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Factors Affecting Student Success in Oregon Associate Degree Nursing Programs

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A Scholarly Project Presented to Faculty of the School of Nursing

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By

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Abstract

Background: Multiple factors contribute to student retention and attrition rates in undergraduate nursing programs. Attrition rates are rising, which affects society as the population is aging and there is a need for more nurses. Identifying attrition risk as a method to increase student success is imperative in order to produce more nurses. The purpose of this project was to analyze and evaluate predictive factors and academic issues that affect student success at Oregon Consortium of Nursing Education (OCNE) schools in order decrease attrition rates in the science courses and increase associate degree of nursing (ADN) program completion.

Methods: This records-based correlational study included a random sampling selection of students from nine OCNE community college associate degree nursing programs in Oregon (n = 500). Deidentified transcripts were collected from students who were enrolled full-time in the nursing programs. The data included students' grade point average (GPA), grades, and completion rates. Prerequisite GPA scores, anatomy and physiology (A&P) course scores, chemistry course scores, microbiology course scores, and prerequisite repeats, and ADN sciences (pathophysiology and pharmacology) course scores were obtained from each participating school via electronic records. Data were analyzed using IBM SPSS Statistics 24 software with predictive analytics.

Results: Of 488 (n = 500) successful completions from OCNE ADN programs, there was a positive statistically significant correlation between prerequisite biological science GPA and ADN GPA (r = .128, n = 488, p = .005). The correlation between prerequisite science GPA and program completion showed a statistically significant negative, albeit weak, correlation (r = -.128, n = 500, p = .004). Analyses reveals a statistically significant positive correlation between A&P and chemistry course repeats and successful completion of ADN sciences.

Recommendations: OCNE admission standards must undergo ongoing and repeated evaluation to improve high academic standards. Current recommendations include revision of admissions

point system and number of course repeats, investigation of A&P teaching methodology and content, and further studies to investigate direct cause and effect of student attrition beyond predictive correlational relationships.

Conclusions: The results of this study were congruent with evidence-based literature. There are four statistically significant and potentially predictive correlations, including: 1) The grade a student receives in a prerequisite science course correlates with the grade they will receive in an ADN science course; 2) Prerequisite science GPA correlates with the GPA a student receives upon completion of the ADN program; 3) Prerequisite science GPA correlates with the likelihood of completing the ADN program; and, 4) Repeating either A&P or chemistry correlates with a higher likelihood of completing the ADN program. In order to decrease attrition, higher standards need to be placed on the prerequisite science courses to ensure that students with high academic qualifications are admitted to nursing programs.

Keywords: student attrition, associate degree of nursing, program evaluation, prerequisite biological sciences, Oregon, consortium, attrition rate

Factors Affecting Student Success in Oregon Associate Degree Nursing Programs

Predicting the association between academic, non-academic, and other factors affecting student success is difficult, albeit imperative to understand and implement necessary changes in associate degree nursing education (ADN). Research supports the hypothesis that there is a correlation between attrition rates and available nursing workforce (Hopkins, 2008). An increase in ADN program attrition rates decreases the number of graduate nurses. This rising attrition rate represents a loss of needed nurses to enter the workforce. Thus, it is crucial to critically examine student academic success predictors to increase the number of nurses. A program evaluation determining predictors of academic success in ADN programs and reducing attrition was the central focus of this records-based correlational study.

Problem

The problem is three-fold: one, prior research indicates that there are steadily increasing numbers of student attrition in ADN programs (Hopkins, 2008; Jeffreys, 2007; McCarey, Barr, & Rattray, 2007; Rogers, 2010). In some states, as much as 50% attrition rates have been reported by some schools (Benn & Pacquiao, 2010). Additionally, as much as one-fourth of nursing students across the country are lost through attrition at some point in their program (Seago, 2012). When a student leaves the program, this leaves their seat to remain empty for the remainder of the program, which means that when the program is complete there are fewer graduating nurses entering the already high nursing shortage (Gillis, 2007). When a program loses a student, there are costs to the college and faculty including time, energy, tuition, and resources within the facility (Bennet, 2003). There are costs to the student as well: books, fees, materials, etc. Two, most two-year ADN programs have high attrition rates in science courses, specifically pathophysiology and pharmacology (Higgins, 2005). High attrition rates in these courses raises concerns for student success in the nursing programs (Rogers, 2010). Three, there is a combined problem of a nursing shortage alongside a nursing faculty shortage. In fact,

nursing education will have to increase the number of new nurse graduates by 30% a year within the next 10 years in order to meet the mounting need for registered nurses (RNs) in health care (Evans, 2009). The shortage of nurse faculty, is expected to drastically increase at a fast pace as faculty members reach retirement age. According to the American Association of Colleges of Nursing (AACN), nursing school enrollment is not growing fast enough to meet the projected demand for RNs (2015). Enrollment was up by 2.6% in 2013, but this increase is still not sufficient to meet the demand for nurses entering the workforce. This shortage portends of our inability to educate sufficient numbers of nurses with competencies that are required in a reformed and changing health care system (Yididia, 2014). Thus, students who are admitted to nursing programs need to be academically qualified to withstand the rigors of the curriculum and complete the program.

Problem Change

Literature supports continually investigating factors that contribute to attrition rates, program completion, and student success in ADN programs (Harris et al, 2014). The national attrition rate of nursing students was 28% in 2011 and the National Council Licensure Examination (NCLEX®) pass rate in the United States for RNs was 81.43%, with a decrease to 79.26% in 2014, for associate degree programs (National Council of State Board of Nursing, 2015). For the nine Oregon Consortium of Nursing Education (OCNE) schools in this evaluation, the overall 2015 NCLEX® pass rate range for each school was 73% to 97% (Oregon State Board of Nursing). According to Lewis & Lewis (2000), attrition rates will continue to escalate and NCLEX® scores will continue to decrease if at-risk students are not identified through admission criteria.

Program evaluation is a systematic review of an educational program, and plays an integral role in nursing programs to help ensure ongoing quality outcomes of the program. A program evaluation is important to help ensure the quality of the program, to meet requirements

of regulatory and accrediting agencies, and to achieve the best student outcomes. Investigative program evaluations and the use of data can improve program outcomes as well as establish the need for possible changes within the program. This program evaluation project is used internally by OCNE, a partnership of nine Oregon community colleges, to help guide change within their program. No study had previously been completed within OCNE to investigate predictive factors affecting student success defined to prerequisite courses. Specifically, the project deliverable is a program evaluation for OCNE. This will allow very direct analysis of prerequisite requirements in order to determine potential change for prerequisite admission criteria.

External drivers present with regard to nursing education program evaluation include accrediting bodies and the Oregon State Board of Nursing (OSBN). Both the Accreditation Commission for Education in Nursing and the Commission on Collegiate Nursing Education have standards related to outcomes. Because programs must show evidence of acting on the aggregated data, it is imperative for OCNE to have a foundation of pertinent records of student success factors and program outcomes. The culmination of data analyses from this project provides the necessary correlational data to support program change.

Background

The rate of academic attrition is problematic for many ADN programs. Attrition is often the result of the interaction between student and program characteristics. Review of the literature on student success reveals multiple student dynamics and/or various interventional methods play a role in predicting academic success (Appendix A & B). The literature supports evidence-based questions of measuring academic success, predictive measures, student outcomes, program evaluation, student retention, and attrition rates (Appendix C). Furthermore, the evidence supports that there are elements contributing to attrition rates within associate

degree nursing programs which are extremely diverse, complex, and multifaceted (Abele at al., 2013; Lewallen, 2015; Harris et al., 2013; Peterson-Graziose, 2013; Rogers, 2010).

Continuous improvement in the quality of a program is necessary to decrease attrition rates (Tinto, 2005). Undergraduate nursing program attrition rates continue to increase, despite the high demand for student placement in these programs (Harris et al., 2014). Critical investigation of student academic success predictors is vital to decreasing attrition rates. A program evaluation can reveal helpful information related to attrition specific to correlation between admission requirements, prerequisite biological science course grades, and student success within the ADN programs.

Past research has been done which has focused on causes of attrition in ADN programs. Much of this research attempts to predict the relationship between multiple academic and non-academic factors attributable to academic success as an ADN student, as measured by grades and attrition. With a specific focus on prerequisite sciences, the literature search revealed that achieving high grades in prerequisite biological science courses were statistically predictive indicators of ADN students' positive academic success (Abele, Penprase, & Ternes, 2013; Griffiths, Bevil, O'Connor, & Wieland, 1995; Jordan & Reid, 1997; Potolsky, Cohen, & Saylor, 2003; Seago, Keane, Chen, Spetz, & Grumbach, 2012).

Pathophysiology and pharmacology are both required courses within all OCNE associate degree nursing programs. Due to the science, quantity, and intensive nature of these courses, they are placed during the second term of the 2-year program in order to ease students into the nursing curriculum at the beginning of the program. The purpose of the sciences early in the program is to develop a student's competency of pathophysiology and pharmacology to apply directly to safe patient care during scheduled clinical experiences. Research has shown that pathophysiology and pharmacology are two of the most difficult required courses for nursing students resulting in high attrition rates (Dunn, Osborne, & Rakes, 2013; Harris et al., 2014;

Salamonson, Andrew, & Everett, 2009). Yet, understanding these sciences is the foundation for safe practice. To improve program retention rates and to lower attrition rates, critically analyzing the reasons behind the attrition within nursing programs may help to ensure future academic success, especially in the science courses. Gillis (2007), in a qualitative research study, suggested more rigorous admissions criteria for nursing programs claiming that changes to admissions processes may help to decrease attrition rates by helping to define the population of students who have a higher chance at success in the program.

The demand to be admitted to rural ADN programs is high. On average, in Oregon, rural community colleges each receive 130 applications each year with only 24-35 students admitted (OCNE). Therefore, the loss of just one student equates to costs upwards of $25,000 of lost tuition revenue for the college. The financial loss creates a large budget gap in academic operations. Unsuccessful program completion impacts colleges and communities who depend on tuition, as well as the nursing programs' reliance on high level NCLEX® pass rates for program sustainability (OSBN, Division 21 Rules, 851-021-0015, 1F).

Attrition rate increases have resulted in a lowered number of nurses entering the workforce of new nurse graduates, contributing to continued nursing shortages (Hopkins, 2008; Peterson-Grazoise et al., 2013). The nursing shortage is predicted to be approximately 300,000 to more than a million by 2016 due to additional losses from nurses retiring and the inability to hire more nursing educators (Aiken, Cheung, & Olds, 2009). Nursing education will have to drastically increase the number of new nurse graduates over the next decade to meet the growing demand for registered nurses. As the rates of attrition rise in ADN programs, the overall quantity of nursing applicants will continue to decline (Saucier, 1995; Harvey & McMurray, 1997). This program evaluation is timely; as current nursing shortages continue to rise, there is great urgency for colleges and educators to uncover and solve issues that are impacting attrition rates and

degree completion rates (Harris et al., 2014; Peterson-Graziose, Bryer, & Nikolaidou, 2013; Rogers, 2010).

