



BUILDING NURSING PATHWAYS @ BELLINGHAM TECHNICAL COLLEGE

FINAL EVALUATION REPORT

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EXECUTIVE SUMMARY

Building Nursing Pathways was proposed to provide training to trade adjustment-assisted (TAA) workers, veterans, and others seeking nursing careers in the medically underserved communities of northwest Washington State. The RNs who earn a nursing credential through Building Nursing Pathways enter a high-demand labor market; Washington State expects a shortage of 12,000-20,000 RNs by 2031. The U.S. Department of Labor awarded a Trade Adjustment Assistance Community College Career Training (TAACCCT) Round 3 grant to Bellingham Technical College (BTC) in Bellingham, Washington, to fund the Building Nursing Pathways (BNP) program from 2013 to 2017.

The centerpiece of Building Nursing Pathways is a rigorous, professionally-oriented education that prepares students for successful entry to the nursing labor market. Building Nursing Pathways' robust academic programming is coupled with extensive wraparound support for students.

This final evaluation report, which represents the culmination of ongoing evaluation efforts across four years of TAACCCT funding, presents two key findings. ***First, the faculty and staff at Bellingham Technical College successfully implemented Building Nursing Pathways with an exceptionally high level of fidelity. Second, this high level of implementation fidelity, combined with the efforts of dedicated faculty and staff, generated student-level outcomes representing efficient and effective degree production and meaningful labor market outcomes for program completers.*** The success of Building Nursing Pathways also demonstrates the value of involving workforce partners and the capacity-building potential of investments in student data systems and data-driven decision making.

PROGRAM OVERVIEW

The U.S. Department of Labor awarded a Trade Adjustment Assistance Community College Career Training (TAACCCT) Round 3 grant to Bellingham Technical College (BTC) in Bellingham, Washington, to fund the Building Nursing Pathways (BNP) program. Building Nursing Pathways was proposed to provide nursing training to trade adjustment-assisted (TAA) workers, veterans, and others seeking nursing careers in the medically underserved communities of northwest Washington State. The RNs who earn a nursing credential through Building Nursing Pathways will enter a high-demand labor market; Washington State expects a shortage of 12,000-20,000 RNs by 2031 (Skillman et al., 2011).

The Building Nursing Pathways program design addresses the Department of Labor (DOL) TAACCCT solicitation for grant application (SGA) option #4 to develop career pathways for adult workers. The centerpiece of Building Nursing Pathways is the development of industry-driven stackable and latticed nursing credentials. Appendix B contains a logic model which visualizes the relationship between program inputs, Building Nursing Pathways components (program outputs), and Building Nursing Pathway's outcomes. Building Nursing Pathways comprised fourteen program components (column "B" of the logic model):

1. Create an Associate Degree in Nursing (ADN), a credential to prepare students for either RN licensure or entry into one of the state's Bachelor of Science in Nursing (BSN) programs.
2. Create an LPN-to-ADN degree option, allowing an incumbent licensed practical nurse (LPN) to obtain an ADN and RN licensure in one year instead of the conventional two-year time frame.

3. Create a Medication Assistant (MA) Certificate, a credential potentially completed during the ADN program certifying an MA to distribute medication under direct supervision in medical settings.
4. Create a concept-based curriculum, which moves from a content-saturated to a content-based curriculum to improve learning experiences.
5. Develop a clinical redesign, including simulation and simulation scenario, plus industry-standard equipment, to engage students in problem solving, care coordination, and decision making skills.
6. Create dual-admission, dual-enrollment pathways with RN to BSN programs in the state to facilitate access to further education for students who aspire to complete a BSN.
7. Create an online and technology-enhanced learning environment, through faculty technology-enhanced instructional strategies, podcast development, and online resources.
8. Create a simulation laboratory, leveraging high-fidelity mannequins, microphones, and video playback to increase learning and student competency with healthcare informatics.
9. Create a Project Advisory Committee and Partner Communications Plan with industry support to facilitate continuous employer engagement during project development and implementation.
10. Initiate faculty professional development that will allow faculty to fully leverage Building Nursing Pathways components such as the concept-based curriculum and the simulation lab.

11. Develop coaching, mentoring, advising, and career services for students through technology and additional FTEs which will primarily support Building Nursing Pathways students throughout their program experience.
12. Create a veterans services model with dedicated FTE support tailored to the unique needs of veterans in both educational and workforce contexts.
13. Create a Prior Learning Assessment (PLA) model that will translate past experiences and acquired skills into credit counting toward ADN program prerequisites.
14. Develop and institutionalize continuous assessment capacity leveraging student-tracking software which will make data retrieval and analysis more transparent and accessible.

PROGRAM MODEL

The centerpiece of Building Nursing Pathways is a rigorous, professionally-oriented education that prepares students for successful entry to the nursing labor market. The evidence-based academic dimensions of Building Nursing Pathways (see components #1 through #5 of logic model, Appendix B) draw from existing evidence-based standards and strategies being piloted and supported around the United States (for specific state-based programs see, for example, Nielsen, Noone, Voss, & Mathews, 2013; Tanner, Gubrud-Howe, & Shores, 2008; Starr, 2010). The use of Designated Educational Units, for example, which integrate students in the workplace in partnership with both faculty and clinical partners, is widely acknowledged to increase the quality of student learning experiences, increase learning of quality and safety competencies, and strengthen the education-practice partnership (Miller, 2004; Moscato et al., 2007).

A widely-praised and researched nursing curriculum from North Carolina centrally informed the development and creation of Building Nursing Pathways' curriculum. Known as the North Carolina Curriculum Improvement Project, this approach combined more than 40 concepts that are prevalent throughout a two-year associate degree in nursing, plus “best practices, through literature reviews and interviews with nursing faculty in other states,” to create a curriculum “steeped in concepts from areas that include medical and surgical nursing; maternal and child health; psychosocial care; health, wellness, and illness; patient safety; health care systems; evidence-based practices; quality improvement; management of care; interdisciplinary team process; informatics; and decision making” (Ralls, 2011, p. 308).

Existing research on nursing education and community/technical college programming also centrally informed related academic aspects of Building Nursing Pathways. The Prior Learning Assessment (PLA) dimension of Building Nursing Pathways (logic model component #13), for instance, is based on evidence which suggests PLA programming substantially improve student graduation rates and time to degree (Klein-Collins, 2010). The coaching, mentoring, and student services feature of Building Nursing Pathways (component #11) is also based on solid evidence demonstrating that wrap-around support services such as these improve persistence and retention, especially among vulnerable populations such as veterans (Bettinger & Baker, 2011; Perksy & Oliver, 2011). Since entry to Building Nursing Pathways is not based on an assessment of participants' abilities or skills *per se* but rather on the completion of prerequisite courses, these services are vital to serving a population of students with wide-ranging abilities and backgrounds.

EVALUATION DESIGN

This final report focuses on two primary evaluation goals related to analyzing Building Nursing Pathways' implementation and outcomes. These goals are based on the evaluation expectations outlined in the TAACCCT SGA and on feedback the Urban Institute provided on the preliminary evaluation plan submitted May 15, 2014.

Separate research questions guide the implementation and outcomes analyses of this evaluation report. These questions map onto distinct data collection strategies, also reviewed in this section.

EVALUATION GOALS

This report seeks to achieve two goals:

1. Analyze the steps Bellingham Technical College had taken by the end of Year 4 to create, operate, and sustain the Building Nursing Pathways program (i.e. gauge implementation fidelity and the extent to which all proposed program components were successfully implemented);
2. Evaluate the required U.S. Department of Labor outcomes and additional progress indicators to gauge Building Nursing Pathways' effectiveness in credential production and labor market results.

These goals were also the foundation of each interim evaluation report provided annually to the Building Nursing Pathways program.

IMPLEMENTATION - STUDY DESIGN

Five implementation-specific research questions explore the steps taken by Bellingham Technical College to create and run the Building Nursing Pathways program:

1. ***Capacity Building***: How was BTC's nursing program improved and expanded using grant funds? In addition to core academic programming, what were characteristics of the administrative structure and support services offered to students as a result of TAACCCT funding?
2. ***Engagement***: What contributions did program stakeholders and partners make across program activities?
3. ***Fidelity***: To what extent were core grant-funded activities implemented as proposed?
4. ***Sustainability***: To what extent have faculty and staff demonstrated a commitment to sustain key Building Nursing Pathways program components after TAACCCT grant funding ends?
5. ***Satisfaction***: How did students experience Building Nursing Pathways during the peak of its implementation processes?

PROGRAM LOGIC MODEL

Building Nursing Pathways is based on a rigorous, professionally-oriented education that prepares students for successful entry to the nursing labor market. A logic model (Appendix B) was created in Year 1 to structure the ongoing implementation analysis that was carried out for each of the four TAACCCT grant years. The logic model comprises inputs, such as Bellingham Technical

College's resources, TAACCCT funding, and the contribution of workforce partners, outputs (represented as Building Nursing Pathways' fourteen program components), and the outcomes and indicators used to gauge Building Nursing Pathways' effectiveness in credential production and labor market results. The program's logic model has served as a valuable tool to track implementation progress and engage stakeholders across the four years of Building Nursing Pathways' evaluation.

