have achieved the required level of proficiency for the outcome. Thus the map has three indicators of student proficiency for each learning outcome: introduced, reinforced and proficient. These indicators can also apply to the teaching methods and the assessment methods used in the course.

The tool structures the information it collects as a database. When all the information has been entered into the interface, the information is linked, allowing for different kinds of reports to be generated. A condensed report, for example, includes the overall mapping of each course against program learning outcomes, with related “introduced,” “reinforced” and “proficient” levels being colour coded. An expanded report includes teaching methods and assessment methods as well. As the tool is refined further, it will dig deeper into the details of the curriculum and make information easier to present using colour or proportion. The tool also allows faculty members to conduct a gap analysis of fundamental concepts and skills taught in the curriculum.

From the course-to-program goals matrix, one is able to tell in what parts of the program students are expected to be working at the “introduced,” “reinforced” and “proficient” levels for certain pre-defined program learning outcomes and whether the courses have been structured appropriately in terms of student progression through the three proficiency levels. From a course methods and assessment matrix, one can know how and at what level the program outcomes have been assessed in the courses.

In terms of the working procedure, the first step in the curriculum mapping process is to develop or refine the program learning outcomes, which become foundational for the whole process. Most departments do not have program learning outcomes, so they first have to define a list of learning outcome statements that capture what graduates of the program will be able to demonstrate. They can do this by developing a set of graduate attributes for their program. Input is drawn from industry and alumni, as well as from the university’s academic plan, faculty’s own experiences and the department’s previous program reviews.

Once the program has outcome statements, the outcomes are cross-referenced to ensure that the program outcome statements comply with the DLEs. Then faculty members are brought together in a computer lab. A curriculum development consultant facilitates the mapping process by taking five minutes to show faculty members how to use the software. It then takes a faculty member approximately twenty minutes to go through the mapping process for each course. The mapping can also be completed at faculty members’ own desks as it is web-based. When the information for all courses has been entered, the software will flag the lowest numbers and the highest numbers under the three levels of all learning outcomes, and a report can be printed out.

The faculty members then gather again and the curriculum development consultant facilitates a conversation to help them look at the report outcome by outcome and year by year to identify patterns and problems. S/he will elicit what faculty members have observed and assist with the interpretation of the report.

Strengths

The technology-supported curriculum mapping process is believed to have many advantages. It allows for real-time adjustments to information that has been entered and it can generate reports in different formats. Using technology for curriculum mapping is considered useful for tabulating information and simplifying the distribution process, thus reducing errors and enhancing efficiency. These advantages are particularly beneficial for a program review process, which usually appears onerous to many faculty members.

The process is generally well received at the university. The software is considered to be user-friendly. Although initial resistance is experienced in some cases, many faculty members become fascinated by the process once they have become more invested in it.

The resources required to develop software of this kind are not considered high. Two factors are helpful: (a) a curriculum expert who is well versed in the curriculum mapping process and the functionality that the software is designed to achieve; and (b) a strong computing department that communicates well with other departments.

Key Observations

The following features of the curriculum mapping process at the university should be highlighted. First, curriculum mapping is instrumental to developing program learning outcomes. Unlike college programs, university programs have to articulate their own set of learning outcomes, which are expected to be aligned with the DLEs. In this sense, the mapping process has become a catalyst for creating those learning outcomes.

Second, the use of a technology-supported tool for curriculum mapping can allow for multiple objectives to be addressed through this process. In addition to facilitating the program review process, the tool helps make the curriculum and the department more coherent and provides opportunities for professional development related to teaching and learning. The process helps faculty members link their courses to the program learning outcomes and to the DLEs. Through the mapping process, faculty members are educated about how the outcomes-based approach can work for the overall interests of the program and how curricula can fit together to achieve a common goal.

Curriculum mapping opens up opportunities to discuss how to improve on certain learning outcomes. The visualization tool provided to faculty members during the mapping process encourages them to talk about teaching and learning and think about their curriculum in a holistic way. In many cases, these kinds of discussions only occur in the context of curriculum mapping. This emphasizes the importance of the communal nature of the program review or curriculum renewal process. Hence, it consolidates the belief that faculty members should take collective ownership of the program, generates faculty engagement and helps build cohesiveness within departments.

The mapping process is only a first step on the road to program enhancement. When decisions have been made to make concrete changes, actions will have to follow in order to make the process truly beneficial to enhancing the quality of academic programs. Mapping is considered a useful tool to identify key strengths and weaknesses in the curriculum of the program, thus helping to drive curriculum reforms. It has provided a structure to the curriculum renewal process and an opportunity to develop a strong curriculum and to reduce course drift over time.