Project Frameworks

Two frameworks guide this program evaluation project. The first framework is the Quality Improvement Program Planning System (QIPPS) which is a systematic and evidence-based approach that incorporates organizational knowledge, empowers collaboration, develops project management, and encourages continuous quality improvement in a cyclical method. This system facilitates a consistent and structured tactic in program evaluation (See Appendix D).

The second framework for development of the focus of this problem is the theoretical framework of Malcom Knowles, called the Knowles' Theory of Adult Learning which is based within an educational and learning theory conceptual framework. Knowles' theory is based upon six assumptions, which are the basis of the theory of andragogy (Merriam & Bierema, 2014). Andragogy assumes educators need an understanding and respectfulness of the adult learners' individuality. Since ADN students are all adult learners, this theoretical framework serves to be a solid underpinning for the focus of this Scholarly Project. The various findings in the literature review support Knowles' theory application and focuses on attrition within associate-degree nursing programs, as student performance in the basic sciences provides a foundation for doing well in the nursing courses. The prerequisite sciences contribute not only to the student's foundational knowledge but are also essential courses in assembling future knowledge basis required for success in the ADN program as well as competent clinical practice (Kyriacus, Jordan, & van den Heever, 2005).

Implementation Process Analysis

This was a quantitative correlational analysis project based on prior students' academic records. This data determined the predictors and/or type of relationship that exists between grades earned in prerequisite sciences courses, the prerequisite grade point average (GPA),

course repeats in the prerequisite science courses, and grades received in pathophysiology and pharmacology in ADN programs within OCNE. In addition, OCNE admission requirements were gathered in order to write a comprehensive program evaluation that took into account prerequisite courses and how these are factored into admission.

Setting and Target Population

Target population. The project participants included all full-time students enrolled in associate degree nursing courses at all nine participating schools within OCNE from 2010-2015. Key internal stakeholders included OCNE administration, participating consortium schools, Oregon State Board of Nursing, Program Directors, and the Project Manager. External stakeholders included students, hospitals, clinics, and community members, who are all impacted by having a strong and competent nursing workforce for communities statewide and nationally.

Students. The students represented in the data included those who were enrolled full-time in the nursing program. Students enrolled in full-time nursing courses who achieved continuous academic success are defined in the OCNE curriculum as having achieved ≥ 75% on examinations and ≥ 75% on all assignments within each sequential semester. Students with this successful academic standing within the OCNE curriculum are able to complete the ADN program in a total of six semesters. Those who do not succeed in a given semester may return to the semester that was attempted unsuccessfully.

Setting. The project took place within the participating schools of OCNE, located in Portland, Oregon. OCNE has encouraged nursing faculty around the country to engage in education reformat for improved student outcomes. The goals of OCNE align nursing education more closely with emerging health care needs and health care system changes. The overarching goal of OCNE's curriculum is to educate nurses with the competencies necessary to provide high quality, compassionate, and competent health care. All nine of the community college OCNE schools between 2010-2015 participated in this study. The data obtained from student records

were de-identified to ensure anonymity and protection. The competency-based curriculum, which encourages metacognition, reflection, and self-directed learning, as well as standardized admission criteria, is shared among all participating schools.

Economic, Social, and Political Environment

Economic. The American Institute of Research (AIR) conducted a five-year, longitudinal, cost analysis. State and local governments had spent nearly 4 billion dollars paying for educational costs of students who either dropped out of or who were lost due to attrition from community colleges (Schneider & Yin, 2011). Oregon ranked 16th in the nation for attrition rates and spent an estimated $11,983,746 due to attrition during this five-year study. Due to the high costs of attrition, OCNE is very supportive of this project and enthusiastic for the results as they are currently financially fragile and eager to have data available to help strengthen the program within the consortium.

The economic impact of attrition goes much further than financial losses. Quantifying the costs and benefits of attrition rates is extremely valuable. Conducting a formal benefit-cost analysis (BCA) requires quantification and comparison of all associated costs and all associated benefits related to the program. This was beyond the scope of this program evaluation, albeit important to mention and discuss. A program investment is generally considered a solid endeavor if benefits outweigh the costs. Calculating the financial return on a nursing program must include all direct (tuition) and indirect costs (productivity). The impact of attrition on stakeholders (community, hospitals, clinics, transfer universities, etc.) must also be considered. It is difficult to calculate true economic value without concrete data, which is recommended for future study. With this said, it is evident that attrition is a terrible waste of investments. Addressing attrition may expand the nursing workforce which, in turn, helps to increase the economy and decrease the costs to colleges, state funding, and students (Harris et al., 2014).

Social. The social impact of this program evaluation takes into account the interprofessional educators who are teaching prerequisite courses. There is a tremendous variability in prerequisites, the quality of these courses, the evaluation of outcomes, and alignment with nursing programs. There is a need to ensure that offerings of prerequisite sciences courses are congruent with the objectives within the nursing programs. There is a huge opportunity for nursing programs to establish collaboration with interprofessional educators to ensure the course criteria is congruent with course objectives for the nursing programs.

Political. The consequences associated with student attrition in ADN programs impact students, faculty, institutions, resources, and health care systems. Employers do expect that nurse graduates possess specific skills, knowledge, and competencies. State and federal governments have focused efforts on issues surrounding student retention at community colleges to increase the skills of graduate nurses to meet changing healthcare needs and challenges of a global economy (Hirshy et al., 2011, p. 300). Nursing is a priority from a policy perspective, as the field has evolved faster than most public policies affecting nursing education and healthcare overall. The Institute of Medicine (IOM) 2010 report, "The Future of Nursing", along with the current Affordable Care Act, states "there will be more monitoring of admission into schools of nursing through workforce entry" to understand factors affecting the nurse workforce (Billings & Halstead, 2012). Nursing shortages have gained attention from state and national policymakers as resources given to colleges to help increase program capacity have not been matched by increased program completion rates (Harris et al., 2014). Thus, political implications resulting from student attrition is priority in order to decrease wasting of resources.

Program Outcomes

This program evaluation determined correlation between prerequisite standards and ADN program success. The main outcomes were (Appendix E & F):

1. A Letter of Support signed by the Oregon Consortium of Nursing Education (OCNE) in October 2016 (Appendix G).
2. Complete comprehensive evaluation of grade point average (GPA), Anatomy & Physiology (A&P) I, II, & III course scores, microbiology and chemistry course scores, biological sciences course repeats, and attrition rates, in the nine community college nursing programs within OCNE by spring 2017.
3. Aggregate student outcomes data collected, statistically analyzed, and predictors established by spring of 2017.
4. Program evaluation of curriculum shows trending data of three predictive factors that prevent student success by spring 2017.
5. Complete comprehensive statistical analyses of trends in GPA, A&P scores, microbiology scores, chemistry scores, attrition rates, and course repeats by spring 2017.
6. Faculty records analyzed for required OCNE standards of qualifications and admission criteria analyzed in OCNE nursing programs by spring 2017.
7. A financial plan secured by in-kind donations to sustain and advance project, with a balanced budget by December 2016.

Implementation Strategies

Using QIPPS systematic framework to guide the project, implementation strategies for this program evaluation project included: 1) engaging key stakeholders for project endorsement, mentorship, and orientation; 2) engaging state institutional researchers for assistance with data collection; and, 3) engaging leadership within OCNE for support, assistance, and guidance for completion of the project. Data from all students, regardless of successful completion of the program or not, was included. Interruptions in the timeline of the usual six-semester completion did not affect the data. Data was collected from the Oregon State Higher Education Coordinating Commission (HECC) in order to analyze overall prerequisite GPA, attrition rates in

prerequisite biological sciences, prerequisite grades in biological sciences, and course repeats in the prerequisite biological sciences, as well as nursing program completion rates. The outcomes were achieved by analyzing the data and determining predictive factors that contribute to student success.

Project Evolution

In the beginning, the focus was to be a change of instructional methodology in the science courses within the ADN program. The project transformed into a program evaluation to analyze the correlation between prerequisites and program completion. As such, the original project that had been based on four OCNE schools expanded to nine OCNE schools due to interest from the stakeholders to receive a statewide correlational report on student outcomes.

Oregon's nurse faculty shortage limits student enrollment and therefore supports lowering attrition by improving student outcomes and academic standards of incoming students (Allan and Aldebron, 2008). Thus, this project is in alignment with the overarching goals and missions of OCNE and the OSBN. Many of the options for solving the faculty shortage, including curriculum innovations and improved working conditions for faculty, are less amenable to public policies and more the domain of educators assisted by private foundations. To maximize the retention and effective utilization of aging nurse faculty, the consortium must invest time, energy, and financial resources to develop strategic plans that focus on building and sustaining healthy working environments, including faculty needs in strategic plans, engaging legislators and community members, and decreasing attrition in order to limit wasted resources of already overloaded nursing faculty (Falk, 2007).

Quality Assurance

To ensure quality of the Scholarly Project, as well as protect the schools, students, faculty, and the impact of results, all data was stored on password-protected database within the Institutional Researcher's office at Southwestern Oregon Community College. No personal

backup or database was stored outside of the college. This project's data is from de-identified archived educational records of past nursing students, so no human participants were affected by this project. An agreement of support was obtained from OCNE summarizing the need for ongoing program evaluation.

Ethics and Human Subjects' Protection

Data collection began after exempt status was provided by the Institutional Research Board (IRB) at Boise State University (Appendix H). This project includes de-identified student transcripts who graduated with an associate degree as well as those who failed or withdrew from their respective program, so no human participants were affected by this data collection and no consent was needed.

Bias

Bias was minimized as much as possible by maintaining the quality of the data. The sample was obtained from the original 10,669 transcripts in equal number from all nine schools by randomly selecting every third deidentified student. Furthermore, all data was maintained on the institutional researcher's campus computer, with password-protected remote access for data analyzation. No data was downloaded onto the author's own computer or storage device.

Threats to Quality

Internal validity could be affected by: 1) the quality of the educator who taught the courses; 2) adherence or non-adherence to strict curriculum set within OCNE; or, 3) the placement of pathophysiology or pharmacology within the two-year curriculum. Because the sample was obtained from nine ADN programs where multiple educators taught the prerequisite courses and multiple nurse educators taught ADN pathophysiology and pharmacology, any such threat to internal validity was undeterminable.

According to Lodico et al., (2010), external validity pertains to the study's results that are indiscriminate outside the sample of a specific study. The results from this project are not

generalizable or indiscriminate to other ADN programs outside of the OCNE partner schools, as the sample is specifically composed of nine community colleges within Oregon under the OCNE curriculum standards. However, other ADN programs could use the project outcomes to explore their own programs.

Results/Outcomes Analysis

Data Collection Analysis

The target population, sampling method, and related procedures are described to ensure valid measures, correct data, and minimization of bias (Creswell, 2009). The transcripts included the students' GPA, grades, and completion rates at selected ADN programs. It was not practical, in this case, to include a total population in this program evaluation (Ravid, 2011). Therefore, a random sample of every third student was selected from the identified population including each class from 2010-2015 from the nine OCNE community college ADN programs. Each class had an average of 30 students. The sample size included 500 de-identified transcripts from these cohorts. Confidentiality and anonymity was maintained by utilizing de-identified transcripts as the source of data (Lodico, Spaulding, & Voegtle, 2010). This project included a random sampling selection of the sample. The de-identified transcripts contained numerical grades earned in prerequisite science courses as well as nursing science courses.

