A Blended Framework for Industry Partnerships in Canadian Polytechnic Business Education

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*Review articles are papers that provide a balanced synopsis of the current literature within a specific area of inquiry. These papers summarize the literature comprehensively and also identify outstanding questions and areas for future inquiry.

Abstract
This integrative literature review examines the underexplored dynamics of industry-academia partnerships within Canadian polytechnic business education. While polytechnics are recognized for fostering applied learning in technical fields, business programs receive comparatively less attention in both research and practice despite representing substantial student populations within these institutions. Drawing on the Triple Helix Model and Stakeholder Theory, this review identifies systemic limitations in current engagement frameworks: inconsistent stakeholder involvement, significant funding disparities favouring technical disciplines, and a lack of scalable, interdisciplinary approaches that address the unique requirements of business education.

Through a thematic synthesis of peer-reviewed and grey literature, this review reveals limited funding allocation to polytechnic academic research initiatives, with business programs receiving less attention despite growing demand for knowledge-based service professionals. The analysis demonstrates that existing frameworks inadequately address leadership development, strategic thinking, and interpersonal competencies essential for business graduates' employability in Canada's evolving labour market.

This review proposes a blended framework that combines the structural rigour of the Triple Helix Model with the relational adaptability of Stakeholder Theory, creating a comprehensive solution for sustained multi-stakeholder collaboration. This integrated approach addresses the distinct pedagogical needs of business education by emphasizing competency-based learning, work-integrated experiences, and measurable employability outcomes. The findings advocate for reimagining polytechnic-industry relationships through targeted policy interventions and strategic funding realignment to ensure business graduates develop the strategic and interpersonal skills required for Canada's knowledge economy.

Introduction

The relationship between academia and industry is fundamental to Canadian polytechnic education. These institutions prioritize applied learning, work-integrated experiences, and responsive programming to meet evolving labour market demands (Polytechnics Canada, 2024b). Business programs offered through degrees, diplomas, and certificates are well-positioned to strengthen this mandate. Yet, despite their relevance, business education within polytechnics has received less scholarly attention in research and policy discourse, particularly in comparison to technical fields such as engineering and applied sciences (Lucietto et al., 2021; Robinson & Komesch, 2018).

Understanding the polytechnic sector requires distinguishing it from Canada's other post-secondary pathways. Canada's post-secondary landscape is provincially governed and therefore lacks a single national institutional classification system. Across provinces, however, policy documents and scholarship frequently distinguish among broad institutional orientations, including research-intensive universities, community colleges, and applied institutions such as polytechnics or institutes of technology that emphasize industry engagement and applied learning (BCIT, 2018). These categories remain approximate, as institutional mandates and program offerings often overlap across provinces and sectors. Polytechnics occupy the space between these models, offering credentials ranging from apprenticeships and diplomas to four-year bachelor's degrees while simultaneously engaging in applied research that supports regional economic development and research at the faculty level (BCIT, 2018; Polytechnics Canada, 2024c). What distinguishes polytechnics is their pedagogical approach, rooted in industry-aligned learning where real-world experience is built into the curriculum, and faculty typically hail from industry rather than traditional academic pathways (Polytechnics Canada, 2024c).

Given these distinctions, the term "polytechnic" lacks a uniform definition across Canadian provinces, reflecting the decentralized nature of post-secondary education governance in Canada. For the purposes of this review, "polytechnic" refers to institutions that prioritize applied learning, work-integrated education, industry-responsive programming, and applied research, distinguishing them from traditional universities and community colleges. As of 2024, 13 institutions comprise Polytechnics Canada, the national alliance established in 2003 to advance applied research and innovation (Polytechnics Canada, 2024a; uniRank, n.d.). Across Canada, provincial terminology varies; "institute of technology," "college," and "polytechnic" are used interchangeably. However, these institutions share a common mandate: bridging academic education with workforce demands through applied, experiential learning. This review focuses on the members institutions of Polytechnics Canada, while acknowledging that many findings may apply to the broader Canadian college sector, particularly where business education and industry partnerships are concerned.

While frameworks for evaluating industry engagement have been developed for technical disciplines, they often fail to capture the specific needs of business education, such as leadership development, interdisciplinary collaboration, and the cultivation of soft skills (AACSB International, 2025; Harmadi & Nelson, 2024). This integrative review draws on peer-reviewed scholarship, policy submissions, and institutional reports to critically assess two existing frameworks and highlight persistent gaps in defining and evaluating industry engagement in business education. A significant limitation of this review is the scarcity of empirical research specifically examining business education within Canadian polytechnics, particularly comparative funding and partnership data disaggregated by discipline. Where direct evidence is unavailable, this review relies on enrollment statistics, work-integrated learning (WIL) participation rates, and institutional reports to identify patterns of differential emphasis.

Given the economic and policy emphasis on skills alignment and innovation (Advanced Education, 2019; Polytechnics Canada, 2024a), addressing this oversight is essential. This integrative literature review critically analyzes two existing frameworks and gaps in defining and evaluating industry engagement within Canadian polytechnics, focusing on the need to implement and formalize these models within business education. Addressing this gap is essential to developing a unified framework for industry engagement in business education, enhancing graduate employability, and fostering sustainable partnerships between academia and industry (Mahalingam, 2024).

To guide this review, the following research question was posed: How can existing industry engagement frameworks be adapted to support business education in Canadian polytechnics? Specifically, the review explores: (a) what

systemic barriers and gaps currently constrain industry partnerships in business programs, (b) how existing models address employability and leadership outcomes, and (c) what opportunities exist to design a blended framework tailored to polytechnic business education. The overarching aim is to strengthen the role of polytechnic institutions in preparing a workforce that meets the demands of an evolving global economy.