IMPLEMENTATION - DATA COLLECTION & METHODS

The analysis of Building Nursing Pathways' implementation across the four years of TAACCCT funding relied heavily on qualitative data. The nature of the evaluation questions (questions beginning with "How" and "What," for example) lent themselves to a qualitative approach because of the questions' open-ended structure (Patton, 2005). As a secondary approach, quantitative data were also collected but these efforts were based primarily on the measurement of expanded institutional capacity (faculty/staff FTEs, student enrollment, etc.).

Semi-structured interviews and document analysis were the centerpiece of the qualitative inquiry into Building Nursing Pathways' implementation. Interviews provided targeted data on each of the specific questions related to Building Nursing Pathways' implementation. By the end of Year 4, interviews had been conducted across a broad range of Building Nursing Pathways stakeholders (Table 1).

The interviews conducted each year followed a conventional semi-structured protocol in which the interview began with a set of uniform questions but subsequent questions followed whatever direction emerged from the interviewee's responses (Adams, 2010).

TABLE 1: DATA SOURCES FOR IMPLEMENTATION/PROCESS ANALYSIS

	Year 1	Year 2	Year 3	Year 4
Director of Nursing	✓		✓	
Faculty/Instructors	✓	✓	✓	
BNP Project Manager	✓	✓	✓	✓
BNP Project Coordinator	✓	✓	✓	
Nursing Transitions Advisor	✓	✓		
Instructional Technician	✓	✓		
Simulation Lab Coordinator	✓	✓		
Curriculum Developer	✓	✓		
Supplemental Instructors	✓			
Workforce partners		✓	✓	
Program participants	✓	✓		

Document analysis was also used as an important qualitative data collection strategy. Documents provided valuable data on the development and operation of many program components (Hatry, 2010). Documents that served as sources of qualitative data included:

- Internal reports written by Building Nursing Pathways staff
- Internal documents such as Building Nursing Pathways job descriptions, process flow charts, and program brochures
- External reports submitted by BTC to DOL
- Building Nursing Pathways meeting minutes and summaries

The analytic approaches to interview data and documents were distinct from each other. For interview data, a thematic approach was used whereby interview data were collected, reviewed for implementation-related themes that emerged within each interview, then analyzed across interviews to identify emergent themes. This identification of themes within and across interviews allowed for the corroboration of themes to the greatest extent possible given the diverse range of individuals from whom data were collected (Patton, 2005).

The analysis of documents was more narrow and deductive. Each document was approached with an eye to how the document could provide evidence that answered one or more of the four implementation-related research questions guiding this evaluation. For example, given a program document we question might be: “Does the document provide evidence of increased capacity at Bellingham Technical College?” (Research question #1); or, “Does the document provide insight into a partner’s role in the implementation of Building Nursing Pathways?” (Research question #2). From this diagnostic assessment, document content was then examined, categorized, and incorporated into broader implementation-related analyses.

OUTCOMES & IMPACT - STUDY DESIGN

Two outcome-specific research questions guided the evaluation of outcomes:

1. To what extent are students successfully completing the stackable and latticed credentials developed with TAACCCT funds at Bellingham Technical College?
2. To what extent are students achieving favorable outcomes, either in forward-transfer or in the labor market?

The analysis of outcomes for each year of TAACCCT funding focused on the nine outcomes required for evaluation by the TAACCCT solicitation for grant applications (SGA). To complement these nine outcomes, additional indicators of program effectiveness not required by the U.S. Department of Labor but of potential value to program managers were evaluated each year.

The nine specific outcomes outlined in the TAACCCT SGA must be evaluated across all years of grant funding (see Appendix F of the SGA, p. 76). These nine mandated outcomes were customized to Building Nursing Pathways as follows:

1. Total unique participants served, measured as the cumulative total number of individuals enrolled in the Building Nursing Pathways program in a given year;
2. Total number of participants completing a Building Nursing Pathways program of study, measured as the number of unique participants having earned all of the credit hours needed for one of the BNP credentials;
3. Total number of participants still retained in Building Nursing Pathways at the end of the grant period, which we measure as the number of unique participants enrolled who did not complete and are still enrolled in any of the credential programs at the end of the grant period;
4. Total number of participants completing credit hours, measured as the total number of students that have completed any number of credit hours at the time of our data collection;
5. Total number of participants earning credentials, measured as the total number of participants completing any one of the stacked or latticed credentials created through the TAACCCT grant;
6. Total number of participants enrolled in further education after completing a BNP credential, measured as the number of students who successfully transfer to Western Washington University's baccalaureate nursing program or other BSN programs in Washington State;

7. Total number of non-incumbent participants employed after completing any Building Nursing Pathways credential, measured as the total number of non-incumbent workers who begin employment in the quarter after the quarter of exit from the program;

8. Total number of non-incumbent participants retained in employment after completing any Building Nursing Pathways credential, measured as the total number of students who began employment in the quarter after the quarter of exit from the program and retained employment in the second and third quarters;

9. Total number of students employed at the time of Building Nursing Pathways enrollment who received a wage increase post-enrollment, measured as the total number of students who are incumbent workers who enrolled in any Building Nursing Pathways credential program and then who received a wage increase after enrollment.

A workforce indicator, based on a pre- and post-program measurement of changes in wages, allowed for measurement each year of the program's impact on wage-earning potential beyond the count reported for Outcome #9:

10. Building Nursing Pathways participants' changes in wages, measured as the mean difference (evaluated for significance with a two-tailed t-test) between pre-program wages and post-program wages for participants who exit with a particular BNP credential.

These measures provided multiple dimensions of Building Nursing Pathways' progress and results across each year of TAACCCT funding.

OUTCOMES & IMPACT - DATA COLLECTION & METHODS

The Building Nursing Pathways program staff served as the primary data source for Building Nursing Pathways' evaluation across the four years of TAACCCT funding. Data provided by program staff were used for two reasons. First, data provided by program staff were used for efficiency's sake; evaluation requests for data to BTC departments and state agencies would have otherwise duplicated requests that program staff had already made. For example, in Year 1 and Year 2 workforce data on labor market outcomes and wages were provided quarterly by staff from the Northwest Workforce Council (the local Workforce Investment Board, or WIB) to the Building Nursing Pathways program coordinator through a process that entailed Northwest Workforce Council staff looking up program participants' wage data one-by-one in a restricted-use database; requesting that Northwest Workforce Council staff carry out the same exercise with the evaluation team was deemed poor use of both parties' time and resources.

The cohort-based nature of how the Building Nursing Pathways program enrolled participants in Year 1 was the second reason why this evaluation relied heavily on data provided by program staff. In January, 2014, all students in BTC's nursing program were enrolled in Building Nursing Pathways. Within this population of newly-enrolled students were students entering BTC's nursing program for the first time; these students just entering the program were either students on the new grant-funded ADN pathway, which took six quarters to complete, or students on the new grant-funded LPN-to-ADN pathway, which took three quarters to complete. The first cohort of ADN pathway students completed their program of study in June, 2015; the first cohort of LPN-to-ADN pathway students completed the program in June, 2014. In addition to these students enrolling for the first time in BTC's nursing programs, the Building Nursing Pathways program also enrolled all other nursing students who were at different stages of earning a nursing credential. Since in the early years of TAACCCT funding the college's institutional student-level data contained no cohort identification for a given

nursing student (that is, the quarter the student gained admission to the program), the evaluation of outcomes therefore depended on program-level records to gauge which students were completing credentials in the first year of the program and beyond.¹

Five additional data sources complemented data provided by the Building Nursing Pathways program staff. First, data for Outcome #6 (the number of students that successfully forward transfer) came in multiple years from a query submitted to the National Student Clearinghouse via BTC's Office of Institutional Effectiveness (IE). Data provided from the National Student Clearinghouse provided an efficient means to explore the regional extent to which Building Nursing Pathways students continued their postsecondary education in pursuit of a baccalaureate credential.²

Second, the Northwest Workforce Council (the local WIB) provided data on pre- and post-program wages for program completers. These data, provided through a partnership between the Building Nursing Pathways program and the workforce investment board, required a labor-intensive process through which a WIB representative ran individual queries for each program completer each quarter.

Washington's State Board for Community and Technical Colleges (SBCTC) was the third source of outcomes data. These data, submitted quarterly starting in Year 3 through a data sharing agreement between Building Nursing Pathways and the SBCTC, replaced the need for data from the Northwest Workforce Council.

Building Nursing Pathways also facilitated a multiyear data sharing agreement with Washington State's Education Research and Data Center (ERDC) for

¹ Important also to note here is that both BTC and the nursing department's capacity for tracking student data expanded significantly under the TAACCCT grant. This point is discussed at length in the subsequent "Implementation Findings" portion of the report.