Data from student records, regardless of successful completion of the program or not, were included. Data were collected from the colleges' registrars to analyze overall prerequisite GPA, attrition rates in prerequisite biological sciences, prerequisite grades in biological sciences, and course repeats in the prerequisite biological sciences, as well as nursing program completion rates.

A crosscheck of the admission policies and procedures from each of the nine schools was compared to OCNE's standardized policies and procedures. All schools had standard policies and procedures and were unaltered from OCNE's requirements. Faculty qualifications from nine

schools were analyzed. All faculty who taught in the ADN program had a minimum of a master's degree in nursing, meeting the requirements of OCNE and the OSBN.

Measures/Indicators for Project Outcomes

The project outcomes determined the correlation between prerequisite biological science grades and ADN program success. A Letter of Support was obtained (Outcome #1); a complete comprehensive evaluation of GPA, A&P scores, attrition rates, and course repeats, in nine nursing programs within OCNE was produced (Outcome #2); aggregate student outcome data were collected, analyzed, and predictors established (Outcome #3); a program evaluation of curriculum showing trending data of three predictive factors that prevent student success was completed (Outcome #4); a comprehensive statistical analysis of trends in GPA, A&P scores, microbiology scores, and chemistry scores, attrition rates, and course repeats was conducted (Outcome #5); faculty records were documented for OCNE and OSBN standards (Outcome #6); and, a financial plan with a balanced budget was produced (Outcome #7).

Outcome Evaluation Analysis

Outcome #1: See Appendix G for Letter of Support from The Oregon Consortium on Nursing Education.

Outcome #2: Total transcripts resulted in a population of 10,669. From those, all transcripts whose prerequisite data was unobtainable were deleted. This resulted in a population of 1600, for which every third dataset was collected for a total of 500. The analyses were conducted to determine the type of relationship between grades earned in the prerequisite biological sciences and the ADN sciences (Appendix I). Analyses entailed frequency (f), frequency distribution, paired-samples *t* test, two-tailed test of significance, and Pearson product-moment correlation.

Outcome #3: Data analysis began by first examining the frequencies of overall completion, prerequisite biological sciences GPA, overall ADN GPA, numerical grades in the prerequisite science courses, and numerical grades in the ADN courses. Of the 500 transcripts analyzed, 488 (97.6%) students successfully completed the ADN program.

The relationship between numerical grades in the prerequisite sciences and the ADN courses were examined using paired-samples *t* test (Appendix J & K). Following this, statistical analysis of data included Pearson product moment, Pearson *r* which determined the strength of the correlation between each prerequisite course and ADN courses. The results of these analyses were used to answer predictive outcome questions that student success in prerequisite sciences does have a positive correlation with success in the ADN science courses (Appendix L & M).

Outcome #4 and #5: Data analysis began with frequency of numerical grades earned in each prerequisite biological science course. Numerical grades are as follows: 4.0 = A, 3.0 = B, 2.0 = C, 1.0 = D, and 0.0 = F. The prerequisite biological sciences GPA showed a frequency distribution of 99.8% of the purposive sample who earned a GPA of 2.0 of greater, with 96.2% earning a GPA of 2.5 or greater. The data showed that 95.2% of the purposive ADN program sample earned a numerical grade of 2.0 or greater, while 86.2% (n = 458) earned a numerical grade of 3.0 or greater. The remaining 0.8% of students (n = 5) earned 1.00 or less, and thus did not pass the course.

There was statistical significance between numerical grades in A&P I (M = 3.06) and ADN courses Pathophysiology I (M = 3.17, t = -2.810, p = .005), Pathophysiology II (M = 3.23, t = -3.976, p = .000), Pharmacology I (M = 3.38, t = -7.533, p = .000), and Pharmacology II (M = 3.38, t = -6.156, p = .000); between A&P II (M = 3.28) and Pathophysiology I (M = 3.17, t = 2.632, p = .009) and Pharmacology I (M = 3.32, t = -2.533, p = 0.12); between A&P III (M = 3.31) and Pathophysiology I (M = 3.17, t = 3.437, p = .001) and II (M = 3.23, t = 2.261, p = .024); between Microbiology (M = 3.19) and Pharmacology I (M = 3.38, t = -4.820, p = .000)

and II (M = 3.32, *t* = -3.159, *p* = .002); and, between Chemistry (M = 3.26) and Pathophysiology I (M = 3.17, *t* = 2.118, *p* = .035) and Pharmacology I (M = 3.38, *t* -2.824, *p* = .005) (Appendix K). Statistical significance is indicated by sig. (two-tailed) greater than 0.05. There was also statistical significance between prerequisite sciences GPA (M = 3.23, SD = .353) and overall graduation GPA (M = 3.09, SD = .405) (Appendix L).

Statistical Significance				
		Mean	*t*	*p*
A&P I (M=3.06)	Patho I	3.17	-2.810	.005
	Patho II	2.23	-3.976	.000
	Pharm I	3.38	-7.533	.000
	Pharm II	3.38	-6.156	.000
A&P II (M=3.28)	Patho I	3.17	2.632	.009
	Pharm I	3.32	-2.533	0.12
A&P III (M=3.31)	Patho I	2.17	3.437	.001
	Patho II	3.23	2.261	.024
Micro (M=3.19	Pharm I	3.38	-4.820	.000
Chemistry (M=3.26)	Patho I	3.17	2.118	.035
	Pharm I	3.38	-2.824	.005
Prerequisite Sciences GPA (M=3.23)	Overall grad GPA	3.09		.005

Statistical analysis using Pearson *r* allows the computation of determination of relationship strength. Coefficients above .60 signify a high correlation. A bivariate Pearson product moment-correlation was run to determine the relationship between prerequisite science GPA and overall graduation GPA. There was a positive correlation between these two GPAs,

which was statistically significant (r = .128, n = 488, p = .005) with small levels of association between the two variables. The higher the prerequisite science GPA, the slightly more likely the student achieved better outcomes (higher grades) in the nursing program.

Conversely, correlation was investigated between prerequisite science GPA and program completion for which there was a statistically significant negative correlation also with a small level of association (r = -.128, n = 500, p = .004). In interpreting this data, those students who had lower GPAs in the prerequisite sciences were more likely to complete the nursing program successfully. This was an unexpected finding. Multiple reasons could account for this result and it is recommended that further investigation occur in future studies.

Correlations				
		r	*n*	*p*
Prerequisite Sciences GPA	Overall Graduation GPA	.128	488	.005
	Program Completion	.128	500	.004

Correlation analysis between repeating the prerequisite sciences and ADN sciences were also completed. Analyses demonstrate a statistical correlation between repeating any of the A&P courses as well as chemistry, and successful completion of the ADN sciences as signified by sig. (two-tailed) at 0.01 (Appendix M). Those students who repeat any of the A&P courses or chemistry do better at pathophysiology and pharmacology in the ADN program. However, results show that there is a negative correlation between repeating microbiology and pathophysiology I (r = .311), pathophysiology II (r = .189), pharmacology I (r = .528) and pharmacology II (r = .313). These show a moderate correlation. Those students who repeat microbiology for a higher grade are not as successful with the ADN sciences compared to

students who did not repeat microbiology for a passing grade. Repeating a course may result in a higher grade merely due to familiarity of content rather than true competency. As this is difficult to measure, it is recommended that admission policies allow only two attempts at a prerequisite course in order to minimize this potential of skewed success due to the nature of repetitive coursework with a course repeat.

Correlation		
		Interpretation
Course Repeat	A&P I, II, & III, and Chemistry	Positive correlation
	Program Completion	Negative correlation*

*Patho I (*r*=.311, Patho II (*r*=.189), Pharm I (*r*=.528), Pharm II (*r*=.313)

Outcome #6: In evaluation of faculty records at all OCNE schools, 100% of nursing faculty had a minimum of a master's degree. This is in alignment with the Oregon State Board of Nursing Division 21 Administrative Rules that state that all full-time nurse educators must possess a master's degree at minimum. OCNE standards parallel this policy as well. In additional, OCNE admission criteria was gathered which outlines the point-based application requirements.

Unanticipated Consequences

During the course of this scholarly project, the data collection underwent multiple delays due to communication lapses between the local institutional researcher and the State of Oregon Higher Education Coordination Commission (HECC). This resulted in a postponement of data analyses.

The data analysis revealed missing prerequisite course grades for those students transferring from one school to the other, resulting in a paring down of total population for data

analyses. This can be rectified in any future studies by asking for transcripts from any transfer schools.

Lastly, the project started with four OCNE schools. Due to an interest from various schools, HECC, and OCNE, the project was expanded to include all nine schools within the consortium during the time period of 2010-2015.

Gap Analysis

On initial evaluation of the total population (n = 10,669), it was found that more than half of the transcripts had incomplete prerequisite data. To evaluate statistical significance with comprehensive data, the incomplete transcripts were deleted; 500 transcripts were randomly selected through choosing every third record for evaluation.

There were fundamental difficulties accompanying the study and measurement of attrition rates. One of these difficulties was ascertaining and measuring all of the reasons a student may leave an ADN program. While this project measured correlation between prerequisite science courses and the sciences within the nursing program, other student factors may have contributed to attrition including but not limited to the inability to cope, financial concerns, or low educational ability.

The data analyses demonstrated statistically significant relationships existed among some of the variables. However, not all correlations were statistically significant, as demonstrated by a null correlation between prerequisite science course repeats and student success in the ADN program. The largest gap in this project was cause and effect which could not be identified even though positive correlations existed. Future study is recommended on cause and effect as correlation only helps to discern association between two variables. While positive correlation assists in prediction, definitive causation cannot be stated.

A faulty assumption may be that high pass rates or high program completion rates are indicative of a solid nursing program with few instructional issues. While these issues may be

limited it is known that grade inflation, failing to fail students due to the fear of lost revenue, and high faculty turnover occur (Jeffreys, 2007). These issues are undetectable within the constraints of this program evaluation but can be considered a limitation of the study.

The final gap discovered during the course of this project was the admission points for the program. There are 70 points allotted to each nursing application; OCNE designates 51 points for the application process, with another 19 discretionary points for the individual schools to determine. Of the 51 OCNE points, there are five points given to students who complete the entire sequence of A&P (BI 231, 232, and 233) by fall term prior to the application process. Three points are given to applicants if they have completed the first two A&P courses. Thus, it is entirely possible for students who have received C's in all three courses to receive more points than for a student who has received an A but has only completed one A&P course.

Financial Analysis

Funding for this project was projected at $21,232.50 for implementation and first year of support. These estimated costs included advisory board, data collection, and evaluation necessary for project completion (Appendix N, O, & P). The final expenses were much lower than anticipated, with the final total cost below budget equaling $1450.00.

