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The Impact of a Faculty Workflow Algorithm on Early Identification and Referral of Students

At Risk for Academic Performance Issues: A Quality Improvement Project

DNP Project
Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Nursing Practice

St. Catherine University
St. Paul, Minnesota

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This is to certify that I have examined this
Doctor of Nursing Practice DNP project manuscript
written by

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and have found that it is complete and satisfactory in all respects,
and that any and all revisions required by
the final examining committee have been made.

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Abstract

A challenging issue in nursing education is the high rate of student failures, often referred to as attrition. Student failures have undesirable consequences for students and faculty, but more importantly, there are negative impacts at a broader system level, within institutions of higher education and the healthcare workforce. At the project site, thirty percent of practical nursing students failed their initial theory course even though these students met program admission criteria. This quality improvement project focused on nursing faculty and the lack of a streamlined process for early identification and referral of students at risk for academic performance issues. The purpose of this project was to design and implement a workflow process, a student success plan, and ongoing communication processes between faculty and learning resource center (LRC) staff. The project was guided by PDSA quality improvement methodology in three cycles: an educational session with survey analysis of attitudes and barriers, a staff interview to identify potential gaps in student services, and a group review of all referrals to evaluate overall adequacy of services. The project intervention included the design and implementation of a standardized, evidence-based workflow algorithm. Despite system barriers, the total number of student referrals entered into early alert system software improved significantly and faculty expressed an increased awareness in referral timing and identified additional categories of at-risk students. Nursing faculty were satisfied with the workflow algorithm but challenged with adherence based on a stated desire to self-remediate students within the department. Nursing faculty have opportunities for improved workflow processes and interprofessional collaboration to impact student success, also known as retention, and prepare qualified practical nurses for immediate entry into the workforce.

Keywords: faculty, nursing students, academic performance, collaboration, retention

The Impact of a Faculty Workflow Algorithm

A challenging issue in nursing education is the increasing rate of student failures, often referred to as attrition (Jeffreys, 2015; Stickney, 2008). Student failures have undesirable consequences for students and faculty, but more importantly, there are negative impacts at a broader system level, within institutions of higher education and the healthcare workforce. Pertinent examples of these adverse outcomes include financial cost incurred to students when repeating a course, faculty investment of time and energy, increased consumption of institutional resources, and delayed entry of graduate nurses into the workforce (Chan et al., 2019; Jeffreys, 2015; Stickney, 2008). Faculty fail to consistently and accurately identify students at risk for academic performance issues.

Institutions of higher learning lack processes, funding, and training for faculty implementation of retention strategies (Freeman & All, 2016; Gambino, 2017; Kotcherlakota, Kupzyk & Rejda, 2017). It is vital for nurse educators to develop workflow processes to identify students at risk for failure early in the program and implement targeted interventions. This is necessary to realize the goal of preparing students to successfully navigate their program of study and achieve end-of-program learning outcomes and subsequently meet the current demand for nurses as care providers in the health system (Chan et al., 2019; Jeffreys, 2015).

Background and Significance

The DNP Project Site

Before the inception of this project, an assessment was conducted to evaluate organizational needs at a small, public Midwestern community and technical college. Within this institution, administrative personnel continually track program attrition rates as a means to calculate retention numbers in order to reach institutional goals. In 2018, the retention rate was reportedly eighty-four percent for the nursing program as well as the institution (academic dean,

personal communication, January 14, 2019). At this facility, it is worth noting that retention numbers in nursing include students graduating within three semesters for a two-semester program. Nursing programs with high failure rates come under scrutiny of the administration, as well as potential investigation by accrediting agencies and state boards of nursing. This issue affects students, faculty, college administration, and support staff. Student success and retention rates are a motivational factor across all campus departments.

In response to major program changes, nursing faculty expressed readiness for change and a desire to improve workflow processes in the department. This practical nursing program is located in a rural area where the demand for practical nurses is high, and local healthcare organizations depend on schools to prepare qualified individuals in quantities sufficient to fill vacant positions. In response to local needs, the DNP Project site aims to enroll thirty-six practical nursing students each semester, with graduation rates projected at seventy-two students per year.

During the past year, enrollment numbers have not been met and there is a need to explore reasons why this shortfall is occurring as both graduating cohorts in 2018 were approximately one-half to two-thirds full. Attrition is an important issue that goes beyond institutional concern and when there is a reduced number of graduates available for licensure and hire, the staffing of local and regional healthcare facilities, and more importantly, patient health outcomes is influenced.