² The analysis of National Clearinghouse records revealed that no Building Nursing Pathways program completers transferred out-of-state so this data source was discontinued after Year 2.

student-level data. Data provided by ERDC, the state’s agency that links education and workforce data, was intended to provide a cursory analysis of program “impact” in alignment with the evaluation expectations described in the TAACCCT Solicitation for Grant Applications (p. 59-61, § C.1.a, which pertains specifically to measuring program impact through random assignment). These data, however, did not provide a sufficient sample size for the statistical analysis of program impacts. Appendix C contains a technical note describing the limitations that prevented a randomized or quasi-experimental program evaluation.

Surveys were used in Year 1, Year 2, and Year 4 to collect data from program completers regarding labor market outcomes. These data were generally used to corroborate data provided by state agencies although in some cases, such as with tracking non-incumbent program completers in Year 4, survey data were used since agency data were not feasible given the reporting timeline.

The sources of quantitative data used over the four-year evaluation of Building Nursing Pathways were diverse (Table 2). These data sources also reflect the value of the interim evaluation reports that were submitted annually to Building Nursing Pathways staff. The annual collection of outcomes data afforded opportunities to better identify efficient, novel data sources – such as SBCTC and ERDC – in the later years of TAACCCT funding.

TABLE 2: DATA SOURCES FOR OUTCOMES/IMPACT ANALYSIS

	Year 1	Year 2	Year 3	Year 4
Building Nursing Pathways Program Staff	✓	✓	✓	✓
Bellingham Technical College	✓	✓	✓	✓
Student Surveys	✓	✓		✓
National Student Clearinghouse	✓	✓		
Workforce Investment Board	✓	✓		
State Board for Community and Technical Colleges			✓	✓
Washington State Education and Data Research Center				✓

IMPLEMENTATION FINDINGS

OVERVIEW

The Building Nursing Pathways faculty and staff successfully and efficiently implemented their proposed eight core activities (Table 3). The rigorous concept-based curriculum and stability of core academic programs, ongoing professional development for faculty, and constant engagement of stakeholders and workforce partners in Year 3 and Year 4 were the result of high implementation fidelity in Year 1 and Year 2. The successful institutionalization of these eight core TAACCCT-funded activities serve as strong evidence of a meaningful commitment to, and likely continuation of, program success extending beyond the period of TAACCCT grant funding.

TABLE 3: IMPLEMENTATION TIMELINE FOR CORE TAACCCT-FUNDED ACTIVITIES

	Year 1	Year 2	Year 3	Year 4
Develop & implement curriculum, clinical redesign	11/1/13			03/31/17
Create simulation lab and curriculum	11/4/13	12/31/14		
Provide continuous assessment	11/4/13			9/29/17
Faculty professional development for curriculum	1/2/14		6/30/16	
Create online/tech enhanced learning environments	1/2/14		6/30/16	
Implement student support program	1/2/14			3/31/17
Provide targeted veteran support and PLA model	1/2/14		9/20/16	
Develop articulation pathways	3/3/14	9/22/15		
	<i>Start Date</i>	<i>End Date</i>		

CAPACITY BUILDING

Capacity building with TAACCCT funds was extensive at Bellingham Technical College throughout the four years of grant funding (Table 4). Assuming a broad definition of capacity building that captures sustainable program innovations, systems-level change that supports student retention, completion, and success in the labor market, plus improvements in processes and operations that facilitate program management and success, ample evidence demonstrates that TAACCCT funds supported a diverse range of capacity-building investments at Bellingham Technical College.³

Building Nursing Pathways program faculty and staff were highly aware of the increased capacity afforded by TAACCCT resources. When asked how Building Nursing Pathways had changed BTC's nursing program throughout the four years of grant funding, for example, faculty members readily gave examples of how grant funds were instrumental in allowing them to update and revise their pedagogy around a concept-based curriculum, incorporate technology into classroom activities, and make course materials more relevant to emerging workforce trends in nursing. Building Nursing Pathways staff also cited ways in which TAACCCT resources built capacity at Bellingham Technical College, most commonly referencing the increased support services for students that spanned the student experience continuum (from recruitment into the program to post-program career services) and staff dedicated to supporting the use of technology in the classroom. The quarterly and annual TAACCCT reporting requirements were also a powerful catalyst for the development of partnerships and resources to track student outcomes. Building Nursing Pathways staff partnered closely with the Office of Institutional Effectiveness and the college's registrar, for instance, to better track student outcomes and develop a data dashboard, one of the first of its kind at Bellingham Technical College.

³ This definition of "capacity building" is based on materials presented on the topic during a webinar for TAACCCT external evaluators on May 27, 2014, sponsored by the Urban Institute.

TABLE 4: TAACCCT-FUNDED CAPACITY BUILDING ACTIVITIES

Program Capacity Building ⁴			
Academic Capacity Building	Workforce Capacity Building	Academic and Workforce Capacity Building	
New workforce-driven credentials (ADN and MA certificates)	Contracted agreement with local Workforce Investment Board (WIB) to have a staff on campus daily to provide student support	Simulation lab translating classroom material into workforce-relevant skills and training	New processes and partnerships with local WIB to support data collection on workforce outcomes (employment, wages) for program assessment
New concept-based curriculum	Enhanced relationships with industry and workforce program partners through ongoing advisory meetings and a Partner Communication Plan	Development of Prior Learning Assessments (PLA) to accelerate progress toward credential completion	New partnership between nursing department staff and the college registrar to facilitate tracking of postsecondary outcomes at 4-year colleges using BTC's National Student Clearinghouse account
Additional faculty members hired	Implemented new learning technologies to expose students to cutting-edge workforce technology	Clinical redesign to focus on cultivating workforce-driven skills	New data sharing agreements between nursing department staff and state agencies (SBCTC, ERDC) to facilitate outcomes tracking
New partnerships with colleges to develop dual-admission, dual-enrollment pathways to baccalaureate degrees	Creation of a career services staff person (Nursing Transitions Advisor) dedicated exclusively to serving program students		
Supplemental instruction program to provide nursing-specific tutoring and support			

⁴ Appendix D contains an organizational chart which reflects the multiple faculty and staff positions that existed at the early stages of the program's implementation as part of the Building Nursing Pathways program between Year 1 to Year 3.

ENGAGEMENT

Throughout the four-year evaluation, ample evidence was collected to demonstrate that ongoing workforce partnerships between Building Nursing Pathways and employers/industry partners were active and productive. The central contribution of workforce partners was their role in placing Building Nursing Pathways nursing students in preceptorships throughout the region. More than ten facilities, comprising hospital settings and a wide range of care facilities, continue to partner with Bellingham Technical College's nursing program to provide on-site, applied learning opportunities for nursing students throughout their two years of training.

On-campus quarterly meetings brought together employers/industry partners, program faculty and staff, and other local stakeholders such as representatives from nearby Western Washington University (which offers a primary transfer destination for students seeking a Bachelor of Science in Nursing) and the local workforce investment board (Northwest Workforce Council). These quarterly meetings provided a valuable opportunity for employers and industry partners to hear program updates from faculty and staff. These meetings also provided an opportunity for employers/industry partners to provide valuable feedback to faculty and staff about workforce trends and experiences with recent grads. In addition to these quarterly meetings, the director of the nursing program also maintains close professional relationships with all workforce sites where program students complete their clinical rotations. This close, ongoing contact with a wide range of employers allows the program director important access to labor market trends and enhances here ability to connect the program's curriculum to the workforce.

Workforce stakeholders attributed their positive experience to a perception that they are an integral part of the program and that their perspective is well respected. “I think I speak for all of us,” said one industry partner in a focus group, “when I say we feel like this program is very purposefully programmed with employers in mind.” Employers spoke positively about the program’s leadership. “[The program director] is transparent, honest, and communicative,” explained an employer, “and she is always looking for feedback and is very responsive to feedback and making changes where necessary.” Added another employer, “She’s also runs a good meeting! That might not seem like a huge deal, but when we’re busy and only have 90 minutes to be away from the office, we appreciate she keeps us on track and shows respect for our time by making these [quarterly] meetings as productive as possible.”

**“THIS PROGRAM IS
VERY PURPOSEFULLY
PROGRAMMED WITH
EMPLOYERS IN MIND.”
- WORKFORCE PARTNER**

FIDELITY

The full implementation of all fourteen program components (as illustrated in column B of the program’s logic model, Appendix B) reflects a program-wide focus by faculty, staff, and the nursing program’s director to leverage TAACCCT grant resources as effectively and efficiently as possible.

- By the end of Year 1, Building Nursing Pathways had fully implemented the Associate Degree in Nursing (ADN) (Component #1), and the LPN-to-ADN degree option for incumbent health care workers who hold an LPN and seek to become a registered nurse (Component #2).