Discussion and Recommendations

OCNE is a partnership of Oregon nursing programs with guiding principles of inclusiveness, beneficence, collegiality, perseverance, healthy conflict, and shared leadership. In order to inform future admission requirements, standards, and curriculum planning this study investigated potential predictive factors contributing to student outcomes in ADN programs. Specifically, data from nine OCNE schools were analyzed to examine the correlational relationship between prerequisite biological sciences and the sciences within the ADN programs, which are the highest attrition rate courses in most ADN programs. The results revealed four statistically significant and potentially predictive correlations, which were congruent with the

literature (Abele, Penprase, & Ternes, 2013; Griffiths, Bevil, O'Connor, & Wieland, 1995; Jordan & Reid, 1997; Potolsky, Cohen, & Saylor, 2003; Seago, Keane, Chen, Spetz, & Grumbach, 2012; Wong & Wong, 1999). First, there is positive correlation between the prerequisite biological sciences GPA (A&P I, II, III; microbiology; and, chemistry) and the grades earned in the ADN program. Second, there is a statistically significant negative correlation between prerequisite science GPA and ADN program completion. This data reveals that students who had lower GPAs in the prerequisite sciences were more likely to have a good outcome and complete the ADN program. This, again, was unexpected and supports further research with a larger dataset to make any conclusions regarding these findings. Third, a statistically significant positive correlation was noted between repeating any of the prerequisite sciences and successful completion of the sciences (pathophysiology and pharmacology) within the ADN program. Finally, there is a statistically significant correlation between repeating any of the A&P courses or chemistry and successful completion of the ADN sciences.

This demonstrates that if a student repeats the coursework in their prerequisites to attain a higher grade or successfully pass the course, he/she is more likely to attain a passing or a higher grade in pathophysiology or pharmacology. Interestingly, when removing the repeated class from the same students' data, there is a positive correlation that the initial prerequisite science grade would likely result in a lower grade in the ADN sciences. However, the data also revealed that repeating microbiology due to a failing grade likely negates a positive outcome in the ADN sciences compared to those students who did not repeat microbiology due to a failing grade.

Colleges and universities are financially strapped, and this is limiting the ability of U.S. nursing schools to take advantage of historically high numbers of qualified applicants due to the lack of nurse educators. With the current nurse faculty shortage, it is critical to potentiate student success in ADN programs in order more appropriately align the workload of nurse educators with needs of students. By ensuring that only the most academically-qualified students are

accepted in nursing programs, overall time spent with students will be less as well as more meaningful. This will allow nursing faculty to focus on curriculum development, teaching of theory and skills, and engagement in professional scholarship.

Recommendations

The results of this study help to confirm there is a need, at minimum, to revise admission standards for the prerequisite biological science courses which would require students to achieve higher academic success in the sciences prior to be admitted to the ADN program. In order to maintain academic and professional standards, ensure appropriate allocation of student and institutional monies, and decrease the potential for attrition, OCNE must continue to take steps to guarantee that only the students with the greatest potential for academic success be eligible for admittance to the ADN program. It is recommended that OCNE utilize these results to support high admission standards through review and revision of admission policies.

The weighted ADN admissions point system at OCNE schools for completion of the A&P sequence (Appendix Q) should be further investigated as there is potential for students who received a higher grade in A&P I to receive fewer admission points than a student who has completed two or three of the A&P courses. As this may impact the academic quality of a student entering the nursing program, it is recommended that an admission criteria change may elevate a higher level of academic standards upon admission into the nursing program. It is recommended that students demonstrate proficiency (cumulative or comprehensive exam at end of A&P sequence, portfolio, etc.) so that there is less weight on a singular course grade.

While correlational analysis does show that repeating either A&P or chemistry does potentially predict academic success in the ADN sciences, it is recommended that admission standards require no more than two attempts at any prerequisite course. This requirement would ensure that the student has higher academic success at the prerequisite course versus repetitive coursework that likely result in a skewed higher grade.

Further evaluation of the teaching methodology, objectives, and content within A&P courses is recommended. This future study is recommended in order to study potential learning strategies, improve learning, and align pedagogy with desired nursing program objectives.

Recommendations for further research as a result from this project's findings include:

1. Utilize a larger population ($n > 500$) to increase validity of results.
2. Transfer courses from other schools are included in student transcripts to ensure a larger sample.
3. Data to include the number of semesters between when academic success was achieved in the prerequisite biological science courses and enrollment in an ADN program, as a break in the continuum of studies may be applicable to research questions.
4. Demographic data to include age and gender.
5. Include the score received on applicant interview during the application process, as factors other than academic may contribute to student success.
6. Include the dependent variable of NCLEX results as another measure of student success beyond program completion.
7. Include non-OCNE ADN programs for correlational comparison of different curriculum and admission standards in order to analyze admission standards effectiveness.
8. Analyses between those who received a high grade in A&P I and/or II and those who have completed the entire A&P sequence for extra admission points, correlated with student success in the ADN program.
9. Evaluate prerequisite courses beyond the biological sciences that are required for OCNE ADN degrees, such as math, writing, sociology, and psychology, to examine any predictive outcomes.
10. Investigate strategies for increasing student success in the prerequisite sciences, such as teaching methodologies and content.

Implications for Practice

These results demonstrate a correlation between numerical grades earned in prerequisite biological sciences and successful completion of an OCNE ADN program supports revision of program admission criteria. Administrators and nursing educators alike are encouraged to reconsider admission criteria for ADN programs so that students are more likely to achieve academic success in nursing courses (Harris et al., 2014). These results support reviewing and possibly changing the admission criteria based on the predictability of some prerequisite biological science courses. This project demonstrates the need for higher standards in prerequisite science courses to increase ADN program completion rates. Since prerequisite courses are taught by faculty prior to entry into nursing programs, OCNE may need to require course grades of a 'B' or above for science courses, completion of the entire A&P sequence prior to program application, and no repeats of any of the prerequisite biological courses. Opting to utilize the predictive data from this project within OCNE's admission criteria may help set the standard for other community college ADN programs outside the consortium to improve student outcomes.

As identified in the gap analysis, there are more admission points given to students who have completed the A&P sequence. There is an argument for changing the admission process by giving extra points for a higher course grade instead of awarding more points for course completion. However, with this focus on students achieving a higher grade to be more competitive for program admission, there is the potential for watered down curriculum and grade inflation by instructors (Donaldson & Gray, 2012). Grade inflation may result in students believing that their competency is higher than actually warranted.

Policy Implications

In order to maintain professional standards and make the best use of student and institutional time and monies, ADN programs must produce graduate nurses who have met

academic standards and gained competency in critical thinking skills. Thus, using a program evaluation to help make informed policy decisions regarding curriculum and admission criteria is crucial to continued student success.

Program evaluation is a complex but integral component of nursing education programs. This ongoing process of collecting and describing data provides the basis for decision making used to prepare for accreditation visits, program expenditures, faculty/staff development, policies evaluation, and examine planned and actual effects of the program and make changes accordingly.

There are several implications for OCNE related to this project. First, OCNE has been transformational in its overarching goal of producing competent nurses and increasing access to baccalaureate education. If OCNE continues to be successful in achieving its goals, there are substantial policy implications for the development of consortiums in other states, as well as the development of innovative nursing education systems. Systematic comparisons among OCNE schools allow for very specific admission policy changes that will affect a target population. As this is the case, other schools may choose to use benchmark studies such as this one to identify and emulate best practices among their ADN programs.

This project outlines the need for student performance evaluation in prerequisite courses as an essential ingredient in program evaluations. Other indicators to consider for policy changes include examining: 1) specific program quality measures including faculty qualifications, appropriate competencies reflective in curriculum, and updated curriculum consistency (Lewallen, 2015); 2) clarity and accessibility of policies to students; 3) achieved program outcomes; and, 4) consistently evaluate and update curriculum and OCNE congruency.

Next, with the combined shortage of nurses in the workforce and a nurse faculty shortage, policies regarding increasing OCNE- or school-funded faculty development efforts may be warranted to increase instructional competencies among nurse educators. While policymakers

are aware of the critical shortage of nurses, they seem to be less aware of the shortage of nurse educators and the connection between the two (Nursing Faculty Shortage, 2015). The private province of OCNE drives a potential policy interposition that includes the ability to measure direct attrition rates and the increased workload on nurse educators.

Lastly, recommended future policy changes could include increasing student requirements for admission in the ADN program, improving methods for assessing clinical competencies, and increasing the minimum educational requirements for ADN-level education. All of these initiatives would contribute to quality of education ensuring the most qualified nursing applicants are admitted to the ADN program, to better align admission processes with qualifications for student success, and improved appropriation of monies to maximize nursing graduates.

Lessons Learned

This project serves as a resource for OCNE and other educational consortiums to examine student outcomes and predictive factors for student success. Within the process of establishing a program evaluation, there were three lessons learned. One, identifying a comprehensive list of the data needed for the evaluation would have been helpful. In hindsight, requesting specific data that was needed from HECC would have hastened the receipt of transcripts transferring schools. In fear of not getting approval for data collection, this author was hesitant to be overly demanding to the exact needs of the evaluation specifications. Two, establishing a stronger communication link between the author and a resource person in OCNE would have helped to receive the data quicker. And, lastly, OCNE needs to conduct program evaluations routinely in order to fully reap the benefits of this data on a continuum basis. With routine examination of predictors related to student success, admission policies can be continually fine-tuned in order to accept the most academically successful students in the ADN programs.

Dissemination to Key Stakeholders

A final Scholarly Project report will be submitted to Boise State University in March of 2017. An abstract has been accepted for presentation at the Western Institute of Nursing (WIN) for the spring conference in April of 2017 as a primary step to disseminate the findings. The program evaluation of the nine community college ADN programs will be provided to OCNE in the summer of 2017 including interventions, results, sustainability, conclusions, and further recommendations.

Maintaining and Sustaining Change

Nursing education is undergoing a paradigm shift. The ADN degree is the foundation of a future workforce of nurses. Nurse competency improves practice expertise, improves patient safety, and improves health outcomes. Because of the rapid changes in healthcare, there is a need for continuous adjustment of the curriculum, teaching methodologies, interprofessional collaboration, and admission processes. A program evaluation of curriculum, teaching methodologies, interprofessional collaboration, and admission processes needs to occur at least every five years.

OCNE needs to acutely measure graduation rates versus attrition rates to accurate assess the quality of students accepted into the ADN programs in order to increase student success. This should be done at least every two years in order to measure current trends in attrition rates. In the IOM progress assessment (2015), the continual need to transform and improve nursing education remains as a priority. Sustainability will depend on OCNE to decide if the results may be beneficial and sustainable after funding has expired.

Conclusion

Associate Degree of Nursing (ADN) programs have had a long-standing problem of attrition rates, adding to the growing concern of the nursing shortage. In order to help alleviate or reduce high attrition rates, the results of this project revealed four statistically significant and

potentially predictive correlations: 1) a positive correlation between the prerequisite biological sciences and the grades earned in the ADN program; 2) a statistically significant negative correlation between prerequisite science GPA and ADN program completion; 3) a positive statistically significant correlation between repeating any of the prerequisite sciences and successful completion of the sciences within the ADN program; and, 4) a statistically significant correlation between repeating any of the A&P courses or chemistry and successful completion of the ADN sciences.

The results from this can assist OCNE to plan strategies that can increase student success. These criteria would include only students with the highest potential to achieve academic success. Overall, continuous program evaluation contributes to the growth, change, and improvement of ADN programs student outcomes, and through reducing student attrition. This is in alignment with the QIPPS conceptual framework which encourages cyclical quality improvement methods and supports the overarching goal of improving ADN student success rates. In addition, the prerequisite courses are essential in foundational knowledge required for success in the ADN program which is supported by the Knowles' Theory of Adult Learning, the theoretical framework for this program. This project helped to identify the association between prerequisite science courses and student success in order to improve ADN program outcomes in Oregon.