Incidence of Attrition

Faculty have studied the dynamics of attrition and retention in order to more effectively support students. Retention is one of the most widely studied areas in higher education. According to the National Center for Education Statistics (2019), the retention rate at colleges

and universities averages seventy-five percent, translating to an attrition rate of twenty-five percent. In higher education, student failure is a national phenomenon across all disciplinary programs, with nursing reporting student failure rates between forty percent (Chan et al., 2019; Stickney, 2008) and fifty percent (Harris, 2014). Academic failure is reportedly the most frequent reason for students to leave nursing school (Karsten & DiCicco-Bloom, 2014; Ryan & Davies, 2016).

In nursing specifically, poor retention is associated with a lack of necessary interventions by faculty (Childs, 2016; Freeman & All, 2016; Gambino, 2017; Kukkonen, Suhonen & Salminen, 2015; Mooring, 2016; Villano, 2018). Community colleges, which educate nearly half the overall college population and record graduation rates as low as twenty percent (Juszkiewicz, 2016), are particularly focused on finding ways to increase persistence, retention, and program completion. Practical nursing programs are almost exclusively administered in the community, or technical college setting, so this issue is extremely pertinent to nurse educators teaching at this degree level.

Risk Factors for Attrition

Attrition is a multifactorial issue, requiring attention to the interplay between student, faculty, and system issues impacting student on-time progression and program completion. This dynamic is especially true for practical nursing programs where the American Association of Community Colleges ([AACC], 2017) reports that forty-five percent of all U.S. undergraduates are enrolled in community colleges. Students enrolled in these schools tend to include a higher percentage of non-traditional students (Harris, 2014; Jeffreys, 2007; Rudel, 2006) described as having one or more of the following characteristics: older, male, part-time, foreign born, non-native English speaking, parent of a dependent, and first generation college student (Jeffreys,

2007). This diversity within the student population requires educators to consider complex solutions to face a wide variety of challenges that impact an individual's ability to succeed.

Student Influences

Because practical nursing programs are delivered in community college settings, understanding the unique needs of this student population is important. Several research studies highlight influences that impact program progression and graduation rates, including student demographics, personal traits, academic factors, and environmental circumstances (Chan et al., 2019; Jeffreys, 2007, 2015). While age, gender, race, and language of origin are not modifiable student influences on attrition, other factors are.

According to Chan et al. (2019) and Jeffreys (2015), personal motivation, study skills, attendance, and social support influence student success. While it is necessary to consider student variables correlated with attrition, it is also important to highlight risk factors. A number of studies associated attrition with the following student factors: minority race, low pre-admission test scores, and low grade point averages on admission (Chan et al., 2019; Harris, 2014; Mooring, 2016; Stickney, 2008). In addition, current research sheds light on the increasing trend of food and housing insecurity in postsecondary students and its negative impact on student success (Blevins, 2018; Broton & Goldrick-Rab, 2016, 2018; Cara & Alleman, 2019; Institute for College Access and Success, 2017, 2018; Vasquez et.al., 2019).

The relationship between these risk factors and attrition is an important understanding and it is necessary to acknowledge the potential challenges students enrolled in practical nursing programs face. In order to design interventions that target both modifiable and non-modifiable risk factors, institutions and faculty must understand these unique barriers to learning.

Faculty Influences

After considering student influences on academic success, it is important to also analyze faculty contributions to this dynamic. In other words, nursing faculty play a significant role when creating an environment conducive to student success. Tinto (1975) researched student success in higher education and study findings suggest that improved student success correlates with faculty practices targeting modifiable factors, such as early identification of at-risk students, remediation, faculty engagement, and social connection. Faculty have a fundamental responsibility to demonstrate professional behaviors and promote role socialization through classroom pedagogy, clinical demonstration, advising, academic coaching, mentoring, scholarly activities, and engagement of students through joint participation in professional nursing committees, organizations, and events (Chan et al., 2019; Jeffreys, 2015; Stickney, 2008). These behaviors are commonly referred to in the literature as faculty engagement.

Nurse educators have high-level training in best practices for teaching and learning; faculty utilize a variety of evidence-based methodologies and tools to guide assessment of student progress, including designated student learning outcomes and evaluation rubrics. However, nursing faculty engagement and utilization of best practices is reliant upon the individual performance, or “human factor,” of the available personnel. Faculty teaching abilities are influenced by leadership style, time constraints, adequate departmental staffing, administrative support, and personal motivation to invest in students and the institution.