The research question presumes framework adaptation rather than new model development because existing frameworks have proven effective in polytechnic technical programs, establishing institutional precedent for structured industry collaboration (Robinson & Komesch, 2018; Cai & Etzkowitz, 2021). Business education shares the core polytechnic mandates these frameworks support: applied learning and labour-market responsiveness. This alignment suggests conceptual compatibility (AACSB International, 2025). The challenge appears to be implementation rather than theory, as business programs lack the systematic framework application and resources available to established technical fields (Polytechnics Canada, 2024b). This review examines whether closing these implementation gaps through tailored adaptation can yield comparable outcomes for business education partnerships.

Method

This integrative literature review is guided by the research question and examines industry–academia partnerships in Canadian polytechnic business education in an effort to explore how industry engagement frameworks can support polytechnic business education in Canada. The review identifies patterns, emerging theories, and gaps for further research by synthesizing peer-reviewed research, institutional reports, and supporting web sources (Whittemore & Knafl, 2005; Paez, 2017).

This review adopts an integrative approach to synthesize conceptual, empirical, and policy literature across disciplines, allowing for a comprehensive analysis of industry-academia partnerships within higher education with a focus on polytechnic business education, which remains underexplored in existing research. Unlike systematic reviews, this method supports the inclusion of diverse theories and models, making it well-suited for evaluating blended frameworks (Whittemore & Knafl, 2005; Repko, 2011; Booth et al.,2016).

A literature search was conducted across academic databases, including Scopus, EBSCOhost, ProQuest, and Google Scholar, as well as institutional repositories such as Polytechnics Canada, Statistics Canada, and Mitacs. The search terms used included combinations of keywords such as "polytechnic business education," "industry engagement," "graduate employability," "Canadian polytechnics," "industry-academia," "work-integrated learning," and "collaborative frameworks." These terms were selected to capture a broad, yet focused range of studies relevant to the review's objectives. Boolean search strategies combined these terms using operators such as ("polytechnic" AND "business education" AND "industry engagement") with platform-specific variation to accommodate database syntax differences. Grey literature was identified through targeted searches of polytechnic institutional websites, government policy submissions, and published applied research reports. The initial search across databases and institutional repositories yielded approximately 140 potential sources for evaluation.

The inclusion criteria focused on studies published within the last 15 years that emphasized Canadian polytechnic education and evaluated industry engagement frameworks across sectors. Literature that fell outside this window was used to ensure a comprehensive review was completed due to the lack of research on Canadian business education industry engagement or models of interest. The exclusion criteria were equally stringent, omitting literature that lacked empirical grounding or addressed theoretical constructs without practical application related to the research topic. By applying these filters, the review aimed to ensure that only high-quality and contextually relevant studies were considered, thereby refining the scope and depth of the investigation (Booth et al., 2016; Paez, 2017).

Sources underwent iterative evaluation through multiple rounds of review consistent with integrative methodology (Whittemore & Knafl, 2005). Initial screening of titles and abstracts against the inclusion and exclusion criteria eliminated sources not addressing industry-academia partnerships in higher education contexts, focusing on K-12 education, or lacking relevance to Canadian or comparable polytechnic or applied learning systems. Approximately 85 sources advanced to full-text review, where they were assessed for substantive engagement with partnership frameworks, empirical contributions to understanding

industry collaboration, and policy insights applicable to business education (Booth et al., 2016). This iterative process resulted in 48 sources for thematic analysis, representing peer-reviewed scholarship, institutional reports, and government policy documents (see Table 2, Appendix A for a representative sample).

As the sole researcher, methodological rigour was maintained through multiple mechanisms appropriate to integrative review design (Whittemore & Knafl, 2005; Booth et al., 2016). The analytical process was anchored by the application of thematic analysis, a top-down methodological approach that employed predefined codes and theoretical constructs derived from the research question to guide the analysis and ensure consistency across source types. Atlas.ti was used to track the thematic coding, enabling categorizing and visualizing patterns across studies. This approach assists in identifying key gaps and commonalities within the research (Braun & Clarke, 2006; Friese, 2019; Soratto et al., 2020). A representation of the search strategy is provided in Appendix A. The codes were both predetermined based on search terms and emergent themes. Inclusion and exclusion decisions were systematically evaluated for alignment with the defined date range and research question and revisited twice due to the nature of the sole researcher. By employing this technique, the analysis ensured a focused and systematic exploration of the data, enabling targeted examination of themes directly pertinent to the guiding research questions and theoretical frameworks. Iterative consultation with the Programme Leader for the Doctor of Education Program and the Director of Studies occurred at critical decision points, particularly when refining thematic categories, making decisions around research outside of the 15-year window, and interpreting conflicting findings across studies. These consultations were instrumental in ensuring analytical rigour and conceptual coherence, as the supervisor provided guidance on theme development and theoretical alignment. This aligns with integrative review methodology, which explicitly accommodates single-researcher designs when transparent decision-making and researcher reflexivity are maintained through oversight (Whittemore & Knafl, 2005; Repko, 2011; Paez, 2017).

It should be noted that discipline-specific data on research funding, industry partnership volume, and faculty-industry collaboration rates remain largely unpublished by Canadian polytechnic institutions, thereby constraining the ability to precisely quantify the extent of resource disparities between business and technical programs.

Findings

Thematic analysis of 48 sources revealed five interconnected themes characterizing industry-academia partnerships in Canadian polytechnic business education.