Third, the process serves the needs of accountability and continuous improvement. The development of the curriculum mapping software was a direct response to the new quality assurance policies in Ontario, as the

Institutional Quality Assurance Process requires that departmental learning outcomes be aligned with the DLEs. On the other hand, the curriculum mapping process facilitates the continuous improvement of the curriculum and related academic program. When time can be saved from data entry, more effort can be devoted to discussions among faculty members regarding teaching and learning. Some interviewees have found that the mapping process has provided a lens through which to effectively examine and discuss curriculum issues, and that the greatest benefit of the process is the resulting coherence within the curriculum and within the department.

Fourth, the mapping process does have challenges. Some faculty members may feel unfamiliar with technology and uncomfortable using the software. A big challenge is to ensure that faculty members are on the same page as to how the different levels of learning outcome proficiency are defined. Although they are instructed to map learning objectives against the level of proficiency they expect from students who have received a bachelor's degree, faculty members sometimes map against the professional standards of the discipline. Another challenge lies in how to interpret the information in a report. While the mapping process yields a good overview of the program as a whole, it can be hard to summarize nuances between courses using data alone. A technical difficulty is that the course-to-program goals matrix can become so wide that it does not fit on the computer screen. Further, not all faculty members buy into the concept of curriculum mapping and many do not see the value in doing it. As a result, it may not have a major impact on their teaching practice. The mapping process also requires a considerable time commitment and may be frustrating to some faculty members, especially when they view it merely as paper work that adds extra work to their busy working schedule.

Finally, the perceived impact of the curriculum mapping process seems to be affected by faculty members' perceptions of the outcome-based approach to teaching and learning. For some faculty members, certain learning outcomes, such as autonomy and awareness, are considered peripheral to the discipline, and their assessment is considered a challenge. In contrast, for those who embrace the idea of outcome-based education, the process can help restructure the curriculum in a significant way.

Case 5: An interdisciplinary science program at a university

The interdisciplinary undergraduate science program received its first group of students in 2009. The enrolment has been approximately 50 students each year and is close to 60 in 2014. An interdisciplinary approach has been integrated throughout the four years of the program.

Program Design

The program's design document sets out an interdisciplinary approach to science education, learning through research or inquiry-based learning, and innovative styles of instruction as goals for the program. The document also states that the program aims to "produce potential graduate students with highly developed scientific research and communication skills and uniquely equipped to contribute to cutting-edge research and development" (p. 3). In addition, the program also aspires to build a strong sense of community, create a project-oriented, rather than course-oriented, learning experience and a learning environment that fosters innovative styles of instruction.

In actual practice, the program educates students in an interdisciplinary manner that emphasizes the connections between the science disciplines while building a good foundation in science through research-based learning. The students are not only expected to learn approaches to science but also to develop a good understanding of the context of science in society.

The Current Curriculum

In the first year of the program, students are expected to conduct four research projects and are introduced to the research process in their first six weeks. There is a great deal of structural support from instructors. The students are guided by instructors as they conduct two small, team-based research projects in the second six weeks of their first term and two larger projects in the second term. The projects integrate the basics of physics, chemistry, biology, earth science and life sciences and place a strong emphasis on scientific literacy. While completing these projects, students are also learning the fundamental concepts about those areas – not on the basis of courses but in an integrated fashion through “learning by research, learning about research, and learning to research”, as one interviewee phrased it. The teaching support is always directed to those projects.

For each research project, the students are presented with a project pack, which articulates the research objectives, learning objects and skills development, as well as learning resources, the assessment scheme and learning specifications in each discipline. Research projects are designed to investigate interdisciplinary questions and each represents a topic that can be approached from various disciplinary angles. In the design phase of the projects, the instructors were brought together to write down all the first-year learning objectives for each discipline and then those objectives were reformulated so that they could fit best with the research projects. Those objectives are laid out clearly for the students so that they know what they have to gain from a particular research project. An important goal of the first-year curriculum is to ensure that students learn all the fundamental science that their peers in other science programs are learning so that they are able to move on to any second-year science courses offered by the university.

The curriculum in the second year is module-based. Within those modules are six research projects, which are less structured than those in the first year program. From the second year onward, students develop their own specialties by taking associated electives in those disciplines. Disciplinary concentrations have been built into the program in conjunction with various departments in the Faculty. As students progress through the program, they are exposed to a reduced amount of instruction and an increased amount of learning through their research.

In the third year, students conduct four interdisciplinary projects, which are more open and much less structured. They also have more room to develop their disciplinary concentrations. A project team is usually structured so that it contains students concentrating in different disciplinary areas. The students have the freedom to pursue their projects in any direction that their interests take them. In the fourth year, each student undertakes an independent research project for a thesis.

The program is targeted at highly motivated and high-achieving students. The teaching and learning approaches the program has elected to use are drastically different from the delivery of traditional science education. In the first six weeks of the program, students learn about all the aspects of the scientific research process. In the remaining parts of the program, students conduct team-based interdisciplinary research projects. Those research projects place contextual relevance to what students are learning in the program and have become the drivers for their learning. Instructors guide the students through scaffolding at certain points and interject certain key fundamentals that the students need to know. In a small class environment, the students are presented with many active learning opportunities. They are encouraged to think about what they need to learn and how they can best learn it. They are also encouraged to find out information that is not covered in classes but listed as learning objectives on their research pack.