Institutional Influences

Finally, broader system issues in higher education impact attrition and further compound student and faculty variables making student success a complex phenomenon. Tinto (2006) challenges thinking about retention by going beyond a singular student focus to a broader view

that considers relational and institutional factors impacting this dynamic. Tinto (2006) identified concepts of social integration and patterns of interaction between the student and other members of the institution as especially important during the first critical year. Additionally, state colleges and universities are challenged with a number of well-documented issues, such as decreased student enrollments, reductions in state funding, deteriorating buildings and infrastructure, diminishing resources, faculty burnout, and the ballooning cost of technology updates.

Jeffreys (2015) describes “outside surrounding factors” to include world events, political climate, current economic state, professional nursing issues, job certainty, and health care system influences (p. 427). These findings emphasize the need for careful consideration of external influences on student success which do not come from the student, but the surrounding environment of people, institutions, and the outside world. This body of research supports the use of strategies aimed at faculty and other system issues within institutions.

Cost of Attrition

The cost of attrition is problematic for students, faculty, institutions, and the workforce. According to the National Center for Education Statistics (2019), one-fourth of postsecondary students at colleges and universities are lost to attrition. Thousands of dollars in costs are accrued to students, who must fund an additional semester of education and delay workforce entry and career earnings; additionally, these individuals often suffer from the resulting low self-esteem, shame, anxiety, and depression associated with personal failure (Freeman & All, 2017; Jeffreys, 2007).

The cost of attrition significantly impacts faculty, especially when considering the emotional burden of this concern. While research is not available that correlates attrition with faculty turnover, national nursing faculty shortages are well documented. According to the

National League for Nursing (2014), thirty percent of practical nursing applicants and forty-one percent of registered nursing applicants are declined admittance due to an inadequate supply of nurse educators. Anecdotally, many faculty are disheartened when students are not successful and whether this contributes to the cost of attrition is unknown, it is still a reality of the situation.

After investing large sums of money into resources for the purposes of marketing, recruitment, retention, staffing, support services, and early-alert system technologies, colleges and universities are paying a high price due to student attrition. According to Ramsey (2019), student financial concerns are the biggest contributing factor to attrition in first year college students; this potentially costs the university 1.9 million dollars in lost revenue for each freshman class that does not advance through the remaining years in a program, based on standard in-state tuition at a typical four-year university. While this measurable finding is significant, other attrition costs are noteworthy. For example, attrition rates represent important accreditation measures and are readily available to the public. When these rates are low, this jeopardizes institutional accreditation, as well as its ability to attract future students, faculty, staff, and administrators.

The cost of attrition is problematic for students, faculty, and institutions, but also needs to be considered as a workforce issue. Attrition rates in undergraduate nursing are particularly alarming due to current demand for practical nurses. As the largest health profession in the United States, nurses are instrumental in providing care for an aging population plagued by chronic illness (U.S. Department of Health and Human Services, 2014). High attrition rates reduce the number of nursing graduates available to fill direct patient care roles in hospitals, clinics, long-term care, public health, and home care settings (HRSA, 2014). Practical nurses comprise nearly twenty percent of the nurse workforce in the state of Minnesota (National

Council of State Boards of Nursing, 2019) and twenty-four percent across the nation (Bureau of Labor Statistics, 2017). According to the Bureau of Labor Statistics (2019), employment of licensed practical nurses is projected to grow twelve percent annually from 2016 to 2026, faster than the average for all occupations.

Problem Statement

Student failure rates in practical nursing are higher than desired and risk factors are multifactorial: student, faculty, and system. In 2018, thirty percent of practical nursing students on both campuses at the DNP project site failed their initial theory course despite meeting the program's admission criteria; this delayed or halted progression leading to program completion (academic dean, personal communication, January 14, 2019). These failures had a negative effect on student success, retention rates, and the overall morale of students and faculty within the nursing program.

This project focused on faculty and the lack of a streamlined workflow process for early identification and referral of practical nursing students at risk for academic performance issues. The DNP project site has an early alert system (EAS) in place that tracks at-risk students and connects them to academic support services. Faculty do not consistently use this tracking system nor document student performance in a way that is accurate and timely.