- **Historical Evolution:** traces how polytechnic-industry collaboration has developed over time, revealing persistent institutional emphasis on technical disciplines while business programs remain comparatively underexplored despite substantial enrollment.
- **Theoretical Frameworks:** examines the conceptual lenses guiding partnership analysis, with the Triple Helix Model and Stakeholder Theory emerging as dominant institutional-level structures.
- **Funding Disparities and Systematic Barriers:** identifies resource constraints, documenting how limited research funding and institutional support can impede partnership development relative to technical fields.
- **Current Partnership Models:** assesses existing collaboration approaches, uncovering implementation and scalability challenges along with insufficient frameworks for measuring outcomes.
- **Graduate Employability Outcomes:** discusses the workforce preparation gap, demonstrating that business students face structural barriers to accessing industry partnerships and work-integrated learning opportunities compared to peers in technical disciplines.

Historical Evolution

Polytechnic education in Canada has undergone significant transformations, adapting to the evolving needs of the labour market and the demands of industry. Historically, polytechnics have been lauded for their focus on applied research and practical skills, which allow students to transition seamlessly into the workforce (Youssef & Hunter, 2016; Robinson & Komesch, 2018). While these collaborations initially centred on technical fields such as the skilled trades, engineering, and healthcare, the potential of industry-academia partnerships in business programs remains under-researched. All 13 publicly funded Canadian polytechnics offer business programs; however, these programs have not received the same

research attention as their technical counterparts (Robinson & Komesch, 2018). This historical overview explores the milestones that have shaped industry engagement in Canadian polytechnic education, providing a contextual framework for addressing this gap.

The roots of polytechnic education in Canada can be traced back to the mid-20th century, when institutions began to emerge as a distinct educational model, separate from traditional universities. According to Youssef and Hunter (2016), the polytechnic model was developed to address the limitations of conventional academic systems, which often fail to align education with labour market needs. Early initiatives, such as cooperative education programs and work-integrated learning (WIL), provided students with hands-on experience that complemented their academic knowledge. These efforts laid the foundation for the strong industry-academic collaborations seen today but were primarily concentrated in technical disciplines.

A significant turning point in polytechnic education came with the establishment of Polytechnics Canada in 2003 (uniRank, n.d.). This alliance of 13 institutions aimed to strengthen the role of applied research in fostering innovation and economic growth (Polytechnics Canada, 2024a). New Canadian polytechnics continue to emerge; in the last five years, a number of community colleges have redesignated or rebranded to become or identify as polytechnic institutions, including Red Deer, Grand Prairie, and Lethbridge in Alberta; Red River in Manitoba and Seneca, Humber and George Brown in Ontario (Red Deer Polytechnic, 2021; Northwestern Polytechnic, 2021; Red River College Polytechnic, 2021; Seneca Polytechnic, 2023; Humber Polytechnic, 2024; Lethbridge Polytechnic, 2024; George Brown Polytechnic, 2025). These transitions highlight a broader trend in Canada, where institutions are evolving to meet the changing demands of students and industries by offering diverse applied-learning opportunities.

Polytechnics excel at supporting small-medium enterprise (SME) by providing research capabilities, generating impressive returns on investment for applied research, and producing work-ready graduates to aid economic growth (Robinson & Komesch, 2018). By aligning workforce training with industry needs, these institutions became key drivers of innovation and productivity for Canadian SME. However, this focus on technical and scientific fields often overshadows

opportunities for business programs to engage similarly with the industry. Robinson and Komesch (2018) note polytechnics were instrumental in addressing national economic challenges, yet advocacy for increased federal support and funding has predominantly centred on technical disciplines. Business education emphasizing leadership, strategic thinking, and interdisciplinary collaboration requires greater focus on these initiatives.

A historical review would be incomplete without examining parallel global influences. Mutch's (2021) study on the U.K. polytechnic tradition offers valuable insights into alternative approaches that could inform Canadian business education. The U.K. model highlights the importance of learner-centred approaches and underscores the challenge of balancing teaching and research, a challenge that Canadian polytechnics also face as they strive to innovate while maintaining applied learning. Similarly, MacDonald et al. (2014) demonstrated the transformative impact of work-integrated learning (WIL) programs on Australian polytechnics. Their findings showed that students in structured two-year internships while pursuing business degrees improved their professional skills and gained a deeper understanding of industry expectations, enhancing employability. These examples suggest that integrating business education into existing polytechnic frameworks requires structural reforms and reimagining industry partnerships to embed experiential learning opportunities that align academic outcomes with industry needs (MacDonald et al., 2014).

The historical evolution of industry engagement in Canadian polytechnics reflects their ability to adapt to labour market demands and foster economic growth. However, the relative underemphasis on programs underscores the need for a more inclusive approach to industry-academia collaboration. From cooperative education initiatives to applied research, polytechnics have demonstrated a unique capacity to bridge academic learning with practical experience. As these institutions look to the future, addressing the opportunity of business education will be crucial. Effective partnership models will play a critical role in shaping their place within an increasingly complex higher education landscape.

Theoretical Frameworks

Contemporary industry-academia collaboration models emphasize experiential learning, such as internships, cooperative education, and capstone projects, aiming to align

academic curricula with labour market demands. While these models have enhanced graduate employability and curriculum relevance, their implementation in business programs continues to face challenges (Du Plessis et al., 2024; Uchenu et al., 2019). With reliance on the development of leadership and interpersonal competencies, business education requires a fundamentally different approach than the more established frameworks for technical disciplines. Competency-based education offers one such pathway, as Foster and Jones (2020) demonstrate, by directly linking demonstrated learning outcomes with workforce requirements. As MacDonald et al. (2014) state, "[work-integrated learning], when properly structured and supported, enables students to interact with professionals, develop their generic skills, and apply their technical knowledge in an actual or simulated workplace setting" (pp.169-170).