The boundaries between disciplines are completely reorganized for teaching and learning purposes in the program. While there are still discipline-based classes, such as physics, biology, chemistry and mathematics, the program is structured to emphasize for students the linkages between various disciplines, through co-teaching of two instructors from different disciplines for example. The students are also asked questions to

facilitate them making those linkages. The instructors order their teaching by relevance to the research projects and the students learn to fill the gaps in the knowledge that is not covered by the projects.

Rather than focusing only on academics, the program strives to build a learning community that emphasizes cohesion between students and faculty members. Senior students support junior students. Students sit on the curriculum committee to inform the changes in curriculum delivery directly. There are also faculty and staff committees that meet on a weekly or bi-weekly basis to discuss teaching, learning and curriculum issues. As such, the program has created a learning community as well as a teaching community.

Although the program is very young, its effects on students have already been seen both inside and outside the program. The students are found by instructors in other programs to be good at asking thoughtful questions and outstanding among their peers when they are in larger classes. Some students have turned their projects into book chapters or magazine articles, while others have presented their projects at academic conferences and even published their findings in academic journals. The achieved learning outcomes are impressive.

Key Observations

The following observations need to be highlighted about the outcome-based approach adopted by the interdisciplinary science program. First, although the outcome-based approach was not clearly stated in the program's design document, the thinking behind the design is very much illustrative of principles in outcome-based education. The design of the program started with a concern about highly specialized science education and the identified characteristics of successful science researchers in the 21st century. Then the following questions were asked: What skill sets do the scientific leaders of the future require? What perspectives do they need? This outcomes-based "backward design" was present from the first conception of the program in 2006.

The outcome-based approach is also reflected in how the program operates. The research and learning objectives as well as the skills to be developed are articulated in each of the project packs. Those outcomes are found to be very effective in helping the students navigate the massive amount of learning in the interdisciplinary science program. Learning objectives are constantly revisited during the program. Those learning objectives have helped the students in the program achieve the academic standards that students in regular science programs are able to reach. The students are also encouraged to use stated learning objectives as guides when preparing for their exams. The learning objectives have become a strong guide for students' learning as they learn by achieving those goals.

The outcomes for each research project are defined in terms of both knowledge and skills. The development of students' research skills starts at the beginning of the program. The program takes the approach that learning proceeds more quickly once the proper skills are developed. This may be a challenging idea for some university faculty, who believe that content has to come first before the focus can shift to skills development. The instructors find that their students have achieved amazing things when expectations are clearly communicated to them on the front end.

Assessment is seen as a means of communication with students. The assessment scheme is designed to align with the outcomes. Students are assessed in the same way that they learn. The scope of the assessment extends from theories to applications, and from the content to the writing style if it is a writing piece of work. The assessment gives credit to both team-based learning through projects and individual learning in disciplinary subjects.

On the program level, the learning objectives have helped the program justify its delivery methods. Without adopting the traditional course-based delivery approach, the program is able to build the same knowledge base for its students as their peers have acquired in traditional science programs. The learning objectives have laid a good foundation for the program to move forward. The well-established learning objectives also grant the program greater confidence and clarity to operate. Otherwise, as one interviewee commented, the program would be left in “murky, muddy water.” Thus, the program has become more manageable and allows instructors to move in and out of the program more easily. The outcome-based approach is considered to be in the best interest of both students and faculty.

It should also be noted that there was some struggle in the program’s first year of operation when the learning objectives were not as well defined and therefore were not clear enough for students. Students wondered what they were supposed to learn from the innovative delivery of the curriculum. Once the learning objectives were clearly identified, it became much easier for the program to move forward. The students are now provided with greater room for creativity as they fulfill those learning objectives.

Second, the program operates in a university that is known for fostering pedagogical innovation. This institutional culture has facilitated the design and delivery of the program. Under the outcomes-oriented institutional quality assurance process mandated by the province’s Quality Assurance Framework, there is a stronger institutional support than before for the outcome-based approach to teaching and learning. However, the interdisciplinary science program has gone beyond the university requirements and is ahead of the curve in what the university is advocating.

Third, while the outcome-based approach is very much embraced by the program and its key faculty members, the program has yet to articulate a set of learning outcomes at the program level. It is clear that the program has a strong vision, and terms such as “lifelong learning”, “information literates” are used to describe the graduates of the program. However, it is also acknowledged that it is difficult to define learning outcomes at the program level because they can go in so many different directions.