- The Medication Assistant (MA) Certificate, a credential certifying an MA to distribute medication under direct supervision in skilled nursing facilities (Component #3), was fully implemented in Year 3.
- A concept-based curriculum (Outcome #4) was in place and nursing students' clinical training was redesigned (Component #5) at the end of Year 1. Interviews with faculty revealed that the concept-based curriculum represented a major step forward in student learning at the college.
- Creating direct transfer agreements (DTA) with BSN programs in the state (Component #6) were fully implemented by the end of Year 2. These agreements, intended to facilitate access to further education for students who aspire to complete a BSN, were part of a statewide effort to link community and technical college completion requirements for nursing with four-year college BSN entrance requirements.
- Creating online and technology-enhanced learning environments (Component #7) were fully implemented in Year 1 and continuously improved throughout subsequent years of TAACCCT funding. Technology-related activities included the migration of course material to an online Learning Management System (Canvas) and the addition of clinical training resources (e.g. safeMedicate and Pearson's MyNursingLab).
- The simulation laboratory, leveraging high-fidelity mannequins, microphones, and video playback to increase learning and student competency with healthcare informatics, was fully operational in Year 1 (Component #8). Every student enrolled in Building Nursing Pathways used and benefited from the simulation laboratory and its technology.

- The Project Advisory Committee and Partner Communications Plan (Component #9) were fully implemented at the end of Year 2.
- Faculty professional development (Component #10) that allowed faculty to fully leverage Building Nursing Pathways' components, such as the concept-based curriculum and the simulation laboratory, were implemented across the three program years of grant funding, concluding in June, 2016.
- The creation of a veterans services model with dedicated FTE support tailored to the unique needs of veterans in both educational and workforce contexts (Component #12) was implemented by the end of Year 2. Building Nursing Pathways' veteran support initiatives dovetailed with Bellingham Technical College's efforts, such as the college's recertification in 2015 as a "Veterans Supportive Campus" by the Washington State Department of Veterans Affairs.
- Prior Learning Assessments (PLA) to translate past experiences and acquired skills into credit counting toward ADN program prerequisites (Component #13) were fully implemented in Year 3 (November, 2015). This PLA developed by Building Nursing Pathways was the first of its kind to be adopted at Bellingham Technical College.
- The development and institutionalization of continuous assessment, leveraging internal reporting and student-tracking software, (Component #14) was fully implemented across the four-year evaluation period.

Building Nursing Pathways faculty and staff were steadfast in their commitment to implementing program components as proposed. This high level of implementation fidelity was undoubtedly a key factor in the program's success.

SUSTAINABILITY

An important implementation-related question began to emerge during interviews with faculty and staff at the end of Year 2: How will Bellingham Technical College sustain key Building Nursing Pathways program components after TAACCCT grant funding ends? This question of program sustainability is central to programs, such as Building Nursing Pathways, with finite streams of external funding (Scheirer, 2005).

With leadership from the nursing program's Assistant Dean, Bellingham Technical College's fiscal year 2017-2018 operating budget maintained the nursing department's programmatic funding at the enrollment levels made possible by TAACCCT. At this enrollment level, of 120 students, BTC's nursing program sustains the substantial increase in enrollment capacity made possible by TAACCCT funding. Beyond the financial support needed to support instruction, institutional funds have also been earmarked to support the student-related staff positions created as part of Building Nursing Pathways. Concerted efforts to secure funding, for example, were successful in maintaining the Nursing Student Navigator position, a staff role identified in past evaluation reports as being a critical component to student success.

Along with increased enrollment and efforts to institutionalize student support structures, a long-lasting legacy of TAACCCT funding will be the nursing department's accreditation by the Accreditation Commission for Education in Nursing (ACEN). The multiyear process through which the nursing department worked toward national accreditation was supported by TAACCCT across three dimensions:

1. *Program enhancements*: Funding tied to Building Nursing Pathways was the catalyst for creating a concept-based curriculum and a clinical redesign, two factors which substantially enhanced the academic rigor of

the nursing program. In particular, the concept-based curriculum was referenced extensively in the accreditors' site visit report as evidence of the program's commitment to a modern, rigorous nursing curriculum. The accreditors' site visit report also acknowledged that the nursing faculty, in creating the concept-based curriculum in partnership with a curriculum design specialist, drew heavily from evidence-based resources to maximize the curriculum's potential for positive learning outcomes.

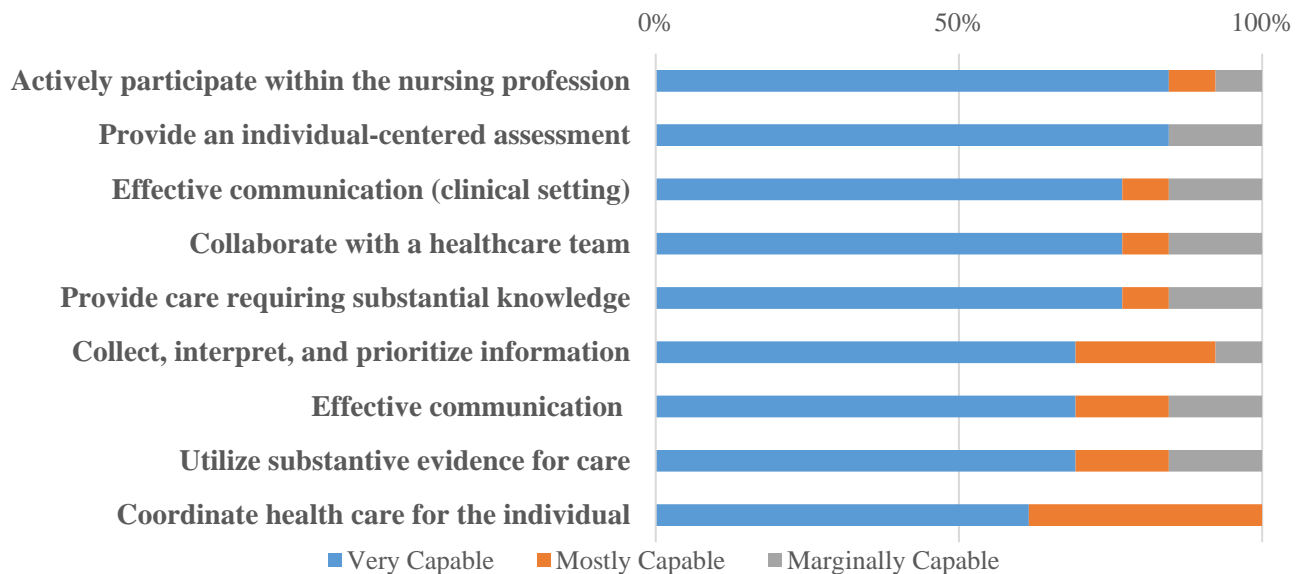
2. *Student achievement:* A central benchmark for accreditation by the Accreditation Commission for Education in Nursing is student achievement. Specifically, ACEN evaluates three "expected levels of achievement" – program completion, job placement, and performance on the National Council Licensure Examination (NCLEX), the exam required to work as a registered nurse. Although Bellingham Technical College's nursing department monitored these outcomes closely before receiving the TAACCCT grant, the DOL's central focus on program completion and labor market outcomes allowed Building Nursing Pathways to target resources specifically to these outcomes. Such TAACCCT-funded staff positions as supplemental instructors, a veterans services coordinator, and a nursing transitions advisor attributed directly to students' improved academic and professional success.
3. *Outcomes tracking:* The DOL's quarterly and annual performance reporting requirements provided resources for the Building Nursing Pathways staff to develop systems to track and store student data. These systems, combined with the numerous data points that ACEN requires for accreditation, laid the groundwork for the nursing department's continuing commitment to data-driven decision making.

STUDENT SATISFACTION

A survey of program completers was undertaken in Year 2 to gauge the extent to which students were satisfied with the Building Nursing Pathways program during the peak of its implementation processes. Program completers were also purposefully selected in Year 2 for follow-up interviews to more thoroughly probe their experiences in the program. The overall response rate for the survey was 51%; the sample size of qualitative interviews was five.

Survey results demonstrate that students exit the program well prepared across a broad range of nursing skills and tasks.⁵ Across nine areas of nursing competence, for instance, more than 90% of students gauged their level of preparation as either “very capable” or “mostly capable” (Figure 1).