The Triple Helix Model and Stakeholder Theory constitute the primary frameworks in the literature for examining institutional-level industry partnership governance in higher education contexts with a focus on polytechnics. No alternative frameworks emerged from the literature or were used for analysis. However, contemporary approaches to industry collaboration, including experiential learning models (MacDonald et al., 2014; Business Higher Education Roundtable, 2024) and competency-based pathways (Foster & Jones, 2020), informed an understanding of what effective partnerships should produce in terms of pedagogical delivery and learning outcomes. While these approaches provide valuable insights into partnership implementation and learner development, they do not offer institutional governance frameworks for multi-partner coordination. These two theoretical models meet the needs of polytechnics by providing complementary foundational frameworks for examining and evaluating industry-academia collaborations.

The Triple Helix Model
The Triple Helix Model, developed by Etzkowitz and Leydesdorff in the 1990s, conceptualizes innovation (Gachie, 2020) as emerging from the dynamic interaction between three institutional spheres: universities, industry, and government (Cai & Etzkowitz, 2021; Gachie, 2020). Each helix represents actors that traditionally operated independently but increasingly overlap in knowledge-based economies, with universities generating knowledge, industry applying it commercially, and government providing regulatory frameworks and funding mechanisms (Cai & Liu, 2018;

Gachie, 2020). For Canadian polytechnics, this model offers a structural lens for understanding how applied research and industry partnerships can be formalized, scaled, and sustained through multi-institutional collaboration. Cai and Etzkowitz (2021) demonstrate the model's effectiveness in fostering regional innovation ecosystems, as evidenced by its application at the Massachusetts Institute of Technology (MIT) and subsequent adaptation in California's innovation clusters. However, as Kravchenko and Bronytska (2023) highlight, higher education institutions operating within constrained regulatory frameworks and with limited financial autonomy face development challenges, particularly in resource-constrained environments. While the Triple Helix Model provides essential structural coordination for institutionalizing partnerships, its emphasis on formalized research collaborations and technical innovation insufficiently addresses the interpersonal competencies, leadership development, and soft skills central to business education.

Stakeholder Theory
In contrast, Stakeholder Theory offers a more flexible and relationally oriented framework that emphasizes the complex interdependencies among diverse actors within organizational systems. Originally developed by Freeman in 1984 for corporate governance contexts Stakeholder Theory is rooted in all parties being represented to create value for the whole (Freeman, 2010; Laplume et al., 2008), Stakeholder Theory has been increasingly applied to higher education to examine how institutions balance the often-competing interests of students, employers, faculty, administrators, government funders, and community partners (Syed et al., 2023). Yin et al. (2024) demonstrate the theory's versatility in managing multi-stakeholder risk frameworks, highlighting its capacity to navigate complex organizational dynamics through sustained engagement and a mutual-benefit orientation. For polytechnic business education, this framework aligns with a process-ontological understanding of stakeholder engagement, which emphasizes that successful industry partnerships depend on ongoing relational practices rather than static agreements (Mahalingam, 2024). Research on post-secondary stakeholder expectations similarly highlights that institutional effectiveness relies on continuous engagement processes rather than one-time agreements or high-level commitments (Stejskal et al., 2020). In this context, program-level structures such as advisory boards, mentorship networks, capstone collaborations, and individualized work-integrated learning placements serve as mechanisms

for sustaining these relational practices. Syed et al.'s (2023) comprehensive bibliometric analysis underscores Stakeholder Theory's growing prominence in higher education research while simultaneously identifying a critical limitation: its diffuse nature can result in fragmented approaches that lack the structural coherence necessary for sustained, scalable collaboration. Without institutional mechanisms to coordinate stakeholder engagement, the theory risks producing ad hoc partnerships that fail to achieve long-term sustainability or equitable access for all students (Uchenu et al., 2019; Valentinov & Chia, 2023). Thus, while Stakeholder Theory captures the relational dynamics essential to business education where employability depends on interpersonal skills, professional networks, and contextual learning it likely requires integration with more structurally oriented frameworks to ensure partnerships are both adaptive and institutionally embedded.

Triple Helix Model and Stakeholder Theory both address collaboration; they represent different starting points that are highly relevant for polytechnic business programs. The Triple Helix offers a structural perspective by framing innovation as the result of coordinated roles among academic institutions, industry partners, and government bodies (Cai & Etzkowitz, 2021). This model highlights the importance of institutional alignment, research capacity, and supportive policy conditions (Cai & Liu, 2018). Stakeholder Theory contributes a relational perspective by emphasizing the interests, expectations, and ongoing interactions among students, employers, faculty, and community partners (Freeman, 2010; Syed et al., 2023). Research in higher education shows that these relational dynamics shape program relevance, curriculum responsiveness, and employability outcomes (Valentinov & Chia, 2022). The models converge in their recognition that effective collaboration requires shared value creation. In business education, where interpersonal competencies and contextual learning are central, their combined insights show that successful partnerships require structural coordination supported by sustained relationship-based engagement.