Finally, rather than being informed or driven by any external quality assurance requirements, the outcome-based education reflected in the program is discipline-based and completely pedagogy-driven. The idea for this program came from observations made about problems in science research and undergraduate science education, and no external government policy or university initiative motivated the creation of the program. Placing students at the centre of program design and operations is considered to be the key to making the program work.

Case 6: Outcome-oriented policy and practice at a university’s arts and social sciences faculty

Policy Development

The faculty of arts and social sciences is the largest one at the university, consisting of more than ten departments. A new policy took effect in January 2013 that requires all faculty members to include student learning outcomes on course outlines. The policy was created through a motion that was passed at a meeting of the faculty coordinating council in the fall of 2012. At the time, it was considered to be imperative to clearly list course-level learning outcomes on each course outline and it was noted that the course-level learning outcomes should be derived from the learning outcomes of the program, which are supposed to be aligned with the university’s graduate attributes. A standard course outline template was created and made available to all faculty members in December 2013 to facilitate the implementation of the new policy.

The faculty seems to be the only one at the university that has a formal policy requiring course learning outcomes. As an attempt to address increasing student complaints regarding procedural irregularities in grading, the policy was initially intended to increase transparency and fairness in grading, and provides students with a clear goal toward which they might work. The initiative is also instrumental to helping support the university's endeavours to convince faculty members to implement outcome-based education while preparing for the Institutional Quality Assurance Process. The policy is considered beneficial for course delivery too, with an understanding that an instructor who has clear student learning outcomes will be better positioned to support students. Instructors are also expected to discuss the learning outcomes with students in the classroom.

Policy Implementation

With respect to implementation, department heads are expected to check with every individual faculty member and make sure that course learning outcomes are in place. Every semester each instructor has to provide a copy of their course outlines to the departmental secretary and the dean's office to make this check-in possible. However, there is no follow-through on what has happened after the policy started to operate at the faculty. Some faculty members may not be doing it and the department heads can be so busy that they do not have the time to check. It is also hoped that the cyclical program review process will bring every program on board with the new policy. An academic support staff will be hired to assist departments and professors with development of learning outcomes.

Some department heads have been more open than others to sharing the benefits they have observed from this outcomes-based approach. They acknowledge that faculty members who devote most of their energy to research may be difficult to convince of the value of the learning outcomes approach to teaching.

In actual practice, there is another use to the course outlines that include articulated course learning outcomes. Outcome information can be extracted from each course outline and then combined to inform a curriculum map for the program, which can be compared to the program learning outcomes so that any gaps and issues can be identified.

Key Observations

The following observations should be highlighted about the outcome-oriented policy and practice at the faculty of arts and social sciences. First, leadership played an important role in creating the policy. In this case, the associate dean is a strong advocate for learning outcomes. The leader has also been trained to develop a good understanding of what learning outcomes are and why they are helpful for educational enhancement. In addition, some department heads are playing an instrumental role in educating other faculty members what learning outcomes are and how they can be created.

Second, institutional environment seems to have played a helpful role in cultivating the outcomes-oriented policy at the faculty level. The university has long strived for student-centred education. A set of university graduate attributes were created in 2003 and program learning outcomes have been mandated to align with those university graduate attributes for a longer period of time than at many other universities in Ontario. The policy for course-level learning outcomes seems to be part of the continuity of the outcomes-oriented university environment that was created a decade ago.

Finally, we must recognize the challenges the faculty has faced in the process of implementing the faculty-level policy. There are challenges in getting messages out consistently to individual faculty members given the size of the faculty. There is certainly variation among departments in terms of policy implementation. Some departments are more interested and mobilizing as a unit, while others are doing as little as is required.

When the department heads themselves are not convinced of the value of the outcomes-based approach, they generally view the policy as a requirement to meet rather than an opportunity for improvement. This is certainly not helpful to build faculty buy-in. Faculty buy-in tends to be a considerable challenge to implementation. Even when support and resources (for example, workshops and consultation from the teaching and learning centre) are available, faculty members may not want to consult them.

Case 7: Senate-approved university learning outcomes at a university

University Learning Outcomes

After two years of broad consultation with faculty, students and staff, the university's undergraduate-level learning outcomes were approved by the senate in December 2012. Six months later, the graduate-level learning outcomes were approved by the senate as well.

The institution has approved five University Learning Outcomes (ULOs): critical and creative thinking; literacy; global understanding; communicating; and professional and ethical behaviour. Each outcome has four associated skills. Detailed rubrics are attached to each of the skills outlining levels of competency (introduce, reinforce and master). The ULOs are intentionally broad. Although graduates' employability was a consideration when developing the list, outcomes were geared toward university education in general rather than to the workplace.

Development Process

The development of the ULOs took into account both the learning objectives that the university had been using since 1987 and the Degree Level Expectations (DLEs) that are mandated for the university sector since 2010 under the Quality Assurance Framework. The ULOs were modeled after the American Association of Universities and Colleges' LEAP Learning Outcomes and made reference to a comprehensive body of literature on learning outcomes. The ULOs are also formally aligned with the earlier institutional learning objectives and the DLEs.