FIGURE 1: PROGRAM COMPLETERS’ ASSESSMENTS OF THEIR CAPABILITIES



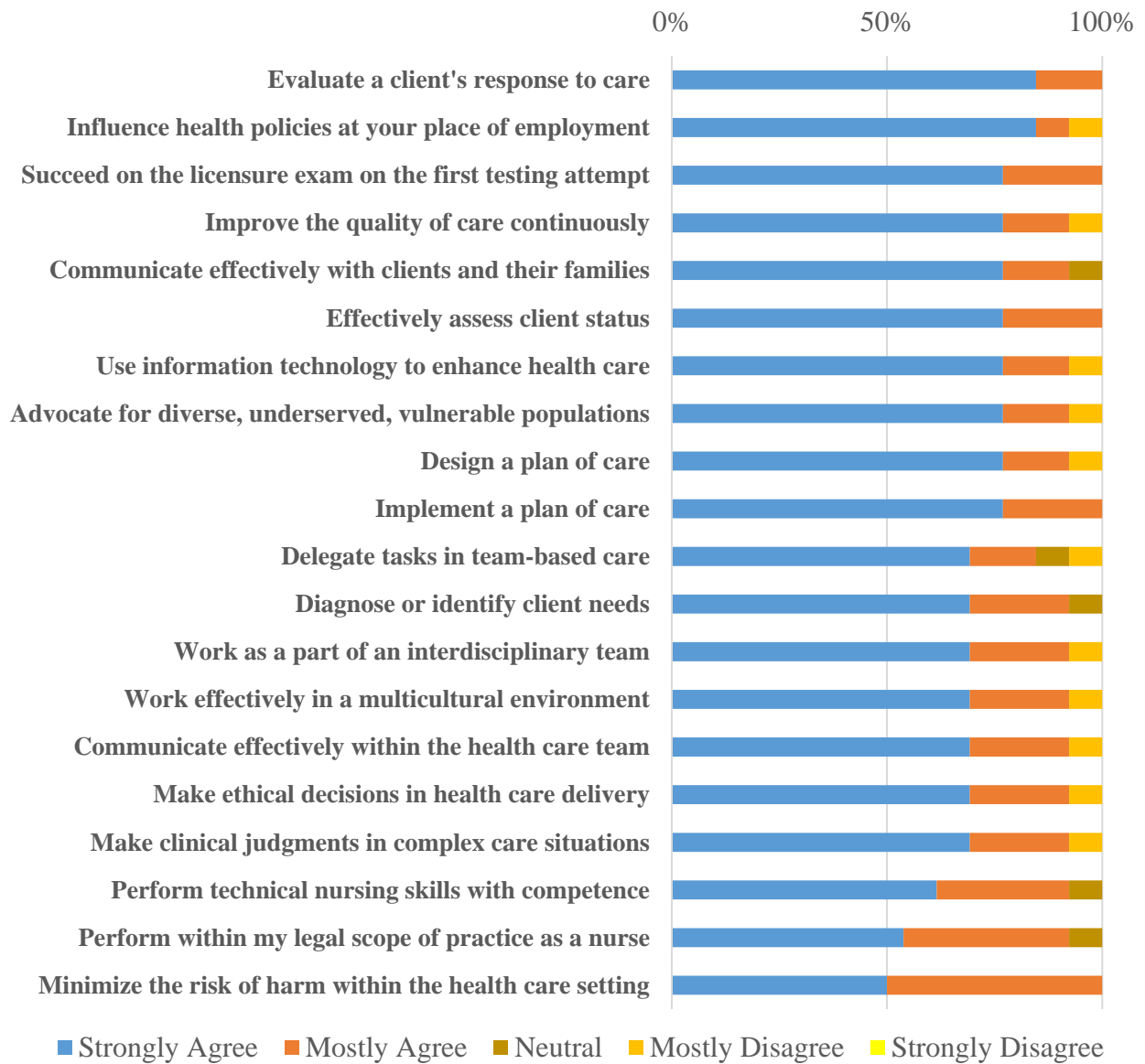
These survey data on nursing skills, as with the nine areas of nursing competence, illustrate that close to 90% of students either strongly or mostly agree that

⁵ Appendix E contains a list of these competency-related questions that students were asked to consider in the survey.

Building Nursing Pathways prepared them to carry out the central tasks that comprise a nurse’s skill set.

Figures 2 illustrates the 18 skills (as ranked by the percent of students responding “strongly agree”) that program completers were asked to consider relative to the extent that Building Nursing Pathways prepared them to do such a task.

FIGURE 2: PREPAREDNESS, RANKED BY “STRONGLY AGREE”



Qualitative interview data collected in Year 2 corroborated these survey results. The overall theme of interviews was that students were very pleased with their experiences in the Building Nursing Pathways program. Specifically, the benefit of intersecting academic and professional experiences was the most common theme to emerge across students. Students experienced an academic program at Bellingham Technical College that they described as “rigorous,” “practical,” and “hands-on.” Students applauded the concept-based curriculum and found the material intuitive and conducive to learning. “It’s so much easier to learn these nursing concepts and how they’re all interconnected,” noted one student, “compared to just going through a textbook chapter by chapter.”

The “real life” training students received was also identified as a point of value. “The instructors are very good at encouraging us to participate in real life

**“MY INSTRUCTORS MADE
ME REALLY FEEL LIKE I
COULD EARN A BSN.”
- PROGRAM STUDENT**

scenarios and clinical situations that empower us to take on the difficulties of the RN role as an employee,” explained one student. “I’m not sure I’ll ever be totally ready to be a nurse until I’m on the floor,” opined another student, “but I feel like my instructors made me as prepared as I can possibly be.” Multiple students reflected on that fact that their instructors also became their nursing role models during the program. Students appreciated that their instructors have diverse clinical experience and could draw from a broad range of contemporary, relevant experiences in the field. Instructors also served to boost students’ aspirations, as was evident by one student’s reflection on her future: “I never would have considered a BSN [Bachelor of Science in Nursing] before this program but my instructors made me really feel like I could earn a BSN. I’m actually going to make that happen now.”

Students also expressed that they felt competitive in the labor market upon completing a Building Nursing Pathways credential. Students used phrases such

as “challenging but rewarding” and “worth the steep learning curve” when describing their clinical experiences and uniformly acknowledged these clinical experiences were critical to their success in the labor market. The hospital setting for their clinical rotation, however, proved to be an area where students diverged in their opinions: some students expressed a desire to spend more time training in a hospital setting while others expressed a desire to spend their clinical training outside a hospital setting since their career aspirations did not involve hospital-based employment. Aside from this minor difference in opinions about the importance of the hospital setting, students were uniformly pleased with their clinical experiences.

Students appreciated that the Building Nursing Pathways program was accessible to a broad range of ability levels and backgrounds. “I like that you don’t need a bachelor’s degree just to get into the program,” explained one student, “because that’d mean I wouldn’t be here.” Multiple students acknowledged, and expressed appreciation, that Building Nursing Pathways’ admissions standards were competitive but not so competitive as to be exclusionary.

Noted another student on the theme of access, “[Building Nursing Pathways] did a really good job of making classes available at night and on weekends, and providing lots of online resources, so that a working mom like me can go to school and earn a degree. No way I could make this happen at a regular university with just daytime classes.”

OUTCOMES/IMPACT FINDINGS

OVERVIEW

Annual outcomes were reported in each of the three previous interim evaluation reports and compared to the outcome projections provided in the Building Nursing Pathways grant application. In this final report, outcomes are instead reported across the four years comprising the evaluation period. Each outcome is then aggregated and compared to its overall projection to gauge the extent to which Building Nursing Pathways achieved its objectives in degree production and workforce results.

Table 5 contains the five outcomes which represent the core of the stacked and latticed credentials that comprise Building Nursing Pathways degrees (Table 5). Since the program enrolled no new students in the grant period’s fourth year, Outcomes #1, 3, and 4 are zero.

TABLE 5: CREDENTIAL PRODUCTION OUTCOMES, YEAR 1 TO YEAR 4

Outcome	Annual Counts				Total
	Year 1	Year 2	Year 3	Year 4	
1. Total unique participants served in any BNP credential program	147	83	38	0	268
2. Total number of participants completing any BNP credential	39	65	73	55	232
3. Total number of participants still retained in any BNP program at the end of year	107	82	38	0	227
4. Total number of participants completing any BNP credit hours	111	86	67	0	264
5. Total number of participants earning any BNP credential (MA certificate or ADN)	39	65	73	55	232

The trend in Table 6, illustrating an increase of students pursuing postsecondary education upon attainment of a Building Nursing Pathways credential, reflects the program’s concerted effort to foster students’ aspirations toward a baccalaureate degree. As noted in the implementation analysis, a number of key factors (instructors’ support, the development of the direct transfer agreements, etc.) emerged during the four years of TAACCCT funding to shift the culture of BTC’s nursing program toward BSN attainment as a realistic and attainable goal for program students.

TABLE 6: CONTINUED POSTSECONDARY EDUCATION OUTCOME, YEAR 1 TO YEAR 3

Outcome	Annual Counts				
	Year 1	Year 2	Year 3	Year 4	Total
6. Total number of participants enrolled in further education after BNP completion (WWU and other universities’ BSN programs)	3	12	13	7	35

The final three outcomes pertaining to the workforce (Table 7) require context to interpret. First, the total number of non-incumbent participants employed after completing any Building Nursing Pathways credential (Outcome #7) was low across the three years of active programming relative to those earning credentials. Yet this low figure is a function of a student population that is primarily *incumbent participants*, not a shortcoming of Building Nursing Pathways ability to place non-incumbents in the workforce. The nature of nursing is such that most students who pursue a credential like those offered by Building Nursing Pathways have prior healthcare experience which qualifies them as incumbent. This figure is more meaningful when the number of non-incumbents employed upon graduation (Outcome #7) is considered against the total number of non-incumbent completers for a given year. In that case, the program boast an employment rate of non-incumbents of 88% in Year 1, 93% in Year 2, and 77% in Year 3.

