Nurse Bridging Education: Optimization, Innovation, and Sustainability

This research project is to develop consensus on efficient, timely, evidenced-informed principles for bridging education that can be implemented across healthcare professions in British Columbia, Canada and internationally.

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TABLE OF CONTENTS

1 LIST OF ABBREVIATIONS

AI	artificial intelligence
B.C.	British Columbia
ESN	Employed Student Nurse
IEN	Internationally Educated Nurse
IQR	interquartile range
JBI	Joanna Briggs Institute
MoH	Ministry of Health
NCLEX	National Council Licensure Examination
PEBE	professionals enrolled in bridging education
PICO	population, intervention, context, outcome
PLAR	prior learning assessment and recognition
OECD	Organisation for Economic Co-operation and Development
RN	Registered Nurse

2 EXECUTIVE SUMMARY

Background –

For over a century, nurses and midwives have been in short supply worldwide. Nurses and midwives make up nearly half of the global health workforce, but labour shortages are predicted to reach 15 million by 2030. Nursing shortages in Canada are expected to reach 117,000 by 2030, with British Columbia (B.C.) reporting 3,700 vacancies in the 3rd quarter of 2024 and predicted to need an additional 27,000 nurses to meet future population demands. The causes of the shortfall and its current escalation have been extensively studied. This research suggests focusing on retention, recruitment, encouraging return to practise, and improving the use of migrant globally educated professionals. The B.C. government's health human resource strategy is to retain, redesign, recruit, and train. Bridging education can be applied in all these areas.

Bridging education leverages past learning and experience to help individuals re-enter the workforce or change careers. However, its definition—including goals, target demographics, and duration—remains unclear. These limitations hinder its potential as a flexible tool for retaining, developing, and recruiting healthcare professionals or aiding career transitions. Educating our current and future healthcare workers requires targeted, inclusive, and facilitated program admissions and distributed practice-based learning at all career stages to actively address increasing health professional attrition. Increasing diversity and representation in all professional healthcare practitioner education programs, including bridging education, will help recruit, retain, and admit healthcare workers.

Current approaches to bridging education are limited in choice, lengthy, and lack accessibility. The existing educational processes are inefficient and fail to leverage and foster the talents of the current workforce. Additionally, there is insufficient collaboration and coordination among the various partners and contributors to programs, resulting in fragmented outcomes that are poorly understood by all. It is essential to develop, deliver, and evaluate new approaches to bridging education that employ more efficient, creative, and innovative methods.

Methodology

The purpose of this research was to identify the key principles of healthcare professional bridging education, understand barriers and facilitators, and develop consensus on these principles for application in planning processes. This involved a two-step approach: a rapid review of the literature on bridging education from nursing, midwifery, and allied health, followed by a multi-round Delphi research study utilising experts in the field to identify and develop consensus on the foundational elements and principles of bridging education.

The rapid review of the literature search strategy yielded a total of 1,215 articles from Medline and CINAHL, plus 14 from grey literature and manual citation searching. Following removal of duplicates, and the use of inclusion/exclusion criteria, 44 articles remained for inclusion in the rapid review. The

Delphi study involved two rounds: a qualitative round with 47 respondents and a consensus study with 44 respondents.

Key findings

The literature review highlighted there is poor evaluation of outcomes from bridging programs, limited evidence of how bridging education is used in career progression, challenges in program sustainability, and lack of input from professionals enrolled or graduates in the development or evaluation of bridging education.

The Delphi study rounds resulted in 39 best practice statements that had a high level of consensus. These statements addressed six areas of focus:

1. Goals of bridging education
2. Accessibility and bridging program design
3. Needs, approaches and lifelong learning
4. Curriculum, competency and assessment
5. Learner support and success
6. Evaluation and outcomes

The key findings relating to these areas were:

- The main goal of bridging education should be to support career pathways, while also addressing workforce needs and supporting individual career aspirations and professional growth and autonomy.
- Accessibility and Program Design: Bridging programs should be accessible, flexible, and designed to support working professionals, including those in rural and remote areas.
- Needs and Lifelong Learning: Programs should focus on high standards, holistic approaches, and continuous quality improvement, addressing individual needs and lifelong learning.
- Curriculum and Competency: Programs should ensure a comprehensive curriculum, including preceptorships and exposure to various clinical settings. Curriculum design challenges included an overemphasis on workforce demands, lack of standardization, and more clarity relating to admission requirements.
- Learner Support and Success: There is a need for robust support systems, including financial aid, mentorship, and career counselling, to enhance learner success.
- Evaluation and Outcomes: While there was consensus that evaluation and accountability were important, there was no agreement on how this should be undertaken. There were concerns that some evaluation processes were overly complex and burdensome, too much reliance on standardized testing, and limitations and challenges with tracking long-term outcomes.

Framework for bridging education

A framework to underpin bridging education was developed with three levels:

1. Elements of bridging education,
2. Key principles of bridging education, and
3. Conceptual model highlighting the relationships between the partners and factors influencing success.

In addition to addressing the elements and principles identified in the key findings, the framework acknowledges the impacts and influences of situational receptivity, social capital, cognitive capacity, and emotional intelligence. These concepts target factors such as communication, empathy, efficiency, teamwork, critical thinking, patterns of learning, self-readiness and learner agency.

For the learner to achieve a successful outcome through bridging education, the key partners in the bridging education system must work together. It is only through the combined efforts of all, to create a seamless connection between the parts, that bridging education can effectively and efficiently work to its maximum potential. Strong bridging education programs make for thriving professionals and an empowered, equitable workforce. Collaboration allows everyone to reach their maximum potential, and everyone emerges stronger.

Recommendations

From this research the following recommendations are proposed. In making these recommendations, it is advised that the approach to implementation be kept as simple as possible to optimize the likelihood of success. It is imperative that a multifaceted, co-operative, and accessible approach is used, and the partners work together in as open, receptive, and transparent a manner as possible to improve the bridging education processes and outcomes.

The list below provides only the high-level summary of each recommendation. Please refer to the main report for the full recommendations and all associated components.

Access and design to facilitate learning

1. Province-wide accessibility and responsiveness to bridging education programs needs to be improved with an emphasis on local responsibility.
2. Current vacancies in healthcare programs (e.g. vacancies created by attrition) and redirection of funds should be used to support individualized learning needs in bridging education.

Needs, approaches and life-long learning / Curriculum, competency and assessment / Learner support and success

3. Bridging education must be learner focused.
4. Prior learning assessment and recognition (PLAR) processes need to be improved and enhanced with a learner-centred lens.

5. Bridging education needs to be recognized as a career building mechanism aligned with sustainable career pathways.
6. An open learning approach with an emphasis on articulation between institutions aligned through BCCAT (BC Council on Admission & Transfer) needs to be established.
7. Apprenticeship work/training options need to be developed which combine employment with study and practical training to meet requirements for career re-entry and progression.

Data, evaluation and outcomes – short- and long-term

8. A common evaluation framework, including short- and long-term measures, for bridging education and the individual programs within this system needs to be developed.

Effective management and teamwork

9. Improved partnerships need to be developed between the partners to ensure an integrated learning strategy with common goals and a shared vision for learners and the workforce.

Conclusion

Redefining and clarifying the meaning of bridging education is critical to ensuring a successful and evidence-informed approach to building and retaining the future workforce. The key partners in the delivery of this education need to work together to create a culture that establishes life-long learning in health careers as the norm, and moves learning to operational and practice levels that will enable training and advancement across diverse sectors, while facilitating the achievement of individual, community, and wider public health goals.

This report recommends improving province-wide accessibility and responsiveness to bridging education programs, enhancing PLAR processes, and developing apprenticeship work/training options. It also advises developing a common evaluation framework and improving partnerships between partners in the bridging education system.

3 PROJECT BACKGROUND

Globally, shortages of healthcare workers, particularly nurses and midwives, have been an acknowledged and consistent problem for more than a century (Buchan et al., 2018; Marc et al., 2019; McNutt, 1920; Morris, 1916; Peters, 2023). Nurses and midwives make up approximately half of the global health workforce (World Health Organization, 2024), however the labour shortages are growing and intensifying, and they are expected to reach 15 million by the year 2030 (International Labour Organization, 2022). Significant research has been undertaken to identify the factors that underpin the persistent shortage and current exacerbation of the problem (Jun et al., 2021; Lee et al., 2021; Lin et al., 2021; Lopez et al., 2022; Turale & Nantsupawat, 2021; Wu et al., 2015). This research has identified four areas where strategies should be focused: enhanced retention, improved recruitment, encouragement to return to practice, and making better use of migrant internationally educated professionals (Peters, 2023). Bridging education is one strategy that can be used across all these areas.

Canada is not immune from the healthcare workforce shortage, with the nursing shortage in particular reaching crisis proportions and forecasted to reach 117,000 by 2030 (Baumann & Crea-Arsenio, 2023). In British Columbia (B.C.), the healthcare system is facing significant workforce challenges as it moves into the coming decades (BC Ministry of Health, 2022). B.C. job vacancy data from Stats Canada showed 3,700 nursing vacancies during the 3rd quarter of 2024 (Statistics Canada, 2025), and recent research undertaken by Ben Ahmed and Bourgeault predict nearly 27,000 nurses will be needed to keep up with the healthcare needs of an expanding B.C. population (Ben Ahmed & Bourgeault, 2022). The B.C. government's approach to addressing these challenges is an integrated strategy focused on systems of care that can assist everyone living in the province to maintain or recover their health and wellness. The health human resources part of this strategy is designed around four cornerstones: retain, redesign, recruit, and train (BC Ministry of Health, 2022).

Bridging education is designed to build on previous education and experience to allow individuals to re-enter the workforce, advance or modify their current career. These educational programs can provide a vehicle for recruitment and return to the workforce for the domestic professionals who have taken time away from their career, as well as the significant number of internationally educated professionals who live outside of their country of origin and want to join the workforce in their new country. Bridging education can also provide a means for modification or advancement of existing careers, which can boost retention of existing professionals (Health Canada, 2024; Lawrence et al., 2023). Despite this, there remains confusion around the 'meaning' or definition of bridging education, including the aims it is intending to achieve, which populations may benefit, and the nature and duration of the education at the prerequisite and program level. Such barriers inhibit the potential for bridging education to be a flexible and dynamic approach that can retain, redesign and help to recruit healthcare staff, especially nurses, to train and enhance skills, or switch pathways within healthcare careers.

Promoting processes for targeted, inclusive, and facilitated program admissions and distributed practice-based learning is crucial in educating our current and future healthcare workforce. Encouraging retention of healthcare practitioners, particularly Indigenous practitioners, through effective, safer educational and career progressions incentives can help lower attrition. Attrition amongst healthcare professionals, particularly nurses, happens across all career phases, from early education and new graduates to experienced professionals. For example, in Canada, there is a 25% attrition rate in early nursing education (Picard, 2009), which results in available vacancies in course seats, inefficient use of resources, and missed educational opportunities (Hamshire et al., 2019). Increasing the diversity and representation across all professional healthcare practitioner educational programs, including bridging education, will also support admission, recruitment, and retention of the healthcare workforce.

Bridging education programs can be utilised at all levels of the workforce. They can assist healthcare aides to transition to practical or enrolled nurses, practical or enrolled nurses to transition to registered nurses (RNs) through transfer credits for bachelor's level programs, as well as providing existing RNs with additional professional skills in areas such as midwifery, emergency or community paramedic, or skills traditionally associated with allied health professions.

The current approaches to bridging education are choice-limited and drawn-out exacerbating the shortages of appropriate professionals and limiting service provision, thus putting the public at increased risk (Canadian Nurses Association, 2021; Udod, 2023). There is a lack of access to bridging education due to limited numbers of programs, program locations, barriers to entry, resource constraints, and lack of appropriately prepared faculty (Arain et al., 2017; Marfo & Fernandez-Sanchez, 2022; Santa Mina et al., 2023). Current educational processes are wasteful and fail to utilize and encourage the talents of the existing workforce (Lawrence et al., 2023). There is also a lack of collaboration and coordination between the different stakeholders or contributors to programs and the outcomes from the programs are fragmented and poorly understood by all partners (Austin & Croteau, 2007; Austin & Gregory, 2024). New approaches to bridging education that utilise more efficient, creative and innovative methods need to be developed, delivered and evaluated. These approaches could include newer evidence-informed educational strategies that facilitate life-long learner-centred learning approaches, such as precision teaching, a system that monitors performance improvements over time and strongly emphasizes instructional techniques that are designed to develop both accurate and fluent responses that are maintained over time (Lydon et al., 2017).

The initial step in determining how approaches to bridging education can be improved is to identify the principles and foundations required to underpin this type of education. It is crucial to identify these principles to ensure bridging education is designed to appropriately address known barriers and impediments to success, can be appropriately matched to existing educational infrastructure and resources, and to ensure new approaches and strategies are forward-looking, efficient, and educationally sound. Despite different types of bridging educational programs existing for more than

three decades (McCloskey et al., 2023), it was identified that there was no multi-contributor, consensus-driven, and evidence-informed framework that identified the fundamental principles and mechanisms for the implementation of bridging education, that promotes best educational practices, facilitates the efficient and effective use of resources, and can be applied across all stages of healthcare professionals' careers.

This project explores 'how' through bridging education we can mobilize B.C.'s Health Human Resources Strategy, which *'envisions a health system that puts people first—fostering workforce satisfaction and innovation to ensure health services are accessible to everybody in B.C.' (p.8).* We believe that bridging education can liberate the talents of our existing and future healthcare workforce to meet the four cornerstones: retain, redesign, recruit, and train, as identified by the Ministry of Health (MoH) (BC Ministry of Health, 2022).

4 RESEARCH OBJECTIVES

The goal of this research was to develop a bridging principles framework that translates across key partnerships. To achieve this goal, we had three objectives:

1. To identify the architecture or structures that inform the key principles of healthcare professional bridging programs[1] across B.C., Canada, and internationally.
2. To understand the barriers and facilitators to bridging education, as experienced by the partners in the bridging education process, and
3. To develop consensus of these identified principles and articulate how these principles can be applied to individual, organizational, environmental, and health human resource planning processes.

To achieve these objectives, we followed a two-step approach: a rapid review of the existing literature on bridging education from nursing, midwifery, and allied health, followed by a multi-round Delphi research study utilising experts in the field to identify and develop consensus on the foundational elements and principles of bridging education. Using principles and concepts taken from Boyatzis's performance model (Boyatzis, 1982), the *OECD Learning Compass 2030* (OECD Future of Education and Skills, 2019), and accreditation of prior learning (Simosko & Cook, 1996) to create a guiding conceptual overlay, the identified bridging principles were then formulated into a bridging education framework to articulate how they could be applied to individual, organizational, environmental, and health human resource planning processes. Ethical approval for this research was obtained from the B.C. Harmonized Research Ethics Board, approval # H24-01082.

[1] The terms 'bridging education' and 'bridging programs' were used interchangeably in the research phase of this project to allow participants more familiarity with their own terminology. However, for simplicity the term bridging education will be used in the report, except when referring to the actual questions used, or information provided during the different research phases.

Early investigations for this work involved a preliminary literature search utilizing Scopus, Cochrane and JBI (Joanna Briggs Institute for Evidence-based Healthcare) databases to identify any current or in-progress systematic or scoping reviews relating to the topic ‘bridging education’ or ‘bridging programs’. While two recent reviews were found, a systematic and a scoping review, both were focused on the student’s experience in bridging education, rather than the principles and foundations that need to be in place in these programs. In these early investigations, it was noted that the term bridging program or education was used differently in different geographical locations and contexts. As a result, the following definition of bridging education or bridging program was developed for this work:

> A bridging program is an educational program designed to address gaps in or advance knowledge, skills, and professional competence for healthcare professionals who have previously obtained credentials allowing them to practice.

Rapid Review of the Literature

The focus of the rapid review of the literature was to identify the different types of pathway options that can support career progression and attainment of professional registration/licensure while at the same time providing efficient, evidence-based, and equitable access to the necessary supplemental education and training. Three research questions were used to guide the rapid review:

1. What types of bridging programs, or other pathways, exist domestically or internationally to support healthcare workers to attain the supplemental education and training necessary to achieve registration or career progression?
2. What are the key features employed to measure the outcome effectiveness of these bridging programs?
3. What challenges and supports (barriers and facilitators) are experienced in bridging programs from the perspectives of students/participants, educational providers/faculty, and other partners – employers, regulators, professional associations, and governments.

Delphi Research Study

The focus of the Delphi research study was to identify and develop consensus on best practice principles and mechanisms that could inform a framework for implementation and evaluation of bridging education. This was done by first collecting the opinions of the expert panel members on the current state of bridging education, key barriers, necessary changes, and requirements for evaluation. Then this information, together with the findings of the rapid review of the literature, were compiled to formulate best practice statements that were circulated amongst the expert panel members to obtain consensus.