The consultation process started in September 2010. The ULO drafts went through two roundtables and two days of focus group sessions with employers of the university's graduates. The ULOs were also presented at the university's annual teaching and learning conference in 2011. The draft outcomes were tested using the e-portfolios of students in two programs before they were reviewed by the associate deans. The process was described as rigorous and was considered to combine both top-down and bottom-up processes, in which senior administration developed the list before it was passed on to the senate for approval. Forward-thinking leadership at the administrative level and the historical development of outcomes-based framework that began in 1987 were both seen to be instrumental to the initiative.

The ULOs were intended to act as a foundation for the planning and the evaluation of all academic programs, ensuring that programs are aligned and that the university can provide evidence that the students are learning what they should be. The homegrown ULOs are believed to be very helpful in positively engaging the academic communities as they were developed by the university itself rather than adopted from somewhere else.

Significance of Senate Approval

The approval of the ULOs by the university senate is considered to grant them significance and "legitimacy." The initiative was described as potentially beneficial to curriculum development for academic programs at the university, providing a manageable and meaningful framework for curriculum review and acting as a powerful

tool to use in a cyclical review process. As a set of standards, the ULOs provide a starting point for quality assurance. They are seen as a resource to help inform continuous improvement of academic programs, from which quality assurance flows. The ULOs become a tool to build capacity within programs across the university as they provide not only a starting point for discussion but also an important framework upon which to base the discussion. The initiative also demonstrates an attempt to align institutional learning outcomes with the system-level DLEs by creating a set of university learning outcomes that are consistent with DLEs, rather than simply adopting them wholesale.

Key Observations

The following observations should be highlighted about the initiative. First, the ULOs were developed in the context of increasing demands for institutional accountability in the postsecondary education system and benefited from a more learning-centred tradition than at many other Ontario universities. On one hand, the ULOs were developed at a time when the earlier prescribed learning objectives were not working well, particularly in terms of measurability. On the other hand, there was pressure from outside the university to implement the DLEs, which some thought might not fit the institutional culture well. This gap created an opportunity to develop a new list of learning outcomes that would incorporate both the university's earlier learning objectives and the DLEs mandated within the system. In practice, various departments can use the ULOs as part of their own internal process of continuous improvement and, in the meantime, the university can use the five learning outcomes for reporting purposes to the government. As such, the initiative was an attempt to achieve the dual goals of both accountability and continuous improvement.

Second, there are champions at various levels of the university for applying the outcomes-based approach to teaching and learning, and their teaching beliefs have played an important role in fostering an institutional environment in favour of outcomes-based education (OBE). Representatives from various schools and colleges were in favour of using learning outcomes to inform the educational practice within their academic units, regardless of discipline. Their positive attitudes toward OBE came either from their prior academic or administrative work related to learning outcomes or from their own outcomes-oriented teaching experiences. Some have been influenced by their programs' outcomes-based accreditation requirements. Others admitted that they were a convert to the outcomes-based approach. Those OBE champions are not only active in developing and assessing learning outcomes for the programs within their own academic units but also instrumental to operationalizing the ULOs at the local level.

Finally, even though the university as a whole has embraced the learning outcomes approach to educational practice, getting buy-in from individual faculty members is still a challenge. Cynicism and resistance have been noted, especially when the learning outcomes approach trickles down to the teaching of individual courses. Some faculty members are struggling to strike a balance between content and the skills that their courses impart to their students, arguing that the importance of some content might be lost when greater focus is placed on skills development. In some academic units, annual retreats have been organized to keep faculty interested in the outcomes-based approach. It is found to be more effective to use the senate-approved ULOs as a tool to strengthen teaching and learning at the University than to simply present the ULOs as a requirement to be met.

4. Findings from Cross-Case Analysis and Discussions

In this section, I discuss the findings from the cross-case analysis of the seven OBE initiatives examined in this study. I begin by discussing how those seven cases can be described as OBE initiatives, and then present the common themes regarding enablers and challenges in OBE implementation. Finally, I extend the discussion beyond the cases themselves to address related issues.

OBE Implementation

The seven cases presented in this report represent recent developments in outcomes-based education (OBE) at Ontario universities and colleges. Although none of them has explicitly labelled itself as an OBE initiative, they still implement the key principles of OBE and demonstrate significant components of OBE, although to varying extents.

In the terms of Spady's (1988) OBE framework, all of the cases involve the use of exit outcomes as a critical factor when designing the curriculum. As shown in Table 4, the seven cases represent practices that involve different levels of learning outcomes, ranging from project-based outcomes and course-level outcomes to program-level outcomes and university-level outcomes.