The campus learning resource center partners with nursing; however, a lack of communication and processes limits the effectiveness of this collaborative effort between professionals. As a consequence, when a student fails an examination during the initial theory course, interventions are not occurring early enough, if at all in the semester to connect students with support services. In addition to a lack of consistent use of the early alert system, there are no active committees for student progression, retention strategies are not addressed at faculty

meetings, and the department is lacking a technology taskforce leader. In general, the current practice is not aligned with institutional objectives for retention. Effective faculty intervention strategies are needed to prevent failures in this student population or high attrition rates will most likely continue.

Purpose

The purpose of this quality improvement project was to design and implement a workflow process for faculty to use with practical nursing students at risk for academic failure. In addition to the design of a workflow process, a personalized student success plan was presented that documents specific steps for faculty to follow when managing ongoing student performance issues. A final element of this project was to establish ongoing communication processes between the student, faculty, and Learning Resource Center (LRC) staff.

While the purpose of this DNP Project ultimately impacts students, interventions are designed to target faculty and LRC staff. All project components were presented during a scheduled education session and evaluated using PDSA methods. While none of these institutional interventions are new, this workflow process was meant to facilitate efficient and effective use of resources already in place at the project site.

The focus population for the educational session was composed of ten individuals, including four practical nursing faculty, four LRC staff, and two administrators in nursing and student services, all of whom currently teach or assist practical nursing students. These ten employees expressed a common goal of connecting students with appropriate resources to support their academic success, primarily program completion.

Evidence Based Practice Question

The PICOT question for this DNP Project is as follows: In a practical nursing program, what is the effect of a faculty workflow algorithm on early identification, referral, and a follow up process for addressing academic performance issues compared to standard practice measured by faculty satisfaction and adherence to recommended processes?

Operational Definitions

- Academic performance - grades achieved from exams
- At-risk student - a student with existing factors that could negatively impact academic performance, i.e. repeating a course or failing an exam
- Attrition - a student who starts the course/program and does not complete the course/program
- Early alert system - a technology-based tracking method to connect students with support services
- Program completion - finishing a program in 150% time, i.e. 3 semesters for a 2 semester program
- Starfish - a specific typology of early alert system, known as Hobsons Starfish Retention Solutions software
- Retention - on-time progression to graduation

Theoretical Framework

According to Moran, Burson, and Conrad (2017), nurse educators utilize theoretical frameworks to guide and support scholarly activities. The theoretical framework for this project is selected to guide the practice change in nursing education using a combination of Lewin's

Theory of Planned Change (TPC) and the Institute for Healthcare Improvement (IHI) quality improvement tool, known as the Plan Do Study Act (PDSA) cycle.

Lewin's TPC is a widely used framework for organizational change and includes three stages (Schriner, 2010; Shirey, 2013). Shirey (2013) describes Lewin's theoretical approach as postulating that behavior is a function of the group environment and addressing driving and restraining forces is necessary to bring about change. Shirey (2013) concludes that "Lewin's framework is best used with change that is planned, where the initiative starts as a top-down effort, and when there is stability and time to produce change" (p. 72).

Through the first stage of change, i.e., unfreezing, the nurse leader identifies an area for quality improvement and engages in data collection, introduces the change and engages team members through participation and collaboration (Schriner, 2010). To promote this early stage of change, Shirey (2013) suggests the need for the nurse leader to convey a sense of urgency. Subsequently, stage two is summarized by a gradual movement into the planned change by identifying the driving and restraining forces and establishing a timeline with target dates for meeting goals and objectives. The nurse leader must identify and implement strategies for overcoming resistance (Schriner, 2010). Finally, stage three occurs when the changes are implemented, integrated, and evaluated (Schriner, 2010). During the evaluation phase, recommendations from team members are collected, shared with key decision makers, and action is taken to implement further quality improvement as needed. This stage supports the sustainability of the improved workflow process. Lewin's TPC model is widely utilized for its ease of implementation and identifiable progress through stages of change (Schriner, 2010).

To complement this effort toward organizational change, the PDSA cycle begins with a plan to test a practice change in the work environment; in this instance, the utilization of a

workflow algorithm to assist in early identification and referral of students at risk for academic performance issues. The proposed change is then performed as planned in writing, examined through observation, and modified in order to achieve forward momentum toward the overall goal of the quality improvement initiative. In the DNP project, there are three consecutive cycles that comprise the PDSA process. The benefits of this approach include ease of use and ability to change track at various points throughout the quality improvement process.