A related constraint impedes Outcome #8, the total number of non-incumbent workers who attained employment for three consecutive quarters upon completing a Building Nursing Pathways credential. Since the number of non-incumbent individuals employed after program completion is modest, the total number of program completers meeting the criteria for Outcome #8 would generally be equal to or less than the result of Outcome #7 for the previous year. Moreover, nearly all nursing students who compete the program usually take several months after graduating to prepare for, schedule, and pass the state exam for nursing licensure (NCLEX); this process leads to an employment lag that may be observed in the data collected for Outcome #7 and Outcome #8. Nonetheless, across the first two years of TAACCCT funding for which data were available, Outcome #8 illustrates that of those non-incumbents gaining employment upon program completion, between 85% and 90% remain employed in subsequent quarters.

TABLE 7: WORKFORCE OUTCOMES, YEAR 1 TO YEAR 3

Outcome	Annual Counts ⁶				
	Year 1	Year 2	Year 3	Year 4	Total
7. Total number of non-incumbent participants employed after BNP completion	7	13	12	15	45
8. Total number of non-incumbent workers who completed any BNP credential, gained employment the quarter after completion, and remained employed in the second and third quarters after BNP exit	7	11	-	-	18
9. Total number of incumbent workers who enrolled in any BNP program and received an increase in wages post-enrollment	19	29	39	24	111

Outcome #9 reflects a clear, important labor market outcome: the capacity to earn a higher wage upon completion of a postsecondary credential. The trend seen

⁶ Year 4 outcomes are underestimated based on data reporting constraints and a lag between when a program completer begins employment and employment records are available.

across Outcome #9 illustrates that an increasing number of program completers each year attained a post-program wage increase. Examined as a proportion of incumbent program completers, Outcome #9 increases from 50% in Year 1 to 60% by Year 3.

The workforce indicator examining pre- and post-program wage changes provides additional insight into program completers’ labor market experiences upon completion of a Building Nursing Pathways credential. The workforce indicator is an extension of Outcome #9 but provides a more precise estimate of wage outcomes beyond a count of those Building Nursing Pathways participants who experience a wage increase post-program.

Program completers’ changes in wages (Table 8, first row) provide some of the strongest evidence of the positive impact that Building Nursing Pathways had on program participants. Across the three years of TAACCCT grant funding students’ hourly wages, on average, increased substantially. Even in Year 3, with the hourly increase of \$6.78 as the least of the average increases across the three years, this figure a boost in pre-tax earnings of \$14,102 for a full-time worker compared to an annual pre- and post-program income.

TABLE 8: PRE- AND POST-PROGRAM CHANGES IN WAGES, YEAR 1 TO YEAR 3

Indicator	Year 1 Completers	Year 2 Completers	Year 3 Completers
Participants’ changes in hourly wages, pre- and post-program ⁷	+ \$8.16	+ \$9.24	+ \$6.78
Average change in hourly wages in Whatcom County ⁸	- \$0.05	+ \$0.21	+ \$1.19

⁷ This difference is significant at 95% confidence for each of the three years evaluated.

⁸ Employment Security Department, Washington State; Average hourly wages from 1990 through 2016 by county.

These substantial wages increases attributable to program completion are more striking when considered within the context of the local economy. The average change in Whatcom County hourly wages (Table 8, second row) over the time a student was enrolled in Building Nursing Pathways contextualizes the observed changes in hourly wages experienced by program completers. In other words, a student who completed the program in Year 1 would have entered the program in 2012 when the average hourly wage in Whatcom County was \$25.48/hour; at the time of degree attainment in 2014, the average hourly wage in Whatcom County was \$25.43/hour, a two-year difference of $-\$0.05$. Hence, while wages were stagnant in the county over those two years, the Year 1 program completer would, on average, earn an hourly wage that was $\$8.16$ *more* than her hourly wage prior to program enrollment.

Turning finally to the comparison of actual outcomes to project outcomes (Table 9), the extent to which Building Nursing Pathways exceeded its projections across multiple outcomes demonstrates clear evidence of program effectiveness. In particular, note that all five outcomes related to enrollment and degree production (Outcomes #1 through #5) exceed the program's projections by a substantial margin. The numbers of students continuing postsecondary education upon credential completion (Outcome #6) and the total number of incumbent workers receiving a wage increase post-enrollment (Outcome #9) are within only a few percentage points of 100% attainment.

The two outcomes for which Building Nursing Pathways did not achieve its projections, those related to non-incumbent workers (Outcome #7 and Outcome #8), reflect the nature of nursing programs' prerequisites, not a program flaw. A more accurate evaluation of the non-incumbent experience upon Building Nursing Pathways credential attainment might be captured in the question, "What proportion of those non-incumbents employed upon program completion remained employed three quarters later?" In this context, Building Nursing

Pathways is highly effective at training non-incumbents to enter nursing as more than 75% or more typically remained employed.

TABLE 9: OUTCOMES, ACTUAL VS. PROJECTED

Outcome	Attainment relative to projection
1. Total unique participants served in any BNP credential program	114%
2. Total number of participants completing any BNP credential	148%
3. Total number of participants still retained in any BNP program at the end of year	146%
4. Total number of participants completing any BNP credit hours	112%
5. Total number of participants earning any BNP credential (MA certificate or ADN)	148%
6. Total number of participants enrolled in further education after BNP completion (WWU and other universities' BSN programs)	93%
7. Total number of non-incumbent participants employed after BNP completion	39%*
8. Total number of non-incumbent workers who completed any BNP credential, gained employment the quarter after completion, and remained employed in the second and third quarters after BNP exit	18%*
9. Total number of incumbent workers who enrolled in any BNP program and received an increase in wages post-enrollment	97%

* The data collection challenges for these figures and the missing data problems with reporting Outcome #7 and Outcome #8 mean the validity of these figures is dubious.

CONCLUSION

This report concludes by returning to the two goals that motivated the evaluation of Building Nursing Pathways across its four years of TAACCCT funding:

1. Bellingham Technical College's faculty and staff were dedicated to a focused, intentional implementation of the Building Nursing Pathways program. The program's fourteen components were implemented with an exceptionally high level of fidelity. Faculty and staff have made concerted efforts to sustain the program improvements and capacity built with TAACCCT funding.
2. The outcomes evaluated across the four years of Building Nursing Pathways demonstrate an efficient and effective use of TAACCCT funds to produce relevant, high-demand workforce credentials. Program completers experience substantial benefits in terms of options for furthering their postsecondary education, employment opportunities, and post-program wage increases.

IMPLICATIONS FOR FUTURE PROGRAMMING

Four valuable themes emerged from the evaluation of Building Nursing Pathways. These themes have implications for future programming, both at Bellingham Technical College and more broadly, for community and technical college programs faced with a potential program expansion.

1. ***An important link exists among implementation fidelity, program outcomes, and student satisfaction.*** The surveys conducted in Year 2 were intentionally scheduled for that timeframe to explore how students experienced a rapidly-changing academic program. In Year 1 and Year 2,

Building Nursing Pathways faculty and staff pursued an ambitious implementation timeline; student dissatisfaction was a potential risk of such a rapid implementation. Both survey results and interviews revealed, however, that students were pleased with their program experience. As noteworthy was the fact that by Year 2, degree production had nearly quadrupled compared to the pre-TAACCT baseline level of degree production. This substantial boost in credential production, while maintaining a high level of student satisfaction, was a consequence of faculty and staff closely following the program proposal and monitoring both progress made and emergent circumstances that required troubleshooting. For instance, when feedback about a learning software program revealed mounting student frustration, faculty and staff quickly moved to a new software that better facilitated learning. This type of flexibility – remaining focused on the fourteen program components but flexibility in how each was implemented – created a responsive, student-centered program environment.

- 2. Student support enhances multiple dimensions of program experience and employment outcomes.*** Accolades for the nursing transitions advisor (also known as the student nurse navigator) was a uniform theme to emerge across student interviews, faculty interviews, survey data, and the Accreditation Commission for Education in Nursing accreditation report. The nursing transitions advisor position demonstrates the impact, which can be significant, of a single FTE position dedicated to student success. From helping students buy textbooks and find childcare to reviewing resumes and connecting program completers with potential employers, the nursing transitions advisor was an advisor, coach, and mentor to Building Nursing Pathways students. The foresight of faculty and staff in making this position part of the Building Nursing Pathways program demonstrates a valuable lesson in making student support a centerpiece of any community and technical college program.