Table 4: OBE Features of the Seven Cases under Investigation

Cases	Three components of OBE (Jackson, 2000)			OBE elements within each case
	Explicit learning outcomes	Strategy to enable the intended outcomes to be achieved	Criteria for assessing learning aligned to the intended outcomes	
#1 New program development process at a college	x	x		Critical performance statement, which is instrumental to articulating course and program learning outcomes
#2 Program review process at a college	x	x		Program-level learning outcomes, as represented in the provincial program standards or program descriptions, and employer expectations
#3 Curriculum mapping process at a college	x	x	x	Alignment between course-level with program-level learning outcomes
#4 Technology-supported curriculum mapping process at a university	x	x		The process is a catalyst for helping to define program-level learning outcomes
#5 Interdisciplinary science program at a university	x	x	x	Outcomes embedded within research projects
#6 Outcomes-oriented policy and practice at a university arts and social sciences faculty	x	x		Development of course-level learning outcomes required by the faculty policy
#7 Senate-approved	x	x		Defining university-level

Cases	Three components of OBE (Jackson, 2000)			OBE elements within each case
	Explicit learning outcomes	Strategy to enable the intended outcomes to be achieved	Criteria for assessing learning aligned to the intended outcomes	
University Learning Outcomes				learning outcomes

In reference to Jackson’s (2000) three components of OBE, all seven cases have used articulated learning outcomes and employed a strategy to enable articulated learning outcomes to be achieved (see Table 4). Defining learning outcomes and developing strategies to translate pre-defined learning outcomes into educational practice are both essential to OBE implementation. However, of the seven cases, only two can be credited with establishing criteria for assessing learning outcomes. In Case 3, the diversity of evaluation methods documented on the evaluation mapping chart demonstrates an attempt to evaluate the alignment of learning assessment with learning outcomes. In Case 5, consideration is given to reflecting student modes of learning (teamwork and individual learning) in assessment methods. My case selection process also suggested that while several learning outcomes assessment initiatives were taking shape in the province, most are still in their early stages. All of these findings suggest that the outcomes-based approach to postsecondary education in Ontario has been primarily reflected in terms of articulating learning outcomes and developing strategies to enable student achievement.

OBE: Enablers and Challenges

The seven OBE initiatives considered in this study suggest approaches to implementing OBE, which can be categorized into two broad areas: the development of learning outcomes and the creation of strategies to enable student achievement of articulated learning outcomes.

Two of the seven cases have offered lessons concerning the development of learning outcomes. From Case 1, we see that a clear program vision can help frame the creation of learning outcomes. One might begin by asking: What attributes would the program like its graduates to have? A “critical performance statement” can then be created on the basis of the program vision and a set of learning outcome statements developed on the basis of desired graduate attributes. The learning outcomes statements should be closely connected with the critical performance statement. In Case 7, a set of university learning outcomes were first compiled by a comprehensive review of literature about the desired qualities of university graduates. The learning outcome statements were finalized after multiple rounds of revisions on the basis of the feedback from broad consultation and the results of a piloting assessment project. In both cases, the creation of new learning outcomes is an iterative process and a collective endeavour, where faculty engagement and collegial conversations are crucial to success.

In terms of strategies that can enable the achievement of articulated learning outcomes, the experiences of three cases in this study suggest that curriculum mapping is an effective way to document how courses in an academic program help students achieve each of the program learning outcomes. It is also a helpful approach to identifying strengths and issues in the curriculum of a program. A tricky component of the process is how to define different levels of student achievement. In Case 3, Bloom’s taxonomy was used as the reference and an expanded list of verbs that reflect the levels of learning objectives in the taxonomy facilitates the process of determining the level of achievement. In Case 4, the lack of clarity in the definition of “introduce”, “reinforce” and “proficient” has led to some confusion on the part of faculty members when they try to determine the level for each learning outcome and try to interpret the results from a curriculum map. In

Case 7, the rubrics for the university learning outcomes are found to be helpful for defining the level of achievement for each outcome.

One institution-wide strategy that helps enable the achievement of pre-defined learning outcomes is program review, which is usually lengthy and involves multiple steps. It can be daunting and overwhelming to programs administrators and faculty members. In Case 2, the process of program review is formalized and consists of eight well-articulated steps, which makes the whole process easy to follow. For a program as in Case 5, the learning outcomes were clearly laid out and communicated to students in each research pack; the clarity in conveying expectations helped students achieve the desired learning outcomes.