Funding Disparities and Systematic Barriers

Despite the potential of such a blended framework, significant challenges persist. The Triple Helix's rigidity may conflict with Stakeholder Theory's emphasis on nuanced stakeholder relationships, creating tensions in governance and decision-making. Given the size of polytechnic business programs, centralized implementation and tracking would prove challenging, forming the "consistency paradox" identified by Mahalingam (2024), wherein stakeholder participation and expectations remain misaligned, highlighting the difficulty of maintaining collaborative momentum in industry-driven curriculum (IDC) initiatives. Uchenu et al. (2019) emphasize that ineffective school-industry partnerships often result in poorly aligned curricula and insufficient training opportunities for business students, underscoring the need for a more integrated framework.

A significant system-level barrier to implementing both the Triple Helix and Stakeholder Theory in Canadian polytechnics is the chronic underfunding of applied research. Polytechnics receive only 2.9% of total academic research funding in Canada and were awarded just 17 of 553 federally funded projects in the most recent cycle (Polytechnics Canada, 2024b; House of Commons Canada SRSR 2024). This resource imbalance makes it difficult to operationalize the institutional coordination the Triple Helix requires, particularly for business programs that do not benefit from the established research pipelines available in technical fields. Limited funding also constrains the relational engagement emphasized in Stakeholder Theory, since sustained employer involvement, mentorship structures, and program-level collaboration require time, staffing, and administrative support (Stejskal et al. 2020; Mahalingam, 2024). As a result, the structural conditions of the Triple Helix and the relational conditions of Stakeholder Theory are simultaneously undermined, restricting the ability of business programs to build scalable, high-impact partnerships that mirror those in more heavily funded polytechnic disciplines.

Saskatchewan Polytechnic's (2021) findings reveal that the absence of robust industry partnerships has hindered the development of key leadership skills in business graduates. Traditional metrics for evaluating collaboration remain inadequate for assessing qualitative outcomes that define success in business education. Von Konsky et al. (2016) highlight this assessment gap, wherein reliance on quantifiable metrics obscures the nuanced contributions of industry engagement to professional growth. Filling this gap is crucial, as vacancies in knowledge-based services are expected to increase by 35% between 2023 and 2040, with a focus on interpersonal skills (Harmadi & Nelson, 2024). Yin et al.'s (2024) application of structural equation modelling offers

promising methodologies for capturing complex stakeholder dynamics but has yet to be adapted to business programs' unique requirements.

The Business Higher Education Roundtable's (2024) examination of Work-Integrated Learning (WIL) programs reveals promising developments and persistent challenges in implementation. These findings complement Otache's (2021) research on employability outcomes, which emphasizes the necessity of comprehensive collaboration policies and adequate funding mechanisms.

These challenges are further compounded by systemic barriers, such as insufficient funding and administrative burdens, which constrain the development of innovative collaboration frameworks. Advanced Education's (2019) report identifies a pressing need for institutional reforms that prioritize comprehensive, interdisciplinary approaches to work-integrated learning. Without these reforms, the most theoretically sound framework risk is undermined by practical limitations in implementation and scalability.

Current Partnership Models

The involvement of industry partnerships within Canadian polytechnics presents an evolving landscape. While these institutions are designed to connect academia with industry, their mechanisms for establishing and evaluating partnerships are developing at different rates across disciplines and institutions. Existing partnership models and evaluation frameworks have historically emphasized technical disciplines, creating opportunities to expand and adapt these approaches for business programs. Business programs typically enroll larger cohorts than cohort-based technical programs, presenting distinct implementation considerations. As per Statistics Canada (2025b) "increases continued to be concentrated in business and administration, where enrolments rose in both colleges (+39.4%; +35,928) and universities (+12.1%; +6,939)" during the 2023/24 academic year (para. 5). These differences highlight opportunities to enhance the inclusivity and adaptability of partnership frameworks through thoughtful redesign and tailored execution strategies.

Despite offering a range of business programs, including two-year Business Administration diplomas and four-year Bachelor of Business Administration degrees, Canadian polytechnics have historically focused on technical disciplines such as science, technology, and skilled trades (Robinson & Komesch, 2018; Polytechnics Canada, 2024a) due to the nature of these institutions. This focus could have resulted in less attention to the distinct characteristics of business education, where the effectiveness of industry partnerships is typically measured by graduate employability, leadership development, and responsiveness to sector-specific needs (AACSB International, 2025).

Uchenu et al. (2019) highlight the consequences of weak academic-industry linkages in business education, particularly the absence of experiential learning opportunities that leave graduates underprepared for workplace demands. Although their research focuses on Nigeria, similar structural challenges can be observed in Canadian polytechnics, where maintaining meaningful industry partnerships within business education remains a persistent and unresolved issue.

Historically, Canadian polytechnic institutions have been proponents of applied research in technical fields, focusing on measurable economic outcomes (Polytechnics Canada, 2024b). However, The Conference Board of Canada's Future of Work Report by Harmadi and Nelson (2024) indicates that Canada is experiencing increasing skills mismatches that disproportionately impact business and managerial roles. Employers encounter difficulties finding candidates with technical and strategic business expertise. Furthermore, the Determinants of Skills Gaps in Canada Report by Fissuh et al. (2022) demonstrates that vocational programs associated with industry partnerships result in improved employment outcomes, thereby reinforcing the necessity for enhanced industry engagement in business education. Industry collaborations in technical fields drive innovation, productivity, and alignment with labour market demands (Robinson & Komesch, 2018; Tong, 2024). Nonetheless, this technical emphasis has resulted in less systematic application of such frameworks to business education. Despite calls for federal support to align with polytechnic outputs with business programs, current analyzes often lack actionable implementation strategies. A gap that reflects the differential emphasis between technical and business programs within the polytechnic-industry collaboration discussion (Robinson & Komesch, 2018).