3. ***The central involvement of workforce partners simultaneously enhances students' academic experience and opportunities in the labor market.***

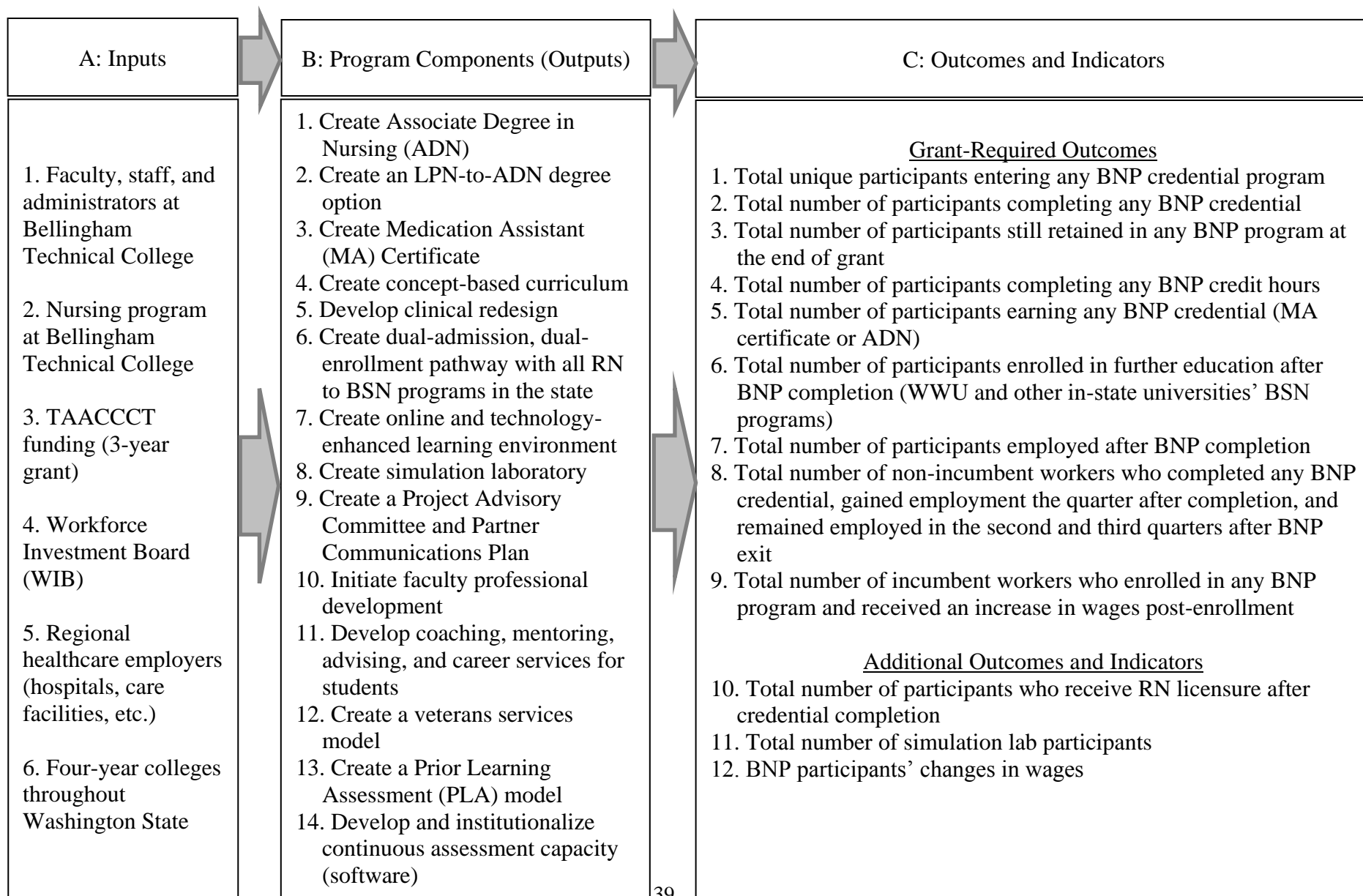
TAACCCT support augmented strong existing relationships between Bellingham Technical College's nursing department and its workforce partners. The Nursing Advisory Committee, for instance, comprises faculty, staff, and workforce partners, and existed prior to Building Nursing Pathway's implementation. The committee's existence and organizational structure, however, guaranteed that from its genesis the TAACCCT-funded Building Nursing Pathways program would have employer input as a programming centerpiece. The insights that employers provided shaped developments in curriculum, pedagogy, and preceptorships. The close connection between workforce partners and Building Nursing Pathways also ensured that program completers were leaving the program with the high-demand skills that would make them competitive in various healthcare labor markets.

4. ***Performance reporting requirements motivate investments in data systems and data-driven decision making.*** Scarce resources mean that community and technical colleges face challenges in developing their capacity to track student outcomes and use such data in decision making processes (Morest & Jenkins, 2007). TAACCCT funding allowed Building Nursing Pathways to infuse data collection and outcomes reporting throughout Bellingham Technical College's nursing department and the broader college. Internally, for example, the development of a data dashboard for Building Nursing Pathways staff became a template for other departments at Bellingham Technical College. Similarly, Building Nursing Pathways' request to the Education Research and Data Center (ERDC) represented the first request made to that agency by any department at Bellingham Technical College. These innovations, bringing important data points into departments' decision making processes, were facilitated by TAACCCT funds and reporting requirements.

APPENDIX A: ABBREVIATIONS AND ACRONYMS

ACEN	Accreditation Commission for Education in Nursing
ADN	Associate Degree in Nursing
BNP	Building Nursing Pathways
BSN	Bachelor of Science in Nursing
BTC	Bellingham Technical College
DOL	U.S. Department of Labor
ERDC	Education Research and Data Center
LPN	Licensed Practical Nurse
MA	Medication Assistant Certificate
NWC	Northwest Workforce Council
IE	Office of Institutional Effectiveness (at BTC)
PLA	Prior Learning Assessment
SBCTC	State Board of Community and Technical Colleges
SGA	TAACCCT Solicitation for Grant Application
TAACCCT	Trade Adjustment Assistance Community College Career Training Grant Program
WIB	Workforce Investment Board
WWU	Western Washington University

APPENDIX B: BUILDING NURSING PATHWAYS LOGIC MODEL



APPENDIX C: TECHNICAL NOTE ABOUT IMPACT ANALYSIS

The preferred evaluation method for the TAACCCT grant program was a quasi-experimental impact analysis in situations where random assignment of treatment was not feasible. This discussion reviews why neither random assignment nor quasi-experimental approaches were feasible given the intervention, the nature of student participation, and the samples sizes of expected outcomes over the course of the grant period. Based on these programmatic constraints, the evaluation focused on outcomes only (i.e. the nine outcomes discussed in the previous section) plus a limited analysis examining a pre- and post-workforce indicator.

BTC stakeholders designed Building Nursing Pathways to serve as many students as possible given the high labor market demand for nurses and the relatively small size of BTC's nursing programs compared to others in Washington State. For this reason of maximizing participation, random assignment was not considered given that randomization requires some students be denied the program's "treatment." The intervention design also contains a range of interrelated components, such as faculty professional development and the development of advising and career services for students, which would make maintenance of treatment and control groups difficult if not impossible on a small community or technical college campus. In other words, a faculty member receiving professional development as part of Building Nursing Pathways may teach students not randomly selected for the program treatment and thus violate the stable unit treatment value assumption (SUTVA). SUTVA, which holds that an experimental participant's response must depend only on the treatment effect of the group to which she was assigned (Rubin, 1974 1991), would be further violated if a student in a treatment group received career counseling and then shared this counseling with a peer in a control group.

The characteristics of Building Nursing Pathways which make random assignment infeasible also render unfeasible the use of a quasi-experimental econometric approach to evaluate causal impacts associated with BNP participation. A briefly summary is warranted as to why quasi-experimental methods are not feasible given the nature of BNP's design and implementation. This discussion is based on quasi-experimental methods identified by Murnane and Willett (2011) since Eide and Showalter (2012) opine that this "first-rate book" is "a valuable resource

to education researchers and social scientists...[and] has the potential to raise the quality of education research and provide more credible causal estimates of important education interventions” (p. 748). Specifically, this discussion examines why a 1) natural experiment, 2) regression discontinuity, and 3) propensity score matching are not feasible. None of these approaches, in the specific context of Building Nursing Pathways, replicate pure exogenous treatment assignment and thus cannot yield two groups which are equal in expectation.

Beginning with the feasibility of a natural experiment, no way existed during TAACCCT funding to replicate pure random assignment based on a lottery or other “forcing variable” that assigned program participation solely on randomization. The lottery (and its associated caveats) used by Building Nursing Pathways in Year 1, Year 2, and Year 3 for program entry was not methodologically rigorous because student circumstances in some cases (e.g. veteran status, or being grandfathered in from a pre-TAACCT program) had priority over others in the lottery.