In addition to those strategies and processes that have effectively enabled the achievement of learning outcomes, the following contributors are also important:

- *Leadership.* In Case 6, the knowledge of faculty members and department leaders about how to define and use learning outcomes was crucial to disseminating the outcomes-oriented policy to other faculty members at the local level. In Case 7, it was the forward-thinking of the university's senior leadership that gave birth to the University Learning Outcomes in the first place.
- *The teaching and learning centre.* In four of the seven cases, the institution's teaching and learning centre played an instrumental role in coordinating and supporting the learning outcomes initiative. In Case 1, the teaching and learning centre became involved in the new program development process at an early stage and a curriculum development consultant worked closely with teams throughout the process, assisting with the creation of program learning outcomes up to the time of proposal submission. The teaching and learning centre in Case 2 provided both pedagogical and administrative support to the program review process. The curriculum development consultant was also critical to the success of curriculum mapping in both Cases 3 and 4.
- *Institutional culture.* In this study, three cases are housed in colleges, which are more likely to adopt outcomes-based approaches to teaching and learning than are universities by virtue of their career orientation. College programs are subject to the government's program standards and their quality assurance processes are governed by the policy-based Program Quality Assurance Process Audit. Under those standards and processes, college programs are outcomes-based and almost inevitably adopt the outcomes-based educational model.

While universities have a very different institutional culture than colleges, the institutional environment can still be conducive to outcomes-based education. Case 5 is situated in a university that has a tradition for pedagogical innovation and this environment has contributed to the outcomes-based design of the program. Case 6 has a longer history than most Ontario universities of aligning program outcomes with the university's homegrown graduate attributes. This institutional context, along with strong leadership, was helpful in developing a faculty policy requiring the development of course-level learning outcomes. Case 7 has a tradition of using learning objectives to inform educational practices, which laid the groundwork for the creation of a new set of university learning outcomes that could better serve the needs of the university.

It is no surprise that the implementation of OBE has also encountered many challenges. A significant one is faculty buy-in. This is often caused by the time-consuming nature of certain outcomes-based processes such as curriculum mapping and program review. Actions have been taken to streamline the onerous process, such as simplifying the program review templates, as in Case 2, and creating a technology-supported curriculum mapping tool as in Case 4.

Although time poses a challenge, a greater one may be identified in the fact that some faculty members do not see the value of an outcomes-based approach to teaching. When they see the outcomes-based processes more as an administrative exercise than as an opportunity for program improvement, they are less willing to participate. In turn, those processes will have less impact on teaching and learning. This obstacle was mentioned in all four cases in university settings. The following quote is a good illustration:

I think a lot of the barriers are conceptual. For a lot of faculty members, they don't understand what a learning outcome is or why you would have it, why it's valuable. To them, it's a hoop jump where they are required to pick meaningless words from verbs then put them on a piece of paper and send them in. When they do that, then it is not useful ... It's really the "why" you would do them is the most important. If they know why, they'll figure out the "what." That's the biggest barrier. [W5]

Another barrier lies in some faculty members' teaching beliefs, which prioritize content instruction rather than skill development. This is heavily contingent upon discipline. Faculty members in profession-oriented disciplines are more often than not open to attaching equal importance to both knowledge and skills. The experiences in Case 5 suggest that students learn content faster once they have acquired related skills. The teaching experiences of some faculty members in Case 7 suggest that content is not ignored when a course becomes more skills-oriented and outcomes-based. As one explained:

We believed that the university education could do both - content and skills....Skills help you to develop whatever content you want. Knowing how to read, speak, and all the other skills are very instrumental in the things that you need to do in university and after university. [G3]

On the other hand, faculty members' positive attitudes toward the outcomes-based approach can be conducive to enhancing their own teaching practice. A professor on the curriculum committee commented:

[It's] a benefit to both. Because I think that as a student I would want to know clearly what I should expect from the course and what the professor is going to expect from me. If I have that clear understanding upfront, then I think that as a student I'm going to be able to engage in that course to its fullest and get the most out of that course that I possibly could. From the professor's view point it allows the professor to practice academic freedom; it doesn't restrict a professor to sort of prescriptive type of instruction. It allows the university to take the full advantage of the diverse skills of the faculty. I think it's fantastic. That's one of the reasons I believe so strongly in outcome based approach. [R3]

Some of these faculty members become champions of OBE when they have taken on a leadership position in the academic unit. The positive influence of faculty members' favorable teaching beliefs on OBE implementation is more prominent in universities than in colleges.

Beyond OBE

In light of Lattuca and Stark's (2009) Academic Plan Model, the seven cases under investigation illustrate various forces at play in shaping the OBE practices in Ontario postsecondary education. A significant external source of influence is the quality assurance policies and processes as implemented by three quality assurance agencies.

Within the college sector, the Program Quality Assurance Process Audit (PQAPA) was implemented fully in 2007 and the Postsecondary Education Quality Assessment Board (PEQAB) was created through the Postsecondary Education Choice and Excellence Act in 2000 to oversee the quality of degree-granting programs (Clark, Moran, Skolnik & Trick, 2009). The outcomes-based degree level standard, which is part of the Ontario Qualifications Framework, is an important component of the PEQAB criteria for degree program quality review (PEQAB, 2014). The six PQAPA criteria (OCQAS, 2014, pp. 8-9) also require college programs

to articulate learning outcomes, develop policies to support student achievement of program learning outcomes, and ensure that program delivery and student assessment are consistent with program learning outcomes. These requirements have oriented college programs toward an outcomes-based education model. The related quality assurance processes have directly impacted new program development (Case 1), program review (Case 2) and curriculum mapping (Case 3) processes by pre-determining the learning outcomes of academic programs in provincial program standards or degree standards and requiring the programs to meet the outcomes-based criteria.