5 RESEARCH METHODOLOGY

5.1 RAPID REVIEW OF LITERATURE

The rapid review of the literature was conducted following the PRISMA systematic review guidelines, modified and simplified to be more consistent with that recommended by the WHO *Rapid Reviews to Strengthen Health Policy and Systems: A Practical Guide* (Smela et al., 2023; Tricco et al., 2017). The inherent components of a rapid literature review identified by Smela et al. (2023) include shortened timeframe, usually no more than 12 weeks, clear research question, search protocol, simplified processes for study selection and data extraction, and quality assurance: all were followed in this review. A research protocol was developed based on the PICO framework (population, intervention, context and outcome) with specific inclusion and exclusion criteria. Table 1 provides the PICO framework used for the rapid review.

Table 1
PICO Inclusion and Exclusion Criteria

	Include	**Exclude**
Population	Must be a regulated health profession, particular focus: Nursing Midwifery Pharmacy Allied Health professions Medicine	Health care aide or assistant Non-regulated health professionals
Intervention	Must be a bridging program leading to license/registration for healthcare professionals who have previously obtained regulated credentials Bridging Programs could address: • practical nurse to registered nurse, • mental health nurse to registered nurse, • registered nurse to midwife, • Internationally educated healthcare professional to currently registered healthcare professional,	Diploma to degree[2] programs. These may be referred to as bridging programs in some jurisdictions (e.g. Saudi Arabia and Middle Eastern nations) but do not meet this definition of bridging program. Post-graduate specialty programs, master's degrees and doctoral programs

[2] This could be any type of degree however named in any jurisdiction.

	• previously registered RN to currently registered RN (return to work)	
Context	Focus on general concepts associated with bridging programs including any of the following: • principles that should be included • how program is delivered • how it is designed • what components are included • emerging approaches / new innovations	Specific curriculum or content topics or areas included in programs e.g. leadership, community nursing, evidenced-based practice, or other specialized areas
Outcome	Factors, barriers and facilitators shown to impact success from different perspectives - student, employer, educational provider, regulator, government	Does not address factors relating to success from any of the identified perspectives - student, employer, educational provider, regulator, government
Study Characteristics	• Studies published since 2005 • Studies from any country, English speaking or non-English speaking	• Studies not published in English • Studies published prior to 2005
PICO Exclusion reasons	Wrong Population Is not a regulated healthcare profession Wrong Intervention Is not a bridging program Wrong Context Addresses a specific curriculum issue rather than principles and general concepts Wrong Outcome Does not include factors that impact success	

Due to project time constraints the protocol was not published. The protocol was registered with Open Science Framework https://doi.org/10.17605/OSF.IO/DU76K .

Using the services of a health librarian, a search strategy was developed, then reviewed, and finalized by the research team. The search terms utilized are provided in Appendix 1. The databases Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Medical Literature Analysis and Retrieval System Online (MEDLINE) were searched for primary research studies (qualitative, cross-sectional, case studies, systematic and scoping reviews, mixed methods, dissertations and

narrative/opinion pieces) published between 2005 and 2024. Publications were limited to English language. Grey literature was located using extensive website searching (Appendix 2) and reference lists of included papers were also searched for additional studies.

Following searching, all identified peer review citations were entered into *Covidence* systematic review software (Veritas Health Innovation, Melbourne, Australia www.covidence.org) where duplicates were removed, and titles and abstracts were screened by one of two reviewers (AR, CS) against the PICO framework inclusion criteria for the review. Potentially relevant studies were then retrieved in full and assessed in detail independently by two assessors (AR, CS) using an extraction template developed from Covidence Extraction Tool 2 (Appendix 3). The extraction template addressed publication metadata which described the basic attributes of the article, characteristics of the study and participants, and findings such as key problems and challenges, indicators of success, and recommendations. Any disagreements in data extraction that arose between the reviewers were resolved by discussion. Studies that did not meet inclusion criteria were excluded, reasons for exclusion are provided in the Findings section (See Figure 2 Search results and study inclusion process). Authors, where possible, from the included articles were contacted by email to explore the knowledge mobilization and sustainability impact from their publications, if there was any further work they could offer to include in this research, or if they had any comments they wished to contribute.

A template for grey literature data extraction was developed from the Covidence Extraction Tool 2 and the data extracted by one assessor (DH). The extracted data was compiled in a shared Google Docs spreadsheet and reviewed by a second assessor (AR).

All included studies were assessed for methodological quality by one assessor (DH) using JBI Critical Appraisal Checklists (JBI Global, 2024) specific to the study type. The critical appraisal checklists used included qualitative research, analytical cross-sectional studies, systematic reviews and research synthesis, case report, case series, and textual evidence: expert opinion. All studies, regardless of the methodological quality were included in the findings of the rapid literature review. The findings of the quality review are presented in Appendix 4.

The data extracted from the peer reviewed and grey literature was then independently synthesized by two reviewers (AR, CS) into dominant themes based on the main headings in the data extraction framework. This was then reviewed by all members of the research team.

5.2 DELPHI RESEARCH STUDY

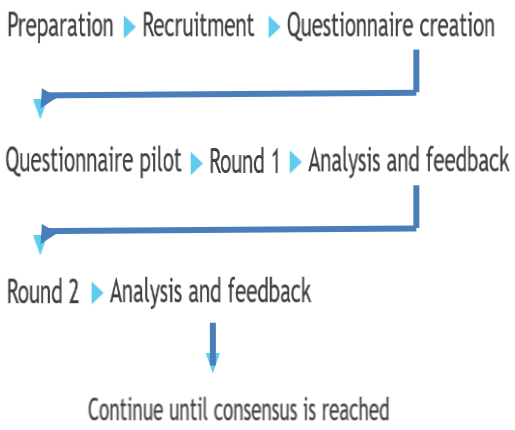
The purpose of a Delphi study “is to attain the most reliable consensus of opinion from a group of experts by using a series of questionnaires interspersed with controlled opinion feedback” (Dalkey & Helmer, 1963 p.458). While the research technique was created in the 1950s (Dalkey & Helmer, 1963), there has been increased interest in the use of the technique in the past five to ten years due

to its ability to generate insights into controversial topics where there is limited available information, particularly in healthcare and policy development (Beiderbeck et al., 2021; Z. Shang, 2023).

There are no universally agreed to guidelines to conducting Delphi studies, however there are classic features of the Delphi study methodology including an iterative process, comprised of multiple rounds, using expert panels, with anonymous group communication, and the responses shared between the subsequent rounds (Beiderbeck et al., 2021; Hsu & Sandford, 2007; Y. Shang, 2023; Z. Shang, 2023).

For this study we engaged a Delphi research advisor (MH) to enhance trustworthiness in process and provide group education and training around Delphi. As a non-health worker, our advisor was able to critique and question our bias as the majority of our team have strong post-secondary and healthcare careers. The study followed a classic approach to the Delphi study as per Figure 1.

Figure 1
Framework for 'Classic' Delphi Study



5.2.1 Preparation, recruitment and creation of the study

The study preparation involved determining the criteria for the recruitment of the expert panel, the plan for the different rounds of the study, the methodology for distribution of the survey, the determination of the software to be used, and the criteria for consensus on the statements in the Delphi rounds.

Based on the findings of the literature review, advice from the Delphi advisor, and the Delphi methodology literature, the following criteria were used for the recruitment of the expert panel members.

1. Representation from the bridging education partners
    - Government
    - Regulators

- Post-secondary educational institutions
- Employer/Health authorities
- Advanced learners/students
- Professional associations
- Context-specific partnerships

2. Work experience – overall work experience in the healthcare sector of greater than five years and preferably more than five years work experience in their current bridging partner work sector.

The Delphi research study was planned to involve three rounds, an initial qualitative data collection followed by two rounds of importance rating of the principle statements by the expert panel.

5.2.2 Round one: Qualitative data collection

The qualitative data collection of the opinions of the expert panel was based on four open-ended questions relating to bridging education sent out through an email with a Microsoft Office linked document to collect the responses. The four questions were:

1. From your perspective, please share your comments on the current state of bridging education.
2. What do you see as key barriers to bridging education?
3. What changes would you suggest for bridging education, both short and long term?
4. How should we evaluate the effectiveness of bridging education across short-, mid-, and long-term outcomes?

The email invitation to participate was sent to 97 potential panel members. Potential panel members were identified using purposive sampling with academic institutions identified through the Canadian Health Workforce Network resources website (Covell et al., 2023). Forty-seven (47) individuals responded providing their comments to the questions and indicating they would be interested in participating in round two of the Delphi study. Respondents wishing to participate in round two were asked to provide an email address to facilitate sending the required information.

5.2.3 Round two: Delphi consensus study

Based on the responses to the round one questions and the findings from the rapid literature review, 39 best practice statements relating to the principles and objectives of bridging education were created across six categories:

1. Goals of bridging education
2. Accessibility and bridging program design
3. Needs, approaches and lifelong learning

4. Curriculum, competency and assessment
5. Student support and success
6. Evaluation and outcomes

A seven-point Likert scale was utilized to rate the importance of each of these statements. This was converted to numerical values for analysis. See Table 2 - Likert scale with numerical values.

Table 2
Likert scale with numerical values

Likert scale	Numerical value
Very unimportant	1
Unimportant	2
Slightly unimportant	3
Neutral	4
Slightly important	5
Important	6
Very important	7

Consensus on a particular statement was pre-determined to be 75% of respondents indicating important or very important. “A level of 70% to 80% is usually adopted and widely considered to be rigorous” (Z. Shang, 2023, p. 5). The statistical measures for central tendency and deviation used in association with this percent agreement were median and interquartile range (IQR), rather than the more traditional ‘mean’ and ‘standard deviation’.

> Likert survey data are considered to be on the ordinal scale, and thus cannot be used for calculating the mean, as it can only be used on an interval scale. Furthermore, the median is less likely to be influenced by outliers, which can very likely occur if there is an expert with an extremely strong and divergent opinion on a certain issue. Therefore, if using central tendency, it is recommended to solely use the median… .
>
> …standard deviation is still sensitive (albeit less so) to outliers and cannot be used for ordinal data coming from Likert questionnaires. Another measure of dispersion is the interquartile range (IQR), which is defined as the amount of spread of middle 50% of observations. The IQR is a frequently used metric for consensus, and is considered objective and rigorous by several authors. Typically, an IQR of 1 or less on a 4 to 5-item Likert scale and 2 or less on a 10-item scale can be considered as consensus … . Therefore, researchers should elect to use the IQR to represent spread and consensus rather than the standard deviation. (Z. Shang, 2023, p. 5)

In addition to the Likert scale ratings, the participants were asked three general questions: their professional background, their current work sector based on the identified partners to bridging education, and the number of years they had worked in their current work sector. The respondents were also given the opportunity to provide any further feedback they desired at the end of each of the six category sections through an open-ended comments box.

The Delphi study was uploaded to *Qualtrics* survey software (https://www.qualtrics.com) and the link to the survey was distributed by email to the 47 participants from round one who indicated interest in participating in round two. The survey was also distributed to another 16 people who either contacted the research team wanting to participate or were identified through snowball sampling as appropriate respondents. In total, 63 individuals received the survey link. The survey was open for three weeks and three email reminders were sent to the participants. Forty-four (44) responses were received in round two. As is presented in the findings section of this report, there was consensus on all items at round two. As a result, the study did not proceed to the planned round three of the Delphi study. The Delphi study statements are attached in Appendix 6.

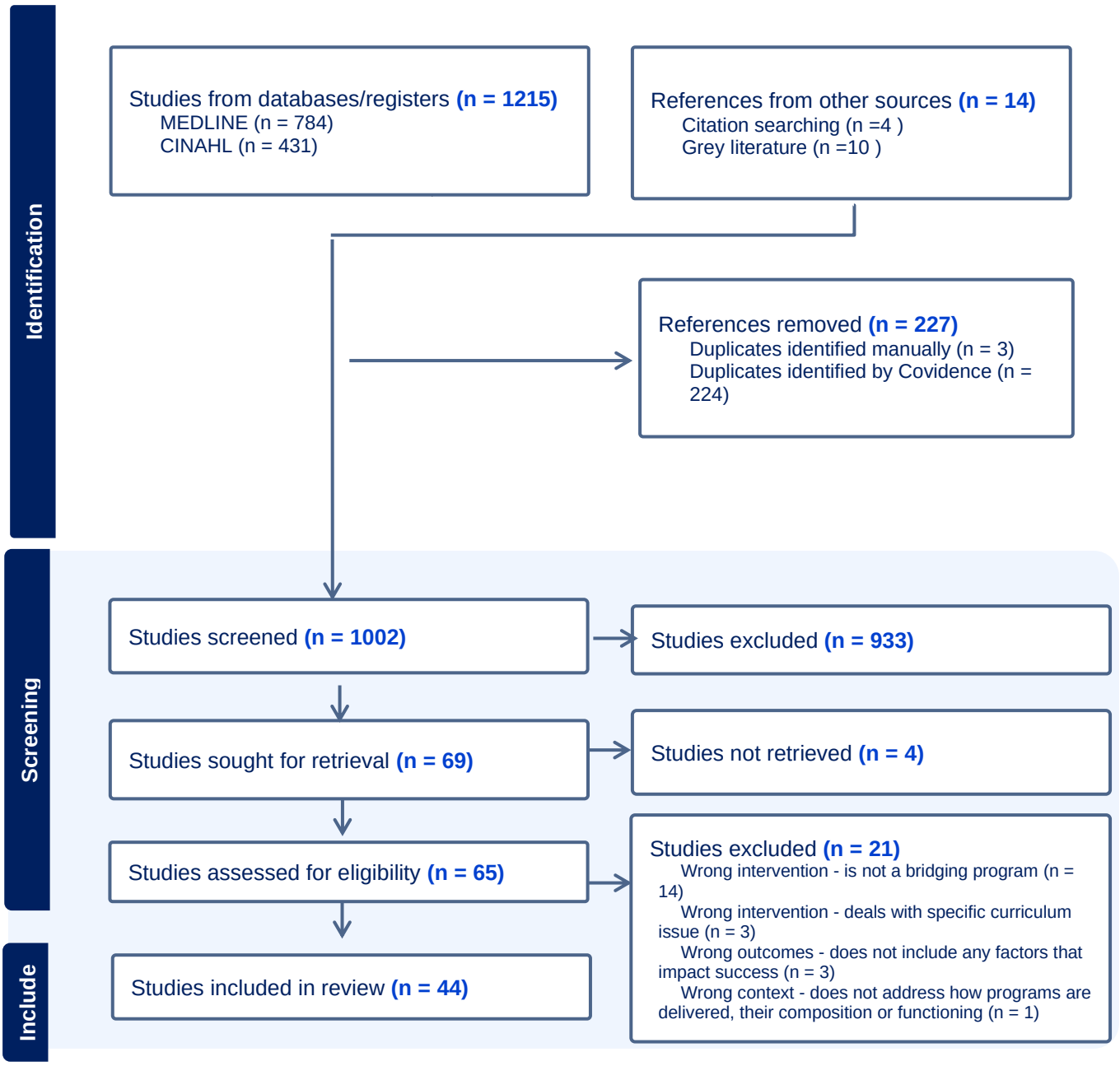
The findings from the rapid review of the literature and the Delphi study are presented in the next section.

6 FINDINGS – RAPID REVIEW OF LITERATURE

6.1 SEARCH RESULTS

The search strategy yielded a total of 1,215 articles from Medline and CINAHL, plus 14 from grey literature and manual citation searching. Following removal of duplicates, and the use of the PICO inclusion/exclusion criteria, 44 articles remained for inclusion in the rapid review. See Figure 2 for search results and study inclusion processes. Appendix 5 provides a full listing and summary of all 44 articles included in the review, including their study aim and key findings.