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Appendix A – Literature Search Table

Database	CINAHL	Results
Strategy	**1 AND 2 AND 3 AND 4…; publication dates 2002-2015** Major headings: student success, predictors, attrition, nursing education, program evaluation, community college, adult learners, associate degree nursing, sciences, pathophysiology and pharmacology, prerequisites, biological sciences, anatomy and physiology, and program completion.	
#1	"attrition" OR "flunking" OR "flunk*"	
#2	"nursing" OR "nurse"	
#3	"associate" OR "ADN"	
#4	"program evaluation" OR "program" OR "program*"	
#5	"curriculum" OR "curricul*"	
AND		
#1	"improvement" OR "improve"	
#2	"nursing"	
#3	"curriculum"	
#4	"sciences" OR "science" OR "pathophysiology" OR "pharmacology"	
#5	"education" OR "academia"	
#6	"determinants" OR "predict*"	**Total: 48**

Database	**MedLine**	
Strategy	**1 AND 2 AND 3 AND 4…; publication dates 2002-2015** Major headings: student success, predictors, attrition, nursing education, program evaluation, community college, adult learners, associate degree nursing, sciences, pathophysiology and pharmacology, prerequisites, biological sciences, anatomy and physiology, and program completion. **Same Strategy as CINAHL**	
		Total: 20
Database	**PubMed**	
Strategy	**1 AND 2 AND 3 AND 4…; publication dates 2002-2015**. **Same Strategy as CINAHL**	
		Total: 22
Database	**Education Research Complete**	
Strategy	**1 AND 2 AND 3 AND 4…; publication dates 2002-2015**. **Same Strategy as CINAHL**	
		Total: 20

Appendix B – Synthesis of Evidence Table

Author/ Year	Aim	Design/ Method	Outcomes	Quality/ Comments	Complete Citation
Hopkins/ 2008.	This study sought to identify to what extent academic and nonacademic variables explain first-semester academic success among ADN students, as defined by passing the Nursing Fundamentals course.	Logistic regression model.	Although much work is necessary to fully understand first-semester nursing students' retention and success, an early identification model is explored to better support students as they enter associate-degree nursing programs. The regression test of the full model with all predictors was statistically significant, indicating that the variables reliably predicted those who would be successful, x2(9, N = 383) = 33.10, p < 0.01.	Level II/Quality B. Supportive evidence for model to assist with predictive qualities of student success.	Hopkins, T.H. (2008). Early identification of at-risk nursing students: A student support model. *Journal of Nursing Education, 47*(6), 254-269.
Rogers/2 010.	The purpose of this qualitative study is to explore the factors that contribute to student success in associate degree nursing programs and on the NCLEX-RN®.	Qualitative study.	The results confirm the continued need for nursing programs to seek to admit students with critical thinking ability and to assist students in fully developing that skill.	Level III/Quality A.	Rogers, T.L. (2010). Prescription for success in an associate degree nursing program. *Journal of Nursing Education, 49*(20), 96-100. doi: 10.3928/01484834-20091022-03
Jeffreys/2 007.	The entry, progression, graduation, and licensure characteristics of culturally diverse associate	Retrospective study.	Descriptive and inferential analyses suggested several variables that influenced first time pass rate on the nurse licensing exam including course grades, number of nursing withdrawals	Level III/Quality B.	Jeffreys, M.R. (2007). Tracking students through program entry, progression, graduation, and licensure: Assisting undergraduate nursing student retention and success. *Nurse Education*

	degree nursing students (n=112) were assessed to gain insight into nursing student progress and success.		or failures, and nursing course grade average.	Predictive qualities within nursing program for passing licensure exam.	*Today*, *27*, 406-419. doi: 10.1016/j.nedt.2006.07.003
Seago et al/2012.	The purpose of this article is to describe predictors of nursing students' success.	Quantitative correlational study.	The most important findings from these analyses found that previous academic achievement, as measured by prenursing GPA and science GPA, was a positive predictor of any-time and on-time graduation.	Level III/Quality B. Positive predictive qualities of prerequisite courses with nursing program success.	Seago, J. A., Keane, D., Chen, E., Spetz, J., & Grumbach, K. (2012). Predictors of students' success in community college nursing programs. *Journal of Nursing Education*, *51*(9), 489-495. doi:10.3928/01484834-20120730-03
Higgins/2005.	This study was designed to determine strategies to raise the NCLEX-RN pass rate and lower the attrition rate in a community college nursing program.	Qualitative study.	Qualitative data indicated preadmission requirements, campus counselors, remediation, faculty, test-item writing, and teaching method were instrumental in completion of the program and passing the NCLEX-RN.	Level III/Quality B.	Higgins, B. (2005). Strategies for lowering attrition rates and raising NCLEX-RN pass rates. *The Journal of Nursing Education*, *44*(12), 541-547.doi:10.5480/11-535.1

Abele et al/2013.	The purpose of this retrospective study was to identify undergraduate courses th at serve as predictors of success for nursing stu dents completing a BSN program. The sample included records of 327 students placed on probation or dismissed from a Midwest school of nursing between 2002 and 2010.	Retrospe ctive study.	The results suggest that nursing programs need to evaluate their programs not only reviewing students' success in nursing courses but also in prerequisites beyond just science courses such as chemistry and biology.	Level III/Quality B. Program evaluation to look beyond prerequisite biological sciences.	Abele, C., Penprase, B., & Ternes, R. (2013). A closer look at academic probation and attrition: What courses are predictive of nursing student success? *Nurse Education Today*, *33*(3), 258-261. doi:10.1016/j.nedt.2011.11.017
Dunn et al/2013.	This study seeks to better understand how to facilitate student success in pathophysiology.	Qualitati ve study.	In this study, the majority of students attributed their successes to controllable, unstable causes—primarily effort. Research indicates that attributing success to effort may reflect that students' confidence in their abilities is suffering, and that attributing failures to external causes, such as task difficulty, are also detrimental to performance and learning.	Level V/Quality B.	Dunn, K. E., Osborne, C., & Rakes, G. C. (2013). It's not my fault: Understanding nursing students' causal attributions in Pathophysiology. *Nurse Education Today*, *33*(8), 828-833. doi:10.1016/j.nedt.2012.02.012
Salamons on et al/2009.	This study selected three elements of academic engagement (homework completion, lecture attendance, and	Prospect ive survey design, with	Results from these findings indicate the importance of active learning engagement in influencing academic success, and provide some direction	Level V/Quality C.	Salamonson, Y., Andrew, S., & Everett, B. (2009). Academic engagement and disengagement as predictors of performance in pathophysiology among nursing students. *Contemporary Nurse:*

	study hours) and academic disengagement (part-time work), to identify predictors of academic performance in a pathophysiology subject in 126 second year nursing students.	multiple regression model.	for nursing academics to design effective learning approaches to promote academic engagement of nursing students.		*A Journal for the Australian Nursing Profession*, *32*(1-2), 123-132. doi:10.5172/conu.32.1-2.123
Peterson-Grazoise/ 2013.	The purpose of this study was to determine whether self-esteem, self-efficacy, and life stressors were significantly related to student attrition in first-semester associate degree nursing students.	Descriptive, correlational design.	Results from this study provide the basis for targeted interventions designed to decrease student attrition rates in associate degree nursing programs	Level V/Quality B.	Peterson-Grazoise, V., Bryer, J., & Nikolaidou, M. (2013). Self-esteem and self-efficacy as predictors of attrition in associate degree nursing student [Research Briefs]. *Journal of Nursing Education*, *52*(6), 351-354. doi: 10.3928/01484834.20130520-01
Harvey & McMurray/1997.	This study examined the effect of students' pre-enrollment perceptions of nursing education on attrition.	Cross-sectional, qualitative study design.	This study's findings suggest a need to adequately convey the scientific basis of nursing knowledge to potential students and to deal with misconceptions early in education, to reduce attrition.	Level V/Quality B.	Harvey, V.C., & McMurray, N.E. (1997). Students' perceptions of nursing: Their relationship to attrition. *Journal of Nursing Education*, *36*(8), 383-389.

Appendix C – Evidence Summary Table

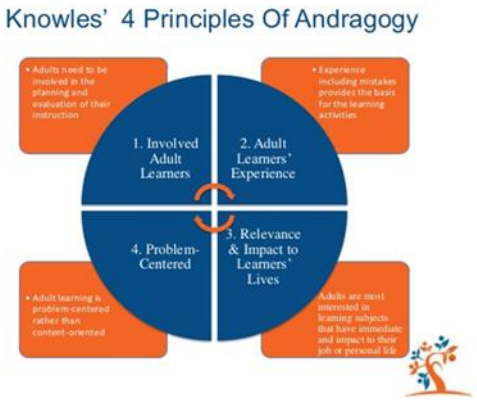
Article #	Author/Date	Evidence Type	Sample, Sample Size, and Setting	Study Findings that may help answer the EBP question	Limitations
1	Hopkins/2008	Logistic regression model.	n = 383 ADN students at a small, private college of health sciences.	Supportive evidence for model to assist with predictive qualities of student success. Variables reliably predicted who would be successful.	Low variance accounted for in predicting student success. Other variables not identified.
2	Rogers/2010	Qualitative study.	n = 6 post-licensure ADN students; 3 faculty members at university of health sciences.	Results confirm the continued need for nursing programs to admit students with critical thinking ability and to assist students in fully developing that skill.	Very small sample group, limited to one ADN program, and only first-pass licensure participants were included.
3	Jeffreys/2007	Retrospective study.	n = 112, culturally diverse ADN students.	Results confirm there are predictive qualities within nursing programs for passing nursing licensure exam. Notably, first time pass rate on the RN licensing exam was significantly influenced by academic indicators rather than demographic variables.	Small sample group, limited to only one ADN program.

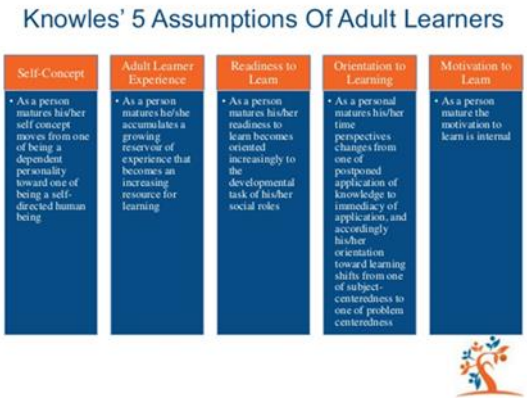
4	Seago et al/2012	Quantitative correlational study.	n = 738. Students from 12 nursing colleges in California central valley.	Positive predictive qualities of academic outcomes of prerequisite courses with nursing program success.	Students were surveyed in various, non-consistent semesters.
5	Higgins/2005	Qualitative study.	n = 213 ADN students.	Results determined that preadmission requirements, as well as counseling, remediation, and teaching methods, were instrumental in completion of the program as well as NCLEX® pass rates.	Limited to small sample.
6	Abele et al/2013	Retrospective study.	N = 327 students on probation or dismissed from a Midwest school of nursing between 2002 and 2010.	Results suggest that nursing programs need to evaluation their programs beyond prerequisite biological sciences to other prerequisite courses (e.g. writing, math, psychology, etc.). Pre-requisites are critical for students to develop an understanding of basic concepts which enhances the likelihood of success in the nursing program and may predict students at risk for academic failure early in the program.	Results limit generalizability: Only one school, and limited to only students on academic probation.