Critical Review and Synthesis of the Literature

A search of the literature was performed using the online databases of Academic Search Premier, CINAHL, ERIC, ProQuest Education Database, and ProQuest Dissertations and Theses Global. Key search terms included attrition, retention, educational interventions, practical nursing students, and quality improvement initiatives. Inclusion criteria were further refined by faculty attitudes and barriers to the use of early alert system technology in higher education. In addition to peer-reviewed journal articles published in the past fifteen years, books, collegiate handbooks, systematic reviews, and reference lists were searched. Although practical nurses comprise twenty to twenty-five percent of the nursing workforce, there is a gap in the literature regarding faculty interventions to promote practical nursing student success.

The following themes emerged from the literature review based on the PICOT question: In a practical nursing program, what is the effect of a faculty workflow algorithm on early identification, referral, and a follow up process compared to standard practice measured by faculty satisfaction and adherence to recommended processes between January 14 and March 29, 2019?

Risk Factors for Attrition are Multifactorial

Research on attrition in nursing has been largely focused on registered nursing programs. The evidence is clear and nurse researchers concur that risk factors for attrition are multifactorial, including the following variables: personal, demographic, academic, environmental, and outside surrounding factors (Beauvais et al., 2013; Chan et al. 2019; Freeman & All, 2017; Jeffreys, 2007, 2015; Harris, Rosenberg & O'Rourke, 2014; Stickney, 2008).

Stickney (2008) explored attrition rates among practical nursing students in an effort to determine whether a relationship between attrition and specific variables existed. The only variables demonstrating a statistically significant relationship with attrition included race, pre-admission test scores, and grade point averages. The significance of this finding, in comparison with a more expansive list of factors impacting attrition is important because it supports the use of targeted interventions upon program admission, which is consistent with the practice of early identification.

A retrospective study was conducted by a nurse researcher who examined admission data on 151 students in a single practical nursing program in Florida. Half of the students were from minority populations with an average age of 34 years. Stickney (2008) divided subjects into a retention group, who finished the one-year program on time, and an attrition group, who did not complete the program during the one-year timeframe. Race differences between retention and attrition groups were determined by a cross-tabulation analysis for demographic data. In a similar fashion, pre-admission test score and GPA differences between groups were determined with *t* test analysis on academic data. The study failed to recognize any other factors that may have contributed to attrition, outside of demographic and academic variables, which is a major

limitation. The single site study design and small sample size also limit the generalizability of this study.

Although the level of evidence for this cohort study was only a four, it provides helpful recommendations for nurse educators to utilize a retention program that includes the following objectives: study skills sessions prior to program admission, higher admission test score requirements, study group formation, referral to student support services, and frequent advisor contact (Stickney, 2008). This study finding highlights the importance of recognizing race, pre-admission test scores, and grade point averages as factors associated with attrition, and the importance of instituting early intervention measures, as these variables are all known upon admittance to the program. When nurse educators have access to information that identifies potential at-risk students, early referral is possible once other variables present in the classroom.

Chan et al. (2019) and Jeffrey (2015) examined variables associated with attrition in undergraduate nursing students and identified institutional factors, such as available support, as an important barrier to retention. Chan et al. (2019) performed a systematic review of sixteen international studies whose purpose was to explore the issue of attrition among undergraduate nursing students in relation to curriculum design. The researchers represent a single school of nursing in Hong Kong. The researchers utilized the PRISMA checklist and Mixed Methods Appraisal Tool as data collection methods. The inclusion criteria were primary research publications written in English and published between the years 1999-2018 that addressed the issue stated above. These articles were a combination of quantitative (2), qualitative (9), and mixed methodologies (5). Chan et al. (2019) performed a thematic data analysis approach and identified unsatisfactory levels of emotional and practical support from clinical instructors led to student attrition, as well as a lack of empathy, advice, social, and emotional support from faculty

on campus; therefore, access to support services and faculty mentorship were recommended based on study findings. Emotional and social support comes from many places; in fact, faculty early identification and referrals initiate personal connections for students outside of the classroom as they become integrated with support service staff members and other students within the Learning Resource Center (LRC) environment.

Likewise, Jeffreys (2015) explored environmental causes of attrition and professional integration factors influencing retention when asking the important question, “Why do students stay?” (p. 426). As a result of this research, this author recommends a proactive and holistic approach to student retention, promoting professional integration of students into the nursing role through the following methods: mentoring, tutoring, professional event attendance, and membership in professional organizations. Jeffreys (2015) promotes the creation of collaborative partnerships and networks focused on retention and student success strategies.