Figure 2
Search results and study inclusion processes



The included studies came predominantly from Canada (42%), followed by Australia, the United States, the United Kingdom, European countries, New Zealand and Japan. Approximately 1/3 of all studies were qualitative in nature, with cross-sectional surveys, case studies, systematic, scoping and rapid reviews, and narrative text and opinion pieces also included. Most of the included literature was quite recent with 2/3 published in the last 10 years and 40% in the last five years. Figures 3, 4, and 5 provide summaries of the source countries, study types, and year published for this literature,

Figure 3
Source countries of literature

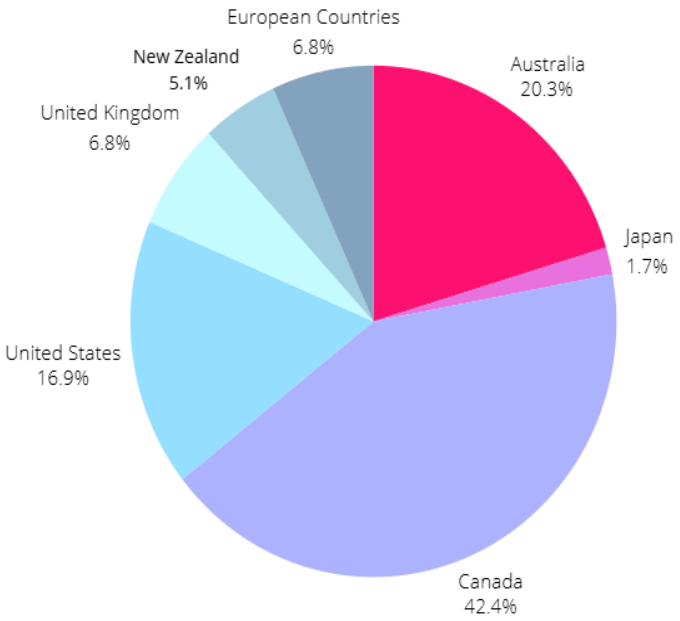


Figure 4
Study types of literature

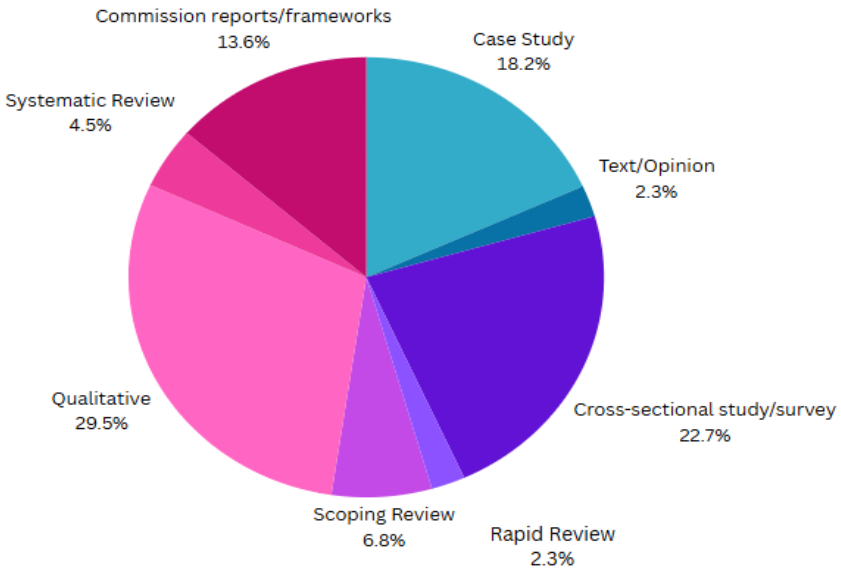
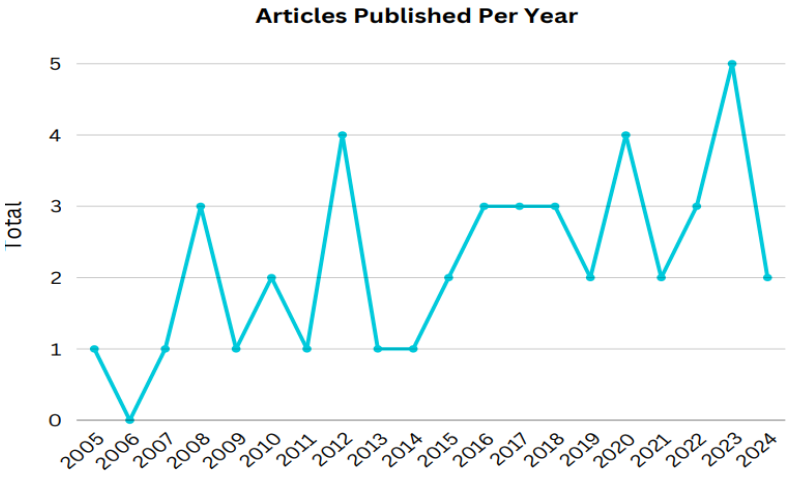


Figure 5
Articles published per year



All peer-reviewed studies were assessed for methodological quality using JBI critical appraisal tools (see Appendix 4). The grey literature was not assessed for methodological quality. The findings from these methodological reviews showed that the majority of studies were of high quality with only a few criteria consistently missing. These missing criteria were:

- Qualitative research – In most cases there was no stated philosophical perspective, therefore it was not possible to determine congruity between this and chosen research methodology. In all cases there was no statement locating the researcher culturally or theoretically.
- Cross-sectional studies – More than half of the studies did not indicate what strategies were utilized to deal with confounding factors that might influence the study outcomes.
- Case reports – The methods of assessment and results were not clearly described and in more than half of the studies there were no outcomes or recommendations provided. It was noted that most studies were process descriptions rather than evaluation of outcomes from the educational intervention.
- Systematic reviews and research synthesis – In no cases was the likelihood of publication bias assessed in the studies' review processes.
- Case series – There was only one case series included in the rapid review. This multiple case study/case series was a high-level overview which made matching the methodological criteria to the study information difficult.
- Text/Expert opinion piece – This study showed a high level of methodological quality across the expected criteria.

As was noted in the methodology, the authors of the publications were contacted to explore if there were any changes, impacts, or uptake that had occurred from their publication(s) or research work. Twelve authors (32%) responded to the enquiry and indicated that their publications and research

work had led to either better understanding of issues, or in some cases increased funding and programs.

The responses included:

- Three instances of funding being provided and a more permanent introduction of the particular program
- Increased understanding of the requirements for job readiness
- Need for more peer mentorship
- Need for increased clinical and simulation time in the program
- Need for better integration of the program within the health system
- Research work used for the development of standards and a better understanding of the need to recognise international qualifications.

6.2 KEY FINDINGS

The findings from the analysis of the rapid literature review confirmed that there are seven partners in the bridging education process that need to be considered to ensure the benefits and outcomes from bridging education are maximized. These partners are:

1. Government
2. Regulators
3. Post-secondary educational institutions
4. Employer/Health authorities
5. Advanced learners/students
6. Professional associations
7. Context-specific partnerships

The dominant themes that emerged from the analysis of the literature were:

- Poor or limited evaluation of outcomes from the studies, with almost no longitudinal data, and most studies being descriptions of process with no evaluation of outcomes.
- Little evidence of how bridging education is being used in career progression or as a pathway to broader careers.
- Rapid changes in one part of the healthcare system led to ripple effects into other parts of the system and created challenges in sustainability for programs.
- The input or voices of professionals enrolled in bridging education (PEBEs) were not included in the development or evaluation of programs.

These key findings were then more specifically allocated into the roles of the specific partners in the bridging education process. The key findings as they related to the specific partners are listed on the following page.

Regulators

- Need to set and enforce minimum competency standards
- Must maintain relationships and collaboration, particularly with academic institutions

Government

- Need to play a role in financing bridging education
- Better understand the demand for education
- Play a strong coordination role between the partners

Employers

- Need to have an education/program advisory role
- Have greater engagement with educational programs and particularly in relation to clinical placements
- Provide more support and learning opportunities (clinical locations) for PEBEs
- Offer work options to learners while they are studying
- Offer transition and post-program employment opportunities
- View bridging education as an important asset

Professional associations

- Need to prioritise communication and information about educational programs
- Provide mentoring and support for participants
- Offer financial scholarships and loans

Academic institutions

- Need to collaborate more with other partners, particularly regulators and employers
- Focus more on individual learners' needs
- Have increased flexibility and modular programming
- Understand that they are working with mature, experienced learners
- Faculty need specific skills and education to undertake this work
- Faculty need to provide mentorship to learners

PEBEs

- Experience financial and family stress
- Need appropriate pre-program assessments and orientation
- Experience learning and transition challenges

6.3 KEY OUTCOMES AND THEMES FROM THE RAPID LITERATURE REVIEW

The key outcomes and themes from the rapid literature review findings were:

1. The need for more sustainable career pathways.
2. There are clear gaps in the evidence-based outcomes for existing educational programs.

3. There is no agreement or consensus on how bridging education should be focused, implemented, or evaluated.
4. Educational programs need to be more flexible, with increased emphasis on cultural competence, support, and mentorship.
5. There needs to be stronger collaboration and coordination amongst the partners, including learners and graduates.
6. There needs to be evaluation of outcomes, short-, mid- and long-term, to ensure value for the investment in educational programs and accountability for the providers of the services.

These outcomes and themes were then taken forward and integrated into the development of the Delphi study. The Delphi study findings are presented in the next section.

7 FINDINGS – DELPHI STUDY

7.1 DELPHI STUDY ROUND ONE

The first round of the Delphi study was the qualitative round with 47 respondents. These respondents came from six of the seven partner sectors identified in the rapid review literature (see Table 3). In round one participants were not asked for their professional background or years of experience in the particular sector.

Table 3

Respondents to Round One

Partner sector	Number of participants
Government	<5
Regulators	5
Post-secondary educational institutions	16
Employer/Health authorities	10
Advanced learners	<5
Professional associations	9

There were four areas of focus in this round:

1. Current state of bridging education,
2. Key barriers to bridging education,
3. Changes needed to bridging education, both short and long term, and
4. Evaluating the effectiveness of bridging education across short-, mid-, and long-term outcomes.

The key findings relating to these areas are addressed below.

7.1.1 Current state of bridging education

The respondents were asked their opinions on the current state of bridging education. The responses indicated there were many problems with the current system and several areas where improvement is needed.

Two main areas of concern were identified:

1) The current processes and programs were arduous, onerous, created barriers and obstacles, and there was limited availability and options for people trying to undertake the programs.

"*Should be more accessible [to people in different geographical areas]"*

"Not enough institutions offering courses"

"Current state of bridging program is arduous and onerous. This needs to be modified to support, … provide training and education suitable to needs"

"Current practices create obstacles and barriers"

"Bridging programs very inaccessible"

'Not adequate to the needs of communities"

2) There was a lack of understanding about bridging education in general.

"The understanding about bridging education is limited. Often bridging programs are thought of as being something for internationally educated nurses [IEN]. There is very limited research about the differences needed for student success."

"Bridging has been heavily focused on bridging LPNs [licensed practical nurses] into RN programs or bridging pathways to move RNs into specialty areas of practice. There is underinvestment in other options for bridging, such as PSW [personal support worker]/HCA [health care aid] to LPN, LPN to RPN [Registered Psychiatric nurse], and RPN to NP [Nurse Practitioner]"

The other problem areas identified in the responses included:

- Healthcare systems have changed, bridging education needs to change to respond the changing circumstances
- Educational programs need to have more than one focus, need to include acute, community and long-term care, in urban, suburban and rural-remote areas, First Nation communities, and virtual care
- Need research into what is necessary for successful programs
- Processes undertaken by regulators and educational institutions create barriers
- Need more locations, there is limited geographical accessibility
- Waitlists are too long
- Too expensive, there needs to be more flexible delivery options
- Education opportunities and programs are poorly advertised
- Too much bureaucracy, red tape for participants to navigate
- Too much focus on RN level, need to be more inclusive of all types of nursing
- Educational institutions – lots of variability in available programs, but no transparency about what is included in the programs.

- Employers' perspective –
    - don't know what the participants have been taught.
    - have limited capacity to provide supports, and educational and continuing professional development programs. Hospitals and health services need to be supported to do this.

7.1.2 Barriers to bridging education

The respondents were asked what they thought were the key barriers to bridging education. The main areas of responses were in relation to accessibility of programs and difficulties with program structure and content.

Barriers associated with the accessibility of programs included:

- Requirements for paperwork or bureaucratic processes associated with program entry. These could include:
    - entry requirements or restrictions that are based on immigration status
    - pre-requisite program requirements
    - difficulties associated with the variability of qualifications and fraudulent documents
    - difficulty in identifying what courses are necessary and where they can go to access these courses
- English language fluency requirements
- Financial issues affecting applicants/PEBEs included:
    - programs are too expensive for many applicants
    - applicants are required to pay initially and then wait for reimbursement; many applicants can not afford the initial payment and can not wait the time necessary for reimbursement
    - participants need to work while taking programs
    - lack of available financial aid for participants
- Wait times to get into programs
    - lack of spaces or seats in programs
    - programs need to be available where people live
    - applicants may not have the required academic pre-requisites or educational background
    - lack of recognition of previous experience/education
    - slowness in processing by the regulator leads to delays and missed opportunities

Barriers associated with educational program structure and content included:

- Lack of transparency in program content and inflexible program structures

    - need for more consistent curriculum, and more innovative and flexible programs and scheduling
    - program faculty and educators may have limited experience with the different requirements of bridging participants and IENs. These learners have different needs and expectations from traditional generic domestic students.
- Lack of understanding of regulators expectations
    - there are inconsistencies and a lack of consistent terminology in the expected competencies between different professional categories
    - regulatory processes too slow
    - need for more consistency and transparency in the requirements from regulators
- Poor supports available to PEBEs while in programs
- Lack of clinical placement time provided in programs
    - hospitals need funding and time to support learners in clinical practice areas
    - not being able to work as an employed student nurse (ESN) when enrolled in bridging programs reduces exposure to clinical settings and opportunities to gain experience
- Poor coordination and resource allocation to employers to help support/mentor bridging program graduates

Other barriers that were identified included:

- Internal cultural issues between different nursing categories, impact of silos and changing professional identities
- Programs take too long to complete
- Poor information is available to applicants and PEBEs, lack of advertising and knowledge about programs
- Discrimination and bias experienced by PEBEs and graduates.

7.1.3 Changes required to bridging education

The respondents were asked what changes, short and long term, they thought were necessary to improve bridging education. The main areas of responses were in relation to:

1. Level of involvement and the roles played by the different partners associated with bridging programs,
2. The accessibility and content provided in programs, and
3. Ways in which additional clinical practice time could added into the bridging programs.

Issues raised in relation to the involvement and roles of different partners included:

- Need for more involvement in the programs by internal/external stakeholders/partners

- Better coordination and collaboration between partners
- Better coordinated approaches across the province and nationally
- Professions (e.g. nursing, midwifery, etc.) need to take a more active role in planning bridging programs
- Need to think more broadly, with a big picture and visionary view to the aim and purpose of bridging education. This needs to be undertaken at the provincial and national level.

Issues raised in relation to accessibility and content provided in programs included:

- Timelines for undertaking and completing courses need to be more appropriate
- Programs need to be available for entry to practice for all professional cadres and categories
- Bridging educations need to be available in more locations
- More flexibility in the intake times for courses i.e., adherence to traditional academic term start times limits opportunities to enter post-secondary education
- IENs should be able to use student immigration visas to undertake bridging education
- Better consideration and recognition of prior education and learning
- More consistency in the pre-requisite requirements and course content in bridging programs.

Issues raised in relation to providing additional clinical time in bridging programs included:

- An apprenticeship style program coupled with online courses should be available, particularly for practical nurses who want to bridge to RNs
- Need for and support of transition to practice programs (including resources – financial/human) for bridging program graduates
    - Allowing IENs to work as ESNs in team-based care
    - More training and support for mentors and clinical supervisors

7.1.4 Evaluating the effectiveness of bridging education – short, medium and long term

Finally, the respondents were asked how they thought the effectiveness of bridging education should be evaluated across short-, mid-, and long-term outcomes.

The main responses in relation to evaluation of short-term effectiveness were:

- Undertaking surveys of graduates, at the beginning, mid and time of exiting programs
- Reviewing pass rates on NCLEX-RN[3], and using post program surveys/studies

[3] NCLEX-RN is the regulator required examination for registration as a RN in Canada.

- Reviewing program attrition, and compare enrolment, and success in workplace with traditional graduates

Mid- and longer-term strategies responses included:

- Reviewing recruitment/retention statistics for these graduates, including how long they stayed in particular jobs, measures of professional growth, and time to assume more mentorship roles
- Using surveys and other tools to self-report confidence in expected competencies
- Reviewing timelines from application to registration, to hire, orientation, and working independently
- Undertaking qualitative interviews at specific time periods and exit interviews from jobs
- Collecting monthly data reports from health authorities relating to numbers hired, dismissed, etc. This may highlight any disconnect between what is happening at the ward or frontline level and the human resources perspective.

> *We're already experiencing challenges with newly hired IENs who are not preforming well. Often, people who are at the provincial HHR [health human resources] discussions don't have feedback from the operations managers and are disconnected from the reality of what's being experienced at the frontline.*

- Finally, there was a need to look at the philosophical, moral, and ethical practices in bridging education.

> *Does bridging actually contribute to stability in nursing as a profession and do nurses believe there are viable, transformative careers available to them, from first entry to practice to retirement?*

These responses were reviewed and combined with the findings from the rapid review of the literature to develop the 39 best practice statements relating to the principles and objectives of bridging education that formed the basis of round two of the Delphi study.