7	Dunn/2013	Qualitative study.	n = 81 fully admitted nurse education undergraduate students enrolled in pathophysiology	Students often place erroneous causal attributes to their own success, attributing failure to external sources which may lead to detrimental performance and learning.	Findings not generalizable. The one-time nature of this sample's self-reported attributions does not fully explore the deep structural nature of casual attributions.
8	Salamonson et al/2009	Prospective survey design, with multiple regression model.	n = 126 second-year nursing students in a pathophysiology course.	Results suggest that active learning influences academic success in pathophysiology course.	Findings of this study need to be interpreted with caution due to the inherent bias of self-report recall measures. As this study was only restricted to a second year cohort, findings of this study cannot be generalized to all students studying in nursing programs.
9	Peterson-Grazoise/2013	Descriptive, correlational study.	n = 34 participants enrolled in the first semester of an associate degree nursing program.	The results provide the basis for targeted interventions to have decrease student attrition related to life stressors and self-esteem.	Limitations of this study include a focus on a single associate degree program and small sample size.
10	Harvey & McMurray/1997	Cross-sectional, qualitative study design.	n = 168 tertiary college student nurses who had commenced their 3-year Diploma of Applied Science (Nursing) education in the 2 years prior to the study.	Students' misconceptions about the nursing program need to be handled early in education (include prerequisites) to adequately convey the importance of the scientific basis of nursing.	Cross-sectional nature contains the potential for influence of social desirability effect, rural setting limits generalizability, and travel to clinical placement is a unique stressor.

Appendix D – Project Frameworks

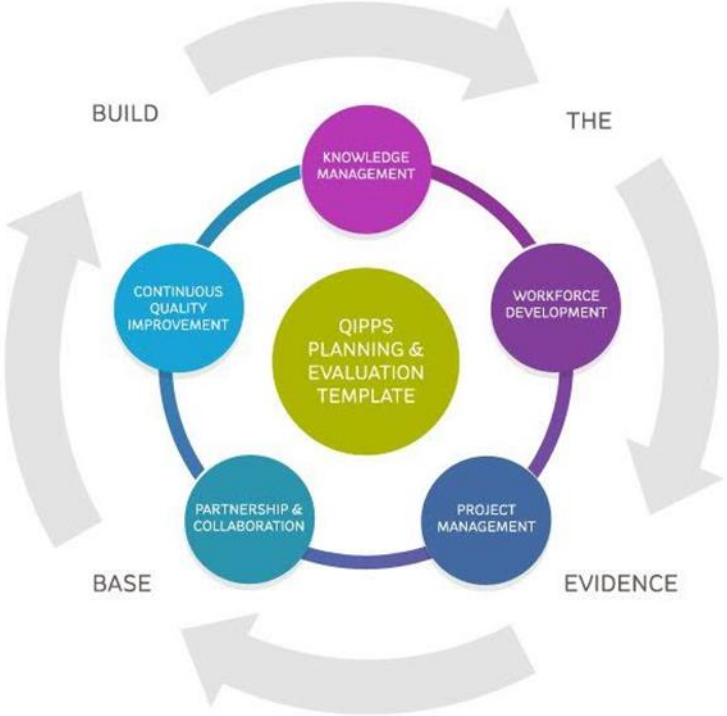
Malcom Knowles' Theory of Adult Education





Pappas, C. (2013)

Quality Improvement Program Planning System



QIPPS. (n.d.)

Appendix E – Logic Model

	Resources/Inputs	Activities/Interventions	Outputs	Objectives	Outcomes: Short-Term	Outcomes: Long-Term	Impact
Human Resources	1. Project Director	1. Project Director a. Obtain OCNE support. b. Provide Scholarly Proposal, Logic Model, and Budget Analysis to team.	1. Project Director a. Team consists of PD, key OCNE liaison, project mentor, other internal/external stakeholders. b. Project plan and meeting schedules formulated.	Establish support to guide and help direct project to ensure success, sustainability, and strengthen communication.	A Letter of Support signed by OCNE by November of 2016.	Project Team to remain assembled throughout the duration of Scholarly Project (completion by June of 2017).	Project team to help ensure Scholarly Project (SP) completed, delivered, and disseminated.
	2. Project Team (comprised of various internal and external stakeholders).	2. Project Team: a. Establish and recommend guidance for SP plan. b. Select participating schools.	2. Project Team: a. Guidance acquired from team for SP plan. b. Participating OCNE schools selected.	Establish SP plan and selection of participating schools to promote effective program evaluation and data collection.	As above in #1.	As above in #1.	As above in #1.
	3. Internal stakeholders: a. OCNE b. Participating OCNE schools. c. Program directors. d. Oregon State Board of Nursing (OSBN).	3. Internal stakeholders: a. Obtain admission criteria. b. Obtain student transcripts.	3. Internal stakeholders: a. Admission criteria obtained & analyses completed. b. Student transcripts obtained from state institutional research board. c. Program evaluation provided.	Analyze trends in GPA, A&P scores, Chemistry scores, Microbiology scores, attrition rates, and course repeats, using predictive data analyses.	Comprehensive evaluation of GPA, A&P scores, Chemistry scores, Microbiology scores, attrition rates, and course repeats, in nine nursing programs	Submit and present a program evaluation of factors affecting student success to OCNE by	a. OCNE support of potential admission criteria changes needed to minimize attrition and maximize program

		c. Provide final program evaluation. d. Provide final program evaluation.	d. Program evaluation provided.		within OCNE by spring of 2017. This report includes outcomes, conclusions, and further recommendations.	spring of 2017.	completion rates. b. OCNE to accept program evaluation and approve admission criteria changes to the ADN programs, if applicable. c. Strengthen curricular programs to produce graduates that are uniquely prepared to anticipate and respond to the future needs of the communities they serve. d. Results of program evaluation will be shared with all communities of interest.

	4. External stakeholders: a. Local hospitals/clinics and nursing administrators. b. BSN programs. c. Community.						
Financial and Material Resources	1. Budget. 2. In-kind contributions. 3. Facilities, workplaces. 4. Communications, computer, telephone.	1. Budget and potential funding creation. 2. Allocation of salaries. 3. Schedule Project Team meeting rooms, establishment of workplace for project. 4. Develop communication process for team (Adobe Connect, phone, etc.), and data management of meeting minutes.	1. Preliminary budget created. 2. Salaries provided from grant/contributions. 3. Meeting place confirmed and scheduled as needed. 4. Communication process agreed upon.	1-2. Secure adequate funding to cover SP costs. 3-4. Encourage professional and timely collaboration on SP.	Fiscal and physical resources secured by grant or in-kind donations to sustain and advance project, with funding secured with a balanced budget by December of 2015.	Fiscal and physical resources are sufficient to enable the SP to fulfill its mission, goals, and expected outcomes. Funding via in-kind contributions secured through 2018 for further program evaluation and sustainability.	Sustainment of program completion rates with ongoing faculty development and ongoing program evaluation.

Curriculum	1. Participating schools.	1. Participating schools. a. Admission criteria. b. Program completion.	1. Participating schools. a. Obtained admission criteria established by OCNE. b. Program completion rates obtained.	Produce admission criterial data to align with statistical predictors with regard to program effectiveness.	a. Program evaluation shows trending data of three predictive factors that prevent student success by spring of 2017. b. Aggregate student outcome data collected, statistically analyzed, and predictors established by spring of 2017.	Aggregate student outcome data and P&P of admission and progression are annually collected, evidencing evaluation of the program's effectiveness in achieving mission, goals and expected outcomes, through 2022.	a. Create or continue an education model that supports caring, collaboration and drives change. b. Program adjustments to foster ongoing improvement related to actual student outcome data 100% of time. c. Program adjustments are deliberate and congruent with program's mission, goals and expected outcomes.

	2. Students.	2. Students. a. GPA data gathered: Prerequisite biological sciences and ADN graduation GPA. b. Grades and repeats from A&P I, II, & III, Chemistry, and Microbiology gathered. c. Grades from ADN sciences (pathophysiology and pharmacology) gathered.	2. Students. a. Prerequisite GPA and ADN GPA data compiled and analyzed. b. Grades from prerequisite biological sciences compiled and analyzed. c. Grades from ADN sciences compiled and analyzed.	2. Students. a. Evaluate prerequisite biological sciences GPA and ADN graduation GPA. b. Evaluation of prerequisite biological sciences grades in comparison to ADN sciences grades, to include course repeats and attrition. c. Evaluation of history of repeating any prerequisite science courses prior to entering ADN program in comparison to ADN sciences grades and attrition.	Complete comprehensive statistical analysis of trends in GPA, A&P scores, attrition rates, and course repeats, statistical predictive data analysis, by Spring 2017.	Provide data collection analysis to OCNE by December of 2017 that details factors that affect student success and 50% of the students studied will demonstrate lower than 80% grade in their sciences courses 2010-2015.	a. Maximize the value of educational resources by increasing productivity, allocating resources appropriately, and accounting for their use. b. Increased program completion rates of greater than 90%.

	3. Faculty and admission criteria.	3. Gather faculty qualifications from each participating OCNE school and OCNE admission requirements.	3. Faculty qualifications and admission criteria gathered and OCNE admission requirements included in SP.	Obtain and evaluated qualifications of faculty and admission criteria at each OCNE schools for adherence to OSBN standards.	Faculty records obtained and evaluated for required OSBN standards of qualifications in nine OCNE programs and OCNE admission criteria gathered by spring of 2017.	100% of OCNE faculty to meet regularly body standards appropriate for ADN level and OCNE admission criteria standard amongst all nine ONCE schools.	Ongoing assessment of faculty qualifications and admission criteria of all OCNE schools evaluated on yearly basis.