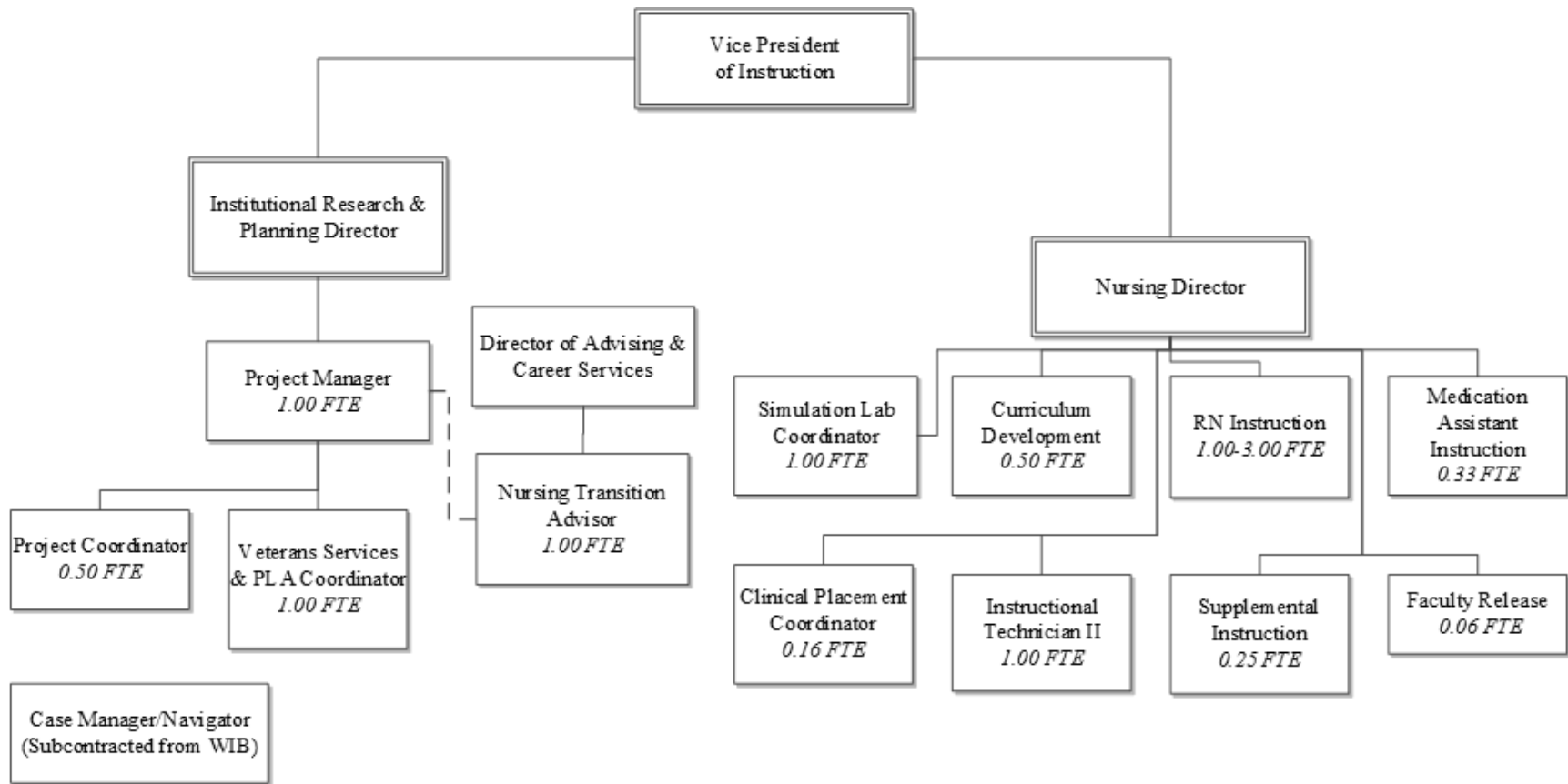
Regression discontinuity is invalid for a similar reason. Participation in Building Nursing Pathways is available to any student seeking a nursing credential at BTC and thus does not depend on assignment variable cut-points dictating participation eligibility. Since all eligible students were enrolled in Building Nursing Pathways in Year 1, no comparison group that facilitates a difference-in-difference analysis exists i.e. only first-differences could be calculated based on the chronological aspect of implementation in Year 1.

Matching, such as with propensity scores, is an increasingly common approach to infer causality between a program or policy and an impact of interest. A matching approach is not feasible, however, based on two programmatic factors. First, the use of propensity scores is problematic in this evaluation because there are no criteria which provide variation on an individual’s probability of BNP participation; incorporating participation criteria into the model that generates propensity scores is a critical, if not *the* critical, dimension of effectively using this method for program evaluation (Agodini & Dynarski, 2004). Program staff use no quantitative, scaled assessment of participants’ abilities, skills, and interests, nor is any type of quantitative, scaled placement test used, to determine program participation; program entry is based on a student’s completion of prerequisite courses.

The enrollment of all eligible BTC nursing students in Year 1 of the TAACCCT grant at BTC is the second reason the use of a quasi-experimental matching approach is invalid. By necessity, since all eligible nursing students at BTC were enrolled in Building Nursing Pathways, a matching approach would require pooling BTC nursing student data from past years with TAACCCT-years nursing student data and regressing program participation on student characteristics, including a binary variable to represent each year of data included in the model. Yet including a variable representing each year creates a model with a perfectly collinear variable in which all years preceding Building Nursing Pathways would predict no participation and all Building Nursing Pathways would predict participation. On the other hand, modeling the probability of participation (to generate propensity scores) using multiple years of data without accounting for the student's year is nonsensical given that one would undoubtedly expect year-to-year variation across student cohorts. Put simply: the wide-ranging access of Building Nursing Pathways in Year 1 means the effects of the intervention are indistinguishable from the effects of time in any regression model on which a quasi-experimental approach would depend.

Under circumstances where extensive participation criteria existed and program participation varied across eligible students over the years in which the TAACCCT grant was administered, propensity scores could have indeed provided a valid means to predict program participation and thus facilitate matching between observably similar individuals who vary only on participation. In reality, however, BTC institutional data contain few individual-level variables on which such an analysis could regress a binary participation variable, let alone variables representing program participation criteria. Given the increasing skepticism around using propensity scores to infer any type of causal relationship between programs and outcomes (i.e. Agodini & Dynarski, 2004; Peikesa, Morenoa, & Orzola, 2012; Pirog et al, 2009; Wilde & Hollister, 2007), a conclusion was ultimately reached that the use of propensity scores or a similar matching method was inappropriate given the characteristics of this TAACCCT-funded program.

APPENDIX D: BUILDING NURSING PATHWAYS ORGANIZATIONAL CHART



APPENDIX E: YEAR 2 SURVEY QUESTIONS

Based on my education at Bellingham Technical College Nursing Program, I am prepared to:

1. Provide care requiring substantial knowledge, judgment, and skill based on the principles of biological, behavioral, health, and nursing sciences.
2. Provide an individual-centered assessment and implement caring interventions.
3. Actively participate within the nursing profession by seeking opportunities for continued learning, self-development, leadership, and management skills.
4. Use effective communication techniques to: therapeutically interact with the individual/family and provide health education.
5. Use effective communication techniques to: completely and accurately convey information to other professionals and coworkers; establish rapport, educate, and resolve conflict.
6. Utilize substantive evidence to demonstrate critical thinking, decision making, and problem solving by reflecting on, integrating, and building upon theoretical concepts.
7. Collaborate with the interdisciplinary healthcare team to advocate for positive individual, organizational, and community outcomes.
8. Coordinate health care for the individual including appropriate allocation of resources, quality improvement processes, and informatics to formulate evidence-based clinical judgments and decisions.
9. Collect, interpret, and prioritize information from a variety of sources to provide safe evidence-based nursing care using a legally-defined scope of practice and professionally defined standards.

Response options:

Very capable

(I can complete this task without direction)

Mostly capable

(I can complete this task with occasional assistance)

Marginally capable

(I need frequent direction and assistance with this task)

Not capable on my own

(I need continuous direction and assistance with this task)

Please rate your satisfaction with the degree to which Bellingham Technical College's nursing program prepared you to do the following:

1. Perform within my legal scope of practice as a nurse
2. Succeed on the licensure exam on the first testing attempt
3. Make clinical judgments in complex care situations
4. Make ethical decisions in health care delivery
5. Perform technical nursing skills with competence
6. Influence health policies at your place of employment
7. Use information technology to enhance health care delivery
8. Improve the quality of care continuously
9. Minimize the risk of harm within the health care setting
10. Work as a part of an interdisciplinary team
11. Delegate tasks in team-based care
12. Work effectively in a multicultural environment
13. Advocate for diverse, underserved, or vulnerable populations
14. Communicate effectively with clients and their families
15. Communicate effectively within the health care team
16. As part of the nursing process, effectively assess client status
17. As part of the nursing process, diagnose or identify client needs
18. As part of the nursing process, design a plan of care
19. As part of the nursing process, implement a plan of care
20. As part of the nursing process, evaluate a client's response to care

Response options:

Strongly Agree Mostly Agree Neutral Mostly Disagree Strongly Disagree

APPENDIX F: BUILDING NURSING PATHWAYS PROJECTED OUTCOMES

Outcome	Year 1	Year 2	Year 3	Year 4*	Total
1. Total unique participants served in any BNP credential program	90	85	60		235
2. Total number of participants completing any BNP credential	25	72	60		157
3. Total number of participants still retained in any BNP program at the end of grant	55	55	45		155
4. Total number of participants completing any BNP credit hours	90	85	60		235
5. Total number of participants earning any BNP credential (MA certificate or ADN)	25	72	60		157
6. Total number of participants enrolled in further education after BNP completion (WWU and other universities' BSN programs)	5	10	15		30
7. Total number of participants employed after BNP completion	10	45	35	25	115
8. Total number of non-incumbent workers who completed any BNP credential, gained employment the quarter after completion, and remained employed in the second and third quarters after BNP exit	8	41	32	20	101
9. Total number of incumbent workers who enrolled in any BNP program and received an increase in wages post-enrollment	15	40	20	15	90

*If applicable; only some outcomes are required for reporting in Year 4

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