The government-supported research initiative Mitacs exemplifies Canada's potential for structured academic-industry collaboration. Mitacs funds research partnerships

that connect post-secondary institutions with businesses and government agencies (Mitacs, n.d.-a). This model has been widely adopted in STEM fields and has recently been piloted and expanded in business programs within Canada. Over the past five years, Mitacs has extended its programming to include polytechnic business programs (Mitacs, n.d.-a). However, there exists a significant opportunity for students to scale and develop opportunities within the business discipline, thereby gaining hands-on experience in addressing industry challenges.

Tong (2024) underscores the value of sustainability principles in vocational training, advocating for experiential learning, such as internships. Nevertheless, the application of these principles is predominantly confined to technical disciplines, overlooking the distinct characteristics and needs of business education. Gregson's (2020) promotion of practitioner-oriented models fails to consider how business programs that emphasize soft skills and employability necessitate fundamentally different partnership approaches. This recurring theme leaning toward technical fields reflects a lack of engagement with the broader educational mandates of polytechnics.

While the integration of emerging technologies into industry-academia collaboration is often lauded, the practical implications for business curricula remains as an area of opportunity. As examined by Esangbedo et al. (2024), technological advancements further highlight this disparity, revealing an implicit assumption that the benefits of technological partnerships in technical disciplines are universally applicable. This assumption does not meet the distinct pedagogical and industry requirements of business education. Such generalization constrains the potential for meaningful cross-disciplinary applications of these advancements.

There is a lack of consensus regarding what constitutes effective academic-industry collaboration. For example, business programs prioritize employability outcomes, leadership skills, and real-world problem-solving, none of which are adequately addressed in frameworks designed for technical disciplines. Lucietto et al. (2021) identify this issue, and while their work provides valuable insights into engineering and technology education, it does not add to the conversation regarding business programs, where success metrics differ significantly. Walsh et al. (2023) offer

a promising model for stakeholder engagement in curriculum design, but their focus on Ireland's brewing and distilling sector limits the generalizability of their findings to broader educational contexts. The absence of comparable studies in Canadian polytechnics creates a gap in the literature, along with further opportunity for exploration.

Graduate Employability

Polytechnic institutions in Canada are focusing on enhancing graduate employability through industry engagement. Aligning academic curricula with job market demands remains challenging, particularly in business education. While polytechnics have shown robust employability outcomes in technical fields, business education requires more nuanced engagement strategies.

The Canadian labour market reveals persistent skills gaps affecting business and management roles. According to Statistics Canada's Q2 2024 Canadian Survey on Business Conditions, 31.3% of businesses identify recruiting skilled employees as their most anticipated labour-related obstacle, with over 60% of small and medium enterprises (SMEs) in skill-dependent sectors reporting ongoing recruitment challenges (Canadian Federation of Independent Business, 2025; Statistics Canada, 2024). Research indicates that 56.1% of businesses report deficiencies in job-specific competencies among employees, particularly business graduates, with 44.5% challenged to fill roles requiring both technical and strategic business expertise (Fissuh et al., 2022). Harmadi and Nelson (2024) further note that employers specifically identify gaps in problem-solving, leadership, and adaptability, which are competencies central to business education. These findings underscore the urgency of aligning business curricula with industry needs through structured engagement frameworks and more sophisticated industry-academia collaboration.

Competency-Based Education (CBE) models offer a structured approach to skill development that prioritizes demonstrated competencies over traditional academic progression. Foster and Jones (2020) argue that CBE provides a more direct link between educational outcomes and workforce requirements. Lawson et al.'s (2011) study in Australia highlights the opportunities and challenges in integrating professional learning into business curricula.

Work-Integrated Learning (WIL) has been widely implemented

in business education, yet existing models reveal limitations. By 2020, just 35% of business graduates in Canada had participated in work-integrated learning, compared to over half (53%) of STEM graduates (Statistics Canada, 2025a). Current approaches often treat internships as short-term recruitment pipelines rather than structured learning experiences, resulting in graduates who lack strategic decision-making capabilities (Du Plessis et al., 2024).

Recent national data reinforces these disparities: the CEWIL Canada 2024 Data Report shows that business and management programs account for only 18.2% of co-op enrollments despite substantial student populations, compared to 39.7% for architecture and engineering programs (Drewery, 2025). These patterns reflect persistent structural barriers to WIL access in non-technical disciplines.

While work-integrated learning initiatives and competency-based education models have made strides in improving graduate employability, their inconsistent application in business programs reveals deeper structural challenges. Addressing these disparities requires more than short-term placements; it demands a sustained, multi-stakeholder commitment embedded throughout the curriculum. This review argues that advancing graduate outcomes in polytechnic business education hinges on a reimagined framework, one that integrates structured institutional collaboration with stakeholder responsiveness. The following section outlines a future-oriented approach to achieving this goal by operationalizing a blended model that addresses both systemic barriers and pedagogical opportunities.

Discussion

To advance industry-academia collaboration in Canadian polytechnic business education, future efforts should focus on developing targeted frameworks that enhance industry engagement and graduate employability. While technical disciplines have seen substantial progress, business programs require greater representation in research and applied models. Addressing this gap involves integrating industry-driven competencies, fostering experiential learning opportunities, and refining collaboration mechanisms between educational institutions and businesses.