Within the university sector, the 2010 Quality Assurance Framework processes, overseen by the Ontario Universities Council on Quality Assurance, require that departments articulate learning outcomes for their respective programs that are in line with the university's mission and goals as well as the Degree Level Expectations (Goff, 2013). This requirement is also mandated as part of the institutional quality assurance processes to which all universities in Ontario are bound. In Case 4, the technology-supported curriculum mapping tool is a direct response to that policy. The creation of faculty policy for course-level learning outcomes in Case 6 also occurred in the context of the enforcement of outcomes-oriented institutional quality assurance policy.

Interestingly, the situation is quite different in Case 5, where the outcomes-based practice in the program was driven by disciplinary demands. The program was created to fill an identified gap in science education. This is not to say that the program will not be influenced by the outcomes-oriented quality assurance policies as the program will go through the same cyclical review process as all other programs. Still, the process may be easier because the program is already outcomes-based and has documented related practices.

Case 7 is similar to Case 5 in terms of being pro-active in the move to outcomes-based education. The university has developed its own institutional learning outcomes, which have been approved by the senate. This initiative was more of a product of the university's mission than of external policies. However, the university still takes the DLEs into account and a matrix is in place to show the close alignment between the two sets of learning outcomes. Some consider it a pre-emptive response to the pressures of the system-wide requirement.

It must be noted that even for those OBE initiatives that are heavily influenced by external quality assurance policies, being accountable to the system-wide requirement is only part of the story. Institutions strive for continuous improvement to satisfy their own needs. This is an important theme across several of my case studies. In Case 1, where the new program development process was designed to meet PEQAB requirements, a streamlined two-phase process has been developed, with a strong focus on program ideation and a view to developing sustainable programs. While Case 2 is designed to align closely with PQAPA requirements, the process has also brought employers' voices into the program review process and introduced a formalized one-year follow-up after the review to ensure that the recommendations have been implemented. In the curriculum mapping of Case 3, while the mapping ensures that the program has met the pre-defined program learning outcomes, the whole process represents a driving force for improvement and often results in an enhanced curriculum. In Case 4, the technology support for curriculum mapping saves time and effort. The conversations generated from the mapping process will hopefully bring increased coherence to both the curriculum and the program. The senate-approved University Learning Outcomes in Case 7 address both continuous improvement and accountability in that the institutional outcomes serve the needs of the academic communities inside the university and also meet the external requirements with respect to the DLEs.

The literature emphasizes the tension that exists between accountability and improvement (Genis, 2002; Newton, 2000). In Proitz's (2010) analytic framework, curriculum development and external quality assurance are conceived as two ends of a continuum, if not a dichotomy, within the learning outcomes approach. While it is true that learning outcomes have helped satisfy calls for increased accountability (Tamburri, 2013, February

7), I would also argue that accountability and improvement do not have to be separated from each other; rather, the findings from the seven cases in this study have provided evidence that accountability and improvement can converge, and support and complement each other. Further, outcomes-based curricula are an instrumental process *as well as* a negotiated process that could lead to transformative learning or institutional transformation, rather than an instrumental process alone as some scholars have argued (Simmons, 2013). Cases 5 and 7 provide good examples of the dual role of OBE.

5. Concluding Thoughts

This study focused on seven cases that demonstrate the active implementation of outcomes-based education (OBE) at different colleges and universities in Ontario. They embody OBE implementation at the program, faculty and institutional levels.

The seven selected OBE initiatives crystallize the recent changes at Ontario universities and colleges, not only in curriculum development but also in quality assurance processes and policies. They have provided further evidence that even though OBE began historically as a type of pedagogical innovation, it has gone far beyond an instructional or curriculum concern in the current environment. OBE can be pedagogy-driven and/or policy-driven. The findings in this study suggest that OBE implementation in Ontario is intertwined with quality assurance requirements and policies for postsecondary education. As a result, curriculum and quality assurance are interconnected and cannot be examined separately. It is my hope that this study can contribute to building the connections between the two conceptually and practically.

While it has been argued that Ontario does not have a sizeable market niche for implementing competency- or outcomes-based education in general (Abner et al., 2014), the orientation toward learning outcomes seems to have been integrated into many aspects of educational practice at Ontario's colleges and universities, such as program development and review, as well as curriculum mapping and renewal. The scope of application is institution-wide, regardless of discipline.

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