Appendix F – Outcomes Evaluation Table

Outcome	Outcome Instrument Data	Analysis Goal	Analytic Technique
Aggregate student outcome data collected, statistically analyzed, and predictors established by Spring 2017.	Facility records (student transcripts). Expected data: Predictors revealed between prerequisite academic factors and nursing program grades and attrition rates. Hypothesis: Academic performance in prenursing and nursing science courses predict attrition in ADN programs. Null hypothesis: There is no statistical relationship between students' grades received in science courses and success in nursing school.	Data shows a relationship between prerequisite science courses, prerequisite GPA, course repeats, and nursing program GPA & completion in order to understand predictive factors.	**Frequency distribution of numerical grades and *t* test analyses:** • Evaluate the relationship between numerical grades earned in each of the prerequisite science courses and identified nursing courses (new relationship data for each prerequisite science course) and overall nursing program GPA and program completion. • Evaluate the relationship between grades earned in each prerequisite science course and the nursing program GPA, attrition rates, and program completion. • Evaluate the relationship between GPA for prerequisite biological science courses and nursing program GPA, attrition rates, and program completion. **Pearson *r*:** • Determine the strength of the correlation/relationship after determination of relationship. • Product-moment correlation coefficient established between numerical grades earned in each of the prerequisite science courses and identified nursing courses. • Evaluate the relationship between GPA for prerequisite biological science courses and nursing program GPA, attrition rates, and program completion. • Evaluate the relationship between grades earned when repeating A&P or other science course and the nursing program GPA to determine success and attrition incidences.
Program evaluation of curriculum shows	Facility records (student transcripts).	Data shows that there are definite trends that can	• Predictive analyses using IBM SPSS predictive analysis software. • Correlational analyses completed. • Determine whether two measurement variables co-vary, and to quantify the strength of the relationship between the variables.

trending data of three predictive factors that prevent student success, by Spring of 2017.	Expected data: At minimum three academic predictors that equate to student success in ADN programs. Hypothesis: There are academic and faculty predictors that can attribute to student outcomes. Null hypothesis: No academic or faculty predictors can be attributed to student success.	predict academic student success in ADN programs based on prerequisite science courses.	• Measure linear association between two variables.
Complete comprehensive statistical analysis of trends in GPA, A&P scores, attrition rates, and course repeats, statistical predictive data analysis, by Spring 2017.	Facility records (student transcripts). Expected data: Grades and course repeats in prerequisite science courses correlate to grades and attrition rates in nursing program.	Data shows a relationship between prerequisite science courses, prerequisite GPA, course repeats, and nursing program GPA & completion in order to understand	**Frequency distribution of numerical grades and *t* test analyses:** • Evaluate the relationship between numerical grades earned in each of the prerequisite science courses and identified nursing courses. • Evaluate the relationship between grades earned in each prerequisite science course and the nursing program GPA and attrition rates. • Evaluate the relationship between GPA for prerequisite biological science courses and nursing program GPA and attrition rates. **Pearson *r*:** • Determine the strength of the relationship. • Product-moment correlation coefficient established between numerical grades earned in each of the prerequisite science courses and identified nursing courses. • Evaluate the relationship between GPA for prerequisite biological science courses and nursing program GPA and attrition rates.

		predictive factors.	• Evaluate the relationship between grades earned when repeating A&P or other science course and the nursing program GPA.
50% of the students studied will demonstrate lower than 80% grade in their sciences courses 2010-2015.	Facility records (student transcripts). Expected data: Data agrees with outcome. Hypothesis: Student success in prerequisite science courses is directly related to success in graduating from ADN program.	Data supports project goal and literature that there are correlational factors between prerequisite grades and ADN student outcomes.	• Above data will be efficient to display this data outcome. • Mean data will be included.
100% of OCNE faculty to meet regulatory body standards appropriate for ADN level.	Facility records (via program directors). Expected data: Data agrees with outcome. Hypothesis: There is a better chance of positive student outcomes when appropriate faculty credentials are consistently met.	Data supports hypothesis.	• Data collected to display percentage of faculty with MSN or above.

Appendix G – OCNE Letter of Support

OCNE

Oregon Consortium for Nursing Education
3455 SW U.S. Veterans Hospital Road
Mail Code: SN-6S
Portland, Oregon 97239-2941 Phone: 503 494-3670 www.ocne.org

November 28, 2016
Michelle Hall
Marilyn McGuire
To Whom It May Concern,

We are pleased to write in support of Tracy Fawns' research project entitled A Program Evaluation: Factors Affecting Student Success in Oregon ADN Programs at Boise State University.

As nurse educators, our goal is to support student success. Ms. Fawns' research will help us to better understand and predict those students that will be successful in the completion of an Associate Degree in Nursing.

Ms. Fawns' project aligns with the interests of the OCNE community college partners, as well as the evidence-based approach to program improvement within the larger Oregon Consortium for Nursing Education (OCNE). By identifying admission criteria that may predict whether a student will or will not be successful in the program, as a consortium, we can work with other stakeholders to prepare strategies to assist those at-risk students.

We look forward to hearing the results of Ms. Fawns' research.

Sincerely,

Michelle Hall, DNP, RN
OCNE Research and Evaluation committee co-chair

Marilyn McGuire, MSN, RN
OCNE Research and Evaluation committee co-chair

Appendix H – Boise State University IRB Exemption

BOISE STATE UNIVERSITY
RESEARCH AND ECONOMIC DEVELOPMENT

Date: March 07, 2016

To: Tracy Fawns cc: Pamela Strohfus

From: Office of Research Compliance (ORC)

Subject:SB-IRB Notification of Exemption - 187-SB16-046

A Program Evaluation: Factors Affecting Student Success in Oregon ADN Programs

The Boise State University ORC has reviewed your protocol application and has determined that your research is exempt from further IRB review and supervision under 45 CFR 46.101(b).

Protocol Number: 187-SB16-046

Approved: 3/3/2016 Application Received: 2/23/2016 Review: Exempt
Category: 4

This exemption covers any research and data collected under your protocol as of the date of approval indicated above, unless terminated in writing by you, the Principal Investigator, or the Boise State University IRB. All amendments or changes (including personnel changes) to your approved protocol **must** be brought to the attention of the Office of Research Compliance for review and approval before they occur, as these modifications may change your exempt status. Complete and submit a Modification Form indicating any changes to your project.

Annual renewals are not required for exempt protocols. When the research project is completed, please notify our office by submitting a Final Report. The exempt status expires when the research project is completed (closed) or when the review category changes as described above.

All forms are available on the ORC website at http://goo.gl/D2FYTV

Please direct any questions or concerns to ORC at 426-5401 or humansubjects@boisestate.edu.

Thank you and good luck with your research.

Office of Research Compliance

1910 University Drive Boise, Idaho 83725-1139
Phone (208) 426-5401 orc@boisestate.edu

Appendix I – Data Collection Table

	School	ADN Overall GPA	Prereq Overall GPA	Prereq Sciences GPA	ADN Patho I Grade	ADN Patho II Grade	ADN Pharm I Grade	ADN Pharm II Grade	A&P I Grade	A&P I Repeat	A&P II Grade	A&P II Repeat	A&P III Grade	A&P III Repeat	Micro Grade	Micro Repeat	Chemistry Grade	Chem Repeat	All Nursing Faculty with MSN or higher; Y/N
Student																			
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Appendix J – Paired Samples of Prerequisite Science Courses with ADN Science Courses

Paired Sample Correlation

Prerequisite Sciences with ADN Science Courses

		N	Correlation	Sig.
Pair 1	AP_I_Grade & Patho_I	499	.169	.000
Pair 2	AP_I_Grade & Patho_II	495	.133	.003
Pair 3	AP_I_Grade & Pharm_I	500	.082	.067
Pair 4	AP_I_Grade & Pharm_II	495	.135	.003
Pair 5	AP_II_Grade & Patho_I	499	.039	.388
Pair 6	AP_II_Grade & Patho_II	495	.139	.002
Pair 7	AP_II_Grade & Pharm_I	500	.095	.035
Pair 8	AP_II_Grade & Pharm_II	495	.023	.604
Pair 9	AP_III_Grade & Patho_I	499	-.005	.907
Pair 10	AP_III_Grade & Patho_II	495	.073	.105
Pair 11	AP_III_Grade & Pharm_I	500	.007	.869
Pair 12	AP_III_Grade & Pharm_II	495	-.017	.698
Pair 13	Microbiology & Patho_I	499	.105	.019
Pair 14	Microbiology & Patho_II	495	.077	.086
Pair 15	Microbiology & Pharm_I	500	.092	.041
Pair 16	Microbiology & Pharm_II	495	-.018	.687
Pair 17	Chemistry & Patho_I	499	.140	.002
Pair 18	Chemistry & Patho_II	495	.151	.001
Pair 19	Chemistry & Pharm_I	500	-.039	.382
Pair 20	Chemistry & Pharm_II	495	.020	.653

Appendix K – Paired t-Test of Prerequisite Science Courses with ADN Science Courses

Paired *t*-Test –With Confidence Interval

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	AP_I_Grade - Patho_I	-.11623	.92408	.04137	-.19751	-.03496	-2.810	498	.005
Pair 2	AP_I_Grade - Patho_II	-.16566	.92690	.04166	-.24751	-.08380	-3.976	494	.000
Pair 3	AP_I_Grade - Pharm_I	-.32400	.96170	.04301	-.40850	-.23950	-7.533	499	.000
Pair 4	AP_I_Grade - Pharm_II	-.25253	.91261	.04102	-.33312	-.17193	-6.156	494	.000
Pair 5	AP_II_Grade - Patho_I	.10822	.91852	.04112	.02743	.18900	2.632	498	.009
Pair 6	AP_II_Grade - Patho_II	.04848	.85466	.03841	-.02699	.12396	1.262	494	.207
Pair 7	AP_II_Grade - Pharm_I	-.10000	.88293	.03949	-.17758	-.02242	-2.533	499	.012
Pair 8	AP_II_Grade - Pharm_II	-.03838	.89337	.04015	-.11728	.04051	-.956	494	.340
Pair 9	AP_III_Grade - Patho_I	.13627	.88578	.03965	.05836	.21418	3.437	498	.001
Pair 10	AP_III_Grade - Patho_II	.08485	.83501	.03753	.01111	.15859	2.261	494	.024
Pair 11	AP_III_Grade - Pharm_I	-.07000	.87099	.03895	-.14653	.00653	-1.797	499	.073
Pair 12	AP_III_Grade - Pharm_II	-.00202	.85721	.03853	-.07772	.07368	-.052	494	.958
Pair 13	Microbiology - Patho_I	.01403	.90170	.04037	-.06528	.09334	.348	498	.728
Pair 14	Microbiology - Patho_II	-.04444	.89649	.04029	-.12361	.03472	-1.103	494	.271
Pair 15	Microbiology - Pharm_I	-.19400	.89999	.04025	-.27308	-.11492	-4.820	499	.000
Pair 16	Microbiology - Pharm_II	-.13131	.92477	.04157	-.21298	-.04965	-3.159	494	.002

Pair 17	Chemistry - Patho_I	.08417	.88774	.03974	.00609	.16225	2.118	498	.035
Pair 18	Chemistry - Patho_II	.03232	.86950	.03908	-.04446	.10911	.827	494	.409
Pair 19	Chemistry - Pharm_I	-.12200	.96591	.04320	-.20687	-.03713	-2.824	499	.005
Pair 20	Chemistry - Pharm_II	-.05455	.91714	.04122	-.13554	.02645	-1.323	494	.186

*Highlighted pairs in this table show statistical significance.
Statistical significance is indicated by sig. (two-tailed) greater than 0.05

Appendix L – Paired Sample of Prerequisite Sciences GPA with ADN Graduation GPA

Paired Sample - Prerequisite Science Courses with ADN Graduation GPA

		Mean	N	Std. Deviation	Std. Error Mean
Pair	Prereq_Sci_GPA	3.2336	488	.35290	.01597
	GradGPA	3.0945	488	.40474	.01832

Paired *t*-test - Prerequisite Science Courses with ADN Graduation GPA with Confidence Interval

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Prereq_Sci_GPA - GradGPA	.13911	.50170	.02271	.09448	.18373	6.125	487	.000