Building upon the author’s prior body of work, a conceptual model of factors influencing student nurse retention was developed and presented for nurse educators to better identify at-risk students. According to Jeffreys (2015), “the model indicates that retention decisions, persistence, and optimal outcomes will be based on the interaction of student profile characteristics, student affective factors, academic factors, environmental factors, academic outcomes, psychological outcomes, outside surrounding factors, and professional integration factors.” Because there are numerous external influences on student success, as measured by academic performance, it makes sense that nurse educators might be overwhelmed by these challenges and benefit from connecting students with additional resources early in the semester. This cohort study provides level four evidence.

Beauvais et al. (2013) utilized a descriptive, correlational design to study the relationship between baccalaureate nursing student academic success and the personal characteristics of emotional intelligence, psychological empowerment, resilience, and spiritual well-being among 124 baccalaureate and graduate degree nursing students. The single site study was performed at a private Catholic University in the northeastern U.S. The four selected survey tools have excellent validity and reliability, and are listed as follows: Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), the Spreitzer Psychological Empowerment Scale, the Wagnild and Young Resilience Scale, and the Spiritual Well-Being Scale (SWBS).

Utilizing survey tool instruments for data collection in this population revealed statistically significant relationships between academic success and the following attributes of nursing students: psychological empowerment, resilience, and spiritual well-being. This is interesting, because nurse educators do not have a formal way of assessing these qualities during the admission process. This may be an area to address during advisor-student interactions and via behavioral grading rubrics during simulation scenarios and other psycho-motor skill test-outs. The participant sample included only twelve percent from minority populations, so this was a very homogenous sample. This study did not include practical nursing students and is rated as level six evidence for a single descriptive study.

Educational Interventions, i.e. Student Success Plans

There is clear and consistent evidence for the use of student success plans in nursing; however, the evidence for their use in practical nursing programs is particularly limited. Nurse educators have implemented student success plans, such as tutoring, with positive retention outcomes. Typically, these plans are part of a multi-pronged approach to improve retention; as such, these efforts happen in conjunction with program admission changes, faculty development,

and grant-funded retention technology. Therefore, it is difficult to attribute improvements in retention directly to a specific type of student success plan. The consensus seems to be that both students and nurse educators found participation in any style of success plan helpful overall; thus, they carried positive attitudes toward the success plans in whatever format those plans were implemented (Fontaine, 2014; Freeman & All, 2017; Harris, Rosenberg & O'Rourke, 2014).

Freeman and All (2017) conducted a systematic review to evaluate the most effective types of academic support programs used for at-risk nursing students and reported that “early intervention, with the provision of academic support programs, aids students in developing critical or analytical thinking and thereby leads to increased retention” (p. 72). The authors found that the most important factor was faculty identification of at-risk students early in the course of study and as such, recommend a uniform program policy and established criteria for faculty to classify students at risk for academic failure.

There is clear and consistent evidence that successful academic support programs start prior to nursing program admission based on pre-admission nursing exam scores and evaluation of student GPA, with special attention to prerequisite nursing, math, and science scores. The student success plan should consist of the following components: mandatory participation for at-risk students, early bridge courses to introduce role development, and faculty establishment of a benchmark, i.e., first exam failure, to be used throughout the curriculum as an indicator requiring implementation of academic support services (Freeman & All, 2017). This study is rated as level five evidence for a systematic review.

Harris, Rosenberg, and O'Rourke (2014) examined previous attempts to increase success in at-risk nursing students and created a student success plan for eighteen at-risk students in the associate degree program at a historically Black college. The plan included group meetings,

individual mentoring with the program director, introduction to student support services, oral presentations by successful program graduates, access to online journaling, and learning modules. The learning module topics were purposefully selected after gathering common themes from a review of the literature, and these categories included the following: learning style inventory, study skills, time management, organization, coping, problem-solving, critical thinking, and future planning. Ultimately, the academic criteria used to identify at-risk students were successful in identifying half of the students who later failed the course. Unfortunately, there was no statistically significant improvement in retention, with ten students either failing or withdrawing, and no single risk factor was found to be more prevalent than another.

Nursing faculty orchestrated two major program improvements toward the goal of student success and retention. Nurse educators participated in two early semester faculty development workshops regarding facilitating different learning styles in the classroom and providing a culturally sensitive classroom. Furthermore, they opted to raise the entrance GPA from 2.0 to 2.5 after evaluating 17 other in-state programs' admission criteria. The limitations of this study include single-site design and option for voluntary participation of at-risk students in the success plan. This cohort study is rated as level four evidence.