Key insights from the literature highlight the positive impact of industry engagement on employability. Studies such as Otache (2021), NAIT (2021), and BCIT (2022)

Graduate Placement Surveys demonstrate the value of integrating industry input into curricula. These findings align with accreditation expectations that business schools demonstrate meaningful stakeholder engagement and document the impact of industry partnerships on learner outcomes and institutional effectiveness (AACSB International, 2025). However, inconsistencies in employment outcomes, as observed in studies like Saskatchewan Polytechnic (2021), point to the need for more nuanced and longitudinal research to understand the factors influencing these variations. Moreover, the distinction between formal and informal work-integrated learning (WIL) opportunities emphasizes the need for comprehensive frameworks that accommodate diverse learning experiences.

The distinction between formal and informal work-integrated learning (WIL) opportunities complicates the implementation of effective industry partnerships. While formal WIL programs like internships offer structured experiences, informal opportunities often lack consistency and scalability along with challenges around ownership and resourcing (MacDonald et al., 2014). These discrepancies clearly highlight the need for comprehensive frameworks that can accommodate diverse forms of learning while ensuring equitable access for all students. Existing research, such as that by Statistics Canada (2025a) and Du Plessis et al. (2024), underscores the importance of expanding WIL initiatives to bridge these gaps and better align business curricula with labour market demands. Programs such as the Mitacs Business Strategy Internship provide students with the opportunity for hands-on experience in business innovation through funded internships that support industry (Mitacs, n.d.-b). Expanding this program would help satisfy this need within emerging models of collaboration.

Despite these insights, significant challenges persist. Existing frameworks often prioritize technical skills, overlooking the critical role of soft skills in business education. The reliance on quantifiable metrics further limits the ability to assess qualitative outcomes, such as stakeholder satisfaction and long-term employability. Addressing these limitations requires the development of integrated models that balance technical and interpersonal skill development while providing robust tools for measuring engagement effectiveness.

Recommendations for Future Research

A key area of opportunity in current engagement models in

business education is to support sustained multi-stakeholder collaboration. This review proposes a blended framework that combines the structural coordination of the Triple Helix Model with the relational adaptability of Stakeholder Theory. As illustrated in Figure 1, this model enables Canadian polytechnics to establish standardized, long-term industry partnerships while remaining responsive to evolving stakeholder needs. By integrating collaboration beyond short-term WIL placements, the model promotes interdisciplinary engagement, leadership development, and strategic decision-making in critical areas that are often missing in current employability models. (Polytechnics Canada, 2024b; Du Plessis et al., 2024).

The following figure illustrates how the key elements of the Triple Helix Model and Stakeholder Theory merge into a cohesive framework. This blended approach ensures that business education is both structured and adaptable, addressing industry needs while fostering long-term employability.

Defining industry engagement categories in Canada will be critical to ensure standardized approaches and definitions. In Australia, Lawson et al. (2011) created eight "professional learning" categories, ranging from industry case studies to work placements within business education. While all categories are important, the focus must be on high-touch, high-impact industry integration to be effective.

The proposed blended model provides a structured and scalable solution; however, implementation could face barriers, including institutional resistance, as curriculum

Triple Helix Model	Stakeholder Theory Model
- Institutions drive innovation, research and development. - Government develops policies and funding mechanisms to enable collaboration. - Industry invests in applied research to foster innovation and supports WIL. - Collaboration tends to focus on outputs metrics. - Industry-academia partnerships are often more formal.	- Employers and alumni co-develop curricula for workforce alignment. - Students and faculty provide iterative feedback on partnership and program design. - Employers mentor students and validate program outcomes for relevance. - Stakeholders prioritize leadership, accountability, and skill development. - Industry-academia partnerships are more informal.

Blended Framework Outcomes
- Balanced funding for business programs to address underrepresentation.   - Co-designed curricula incorporating academic and industry priorities.   - Developmental metrics to measure leadership, adaptability, and strategic thinking.   - Continuous feedback loops involving industry, alumni, and students harnessed in a standardized dashboard   - Policy reforms to standardize funding models and prioritize interdisciplinary collaboration.   - Embedding leaderships and strategic thinking modules in the classroom co-taught by academic and industry professionals.

Figure 1. Blended Framework Outcomes

reform often requires long lead times and approval processes. Funding constraints could also limit the ability to build new partnerships and establish the foundation to operationalize this model. Finally, scalability could be challenging, depending on institutional resources and capacity. For example, in China's regional innovation clusters, studies found that while universities played a role in applied research, government intervention often delayed industry adoption due to bureaucratic inefficiencies (Cai & Liu, 2018).

Overcoming these challenges requires targeted policy interventions and strategic realignment of funding. With polytechnics' emergence and continued growth in Canada, there must be a clear line of sight regarding funding priorities. Polytechnics Canada (2024a) highlights applied research's economic and social benefits as every $1 invested in applied research yields a return on investment of $8.09 - $18.49 (Polytechnics Canada, 2024a). By aligning funding structures with the specific needs of business programs, policymakers can facilitate more robust collaborations between industry and academia. Federal and provincial funding bodies should prioritize dedicated grants, while institutions could leverage advancement departments to mitigate financial constraints. Additionally, gradual pilot programs in select institutions can help address scalability concerns and provide a framework for broader adoption of industry-academia engagement models.

Future research and policy development must prioritize integrating quantitative and qualitative metrics to better capture the full spectrum of skills required in business education. A blended approach to collaboration, incorporating elements of both the Triple Helix and Stakeholder Theory, can address these challenges by fostering structured and flexible partnerships. Such an approach would enable Canadian polytechnics to develop scalable, sustainable models of industry engagement tailored to the evolving needs of business education, bridging the gaps between academic preparation and workforce demands. Future research should also prioritize the implementation of pilot programs across select polytechnic institutions to assess the framework's scalability and impact. Comparative studies between institutions with mature partnerships and those without can yield actionable insights, while funding alignment and institutional support will be essential to ensure a sustained impact on graduate outcomes and institutional innovation.