7.2 DELPHI STUDY ROUND TWO

The second round of the Delphi study was the consensus study of the 39 statements (Appendix 6) with 44 respondents. These respondents were primarily nurses (75%), came from the seven partner sectors identified in the rapid review literature, and the majority had been working in their current work sector for more than 10 years (see Table 4). While this table does not show any responses from graduates or PEBEs, the meta-data associated with the survey identified that four of these

respondents were graduates of bridging programs, but they identified as being from their current work sector (health authority, education, or other) and not as a bridging program graduate.

Table 4
Respondents to round two

Professional background	Number of participants	Percentage
Nursing	33	75%
Other Healthcare profession	6	14%
Non-healthcare profession	5	11%
Partner sector		
Government	7	16%
Regulator	5	11%
Post-secondary educational institution	17	39%
Employer/Health authority	10	23%
Professional association	3	7%
Other	2	4%
Years of work in current sector		
Less than 5 years	5	11%
5 to 10 years	8	18%
Greater than 10 years	31	70%

There were six areas of focus in this round, with the 39 statements located in these areas:

1. Goals of bridging education – three statements
2. Accessibility and bridging program design – nine statements
3. Needs, approaches and lifelong learning – seven statements
4. Curriculum, competency and assessment – six statements
5. Student support and success – four statements
6. Evaluation and outcomes – 10 statements

All 39 statements showed consensus after round two with 75 – 98% agreement and medians of 6.0, 6.5, or 7.0. The IQRs for 37/39 statements were 0, 1, or 2. There were 2 statements in the curriculum, competency and assessment section that had IQRs of 3, but both had medians of 6.0. These statements were those relating to exposure to all domains of practice, and the need to include a post-qualifying internship. The medians, IQRs, and percentage of respondents indicating important or very important for every statement are provided in Appendix 6.

A significant amount of additional feedback was also provided in this round through the comment boxes provided at the end of each focus area. The extent of comments was unexpected, along with the average time to complete round two of the study being 69 minutes.

7.2.1 Goals of bridging education

The three statements in this area related to what the focus of bridging education should be: addressing critical shortages, supporting various career pathways, and preparing professionals for specific roles in high-demand areas or workforce gaps. All areas showed a high level of consensus with median scores of 6 or 7, IQRs of 1 or 2, and the percentage of experts rating important or very important across the three statements ranged from 75 to 93%.

Ninety-three (93) percent of respondents and the comments associated with this topic showed that the expert panel consistently supported a wider goal to bridging education. This was summarized in the following:

> *"The goal is to provide the support and tools a professional needs to move on in one's career"*

There was a consistent view that addressing shortages was important, but this should not be the goal of bridging education. The following themes address the direction that the expert panel felt bridging education should take and some of the common misconceptions they believe exist:

1. ***Support individual career aspirations and professional growth*****:** The primary goal of bridging education should be to support professionals in advancing their careers, whether that involves re-entering the workforce, pursuing career changes, or seeking professional development opportunities. This focus on individual needs emphasizes the importance of empowering individuals to take control of their professional journeys. Bridging education should provide career and labor market information to enable learners to make informed decisions. Curriculum was situated here with bridging programs needing to have the capability to both recognize and evaluate the pre-existing skills, knowledge, and competencies learners had at their entry into a program. Insights into the overlap across and between professional career curriculum models could allow for learners to switch career pathways at different stages in their careers.

2. ***Address workforce needs while maintaining professional autonomy****:* While bridging education can help address healthcare workforce shortages, particularly in high-demand areas, this should not be their main focus. Programs should strive to balance workforce needs with individual career goals and professional autonomy. Over-reliance on workforce demands in shaping educational decisions can lead to a misalignment between professional education and the profession's values.

3. ***Focusing on knowledge gaps can lead to the potential for constraint*:** The historical and traditional view that bridging education has a sole purpose for a specific 'generalist' position was challenged by the majority of respondents, though there were some who held the view that it was just for IENs. *"Bridging programs should be for foreign educated nurses who wish to work in Canada.*" Most responses favoured a more inclusive and flexible perspective for all that focused on the capacity to advance careers, support specialist practice, and "*prepare learners for a lifetime of professional practice"*. Divergence was noted between how regulatory and accrediting bodies expressed their priorities and standards, which warrants discussion since it can influence bridging program curriculum and performance standards.

Various factors were identified that can hinder the success of bridging education and impact their ability to achieve their overarching goals. These challenges encompassed issues relating to all the other focus areas addressed across the statements: accessibility, needs and approaches, curriculum design, learner support, and evaluation and outcomes.

7.2.2 Accessibility and bridging program design

The nine statements in this area related to different aspects of the availability and design of programs. All statements showed a high level of consensus with median scores of 6, 6.5, and 7; IQRs of 0, 1, 1.5, or 2 (one statement only); and the percentage of experts rating important or very important across the nine statements ranged from 75 to 98%.

The comments associated with this topic identified that the expert panel consistently supported ensuring increased program accessibility and more flexibility in design.

- Bridging education and programs should be accessible to a diverse range of professionals, including those in rural and remote areas, and those returning to the workforce.
- Flexibility in program design, delivery, and scheduling is crucial to support working professionals who are juggling multiple commitments. This includes offering part-time and asynchronous learning options.
- "*Should be designed to support student success, … There is room for customization, but this needs to be done with care and attention to ensure that the core objectives that have been identified for the program remain intact."*
- Financial support and funding opportunities should be utilized to further enhance accessibility.

Factors that limited accessibility and flexibility included:

- ***Financial constraints:*** High program costs, coupled with the need for working professionals to reduce work hours to attend classes, can create a significant financial burden for prospective participants.
- ***Inflexible program structure****:* The lack of part-time, self-paced, and asynchronous learning options, particularly for those residing in rural or remote areas, can hinder access for working professionals who have family and other professional commitments. Course sequencing was

identified as an important factor in exploring flexibility, as well as investigating ways in which opportunities to assess, review, or recap knowledge could be enhanced prior to new primary content delivery in a bridging program.

- ***Limited program availability****:* The number of available seats in bridging programs is often restricted, making them highly competitive and potentially excluding qualified applicants.

7.2.3 Needs, approaches and lifelong learning

The seven statements in this area related to learning approaches, developing higher order competencies, and addressing individual needs and aspirations. All statements showed a high level of consensus with median scores of 6 and 7; IQRs of 1, 1.5, or 2 (one statement only); and the percentage of experts rating important or very important across the seven statements ranged from 75 to 91%.

The comments associated with this topic identified the need for high quality programs, a holistic approach, and evaluation and continuous quality improvement.

- Bridging programs should maintain high standards of academic and practical integrity, preparing professionals to meet the demands of contemporary practice. This includes focusing on learner growth, workplace readiness, and the development of essential competencies.
- While incorporating current workforce needs is helpful, programs should prioritize preparing professionals for lifelong learning and adaptability in a rapidly evolving healthcare landscape.
- *"It is essential for us to be bold and confront the realities and potential of our current and future healthcare system"*
- Bridging education should embrace a holistic view of the profession, going beyond purely vocational training and emphasizing the essential social role of the profession as it exists across diverse communities. This includes attention to emotional intelligence, community engagement, and a commitment to compassionate, informed, and innovative care.
- Need for ongoing evaluation and quality improvement of bridging education and programs.
- This includes collecting data on program effectiveness, graduate outcomes, and workforce integration.

7.2.4 Curriculum, competency and assessment

The six statements in this area related to breadth of the course content, and the need for preceptorship, internship, and a variety of clinical settings. All statements showed a high level of consensus with median scores of 6, 6.5, and 7; however, this was the area where there was some variation in the IQRs with 66% of statements being 1 or 1.5, and two statements having a range of 3. The IQRs of 3 were associated with the statements relating to exposure to all domains of professional practice (clinical, leadership, policy, education, and research), and the need for a post-qualifying

internship for consolidation and safe transition to practice. The percentage of experts rating important or very important across the six statements ranged from 74 (two statements with IQRs of 3) to 91%.

The comments associated with this area identified curriculum design challenges relating to an overemphasis on workforce demands, lack of standardization, linear format linked to progression, more clarity associated with admission requirements, and insufficient focus on clinical practice.

- *"It's important to really focus on what the bridging program is trying to achieve rather than all the things that would be nice for learners to know."*
- It was recognized that aligning with workforce needs was important, however, an excessive focus on filling immediate gaps can compromise professional autonomy and limit career choices.
- Inconsistent prerequisites and admission requirements across different institutions can create confusion and unnecessary hurdles for prospective participants.
- Over-reliance on simulation and limited opportunities for real-life practice within clinical settings can hinder the development of essential clinical skills and competencies. There was a recognition that placement models need to be reconfigured to enhance local capacity for participants across more diverse areas that can facilitate interdisciplinary and intradisciplinary learning encounters.

7.2.5 Student support and success

The four statements in this area related to the need for a supportive environment from academic institutions and employers, the need to communicate the benefits and value of bridging education, and for funding for these programs to be prioritized. This was the area with the highest level of consensus with all statements scoring a median of 7,an IQR of 1, and the percentage of experts rating important or very important across the four statements ranging from 80 to 95%.

The comments associated with this area highlighted the consequences imparted by inadequate support for bridging program participants, particularly in the areas of funding, mentorship, guidance, and preceptor training.

- *"It is critical to provide suitable and effective [participant] support that also includes clear advice and supports placing graduates in appropriate positions."*
- Limited financial support for participants, including scholarships, bursaries, and living stipends can exacerbate the financial burden and limit access to bridging education**.**
- The absence of robust mentorship programs and career counseling can leave participants feeling unsupported in their transition to new roles and practice settings.
- Preceptors who lack understanding of bridging education goals and the unique needs of bridging participants may not provide adequate support or feedback. "*Greater efforts are needed to help employers understand their role and the impact they may have. Additionally,*

more standardized criteria should be established to prevent biases when evaluating [participants]."

7.2.6 Evaluation and outcomes

The ten statements in this area related to different methods and options for evaluation and measurement of outcomes from bridging education. This was the area with the lowest level of consensus with all statements scoring a median of 6, and IQRs of 1, 1.5, and mostly 2 (70% of statements). The percentage of experts rating important or very important across the ten statements ranged from 75 to 82%.

While the consensus of the comments was that evaluation and accountability were important, *"bridging programs must be sustained and informed by research"*, there was no significant agreement on how this should be undertaken. Comments highlighted that some evaluation processes were overly complex and burdensome, there were concerns with too much reliance on standardized testing, and that there were limitations and challenges with tracking long-term outcomes.

- Cumbersome accreditation requirements and a focus on traditional metrics can create unnecessary workloads and limit program agility.
- Using standardized test pass rates as the primary measure of success may not accurately reflect clinical practice competence or overall program effectiveness.
- Lack of robust data collection on graduate career trajectories, job satisfaction, and long-term retention can hinder efforts to assess program impact and make necessary adjustments.
- "…*should be an iterative process where feedback and data inform adjustments to the existing and future curriculum"*

8 DISCUSSION

This study has developed consensus on a principles framework that should underpin bridging education programs. The strong level of support received, and consensus being achieved across the rounds of the Delphi study, has confirmed strong congruence between the literature evidence and the opinions of the expert panel, and demonstrated the importance and need for this framework. This framework has been developed in three levels with elements of bridging education leading into principles and then a conceptual model highlighting the relationships between the partners and factors influencing success. This work has also highlighted specific areas of challenges and issues requiring further work, these are also discussed below.

8.1 ELEMENTS AND PRINCPLES OF BRIDGING EDUCATION

The 39 ranking statements relating to principles and objectives of bridging education from the Delphi study have been summarised into 12 elements across the six areas of focus. These elements underpin the principles of bridging education and are listed in Table 5.

Table 5
Elements underpinning principles for bridging education

Goal of bridging education
Bridging education provides a mutually beneficial and flexible platform for individual growth and career progression while supporting health human resources recruitment, retention, and redesign.

Accessibility and bridging program design
1. Bridging programs need to provide equitable, flexible, and adaptable access to meet the needs of both local populations, including rural and remote contexts, and workforce demands, while promoting improvement of standards and opportunities for career enhancement or change. 2. Bridging programs should maximise learning opportunities through the application of new, dynamic, and evolving theoretical and clinical practice learning models, including simulation and artificial intelligence (AI), to meet the needs of the changing healthcare landscape, while demonstrating fiscal responsibility and ensuring efficient utilization of existing resources.

Needs, approaches and lifelong learning
1. Bridging programs assess and recognize prior and experiential knowledge, offer clinical interfaces and connectivity, and provide an iterative process using feedback and data to inform ongoing learning, while offering versatile modular approaches. 2. Bridging education is a recognized continuous improvement opportunity able to facilitate varied career pathways while prioritizing the development of emotional, social, and cognitive intelligence competencies in healthcare professionals.

Curriculum, competency and assessment

1. Bridging education should effectively assess and develop key competencies, consider the importance of both observable behaviour and underlying intent, and be recognized by an approved accreditation body.

2. Bridging programs should be designed to integrate across clinical areas and utilize different modes of learning (i.e., micro-credentialling, digital portfolios, holistic approaches) and assessment (i.e., diagnostic, mastery, performance-based, ipsative, standard-based), as well as preceptorship or graduate internships guided by appropriately prepared and recognized preceptors.

Learner support and success

1. Bridging programs and employers should provide a supportive ecological, managerial, and social environment for learners and graduates.

2. Healthcare partners (i.e., regulators, governments, professional associations/unions, educational institutions, employers) should clearly communicate the value and benefits of bridging education, while the government should prioritize funding to improve accessibility and quality.

Evaluation and outcomes

1. Bridging program partners (funding, accreditation, delivery, and evaluation) should work together to establish key program values and performance indicators, governance structures, and competency metrics with thresholds. These constructs should be clearly stated and available to all parties.

2. Bridging program effectiveness measures should include key performance indicators, success on licensure examinations, and satisfaction and effectiveness surveys presented through various strategies to multiple key partners including graduates, other healthcare providers, employers, post-secondary educational institutions, funders, and local communities. Data from these sources should be held by an accountable, centralized and accessible organization, and utilized and shared in an integrated fashion to support evolving instructional and assessment strategies, program development, accreditation processes, and workforce demands.

3. Longitudinal evaluations and research on bridging education outcomes should address graduates' long-term retention rates, cost benefit analysis of the long-term impacts, and educational, environmental, and professional factors that influence graduates' experiences after completing a program.

These elements have been condensed into the following key principles underpinning bridging education. These principles address the areas:

Goal of bridging education,

Access and design to facilitate learning

Needs, approaches and life-long learning

Learner support and success

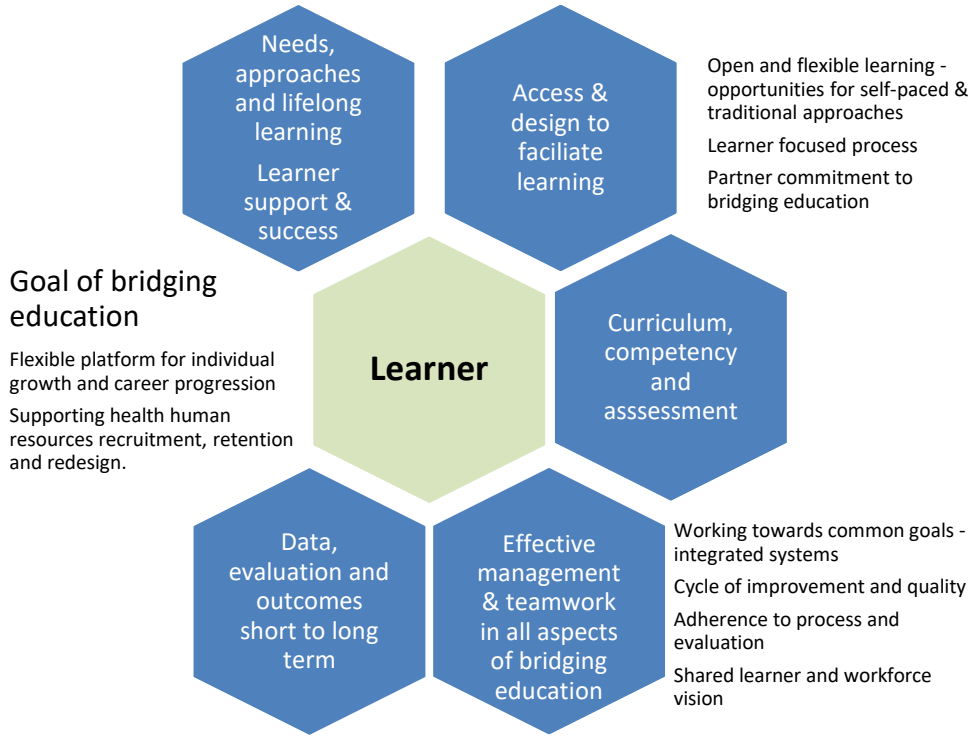
Curriculum, competency and assessment

Data, evaluation and outcomes – short and long term

Effective management and teamwork

These principles are depicted in Figure 6 along with some important aspects highlighted.