Fontaine (2014) conducted a study in a community college setting to evaluate the effects of seven different retention interventions on associate degree nursing student persistence to program completion. The interventions included the following approaches: counseling, nurse mentoring, peer tutoring, stipends, learning communities, individualized academic planning, and comprehensive orientation. The author found a statistically significant improvement in retention from 61 to 71 percent; however, there was no correlation between a specific intervention and retention (Fontaine, 2014).

The provision of grant funding for a three-year period from the U.S. Department of Labor led to a study participant stipend of four thousand dollars; interestingly, this may be a confounding factor if these students faced food or housing insecurity, perhaps their persistence was somewhat dependent upon these additional financial resources, which were not made available to non-study participants. An important finding for nurse educators is that of the listed interventions, peer tutoring received the highest mean satisfaction levels from participants, and the college foundation continues to fund this program offering.

Student participants “valued all of the services and the program itself and appreciated the attention to and efforts applied in meeting their needs” (Fontaine, 2014, p. 98). Furthermore, faculty “recognized that their contributions to retention mattered” (p. 99). Fontaine (2014) concluded that it would improve retention to an even greater degree if at-risk students were identified on admission and provided with targeted services. This cohort study provides level four evidence.

Quality Improvement Initiatives to Guide Institutional Change

Whereas student success plans are educational interventions geared toward a population of nursing students, quality improvement initiatives are educational interventions focused on faculty attitudes and behaviors, to create institutional change. As such, these are known as workflow, or process improvement, initiatives. These types of implementation studies are abundant in direct patient care nursing populations, but there is some evidence of utilization among faculty in light of national incentives to increase retention in colleges and universities.

Within nursing education specifically, one author explored how a quality improvement initiative affected faculty knowledge and attitudes about transgender patient health and experience. Sieve (2016) performed a single dose education intervention using a pre-test post-

test survey design for fifty-six nursing faculty and found a statistically significant improvement in knowledge on 16 of 22 self-assessment question items. What was notable about this work was the comprehensive nature of the educational intervention, including an expert panel of presenters followed by a question and answer audience exchange.

The value in this quality improvement initiative is the demonstration of how a well-orchestrated educational intervention can impact faculty knowledge and attitudes. This study is limited by its single-site design and small homogenous sample consisting of predominantly Caucasian female participants. There was good nursing faculty participation recorded at 53 percent. Practical nursing faculty were not represented in this study; however, associate degree faculty were, along with baccalaureate and graduate degree faculty. There may be some fault in the assumption that improved faculty knowledge and attitudes will translate to student competence regarding the delivery of nursing care to transgender patients. However, this study provides valuable information for nurse faculty who are trying to promote change within their institutions of employment, because the first step of creating change is to increase awareness of the presenting problem to “unfreeze” pre-existing beliefs and behaviors (Schriner, 2010; Shirey, 2013). This study offers level six evidence as a single descriptive study.

Gambino (2017) explored the application of a retention initiative known as Integrated Planning and Advising for Student Success, or “iPASS,” which included implementation of the early alert system (EAS) known as Hobsons Starfish Retention Solutions software. According to Gambino, access to technology to improve student outcomes is insufficient by itself and requires a collaborative approach that addresses structures, processes, and attitudes, stating “institutions must focus attention on broader institutional change: finding ways to *integrate technology* and *enhance practices*, leading to effective processes that better support students” (2017, p. 65).

Although this is an in-progress study, there have been some preliminary findings of strong faculty participation, high levels of technology use, and positive student response to the systems and practices (Gambino, 2017). One of the goals at their diverse, urban university was to increase the fall-to-fall retention from approximately 70 percent to 80 percent; however, it is too early to measure whether this outcome has been met. This case study is rated as level four evidence.

Faculty Attitudes and Barriers

There is clear and consistent evidence of faculty attitudes and barriers to institutional changes and the use of innovative technology. Faculty tend to have a positive attitude toward change and are likely to comply with change as long as it is toward the shared goal of student success and ideally if it is facilitated during their engagement in faculty development days (Faulconer et al., 2014; Gambino, 2017; Kotcherlakota, Kupzyk & Rejda, 2017; Sieve, 2016).

Nurse educators have explored faculty attitudes and barriers regarding the use of technology in the academic teaching and learning environment. Kotcherlakota et al. (2017) performed a multiple cohort study design over a two years to assess the relationship between nursing faculty years of teaching experience and preferences in technology use. One of the driving forces for this investigation was the acknowledgment of the aging nurse faculty workforce.