Conclusion

The existing literature sheds light on industry-academia collaboration, revealing a wealth of research on successful engagement models within polytechnic institutions. However, this review has identified a significant gap in research and implementation strategies for business programs, which remain overshadowed by technical disciplines. The persistent lack of standardized engagement models, underrepresentation in funding priorities, and insufficient focus on leadership and strategic skills continue to hinder business graduates' employability.

This review proposes a blended framework that integrates the structural collaboration of the Triple Helix Model with the adaptive, multi-stakeholder approach of Stakeholder Theory. By balancing institutional coordination with flexible engagement mechanisms, this model provides a practical solution for strengthening industry partnerships in business education. Future research should focus on testing this framework through pilot programs and refining developmental metrics to assess its long-term impact on graduate employability.

As Canada continues to adapt to a knowledge-driven economy, rethinking industry partnerships in business education is no longer optional, it is essential. Future research and policy initiatives must prioritize sustainable, multi-stakeholder engagement to ensure that business graduates are equipped with the skills, leadership, and strategic adaptability required to thrive in a rapidly evolving workforce.

Conflict of Interest
No conflict of interest.

Note on Contributor

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Appendix
Appendix A: Search Strategy and Coding

To ensure a structured and orderly approach, this study employed a thematic analysis methodology using Atlas.ti for qualitative coding despite being an integrative review; this approach was applicable to ensure consistency with terms and themes. The literature search was conducted across academic databases (Scopus, ProQuest, EBSCOhost, Google Scholar) and institutional repositories (Polytechnics Canada, Statistics Canada, Mitacs, and Government Reports).

The search terms (see Table 1) were strategically selected to capture the intersection of industry engagement, employability, and polytechnic business education. The inclusion criteria prioritized peer-reviewed studies (2014-2025), ensuring relevance to contemporary industry-academia partnerships, while foundational literature was incorporated where necessary to establish theoretical context.

The analysis was structured around predefined thematic codes drawn from search terms and theoretical frameworks

(Triple Helix Model and Stakeholder Theory). However, new themes emerged inductively, particularly regarding funding disparities, curriculum misalignment, and institutional barriers, which were integrated into the final analysis.

The data extraction framework (see Table 2) summarizes a representative sample of studies included in this integrative review. It captures the scope and characteristics of both peer-reviewed and grey literature, organized by author, year, country, study type, focus area, and theoretical framework. This structured approach ensured methodological consistency across diverse data sources while supporting cross-comparison of theoretical and empirical insights. By incorporating academic scholarship, institutional reports, and policy submissions particularly from Canadian contexts the framework reinforces the review's analytical rigour and enhances its contextual relevance in advancing industry academia partnerships within polytechnic business education.

Table 1: Search Strategy

Stage	Description

Databases Searched	1. University of Derby and NAIT Library
	    • Scopus, ProQuest EBSCOhost
	 2. Google Scholar
	
	 3. Grey Literature
	    • Polytechnics Canada
	    • Government of Canada
	    • Government of Alberta
	    • Polytechnic Institution websites
	    • Mitacs

Search terms	"polytechnic business education", "industry engagement," "graduate employability," "Canadian polytechnics," "industry-academia," "work-integrated learning," and "collaborative frameworks", "stakeholder theory," "Triple helix model," "post-secondary education"
Inclusion Criteria	Peer-reviewed studies between 2014-2025 focused on Industry engagement at Canadian polytechnic education and related concepts within higher education. Anything falling outside of this timeframe was included to support methodology or business specific context.
Exclusion Criteria	Studies without empirical data or practical application
Final Studies Included	48 sources were included in the review. The thematic analysis excluded institutional websites for basic facts, data, and supporting details.

Table 2: Data Extraction Sample

Author(s)	Year	Study Type	Country/ Context	Focus Area	Theoretical Framework Used	Relevance to Review
Whittemore & Knafl	2005	Methodological Paper	USA	Integrative Review Methods	N/A	Justifies the chosen review methodology
Cai & Etzkowitz	2021	Theoretical Analysis	USA	Triple Helix Model	Triple Helix	Forms one pillar of the proposed blended framework
Yin et al.	2024	Empirical Study	China & Malaysia	Stakeholder Engagement in Construction	Stakeholder Theory, SEM	Demonstrates analytical methods transferable to business education research
Syed et al.	2023	Bibliometric Review	Global	Stakeholder Engagement in Higher Ed	Stakeholder Theory	Highlights flexibility of Stakeholder Theory but shows its diffuse nature
Du Plessis et al.	2024	Literature Review	Namibia & Global	University-Industry Collaboration	N/A	Links industry collaboration with graduate employment outcomes
Lawson et al.	2011	Empirical Study	Australia	Business Curriculum Design	N/A	Used to suggest Canadian categories of engagement
MacDonald et al.	2014	Empirical Study	Australia	Work-Integrated Learning in Australia	N/A	Evidence for long-term WIL in business education
Harmadi & Nelson	2024	Policy Report	Canada	Future Skills & Workforce Gaps	N/A	Urges alignment of curricula with soft skills and leadership needs
Otache	2021	Empirical Study	Nigeria	Polytechnic-Industry Engagement	Stakeholder Theory	Supports core thesis on structured partnership development
Polytechnics Canada	2024	Policy Submission	Canada	Federal Research Funding	Triple Helix	Underscores underfunding and relevance of structural models like Triple Helix