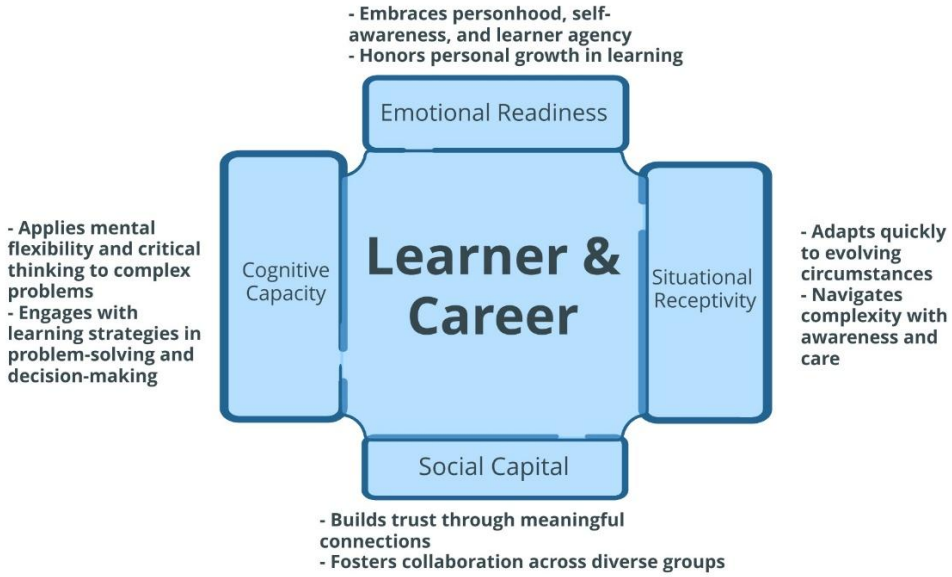
Figure 6 Key principles for bridging education



8.2 CONCEPTUAL FRAMEWORK FOR BRIDGING EDUCATION

To improve the current experience with bridging education, and facilitate successful outcomes for all partners, these elements and principles have been brought together into a conceptual model that highlights the factors influencing success for PEBEs and how this success is impacted by the relationships between the key partners. Successful outcomes and positive career impacts for PEBEs are influenced by their situational receptivity, social capital, cognitive capacity, and emotional intelligence. These concepts target factors such as communication, empathy, efficiency, teamwork, critical thinking, patterns of learning, self-readiness, and learner agency. The relationships between these concepts and factors in bridging education are depicted in Figure 7.

Figure 7 Concepts influencing learner success in bridging education

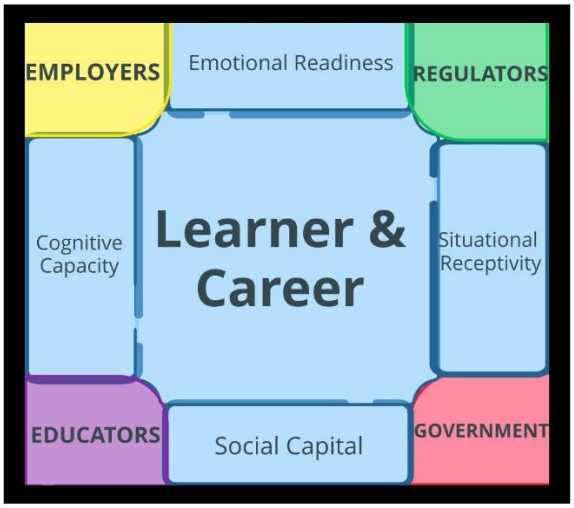


However, for the learner to achieve a successful outcome through bridging education, the key partners in the bridging education system must work together.

- Government policies need to provide a strong foundation for bridging education, but the structure is not complete without others.
- Regulators must set and uphold the standards, but they can't achieve alignment without collaboration.
- Educators guide the way, but without others the journey stops short.
- Employers must offer opportunities, but without the other supports, progress and success will not be realized.

It is only through the combined efforts of all, to create a seamless connection between the parts, that bridging education can effectively and efficiently work to its maximum potential. Strong bridging education programs make for thriving professionals and an empowered, equitable workforce. Collaboration allows everyone to reach their maximum potential, and everyone emerges stronger (Figure 8).

Figure 8 Bridging education, concepts and key partners



8.3 CHALLENGES AND ISSUES

Despite the high level of consensus demonstrated for the underlying elements, principles and overarching framework, this research identified challenges and issues relating to each principle area that would benefit from further discussion and clarification.

8.3.1 Goal and focus of bridging education

The comments and feedback from the survey demonstrated that there remains confusion around the meaning and purpose of bridging education, what these programs aim to achieve, which populations may benefit, and the nature and duration of this education at both the prerequisite and program level. This confusion has the potential to inhibit programs from demonstrating the flexible and dynamic approach necessary to retain, redesign, and help recruit healthcare staff, train and enhance skills, or enable professionals to switch pathways within their own profession or to other healthcare careers. This is a fundamental concern which could have significant impact on the direction, focus, and outcomes achieved by bridging programs. This research presented three potential goals for bridging education: addressing critical shortages, supporting career pathways, and preparing professionals for specific roles. While all of these were viewed as important goals by the expert panel, only the goal of supporting multiple career pathways was acknowledged to be very important by the majority of respondents and had a dispersion (IQR) of only one level of importance by the respondents. This goal is also consistent with the current B.C. MoH health human resources strategy: retain, redesign, recruit, and train (BC Ministry of Health, 2022).

The existence of this confusion demonstrates that there is an urgent need to modernize the narrative linked to bridging education and ensure it moves away from outdated assumptions and beliefs about education and healthcare delivery. These assumptions/biases unintentionally limit the possibilities

available through bridging education. If key accreditation, employer, or educational sectors focus on bridging for a specific type of learner, or as an intradisciplinary approach, this will result in missed opportunities for life-long learning, career development, and professional movement across disciplines.

8.3.2 Access and design concerns

The need to increase accessibility to programs was consistently reported. To achieve this, bridging education will require input and action from all partners to ensure the following:

- Funding opportunities for participants must be expanded through scholarships, grants, and employer-sponsored tuition reimbursement programs.
- Flexible delivery models need to be implemented that incorporate online, hybrid, and asynchronous learning options. This is particularly important for professionals in rural and remote areas.
- Seat numbers in bridging programs need to be increased and innovative approaches to program delivery explored. This could include options such as partnerships between educational institutions and healthcare organizations, and investigating the availability and use of existing, underutilized, but funded educational seats from existing programs, i.e. using empty seats or courses that have resulted from low admission or attrition during a health professional program.

Moving forward it will be necessary to think outside of the traditional approaches utilized by academic institutions and develop innovative, flexible, and more expansive program design options that address the needs of all partners, including academic institutions, employers, communities, regulators, and participants. This coincides with the evolving learning framework and wider, aspirational goals set out in the *OECD Learning Compass 2030* (OECD Future of Education and Skills, 2019) and the *Universal Design for Learning* (CAST, 2025).

8.3.3 Meeting needs, approaches and ensuring flexibility

The focus of bridging education needs to be on learners attaining essential new competencies while avoiding unnecessary reteaching and relearning (CAST, 2025). Education science, particularly as it relates to adult learners, has illuminated that learners should access only the parts of training where they have not demonstrated proficiency (Fidishun, 2000). This requires ensuring prior learning assessment and recognition (PLAR) effectively identifies the learner's knowledge, skills, and experiences thus preventing them from having to relearn what they already know and can do (Simosko, 2012). Recognizing and acknowledging that learning can and does occur outside of formal educational pathways, through experience, interactions, reflexivity, and opportunities that people have collected during their personal and social journeys and ensuring that this emotional and social intelligence does not go unassessed, is paramount (OECD Future of Education and Skills, 2019). Having an effective way to assess and determine existing competencies and skills will shorten the time required to complete education, without diluting the quality of the outcome. If we can become

adept at undertaking broader, more flexible, and inclusive PLAR assessment processes it could "serve as a powerful motivator for individuals to seek new learning opportunities and complete recognised qualifications" (Simosko & Cook, 1996, p. 5). Bridging education has the potential to identify the gaps in knowledge, fill these to enhance overall competency and career development, and get people into the workforce more quickly.

Achieving equity and inclusion for diverse populations also warrants more consideration. Bridging education and individual programs need to create space for a wide population-based approach which includes disadvantaged and marginalized learners. It has the capacity to be an effective method to deliver opportunities to Indigenous learners, as well as potentially targeting positive rural and remote exposure for distributed learning. There needs to be an increased emphasis on flexible, adaptive, and inclusive processes, and a movement away from a one size fits all approach.

8.3.4 Enhancing curriculum design

The curriculum design for bridging education needs to be improved to ensure it is more inclusive, has clear aims and expected outcomes, and meets the requirements of all partners. Areas of concern were noted to include:

- Tensions between regulatory bodies and accrediting bodies resulting from differences in how they define or determine priorities and standards. These tensions warrant broader discussion since they can influence accessibility, program design, performance expectations, and outcomes.
- The need to strike a balance between addressing workforce needs and promoting professional autonomy by offering various program specializations and career pathways.
- Establishment of clear and consistent admission criteria and prerequisites across institutions to streamline application processes for prospective participants.
- Strengthening clinical practice components through partnerships with healthcare facilities, to ensure adequate clinical placement opportunities and preceptor training.
- The need to increase the emphasis on cultural competence and 'soft skills'.

Since a learner's characteristics and abilities enable their personal demonstration of the expected professional competencies, the curriculum and delivery of bridging education needs to focus on employing engaging and flexible approaches consistent with current best learning science (CAST, 2025; Fidishun, 2000). This is crucial with the rapidly changing digital landscape, and the increasing use of biotechnology/precision and personalized healthcare, that require healthcare professionals to be nimble, continuously learn new knowledge, and enhance skill capacity. Such continuous learning, taking place every day in professional working lives, is often neglected when considering the prerequisites for entry and the current level of knowledge a learner has (Simosko & Cook, 1996).

New approaches to bridging education that utilise more efficient, creative, and innovative methods need to be developed, delivered, and evaluated. These approaches could include newer evidence-

informed educational strategies that facilitate life-long learner-centred learning approaches, such as precision teaching. Precision teaching refers to a system that monitors performance improvements over time and strongly emphasizes instructional techniques that are designed to develop both accurate and fluent responses that are maintained over time (Lydon et al., 2017). Bridging education is also a domain in which AI or technology learning could be more closely integrated to reduce stress-related burnout shortages and foster cultural transformation and change: for example, when developed and applied through a health equity lens AI can challenge the existing disparities found in current healthcare practices (Bloomgarden, 2024; Pavuluri et al., 2024).

While the use of simulation and other technologies to prepare learners for workplace expectations and clinical practice is paramount (Diamond et al., 2023), the need for in-person preceptorships/internships cannot be underestimated as only some aspects of clinical practice can be addressed with simulation. Research conducted by the National Council of State Boards of Nursing in the USA relating to the use of simulation in nursing education programs demonstrated that only 50% of clinical placements can be effectively replaced by simulation technologies (Hayden et al., 2014).

The widespread use of bridging education has the added potential of aligning essential generic traits and skills at intra- and inter-professional levels. Distinctions in the level and extent of competencies and associated skills required at the learner level to achieve necessary performance outcomes will require bridging education that is nimble in its delivery approach to uplift learners' knowledge and skills in areas where they need to build proficiency. The use of curriculum that is both current and linked to competency frameworks would aid in recognising learners' needs and skills and assessing their ongoing performance (Boyatzis, 1982).

8.3.5 Strengthening learner support

There is a need to strengthen and enhance the support available to PEBEs. The development of more comprehensive support systems that include financial aid counseling, academic advising, mentorship programs, career navigation/mapping, and career development resources, as well as providing timely and practical practicum and workplace support will help ensure the best outcomes. Academic institutions and partner healthcare employers need to ensure preceptors are provided with specialized training on the unique needs of bridging program participants as experienced adult learners. They also need to establish clear expectations for preceptor roles and responsibilities. By promoting learner agency and strengthening learner support, bridging education can achieve the intended future direction of individual and collective learning envisioned by the current B.C. health human resources strategy (Diamond et al., 2023) and the OECD future of education (OECD Future of Education and Skills, 2019), while enhancing the outcomes and success of bridging education.

8.3.6 Improving program evaluation and measuring outcomes

While all respondents agreed there needed to be improved program evaluation methods and better measurement of program outputs, there was no consensus on how this should be done. Comments highlighted that some evaluation processes were overly complex and burdensome, there were concerns with too much reliance on standardized testing, and there were limitations and challenges with tracking long-term outcomes.

Adopting a more holistic approach to evaluation which incorporates a wider range of outcome measures, including learner satisfaction, career progression, and contributions to the healthcare system is likely to be a better choice. In addition, evaluation strategies need to be efficient, meaningful, and provide timely feedback for program improvement, without burdening faculty and staff. To achieve this there must be collaboration, transparency, and the desire to change the current status quo by all key stakeholders, including employers, regulatory bodies, government, academic institutions, professional organizations and learners/graduates. Relevant and impactful evaluation frameworks need to be developed that incorporate both quantitative, benchmarked, and standardized data measures, and qualitative feedback from multiple sources. Findings and outcomes from these evaluative measures need to be shared across partners and housed in a common repository which is accessible to all partners to ensure the knowledge and benefits gained can be utilized by all current and future programs. By enacting this type of evaluative process, bridging education can play a more effective and vital role in supporting the professional growth of healthcare professionals and strengthening the healthcare workforce.

8.3.7 Effective management and teamwork

To apply these principles to bridging education will require effective management and teamwork across the partners. The juxtaposition of a sophisticated bridging education system and the reality of seven partners that need to be involved has the capacity to lead to limited/poor implementation and unsuccessful or minimally successful outcomes. If the bridging education system is too complex it will be its failing. It needs to be kept simple and streamlined, across as many aspects as possible, from pre-program requirements to employer–learner partnerships and supported learning, while also supporting greater flexibility and adaptation to suit local circumstances. To do this we need to clarify a learner-centric bridging education learning strategy, develop and promote provincial best practice guidelines with benchmarks, embed these in policy directions and directives, and incentivize and support partners to achieve this.

9 LIMITATIONS TO THE REPORT

Despite the study demonstrating strong congruence between the research evidence from the literature and the findings from the Delphi study there are a few factors that need to be considered when reviewing the findings and recommendations from this study

- The literature included in this study came from a rapid review, which has limitations by the nature of its processes and timeframe. Literature searching was limited by the simplified processes used during the search protocol, study selection, and data extraction. As a result of this, research and grey literature included in this study may have missed articles and papers which should have been included and could have impacted on the findings from the literature review.
- While quality analysis was undertaken on all literature included in the rapid review, and the majority of literature was deemed to be high quality, not all included literature met all quality requirements and bias or other deficiencies may have impact on the results.
- Delphi studies are exploratory, and the responses represent the opinions from a specific group of experts at that point in time rather than "indisputable fact". The generalizability of these opinions/results is something that may need to be further evaluated (Hassan & Keeney, 2011).
- The time frame for the Delphi study was also limited and as such there was a limited time period for expert panel members to provide their contributions in rounds one and two. While we did receive feedback from a significant number of experts, there was not equal representation from the seven key partner sectors. Nursing professionals were the majority of the members of the expert panel, despite attempts to obtain input from other healthcare professionals, and post-secondary educators also represented a larger proportion of the panelist than the other partner sectors.

10 RECOMMENDATIONS AND CONCLUSIONS

From the findings of this research and development of the principles and conceptual framework for bridging education, the following recommendations are proposed. In making these recommendations, it is advised that the approach to implementation be kept as simple as possible to optimize the likelihood of success. It is imperative that a multifaceted, co-operative, and accessible approach is used, and the bridging education partners work in as open, receptive, and transparent a manner as possible as they work together to improve the bridging education processes and outcomes.

The recommendations below have been presented under the principles area they are most directly connected to, however many of them transverse and impact across a number of principles and areas.

Recommendations:
Access and design to facilitate learning

1. Province-wide accessibility and responsiveness to bridging education programs needs to be improved with an emphasis on local responsibility. This includes:
    - Ensuring partnership and alignment with local contexts and players, particularly in relation to clinical/practicum components. This aligns with the recommendations and intended outcomes of the *B.C. Student Practice Education Capacity Building* project (Diamond et al., 2023).
    - Working to ensue that career pathways and workforce demands are aligned within bridging education priorities.