Appendix M – Correlations (Pearson Product)

Correlations of Prerequisite Biological Sciences Repeats & ADN Sciences

		Repeat_AP_I	Repeat_AP_II	Repeat_AP_III	Micro_Repeat	Chem_Repeat	Patho_I	Patho_II	Pharm_I	Pharm_II
Repeat_AP_I	Pearson Correlation	1	1.000**	.b	1.000**	-1.000**	.087	-.021	.024	.145
	Sig. (2-tailed)		.000	.	.	.	.700	.928	.916	.529
	N	22	5	2	2	2	22	21	22	21
Repeat_AP_II	Pearson Correlation	1.000**	1	.b	.b	.b	-.083	.000	.105	.064
	Sig. (2-tailed)	.000		.	.	.	.777	1.000	.721	.837
	N	5	14	2	0	1	14	13	14	13
Repeat_AP_III	Pearson Correlation	.b	.b	1	.b	.b	.191	-.590	.000	-.365
	Sig. (2-tailed)	.	.		.	.	.623	.124	1.000	.374
	N	2	2	9	0	1	9	8	9	8
Micro_Repeat	Pearson Correlation	1.000**	.b	.b	1	.b	-.261	-.346	.165	-.269
	Sig. (2-tailed)	.	.	.		.	.311	.189	.528	.313
	N	2	0	0	17	2	17	16	17	16
Chem_Repeat	Pearson Correlation	-1.000**	.b	.b	.b	1	.455	.140	.624*	.120
	Sig. (2-tailed)	.	.	.	.		.088	.633	.013	.683
	N	2	1	1	2	15	15	14	15	14
Patho_I	Pearson Correlation	.087	-.083	.191	-.261	.455	1	.122**	.104*	-.048
	Sig. (2-tailed)	.700	.777	.623	.311	.088		.006	.021	.288
	N	22	14	9	17	15	499	494	499	494
Patho_II	Pearson Correlation	-.021	.000	-.590	-.346	.140	.122**	1	.067	.141**

	Sig. (2-tailed)	.928	1.000	.124	.189	.633	.006		.136	.002
	N	21	13	8	16	14	494	495	495	495
Pharm_I	Pearson Correlation	.024	.105	.000	.165	.624*	.104*	.067	1	.034
	Sig. (2-tailed)	.916	.721	1.000	.528	.013	.021	.136		.449
	N	22	14	9	17	15	499	495	500	495
Pharm_II	Pearson Correlation	.145	.064	-.365	-.269	.120	-.048	.141**	.034	1
	Sig. (2-tailed)	.529	.837	.374	.313	.683	.288	.002	.449	
	N	21	13	8	16	14	494	495	495	495

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

b. Cannot be computed because at least one of the variables is constant.

Correlations – Prerequisite Sciences GPA & ADN Completion GPA

		GradGPA	Prereq_Sci_GPA
GradGPA	Pearson Correlation	1	.128**
	Sig. (2-tailed)		.005
	N	488	488
Prereq_Sci_GPA	Pearson Correlation	.128**	1
	Sig. (2-tailed)	.005	
	N	488	500

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations – Prerequisite Sciences GPA & ADN Completion

		Prereq_Sci_GPA	Completion
Prereq_Sci_GPA	Pearson Correlation	1	-.128**
	Sig. (2-tailed)		.004
	N	500	500

Completion	Pearson Correlation	-.128**	1
	Sig. (2-tailed)	.004	
	N	500	500

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix N – Statement of Operations Report

Statement of Operations		
Revenues		
IN-KIND: Advisory board, data collection, evaluation, and operations.		
	Total	***21,232.50***
Expenses		
In-kind:		
Advisory board		**$1600.00**
Data Collection		**$4825.00**
Evaluation/Assessment		**$4530.00**
Operations		**$9397.50**
	Total	**$21,232.50**
Operating Income		***$0.00***

Appendix O – Expense Report

Source of Expense	Expense Description	Dollar Value	Type of Cost (fixed or variable)	Description of Cost	Estimated Volume	Expense Per Unit
Advisory Board		**Cost ($)**				
Administrative Supplies & Support	Printer cartridges, cell phone charges, paper, copying, internet	350.00	Fixed	Supplies	Varies.	$350.00
OCNE Administration	In-kind wages for project support and advising	$1000.00	Variable	Wages	20 hours	$50.00
Rental of Meeting Room	Meeting/board room for advisory meetings	$200.00	Fixed	Rental	2	$100.00
Adobe Connect	Microphone & computer camera, online meetings for advisory board	$50.00	Fixed	Supplies	1	$50.00
	Total Requested	***$1600.00***				
Data Collection		**Cost ($)**				
Travel	Travel to OCNE schools. Gas, food, lodging.	$2000.00	Variable	Travel expenses	Four trips.	$500.00
Travel	Travel to OHSU/OCNE.	$1000.00	Variable	Travel expenses.	Two trips.	$500.00
Materials/Supplies	Software for data analysis	$1200.00	Fixed	Data collection	1	$1200.00

Registrars	In-kind wages for assistance with data collection ***Total Requested:***	$625.00 ***$4825.00***	Variable	Data collection	25 hours	$25.00
Evaluation/Assessment		**Cost ($)**				
Evaluation & Assessment Salary at $-45/hour Fringe @ 17% ***Total***	Administration of program evaluation, data entry, data analyses, personnel time for preparation ***Total***	$4530.00 ***$4530.00***	Fixed/In-kind	Cost to evaluate program x hours Fringe		$3000.00 $1530.00
Management & Operations Salary						
Project Manager Fringe @ 17% Material/supplies ***Total***	Project operations salaries = $45/hour times 17% fringe times 150 hours Computer, internet, phone, recording equipment, external hard drive, Cloud space for storage, printer ink, paper ***Total***	7897.50 $1500.00 ***$9397.50***	Fixed/In-kind Fixed Fixed/In-kind	Operations salaries x hours Fringe 17% Data analysis and project formatting	Varies	$6750.00 $1147.50 $1500.00

Marketing & Advertising						
Marketing & Advertising	Marketing costs	0	None	Marketing		$0
	Total	**0**				
	Grand Total	***$21,232.50***				

Appendix P – Budget Plan (3- to 5-year)

IEP						
Revenues	**Budget Year 1**	**Budget Year 2**	**Budget Year 3**	**Budget Year 4**	**Budget Year 5**	**Rationale**
Personal funding.	21,232.50	10,530	500	500	500	No grant funding at this time. Funds from personal funds.
Total	***21,232.50***	10,530	500	500	500	
Expenses						
Advisory Board (every year)	1600.00	500.00	500.00	500.00	500.00	Continuation of program evaluation to describe academic factors that attribute to student success. After 1st year, needs diminished.
Data collection	4825.00					Data collection & software training.
Evaluation Assessment Salaries (1st & 2nd year)	4530.00	4530.00				Not necessary to perform assessments after 2nd year.
Management & Operations Salary (1st & 2nd year)	7397.00	4000.00				Not necessary to pay for project management after 2nd year. Second year cost less due to previous competencies in data analysis and collection of data.

Marketing & Advertising (1st & 2nd year)	None.	None.			
Total	***21,232.50***	***$10,530***	***$500***	***$500***	***$500***
Operating Income	***21,232.50***	***0***	***0***	***0***	***0***

Appendix Q – OCNE Admission Requirements

OCNE Designated Admission Criteria

Program selection for OCNE nursing programs is a two-part process. Part 1 is based on a point system worth up to 70 points as detailed below. 51 of the points are designated by Oregon Consortium for Nursing Education (OCNE), and 19 points are discretionary allotted by each individual community college (such as completion of medical terminology, extra points for complete of certain number of prerequisites at the time of application, extra points for not repeating A&P, extra points for preadmission exam, etc.). The point totals are based upon courses completed by the application deadline. All courses taken during or after the application deadline will not improve the students' point ratings. Based on the 70 points, the college will select a certain predetermined number of the top applicants to participate in the second step of the process. Part 2 consists of an interview and/or a proctored essay. The interview and/or essay will be worth up to 30 points. The total points out of 100 will determine tentative admission to the nursing program and alternates selected. All prerequisite courses must be completed with a grade of C or better, with a cumulative minimum 3.0 GPA. Failure to maintain a cumulative 3.0 GPA on prerequisite courses through winter, spring, and summer terms will disqualify students from the program.

Prerequisite GPA Max 40

GPA is calculated from grades earned in the 30-54 prerequisite credits completed by the end of fall term prior to application submission. Points are calculated using the following equation:

(GPA x 24) – 56 = Points

Examples:

(4.00 x 24) – 56 = 40 points (3.50 x 24) – 56 = 28 points

Completion of A&P (BI 231, 232, and BI 233) Max 5

BI 231, 232, & BI 233 completed with C or better by end of Fall term by end of fall term prior to application 5 points

Two courses (BI 231 & BI 232) completed with C or better by end of fall term prior to application 3 points

Prior Degree Max 1

Applicants who hold a prior degree will be awarded a maximum of 1 point for having previously earned an associate or higher degree.

Completion of All Prerequisite Credits Max 5

All prerequisite courses completed by the end of fall term prior to application being submitted 5 points

37 or more prerequisite credits completed by the end of fall term prior to application being submitted 3 points

Appendix R – Oregon State Board of Nursing Faculty Requirements

The OSBN Division 21 Administrative Rules 851-021-0045 state the following with regard to the qualifications of nurse faculty at Oregon schools:

b) Each nurse educator shall:

(A) Hold at least a master's degree in nursing or a baccalaureate degree in nursing, and master's in a related field with a post-master's certificate in nursing from a program that is at least two semesters or three quarters in length; and

(B) Have at least three years of nursing experience.

(c) Each nurse educator associate shall hold at least a bachelor's degree in nursing with no less than two years of nursing experience.

(d) Each clinical lab teaching assistant shall:

(A) Hold at least the educational level of preparation for which students are being taught; and

(B) Have at least two years of nursing experience.

(8) Any exceptions to subsections (6)(a), (b), (c), (d), (e) and (7)(a), (b), (c), (d) of this rule shall be submitted in writing to the Board and shall include rationale for the request. The Board may grant exceptions for any of the following circumstances:

(a) The education and experience qualifications are deemed equivalent to the requirements; or

(b) The individual has a baccalaureate in nursing, a masters or doctorate in a related field, and relevant nursing experience. The background of the individual is related to the teaching assignment and is complementary to the faculty mix, or

(c) Substantial effort has been made to recruit a qualified faculty member, and the appointed individual is pursuing the needed qualifications; or

(d) Substantial effort has been made to recruit a qualified faculty member, and the individual without full qualification is appointed for one year. The exception may be extended for one year with documentation of either continued or unsuccessful recruitment for a qualified replacement, or a plan to establish eligibility under exception (c) above.

(9) Special Provision for Nursing Faculty. Nurse administrators and faculty members employed as such in Oregon during the 1984 85 academic year may be appointed after September 1, 1985 without meeting new requirements under paragraphs 6(a)(A), (6)(b)(A), (7)(a)(A) and (7)(b)(A) of this rule (OSBN, Division 21 Rules, 851-021-0045, 2016).