2. Current vacancies in healthcare programs (e.g. vacancies created by attrition) should be used to support individualized learning needs in bridging education. Further support for bridging education could include the redirection of funds from existing funding streams and prioritization of this area as a shortened and speedier process for re-entry and retraining of existing health professionals. All program funding should include an emphasis on fiscal responsibility and sharing of resources across institutions and partners.

Needs, approaches and life-long learning / Curriculum, competency and assessment / Learner support and success

3. Bridging education must be learner focused. It should be focused on principles of engagement, multiple means of representation, and varying forms of action and expression as identified by in the goals and objectives of *Universal Design in Learning* (CAST, 2025). This will also ensure alignment with the B.C. MoH human resources strategy goals of learning, retention, and redesign (BC Ministry of Health, 2022), and the associated student practice education recommendations (Diamond et al., 2023).

4. PLAR processes need to be improved and enhanced with a learner-centred lens. This should include upscaling the capacity of the assessment workforce to undertake PLAR, identifying

and standardizing what can be included as PLAR experience, and providing more opportunities and locations where PLAR assessments can be undertaken. This would ensure continued alignment with the earlier work undertaken through the *Towards a Learning Province: Recognizing and Crediting Learning in B.C. – A Vision for Prior Learning Assessment in the 21st Century* (Simosko, 2000).

5. Bridging education being recognized as a career building mechanism aligned with sustainable career pathways. This should include:
    - Ensuring career mapping is undertaken for new learners/participants.
    - Providing opportunities for continuous experiential learning including new placement models and designs to enhance capacity and optimization (Diamond et al., 2023).

6. An open learning approach with an emphasis on articulation between institutions should be developed and promoted. This should lead to quicker and easier recognition and awarding of appropriate qualifications without requiring repetition and unnecessary delays and barriers. This would involve aligning bridging education within the articulation role and credit transfer system of BCCAT (BC Council on Admission & Transfer, BC Transfer System).

7. Develop apprenticeship work/training options to combine employment with study and practical training to meet requirements for career re-entry and progression. Exploration and investigation of the apprenticeship training system used by the National Health Service in the United Kingdom will provide further information about these programs and opportunities (NHS England, 2025). These apprenticeships are adaptive to the student/learner needs and requirements and are designed around a work/learn/team balance.

Data, evaluation and outcomes – short- and long-term

8. Develop a common evaluation framework for bridging education and the individual programs within this system. This should have both short- and long-term measures and include input from all key partners. It should be developed as a matter of priority, ideally within 12 months, have benchmarks for measurement against a minimum standard, have an agreement on what data should be collected, and the data stored in a common repository in a manner accessible to all partners. This would align with the recommendations of the *B.C. Student Practice Education Capacity Building* project (Diamond et al., 2023) and the monitoring and evaluation component of the health human resources strategy (BC Ministry of Health, 2022).

Effective management and teamwork

9. Improved partnerships need to be developed between the different partners in the bridging education system to develop an integrated learning strategy with common goals and a shared vision for learners and the workforce. To do this will require partners to work more closely together, have a clear understanding of the purpose and role of bridging education, and develop collaboration and team-based governance structures with embedded best practice

guidelines, benchmarks, and appropriate lines of responsibility and accountability. Strong leadership and coordination from the government sector will be necessary to facilitate policy directives and incentivize and support partners to achieve these outcomes.

Conclusion

Redefining and clarifying the meaning of bridging education to address outdated assumptions and beliefs about healthcare and education is critical to ensuring its success and creating an exciting and evidence-informed approach to building a future workforce, retaining, and (re)attracting those with healthcare experience into the workforce. Mature learners and professionals do not re-enter education lightly. Before moving in any particular direction, they carefully examine the complex and demanding situations they are embarking upon, and (re)consider their values and beliefs against the existing and hoped for healthcare landscape. Both formal and informal advice will be collected and collated, measured, and considered by potential learners. Recognition and value of the professional's existing skills, knowledge, and competencies are important factors in deciding when and how that individual will re-enter post-secondary education.

Building bridging education capacity and opportunities throughout health careers is a critical aspect of workforce sustainability. The key partners that have the capacity to deliver this work include the Ministry of Health and Ministry of Post-Secondary Education and Future Skills, post-secondary institutions, health sector providers, regulators, and employers. Together they can create a culture that establishes life-long learning in health careers as the norm by articulating a collaborative learning strategy. Removing barriers to learning at operational and practice levels will enable workforce training and advancement across diverse sectors, facilitating the achievement of individual, community, and wider public health goals.

This report recommends improving province-wide accessibility and responsiveness to bridging education programs, enhancing PLAR processes, and developing apprenticeship work/training options. It also advises developing a common evaluation framework and improving partnerships between partners in the bridging education system.

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12 APPENDICES

Appendix 1 Search Strategy for Rapid Literature Review – Medline & CINAHL

Appendix 2 Search Strategy – Grey Literature

Appendix 3 - Covidence Data Extraction Template

Appendix 4 Methodological Quality of Included Articles

Appendix 5 Articles included in Rapid Review of Literature

Appendix 6 Delphi Study Statements with importance ratings, IQRs and percentages

12.1 APPENDIX 1 – SEARCH TERM SUMMARY – MEDLINE & CINAHL

	Query	Medline	CINAL
1	lpn to rn.mp.	32	37
2	pn to rn.mp.	186	2
3	rpn to rn.mp.	5	1
4	practical nurs* to registered nurs*.mp.	74	8
5	lpn to bsn.mp.	11	9
6	lvn to rn.mp.	1	4
7	vocational nurs* to registered nurs*.mp.	9	2
8	en to rn.mp.	24	6
9	enrolled nurs* to registered nurs*.mp.	13	6
10	RN to BSN.mp.	396	326
11	(nurs* adj3 diploma* to degree*).mp.	35	66
12	HCA to PN.mp.	0	0
13	Healthcare aid* to practical nurs*.mp.	3	0
14	RN to midwi*.mp.	5	0
15	registered nurs* to midwi*.mp.	138	0
16	(midwi* and (bridg* adj2 program*)).mp. [mp=title, book title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms, population supplementary concept word, anatomy supplementary concept word]	4	10
17	(nurs* and (bridg* adj2 program*)).mp. [mp=title, book title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms, population supplementary concept word, anatomy supplementary concept word]	104	145
18	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17	1,020	602
19	limit 18 to yr="2005-current"	784	431

12.2 APPENDIX 2 – SEARCH STRATEGY – GREY LITERATURE

Search strategy	Websites searched	Results
****keywords**: "Bridging program" "Bridge program" "Bridging Education" "Transition Program"	Australian Department of Home Affairs	No results
Used each website's search function	Immigration, Refugees, and Citizenship Canada	1 report
Limitations English Language, any region, any time, anywhere in the page, any format, not filtered by licence	Immigration New Zealand	No results
Searched through five pages OR when relevancy meaningfully decreased	Home Office - UK Visas & Immigration	No results
	U.S. Citizenship and Immigration Services	2 reports
	Centre for Health Services and Policy Research, University of British Columbia	No results
	University of Ottawa Evidence-based Practice Center (EPC)	No results
	National Library of Medicine	3 reports
	National Institute of Nursing Research	No results
	International Council of Nurses	No results
	European Federation of Nurses Associations	No results
	European Student Nurses Association	No results
	American Nurses Associations	No results
	Australian College of Nursing	No results
	Canadian Indigenous Nurses Association	No results
	Canadian Nurses Association	No results
	CASN	2 reports
	New Zealand Nurses Organisation	No results
	Royal College of Nursing	No results
	American Nurses Credentialing Center	No results
	Nursing and Midwifery Council UK	No results
	Nursing Students Without Borders	No results
	National Students Nurses' Association	No results
	Registered Nurses' Association of Ontario	No results
	Canadian Health Workforce Network	2 reports
	Access Employment – Bridging and sector specific programs	No results
	International nursing bridging programme (INBP – UK)	No results
	Immigration and Refugee Protection Act (IRPA) in Canada	No results
	Higher Education Quality Council of Ontario	1 report
	Forum of Labour Market Ministers	2 reports
	Canadian Society for Medical Laboratory Science	No results

12.3 APPENDIX 3 – DATA EXTRACTION TEMPLATE

General information

Study ID #

Title

Title of paper / abstract / report that data are extracted from

Lead author contact details

Country(s) in which the study was conducted

1. United States
2. UK
3. Canada
4. Australia
5. New Zealand
6. Nordic Countries
7. Other European
8. Asian countries
9. Other

Notes

Characteristics of included studies

Methods

Aim of study

Study design

1. Scoping review
2. Cross-sectional study / survey
3. Qualitative systematic review
4. Mixed methods study
5. Qualitative interview study
6. Case study
7. Economic evaluation
8. Text and opinion piece
9. Other

Start date

End date

Study funding sources

Possible conflicts of interest for study authors

Participants

Profession

1. Nursing
2. Midwifery
3. Pharmacy
4. Physiotherapy
5. Paramedic
6. Physician assistant
7. Medical laboratory science
8. Medical radiological technology
9. Respiratory therapy
10. Diagnostic medical sonography
11. Medicine
12. Other

Type of bridging education

1. HCA - PN
2. PN/EN/VN - RN
3. IEN - RN
4. IEP - Reg Prof (MW, Pharm, other)

Total number of participants / studies included

Types of participants

	Number
Students (not yet registered)	
Graduates (registered & practising)	
Faculty	
Preceptors	
Mentors	
Employers	
Regulators	
Other	

Findings

Key Findings / Problems / Challenges identified

Recommendations

Indicators of success identified

12.4 APPENDIX 4 – METHODOLOGICAL QUALITY OF INCLUDED ARTICLES

Critical Appraisal of Qualitative Studies

JBI critical appraisal checklist for qualitative research

Author	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Aggar 2020	Y	Y	Y	Y	Y	N	U	Y	Y	Y
Arain 2017	N/A	Y	Y	Y	Y	N	N	Y	Y	Y
Atack 2012	N/A	Y	Y	Y	Y	N	N	Y	Y	Y
Austin 2024	N/A	Y	Y	Y	Y	N	N	Y	Y	Y
Bourgeault 2011	N/A	Y	Y	Y	Y	N	N	Y	Y	Y
Cubelo 2023	N/A	Y	Y	Y	Y	N	N	Y	Y	Y
Hadziabdic 2021	N/A	Y	Y	Y	Y	N	N	Y	Y	Y
Lordly 2014	N/A	Y	Y	Y	Y	N	N	N	N	Y
Mahathevan 2023	N/A	Y	Y	Y	Y	N	N	Y	Y	N
Nayda 2008	Y	Y	Y	Y	U	N	N	Y	Y	U
Neiterman 2013	N/A	Y	Y	Y	Y	N	N	Y	Y	Y
Wall 2018	N/A	Y	Y	Y	Y	N	N	N/A	N/A	Y
Wall 2020	U	Y	Y	Y	Y	N	Y	Y	Y	Y
% of studies	66	100	100	100	92	0	8	85	85	85

Y – yes, N - no, U – unclear, N/A – not applicable
Q1 = Is there congruity between the stated philosophical perspective and the research methodology?
Q2 = Is there congruity between the research methodology and the research question or objectives?
Q3 = Is there congruity between the research methodology and the methods used to collect data?
Q4 = Is there congruity between the research methodology and the representation and analysis of data?
Q5 = Is there congruity between the research methodology and the interpretation of results?
Q6 = Is there a statement locating the researcher culturally or theoretically?
Q7 = Is the influence of the researcher on the research, and vice-versa, addressed?
Q8 = Are participants, and their voices, adequately represented?
Q9 = Is the research ethical according to current criteria or, for recent studies, is there evidence of ethical approval by an appropriate body?
Q10 = Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?

Critical Appraisal of Analytical Cross-Sectional Studies

JBI critical appraisal checklist for analytical cross-sectional studies

Author	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Aggar 2021	Y	N	Y	Y	Y	Y	Y	Y
Birkhead 2016	N/A	Y	Y	U	N	N	Y	Y
Cook 2010	N	N	N/A	Y	N	N	Y	Y
Cornine 2023	Y	Y	Y	Y	N	N	Y	Y
Covell 2017	Y	Y	Y	Y	Y	Y	Y	Y
Covell 2018	Y	Y	Y	Y	Y	Y	Y	Y
Hogstedt 2022	Y	Y	U	Y	Y	N	Y	Y
Muma 2012	Y	Y	Y	Y	Y	N	Y	Y
Rapley 2008	Y	N	Y	Y	Y	Y	Y	Y
Sweet 2008	Y	N	Y	Y	N	N	U	Y
% of studies	89	60	89	90	60	40	90	100

Y – yes, N - no, U – unclear, N/A – not applicable
Q1 = Were the criteria for inclusion in the study clearly defined?
Q2 = Were the study subjects and the setting described in detail?
Q3 = Was the exposed measured in a valid and reliable way?
Q4 = Were objective, standard criteria used for the measurement of the condition?
Q5 = Were confounding factors identified?
Q6 = Were strategies to deal with confounding factors stated?
Q7 = Were outcomes measured in a valid and reliable way?
Q8 = Was appropriate statistical analysis used?

Critical Appraisal of Case Reports

JBI critical appraisal checklist for case reports

Author	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Austin 2007	N	Y	Y	N	N	Y	Y	Y
Boelen 2009	Y	N	N	Y	Y	Y	N	Y
Brown 2005	Y	Y	Y	N	Y	Y	N	N
Chachula 2020	Y	Y	Y	Y	Y	Y	Y	Y
Faithfull-Byrne 2017	Y	N	Y	N	Y	Y	Y	N
Miller 2020	Y	Y	Y	Y	Y	Y	Y	N
Tyson 2016	Y	Y	Y	N	Y	Y	Y	N
% of studies	86	71	86	43	86	100	71	43

Y – yes, N - no, U – unclear, N/A – not applicable
Q1 = Were the patient's* demographic characteristics clearly described? (*Bridging programs were used in the place of patient)
Q2 = Was the patient's history clearly describe and presented as a timeline?
Q3 = was the current clinical condition of the patient on presentation clearly described?
Q4 = Were diagnostic tests or assessment method and results clearly described?
Q5 = Was the intervention(s) or treatment procedure(s) clearly described?
Q6 = Was the post-intervention clinical condition clearly described? Framed in the context of professionals enrolled in bridging education, not bridging programs.
Q7 = Were adverse events (harms) or unanticipated events* identified and described? (*limitations of the program)
Q8 = Does the case report provide takeaway lessons?

Critical Appraisal of Systematic Reviews and Research Synthesis

JBI critical appraisal checklist for systematic reviews and research synthesis

Author	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
Connelly 2023	N	Y	Y	N	Y	Y	N	Y	N	Y	Y
Covell 2016	Y	Y	Y	Y	N/A	N/A	Y	Y	N	Y	Y
McCloskey 2023	Y	Y	Y	Y	Y	Y	Y	Y	N/A	U	U
Njie-Mokonya 2024	Y	Y	Y	Y	N/A	N/A	N	Y	N	N/A	N/A
Smith 2022	Y	Y	Y	Y	Y	U	Y	U	N	Y	Y
Suva 2015	Y	Y	Y	Y	U	Y	Y	U	N	Y	Y
% of studies	83	100	100	83	75	75	67	67	0	80	80

Y – yes, N - no, U – unclear, N/A – not applicable
Q1 = Is the review question clearly and explicitly stated?
Q2 = Were the inclusion criteria appropriate for the review question?
Q3 = Was the search strategy appropriate?
Q4 = Were the sources and resources used to search for studies adequate?
Q5 = Were the criteria for appraising studies appropriate?
Q6 = Was critical appraisal conducted by two or more reviewers independently?
Q7 = Were there methods to minimize errors in data extraction?
Q8 = Were the methods used to combine studies appropriate?
Q9 = Was the likelihood of publication bias assessed?
Q10 = Were recommendations for policy and/or practice supported by the reported data?
Q11 = Were the specific directives for new research appropriate?

Critical Appraisal of Case Series

JBI critical appraisal checklist for case series

Author	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Neiterman 2018	Y	U	Y	N/A	N/A	N	N/A	Y	N	Y

Y – yes, N - no, U – unclear, N/A – not applicable
Q1 = Were there clear criteria for inclusion in the case series? ? (*Bridging programs were used in the place of patients)
Q2 = Was the condition measured in a standard, reliable way for all participants included in the case series?
Q3 = Were valid methods used for identification of the condition for all participants included in the case series?
Q4 = Did the case series have consecutive inclusion of participants?
Q5 = Did the case series have complete inclusion of participants?
Q6 = Was there clear reporting of the demographics of the participants in the study?
Q7 = Was there clear reporting of clinical information of the participants?
Q8 = Were the outcomes or follow up of the results of cases clearly reported?
Q9 = Was there clear reporting the presenting site(s)/ clinic(s) demographic information?
Q10 = Was the statistical analysis appropriate?

Critical Appraisal of Textual Evidence: Expert Opinion

JBI critical appraisal checklist for textual evidence: expert opinion

Author	Q1	Q2	Q3	Q4	Q5	Q6
Marfo 2022	Y	Y	Y	Y	Y	N/A

Y – yes, N- no, U – unclear, N/A – not applicable
Q1 = Is the source of the opinion clearly identified?
Q2 = Does the source of the opinion have standing in the field of expertise?
Q3 = Are the interests of the relevant population the central focus of the opinion?
Q4 = Does the opinion demonstrate a logically defended arguments to support the conclusions drawn?
Q5 = Is there reference to the extant literature?
Q6 = Is any incongruence with the literature/sources logically defended?

12.5 APPENDIX 5 – ARTICLES INCLUDED IN RAPID REVIEW OF THE LITERATURE

Study & date	Study aim	Country(s)	Methods	Profession / Type of bridging education / sample size	Key Findings
Aggar 2020	Experience of being enrolled in bridging program and intention to remain and seek employment in healthcare system.	Australia	Mixed methods – questionnaires focus groups	Nursing IEN – RN 9 students	Participants experienced increased stress relating to personal, financial & social issues. Concerned about gaining employment post program. Need social / financial security Clinical workload not difficult. Most important aspects - peer support, preceptorship, and understanding new professional nursing role (as role was different to home country). Pre-program learning resources needed Post program mentorship/ transition to practice needed
Aggar 2021	Evaluation of a digital application (mPreceptor) to support internationally qualified nurses' communication and leadership skills.	Australia	Cross-sectional study Pre and post intervention questionnaire	Nursing Intervention group 104; non-equivalent control group 48	Overall IQNs self-appraisal of professional self-concept, including leadership and communication skills increased with clinical placement, with or without use of the interactive mobile application. The intervention group scored significantly higher in leadership, indicating the mPreceptor program was beneficial for improving the leadership skills. The mean difference in professional self-concept scores post intervention was higher for the intervention group, but not significantly.
Arain 2017	Pilot testing and evaluation of the effectiveness of interprofessional education curriculum (ICT) for IE Health Professionals.	Canada	Mixed methods study	Nursing; Pharmacy Physiotherapy Medicine; Other 35 survey respondents; 22 interviews	Modules improved self-confidence in most of the competency domains. Conflict management needs more intense education and coaching, particularly important as interpersonal conflicts develop the perceptions for a disrespectful working environment and weaken team collaboration. Increased role clarification and patient centred domains. Online delivery improves knowledge and attitudes, but does not improve skills in working in IPC. Simulation, workshops or seminars need to be included.
Atack 2012	Exploring IENs' experiences with bridging program and	Canada	Qualitative interview study	Nursing Participants-	Fast track program for IEN to practical nurse diploma (3 semesters - 2 semesters theory and 15-week fulltime work preceptorship). Program also includes English upgrading, knowledge of Canadian prof practice, and technology skills, prep for registration exam, and job preparation (resume and interview skills).

	determining effectiveness in transition to the workplace .			62 surveys, 29 focus group, 9 telephone interviews post program	Program workload and schedule - overwhelming with school, family and work responsibilities, program costs and lost income serious issues. Technology challenges if not used this before, Differences in educational approach. Need to educate all involved with program to understand the program, purpose and expectations - includes faculty, HR departments for future jobs etc.
Austin 2007	Exploring international graduates' experiences with bridging program and determining effectiveness in transition to the workplace.	Canada	Case study	Pharmacy 1 program, approx. 400 participants	Identifies challenges experienced. Program designed to provide bridging for IEPs, refresher courses for existing pharmacists, and remedial training and support. Program is a requirement for registration, unless exemption provided. Employer sponsorship of participants pays costs of program in exchange for work guarantee for minimum number of years post licensure, Key principle to work collaboratively with prospective employers to ensure fair and transparent recruitment and incentive practices. Program cost equivalent to 1 year of the university degree program, some employee sponsored, others low interest loans from organisations assisting new arrivals to Canada
Austin 2024	Examine and characterize the integration of IEHPs in the healthcare workforce in Canada.	Canada	Interviews	Nursing; Pharmacy; Physiotherapy ; Medicine 48 participants	6 themes: 1. IEHPs have complex personal integration needs not recognized by health systems or regulators 2. mastery of domestic professional culture is crucial for workplace integration success 3. social/contextual skills are equally important to technical/procedural skills for workplace success 4. communication is more than just language skills or scores on standardised tests 5. patient-centeredness is not a universally accepted or understood construct 6. interprofessionalism may be understood differently in different contexts Interprofessional, interpersonal, communication and sociocultural skills are challenging to teach, learn and assess.
Birkhead 2016	Evaluate the effectiveness of the New York State LPN-to-RN Articulation Model	United States	Cross-sectional study / survey Retrospective data analysis comparing PNs with generic RN students in matched pairs	Nursing 78 matched pairs	Fast-track articulation model involved placing PNs into 2nd year of the associate degree program (2-year program). Must meet admission requirements including transition course and required liberal arts courses prior to acceptance. No significant difference in NCLEX first time passing rates, predictor assessment scores, course grades or proficiency levels in assessment between the 2 cohorts.

Boelen 2009	Description of a 1 week long transitional program prior to bridging program for EN - RN.	Australia	Case study	Nursing 70 participants	Significant increases in confidence were noted after the return to study and basic scientific knowledge program. Mostly related to support network and study skills development, in some cases re-establishment of scientific knowledge. Making contact, social networking, with other students and talking to lecturers were the most significant factors. Important regardless of length of program Increased years of working as PN/EN does not increase confidence in return to educational programs.
Bourgeault 2011	Identifying the institutional dynamics, policies, barries, and facilitators, that affect the integration process for internationally educated midwives.	United States UK Canada Australia	Mixed methods study	Midwifery 29 key informants (policy and decision-making and professional stakeholder groups)	Problems – Lack of access (program numbers very small), Funding - cost of program very high, Time involved with taking program. Other barriers - cultural - unfamiliar with informed choice, different model of practice (e.g. primary care only in most Canadian jurisdictions) US - summarises all the different types of midwives and routes to licensure, which vary with the state concerned. Process is generally very lengthy. Most have to re do training, integration of IEMs had "little resonance" with key stakeholders in most states. UK and Australia - very similar - most are RNs with post grad training, work in the hospital sector. Focus of bridging programs is mostly orientation to the structure and organisation of the health system, not upgrade education.
Brown 2005	Description of the stepped PN / RN program to avoid repetition and duplication.	United States	Case description	Nursing 1 Case	Identifies the need for transition course from program to program which includes more independent practice, and active learning utilizing independent thinking, problem solving and self-directed learning.
CASN 2012	Consultation work to develop a Pan-Canadian framework of guiding principles and components for IEN bridging programs	Canada	L:iteraure synthesis, environmental scan , and national forum	Nursing 32 participants	Main concerns: Varying methods of delivery (content, teaching methods, clinical experience, language instruction) were found across Canada. Best practices: flexibility and based on individual needs, accessibility of full-time and part-time options, online vs. in-person, and multiple teaching methods are needed. Programs must be evaluated to produce evidence for best practices. Need increased focus on teaching critical thinking skills to boost IEN examination performance.
CASN 2012	Pan-Canadian framework of guiding principles and components for IEN bridging programs	Canada	Framework	Nursing	Framework Best Practices: • Collaborative partnerships with relevant stakeholders • Safe learning space • Appropriately resourced • Accessible/transparent program information • Evaluation framework. Course content should: • emphasize a culture of professional practice,

					• weave professional communication development into all courses, • provide learners with information regarding the healthcare system, trends/issues, and nurses' role, • prioritize critical thinking/judgement skills.
Chachula 2020	Description of streamlined bridging course (PN - RN) for career advancement and academic progression.	Canada	Case description, using appreciative enquiry	Nursing 1 Case	Bridging course needs to: • Included pre-course orientation and student advisor support. • Address realities of bridging into university setting, and support mindset change from practising nurse to student. • Faculty needed attributes to understand working with experienced learners and help them be able to transition to a more autonomous, critical thinking leadership roles, as well as being familiar with scope of practice issues between the two roles.
Connelly 2023	Summarize and critically evaluate international research on nursing bridging education programs	United States UK Canada Australia New Zealand Japan	Scoping review	Nursing 15 studies	4 Themes identified: 1 participating in bridging education programs fuels both professional and personal development 2. nursing bridging education programs enhance diversity in nursing workforce 3. student nurses do not anticipate the challenges associated with participating in bridging program 4. mentor-mentee connection promotes academic learning and successful completion of bridging program Challenges in enrolling are not always anticipated, - need for up-front and clear information, perception was - 'brush up approach', part of the problem is how people see bridging Program availability and lack of academic prep Students report anxiety, low self-esteem, and self-reported = "difficulty finding their voice"
Cook 2010	Challenges of transition from LPN to RN.	United States	Cross-sectional study / survey	Nursing 79 students	Most frequent challenges - financial, family responsibilities (child care) PN to RN Role change is a challenge for many. Course work more challenging than anticipated, more study time than expected. Lack of skills for mathematical calculations. Not familiar with self-directed learning Return was driven by career change, accomplishing a lifelong goal, lack of previous financial ability or employment requirement
Cornine 2023	Describe the transition conditions (facilitators and inhibitors) encountered by LPNs in RN	United States	Cross-sectional study / survey	Nursing 873 survey respondents from 131 programs	Support was the most important facilitator for transition Inhibitors - juggling multiple responsibilities, personal and financial stress Work experience in new role is important

	educational programs				
Covell 2016	Map key themes in the literature on professional integration of IEHPs	Canada	Scoping review	Nursing; Midwifery; Pharmacy; Physiotherapy ; Medical laboratory science; Medical radiological technology; Respiratory therapy; Medicine. 407 lit sources including grey lit	6 themes - bridging and residency training programs (professional recertification) only included here. Area of largest amount of literature Barriers -associated with bridging programs - cultural competency big issue, even with English speaking IHP from countries with similar healthcare practices. Limited availability of programs outside of major urban centres, low enrolment capacity, isolated or temporary funding of initiatives, financial barriers for students, process is often confusing and opaque to IHPs, limited information on effectiveness of programs Gap in literature about alternative paths to achieving professional integration Lack of supports in the workplace, especially in non-urban areas. Social supports very important. Employers play a critical role in professional integration, but limited information on what they should be doing.
Covell 2017	Identify the predictors of successful workforce integration of IENs	Canada	Cross-sectional study / survey	Nursing 2280 survey participants including PN, RN and Psych nurses,	Bridging programs are more important for making job search easier than skills development. Bridging programs lead to social networks, which are more important. Mentorship and study groups are important for success
Covell 2018	Identify the benefits of participating in a bridging program	Canada	Cross-sectional study / survey	Nursing 360 participants	Human capital (education and previous nursing practise experience) influences the amount of upgrading needed. Overall, bridging program participants rated participation in bridging programmes as moderately helpful. They viewed their participation most helpful to: understand the roles and responsibilities of nurses in Canada and learn about the Canadian healthcare system (cultural competency), but least helpful in perfecting their language skills and understanding the conditions of employment.
Cubelo 2023	Understand the experiences of Filipino internationally educated nurses (FIENs) on their	Finland	Qualitative interview study	Nursing 10 participants	Transition process causes financial stress, had to give up job to study Finnish language Need to recognise study time as work time Concern about lack of trust and being undervalued in the workplace. Lack of feeling welcome in the workplace Barriers - differences in scope of practice, cultural values, language, and delays in recognition of competence

	recognition and credentialing pathway in the recruitment process in Finland.				
Faithfull-Byrne 2017	Discussion of a collaborative quality improvement project designed to facilitate Assistants in Nursing (AIN) progressing to Enrolled Nurse (EN)	Australia	Case study	Nursing 60 students	Program provide flexible education pathway, with flexible delivery modes in regional area, at low cost, for career progression, and allowed students to continue to work and maintain job security Collaboration between health sector and educational provider in an acute care regional hospital. Team/ward culture critical in supporting the transformation from AIN to EN. Heavy financial burden for students, received outside assistance (bursaries), but still challenging - lost 2 days / week paid work to attend. Provided job ready ENs, and reduced costs of recruitment for health service
Guthrie Consulting Services Inc. 2019	Identify best practices in bridging programs for internationally trained seeking professional registration and Develop Best Practices Tool	Canada	Literature Review 40 articles over 20 years	Accounting Dietitians Engineering Medicine Medical laboratory science, Nursing Pharmacy Physiotherapy	Lack of communication amongst stakeholders leads to duplication or gaps in bridging programs. The system itself is undermined if there is no teamwork between immigrant-serving orgs., regulatory authorities, and other groups. Regulator role: protect the public, not mandated to provide education. Strong employer partnerships cultivated meaningful language/communication curriculum development, expanded work placements, improved job search processes, employers as ambassadors, financial contributions. Employer engagement may be dictated (in part) to market pressures, which incentivizes employers to become involved. Details on how to engage employers are vague in literature. Future research: • increasing collaboration on the evaluation of program components and delivery format, • improving clarity on partnership roles, • conducting more analysis of the business case for program investment, non-health occupations, and reporting on outcomes. To make programs sustainable: • make bridging a core offering at educational institutions, • use a clear organization framework to curriculum development, • conduct market research on program demand, • market the program, and boost flexibility.
Hadziabdic 2021	Explore the experiences of nurses in	Sweden	Qualitative interview study	Nursing	1 year bridging program used for return to nursing and transition to nursing for IENs. Bridging program more reliable way to succeed. Understanding person centred care was new to most, clinical skills and competencies were the same and repetitive to what they already knew. Clinical

	Swedish bridging program and of the program's role in their integration into the nursing profession in Sweden			11 participants	experience allowed learning about Swedish health care system, scope of practice, relationships with other professionals, team work and role delineation. Clinical practicum should be at least 6 months to get experience in different areas. More 'learning-by-doing'. Lack of respect for previous clinical competence was problem. Support from employers very important
Higher Education Quality Council of Ontario; 2015	Evaluation of bridging programs for IEHPs	Canada	Mixed methods case study (document reviews, surveys, interviews)	Physiotherapy ; Medical laboratory science; Medical radiological technology; Respiratory therapy; Diagnostic medica	Recommendations: • Hybrid theoretical/practical program content (develop occupation-specific language skills, understandings of Canadian workforce, and prep for examinations). • Flexible program delivery (only take courses they need; weekend and evening sessions, online/self-study). • Faculty sensitive to the needs of IEHPs (Hiring IEHPs themselves or individuals familiar with working with IEHPs). • Inclusion and coordination of key stakeholders, communication very important • Centralized registry (potentially to be housed on the Citizenship and Immigration [CIC] website). Sustainable and coordinated funding (federal-provincial cost sharing). • Need indicators for outcomes / success
Hogstedt 2022	A study of self-rated professional competence, self-efficacy, and thriving across 3 pathways to nursing licensure.	Sweden	Cross-sectional study / survey Comparison of migrating and domestic nurses. Part of a longitudinal research project on IENs	Nursing Participants IENs - bridging program - 128, validation process - 61; domestic students - 213	IENs from both streams rated self-rate competence, self-efficacy and thriving higher than generic nursing students. No statistically significant difference between the 2 routes of registration for IENs. Only area of difference for IENs was bridging programs had higher value-based nursing care - integrity, person-centred care and teamwork.
Lordly 2014	Review of bridging program for dietitians	Canada	Qualitative Interview study	Dietitians	Course delivery needs to be online and in-person, flexibility very important Need access to onsite preceptors, who provided practical experience, support, feedback and ongoing assessment. Language remained a significant difficulty for students, need minimum standards for admission Multi-stakeholder advisory board – key to success Program should be mandatory before proceeding to further university level study

Mahathevan 2023	Explore IENs experiences and knowledge of interprofessional collaboration in a bridging program.	Canada	Mixed methods study	Nursing 87 IEN - PN participants	Interprofessional teams and collaboration needs to be included in bridging programs, appropriate education, experiential training, and work readiness.
Marfo 2022	Personal explanation of barriers that delay or discourage IENs from transitioning into the Canadian nursing workforce	Canada	Text and opinion piece	Nursing	Inaccessibility to bridging programs and prolonged processing times are barriers and provide unnecessary obstacles There should be an opportunity to allow IENs to be eligible for student's line of credits and collaborate with more academic institutions and hospitals to ensure that bridging programs are financially and logistically accessible.
McCloskey 2023	To synthesize qualitative evidence on students' experiences of a post-licensure PN to RN bridging program	United States UK Canada Australia New Zealand	Qualitative systematic study	Nursing 24 studies	4 main findings: 1) growth through professional advancement - bridging students report personal growth and professional transformation when they return to school 2) need for positive support networks in their lives, mainly with their family, co-workers, and classmates 3) as adult learners, with prior nursing experience, expected to receive more support from the educational institutions and higher levels of clinical expertise and competence amongst faculty than what is provided in educational programs - disorganised and faculty lack competence 4) students struggle to balance and manage multiple roles and responsibilities in their lives as they return to school to study to become a RN More flexible and alternative learning options to increase accessibility Support from faculty, faculty advisor could provide needed support to students

Miller 2010	To examine whether a formal, structured, faculty-directed mentoring program would promote student progression and to examine student perceptions of the program itself.	United States	Case study	Nursing 313 students	Mentoring increased student satisfaction with bridging program Identifying learning styles, working with mentors to develop a plan of action, helped attain success Mentored students had higher rates of success, more likely to persist to complete program (not statistically significant). Quality of faculty member or mentors is important
Muma 2012	To determine the perceptions on developing physician assistants (PAs) to-physician bridge program.	United States	Cross-sectional study / survey	Physician assistant Physician 455 participants	Overall, PAs were strongly supportive of the idea of a bridging program (89%), only 26% physicians supported the idea. More female PAs supported than male (statistically significant).
Nayda 2008	To gain an understanding of the lived experience of EN to RN transition in the context of rural generalist RN	Australia	Qualitative interview study	Nursing 4 participants from 4 different hospitals	Three main themes - 1) great expectations - self-expectations, adjusting to the new role, role boundary confusion, others expectations of them - expectations of self and by others much higher than regular new grad, leads to lack of support & high levels of anxiety 2) support - sink or swim - peer, managerial and medical staff, need more support because of high level of expectations. Lack of constructive communication and feedback, left unsupported, no mentoring 3) Jacks and Jills of all trades - coping with the scope, proficiency equals specialisation, positives of rural transition, significant growth and development opportunities, diversity and autonomy Transition in role does not equal preparedness for new practice role, a period of shock / transition/ consolidation is needed

Neiterman 2018	Comparative analysis of bridging programs to address: - challenges -outcomes & how can they be measured -effectiveness - challenges	Canada	Mixed methods study; Case study	Physiotherapy ; Medical laboratory science; Medical radiological technology; Respiratory therapy; Diagnostic medical sonography 7 bridging programs - 86 individuals (interviews, surveys, focus groups)	Outcomes used to measure success in bridging programs: 2 levels 1. Individual Passing certification exams, obtaining employment, increasing cultural competence (e.g. knowledge of healthcare system and profession-specific language assessed via clinical placement) 2. Systemic Diversifying healthcare workforce, creating change in post-secondary education (need to focus on what the individual needs, not the institution) Challenges faced and factors of improved success - 1.Developing a curriculum that addressed diverse needs of participants - use of modular programming better for participants, but more challenging for institutions (enrolments and budgeting) 2. Identifying optimal format for program delivery - range from 4 months - 1 year, courses need to be offered at various times of the week, and in different formats - online, in-person and blended 3. Obtaining clinical placements- need to schedule clinical placements off-cycle with regular full-time education programs to decrease competition, seek placements in rural and underserved areas, involve employers in an advisory capacity to promote greater investment in program 4. Ensuring financial sustainability - do market research and understand demand for program, market program through regulatory bodies / professional associations, build flexibility to adapt to changing enrolment numbers, coordinate online delivery across multiple provinces. Role of Stakeholders in ensuring effectiveness - 1. Involve regulatory bodies in design of curricula to ensure meeting competencies. Collect data on licensure rates of recent graduates. 2. Federal and provincial govts - need to play a role in both financing and coordination of programs. Need to share across provinces, particularly what is shown to improve success, significant gap identified here. 3. Employers - engagement with program is paramount - provide placements and feedback, need to understand unique needs of IEHPs. 4. Professional associations - communication about availability of programs, support through scholarships, employment information, mentors, and post-bridging supports. 5. Data collection - lack of systematic data collection on outcomes -limitation in future planning, need to know how graduates do in the workforce to improve quality of education and employability of graduates. Mastering cultural competence a challenge
Neiterman 2013	How and why cultural competence becomes a challenge in IEN professional integration	Canada	Qualitative interview study	Nursing 71 IENs 70 key stakeholders	Nursing is not situated in a social vacuum, cultural differences manifest in the way nursing is practised. Knowing the new expectations of language, Exams and regulators - it is the subjective testing that is hard for those with experience, loss of or gain in autonomy - is hard Technology and communication main issues

Njie-Mokonya 2024	What integration strategies used with onboarding IENs in acute care settings?	Canada	Scoping review	Nursing 14 studies	Main goal of bridging programs offered by academic institutions is to support entry-to-practice and licensing requirements, but educational practices to support IENs in transitioning to acute care settings are poorly understood. No literature directly relating to structured educational bridging programs for IENs in acute care settings was found. Traditional bridging programs do not prepare participants for meeting the day-to-day practice demands of the workplace
Rapley 2008	Determine relationships between prior education, length of experience as EN, and geographical location, and BN course completion.	Australia	Cross-sectional study / survey	Nursing 112 EN bridging students	Not able to determine any relationships between prior education, length of experience as an EN and geographical location of the student to course completion Being located in rural or metropolitan areas did not significantly influence whether the course was completed or not, but it may influence the time taken to complete the course. Those with hospital-based learning were more likely to complete it - which highlights the need for ongoing clinical workplace-based learning.
Smith 2022	Explore how migrant nurses are represented in academic research on nurse migration.	UK Australia Germany	Rapid Review of Literature	Nursing 56 studies	Four themes: (1) how migrant nurses are described in the literature- often not clearly defined (2) language background and language competence (3) discrimination (most prominent theme), and (4) integration and structured educational programmes (bridging programs) Frequent reference to the importance of bridging programs but little evaluation of the structure, goals or content of these programs beyond participants reports of their usefulness. Needs of migrant nurses, and what bridging programs must address, are different from novice nurses or nurses domestically educated, their have skills and expertise that needs to be developed in a different cultural context. Migrants must work in a different, and often less respected position in destination country- starting at bottom of the pile again - being an authority and highlighting opportunities = risk to self and also can make you a target Educators did not feel prepared enough and the teaching cultures experienced were very different to domestically educated nurses. Identified need for a specific educational framework for educators of overseas nurses. Bridging programs lead to improved health and well-being of nurses, which contributes to better recruitment and retention. Programs create camaraderie and support, reduce discrimination and

					improving integration. Are essential for positive outcomes. Bridging programmes are highly valued by all stakeholders: therefore, it is remarkable how infrequently they are addressed, scientifically substantiated and empirically investigated. Much of the research comes from small qualitative studies with limited scope. What research findings do exist have not been used to support migration policies and initiatives.
Social Research and Demonstration Corporation (SRDC); Rodier, J., Hui, S., Gurr, S., Lehrer, K., & Appiah, A. 2020	Evaluation of work experience pilot projects	Canada	Comparative mixed methods case study (surveys, lit review, interviews, focus groups)	Occupations included: Mostly business, finance and administrative , Some natural sciences, retail and trades, Very few health sector	Coaching/mentoring services were rated as the most useful by participants, and bridging programs Needs for supports while searching for employment were underestimated Overall Recommendations: • Build flexibility into programs; provide work placements for all program participants • offer structured training as part of the program • extending work placement durations to 6-months to a year • future programs should offer a range of opportunities from mentoring to work placements with wage subsidies, and ensure that delivery organisations have the capacity to manage employer engagement • employers could benefit from an intercultural component to learn and understand newcomers' cultures and backgrounds • marketing strategies should target a broader group
Suva 2015	To synthesize the evidence on the influences of successful degree completion and professional role transition for RPNs pursuing RN licensure through bridging programs.	Canada	Qualitative systematic review	Nursing 39 studies	Bridging programs represent multiple simultaneous situational transitions at personal level. Leads to cumulative stress All require awareness, engagement, accepting difference and change. Need to prepare for return to school - orientation and prep beforehand. Financial pressures, shock, anxiety, stress, misperception of academic requirements. Success is influenced by transitional conditions including personal conditions of the experience, financial, ability to let go and take on new ways. community and societal conditions also important, support, Peers can disapprove - management can be unsupportive while trying to work and learn, others may not see they have new skills No best practice or standards for bridging programs found No evaluation studies to determine facilitators / barriers to success Big gaps in the literature
Sweet 2008	Evaluate the mentor program	United States	Cross-sectional study / survey	Nursing 37 surveys	Use of a peer mentor (generic student) for incoming bridging students was a positive support in helping them feel included and valued in the program, that they were able to ask for help, and they transitioned more easily into the program. There was increased social integration, decreased social isolation and increased student's self-confidence.

Tyson 2016	Description of midwifery bridging program	Canada	Case study	Midwifery 214 midwives	A key program innovation was to combine prior learning assessment with the evaluation of newly acquired skills. Scaffolding teaching technique of introducing new skills that build upon previously learned skills. The program emphasizes the use of testing as a learning tool rather than a by-product of learning. Multiple forms of testing used. Formative evaluations of the program revealed that the blending of various evaluation methods appears to accelerate learning. Use of virtual triage community placements is another successful innovation that facilitates learning. Written and oral tests incorporate double peer participant testing (e.g., 2 identical multiple-choice tests administered within a week), with discussion and individual coaching. These peer-led approaches facilitate learning and retention.
Wall 2018	Experiences of ENs undertaking RN programs in Australia, New Zealand and the UK	UK Australia New Zealand	Narrative review	Nursing 33 studies	Describes 4 stages - 1) Preparing to move in - personal goals, expectations, establishing balance work, personal and school; 2) Moving in - meeting demands, frustrations, being different and feeling excluded, accessing resources and support, seeking balance; 3) Moving through - overcoming setbacks and experiencing success, self-efficacy and self-belief, dev personal strategies and individual resources, building relationships, maintaining support ; 4) preparing to move out - constructing RN role and identity, identifying RN mentors, anticipating and planning for the future role Attitude at the start matters - so should there be a testing approach and standard tool measure that helps determine 'readiness' for new role. Personal characteristics important Driving factors to move into this work vs moving out of previous work
Wall 2020	Experiences of Ens transitioning to RN in Bachelor of Nursing program.	Australia	Qualitative interview study	Nursing 7 ENs , 1 focus group of educators (10 participants)	5 themes 1) standing out from the crowd - feeling different and stereotyped , frustration with lack of PLAR 2) struggling with academic demands - unprepared for academic challenges, disadvantaged by commencing in 2nd year; did not feel their prior experience was given enough credit, ongoing dissatisfaction and unhappiness with treatment 3) seeking personal and professional balance - competing priorities, identity challenges, realising aspirations, 4) moving beyond EN constraints - developing personal strategies, stepping up to the challenge, strengthening beliefs and capabilities 5) growing within the program - feeling gratified when valued, empowered with success

12.6 APPENDIX 6 – DELPHI STUDY STATEMENTS

With Likert scale importance ratings, interquartile range and percent of respondents choosing important or very important

Maximum median score 7.0, interquartile range scales 0 – 6.

Goals of Bridging Education

Statement	Median	Interquartile range	Percent respondents choosing important or very important
1. The goal of bridging education should be to address critical health professional shortages in the healthcare system.	6.0	2	75
2. Bridging education should support various career pathways for healthcare professionals, including re-entry into the workforce, career advancement, or career changes. This can involve transitions within different nursing roles or specialities, shifts between nursing and midwifery, or movements to and from allied health professions.	7.0	1	93
3. Bridging education should focus on preparing healthcare professionals for specific roles in high-demand areas or workforce gaps.	6.0	2	75

Accessibility and bridging program design

Statement	Median	Interquartile range	Percent respondents choosing important or very important
1. Bridging programs should be widely available across all regions of the province, including rural and remote communities.	7.0	1	93
2. Bridging programs should include simulated learning as formal instruction. Simulation learning is teaching skills, knowledge or ideas in an environment that mirrors a real-world setting.	6.0	1	80
3. Bridging programs should combine experiential learning with theoretical knowledge and practical skills.	7.0	0	98
4. Bridging programs should offer a combination of online, in person, synchronous and asynchronous modes of delivery to increase accessibility.	7.0	1	89

5. To accommodate working professionals, bridging programs should offer condensed and part-time options that do not overly extend time to completion.	6.0	1	80
6. Bridging programs should have designated seats set aside for local residents and Indigenous students.	6.5	1	80
7. Bridging programs should have pre-requisite baseline knowledge levels in core subjects (e.g. basic human sciences).	6.5	1.5	77
8. Bridging programs for advancement in the same profession (i.e. second level to first level nurse (practical / enrolled nurse to RN), and specialty RN (mental health, child, etc.) to generic RN) should have consistent entry requirements for domestic and non-domestic students.	6.0	1.5	80
9. Bridging programs should offer modular access to support students requiring targeted or specific remediation. This can be achieved by integrating with existing education programs and making use of available seat vacancies.	6.0	2	75

Needs, approaches and lifelong learning

Statement	**Median**	**Interquartile range**	**Percent respondents choosing important or very important**
3. Bridging programs should have flexibility to be tailored to individual learners' prior experience, educational backgrounds, and career aspirations.	6.0	1.5	75
4. Bridging programs should foster a culture of lifelong learning among healthcare professionals, equipping them to adapt to ongoing changes in healthcare practice and technology.	7.0	1	91
5. Bridging programs should prioritize the development of emotional, social, and cognitive intelligence competencies in healthcare professionals.	6.0	1	82
6. Bridging programs should address potential implications of emerging technologies, such as artificial intelligence, on the knowledge and competencies required for future healthcare professional practice.	6.0	2	77

7. Bridging programs should include a guided learning approach (preceptorships) combined with measures of performance in real-world contexts.	7.0	1	84
8. Bridging programs should be a recognized pathway for health professional career development.	7.0	1	84
9. Bridging programs should include an iterative process where feedback and data inform ongoing adjustments to the learning process.	7.0	1.	91

Curriculum, competency and assessment

Statement	**Median**	**Interquartile range**	**Percent respondents choosing important or very important**
1. Bridging programs should effectively assess and develop key competencies and consider the importance of both observable behaviour and underlying intent.	6.0	1	93
2. A preceptor-style placement model should be integrated into bridging programs.	7.0	1	82
3. Bridging programs should ensure exposure to practice in a variety of settings, e.g. acute, community, long-term care.	6.5	1.5	80
4. Bridging programs should ensure exposure to healthcare practice across all domains, including clinical, leadership, policy, education, and research.	6.0	3	74*
5. All bridging programs should be accredited by an approved accreditation body.	7.0	1	82
6. Bridging programs should include a post-qualifying internship to consolidate skills and provide for safe and competent transition to practice.	6.0	3	74*

***These two statements had 1 missing response in the data set, the percent consensus was 74.48% based on 43 responses instead of 44 responses.

Student support and success

Statement	Median	Interquartile range	Percent respondents choosing important or very important
1. Bridging programs should provide adequate support services for students.	7.0	1	95
2. Employers should ensure their ecological, managerial, and social environment is able to support bridging program students and graduates.	7.0	1	86
3. Healthcare systems and mechanisms (i.e., regulators, governments, professional associations / unions, educational institutions, employers) should clearly communicate the value and benefits of bridging education.	7.0	1	86
4. The government should prioritize funding for bridging programs to improve accessibility and quality.	7.0	1	80

Evaluation and outcomes

Statement	Median	Interquartile range	Percent respondents choosing important or very important
1. Success on licensure exams should be a key performance indicator for bridging program effectiveness.	6.0	2	75
2. Bridging program success should be measured by graduates' long term (i.e., >5 – 10 years) retention rates in the healthcare profession.	6.0	2	75
3. A cost-benefit analysis should be conducted to evaluate the long-term impact of bridging education on the healthcare system.	6.0	2	75
4. Bridging program success should include graduates' evaluation of program effectiveness on transition to a different position or profession.	6.0	1	82
5. Satisfaction surveys of bridging programs must include feedback from key partners including healthcare providers, post-secondary education, funders, local community, etc.	6.0	1	82

6. Longitudinal evaluations of bridging programs outcomes should include multiple communication strategies to facilitate graduate participation.	6.0	2	75
7. Key bridging program partners (funding, delivery and evaluation) should be involved in the establishment of the values and standard performance indicators, these should be clearly stated and utilized to measure program effectiveness.	6.0	2	75
8. All bridging program reporting data should be held by an accountable, centralized and accessible organization and utilized to support program development and accreditation processes.	6.0	2	75
9. Bridging programs should have competency metrics, with thresholds, and governance structures agreed to by the funding and accreditation agencies.	6.0	2	75
10. Longitudinal research tracking the educational, environmental, and professional factors influencing graduate students' experiences after completing a bridging program would serve as a valuable resource for researchers, funding bodies, and program providers.	6.0	1.5	79