According to the American Association of Colleges of Nursing report on 2016-2017 *Salaries of Instructional and Administrative Nursing Faculty* (n.d.), “the average ages of doctorally-prepared nurse faculty holding the ranks of professor, associate professor, and assistant professor were 62.4, 57.2, and 51.2 years, respectively. For master's degree-prepared nurse faculty, the average ages for professors, associate professors, and assistant professors were

55.5, 56.4, and 50.6 years, respectively.” Using an online survey instrument, Kotcherlakota et al. (2017) found that years of experience was a detriment toward technology use; in fact, newer faculty were more likely to have positive attitudes and motivation for increased technology use and adoption. According to Kotcherlakota et al. (2017), the Educause Center for Analysis and Research (ECAR) survey “has been used by many institutions to assess student and faculty use of, and attitudes toward, several types of educational technologies” (p. 116). A drawback of this study is that early alert system usage is not specifically mentioned by name, although it would most likely fall within the stated category of communication technologies. Another limitation would be to assume that faculty years of experience was commensurate with advancing age. Overall, this cohort study provides level four evidence.

Faulconer et al. (2014) performed a single descriptive study highlighting their institution’s process of adopting an early alert system to improve student retention at a large southeastern university. The authors described EAS as “software to provide a formal, proactive feedback structure through which university faculty alert students and their campus support agents to issues impacting academic performance” (p. 45). Educators from various program areas convened to select an EAS, conduct a pilot study, implement an EAS across campus, and review the effectiveness of the implementation.

The EAS selected was Hobsons Starfish Retention Solutions; interestingly, after the pilot phase, one-hundred percent of faculty indicated they would use the program in future semesters. From a student perspective, Faulconer et al. (2014) reported that students who received flag notifications, whether positive, i.e., good work, or negative, i.e., absence or failing grade, preferred all of their professors to utilize the EAS program. Students reported they “believed their professor was paying attention to their performance” and “it was beneficial to receive an

update on their academic performance” (p. 47). It was not reported whether nursing faculty were among these numbers; however, it is likely they were included as the EAS was utilized across the entire campus. This cohort study provides level four evidence.

Synthesis

Overall, the evidence is clear and consistent that students at-risk for academic performance issues are identifiable upon program admission and can benefit from early faculty interventions to promote student success toward on-time progression and program completion. In particular, faculty have found early alert system technology to be a beneficial tool in connecting students with academic support services and providing an ongoing channel of communication between the student, faculty, and support staff, such as tutors. Because early alert systems were designed to be proactive, the research supports project implementation at the beginning of the semester. Finally, studies demonstrating the effectiveness of quality improvement initiatives on faculty satisfaction and adherence are promising to nurse educators seeking to create organizational change; furthermore, established workflow processes are likely to be followed when introduced during faculty development dates (Faulconer, Geissler, Majewski, & Trifilo, 2014; Gambino, 2017).

Method

Design

This DNP Project was conducted using a Plan Do Study Act (PDSA) rapid improvement process approach organized by three separate implementation and evaluation cycles, allowing for strategically timed data collection points over the course of the semester. A number of factors influenced the outcome of this project, highly tied to human behavior, such as beliefs, values, timing, data entry, and communication, especially among the practical nursing faculty teaching

first-semester students. Areas of interest in this quality improvement initiative included the following: participation in an educational session, introduction of a workflow algorithm, ability to recognize at-risk students based on repeater status and/or exam failure, prompt utilization of early alert system, i.e., Starfish, for referrals, development of a personalized improvement plan for failing students at the midterm point in the semester, and ongoing communication with LRC staff and students involved in the referral process. Following procedural implementation, a process evaluation occurred within each of the three cycles through answering a series of questions (see Appendix D) established by the DNP Project Leader.

Setting and Sample

This quality improvement project was conducted at a small, Midwestern community and technical college located on two campuses. The ten participants included four practical nursing faculty, three Learning Resource Center (LRC) staff, one LRC tutor, and two administrators in nursing and student services. All of these employees were Caucasian adults, eight out of ten female, and ninety percent worked in a full-time capacity. Inclusion criteria included faculty and staff who interacted with practical nursing students regarding academic success. There were no specific exclusion criteria.

All ten individuals who were invited elected to participate in the sessions. Participants were recruited via an email invitation sent one week prior to their scheduled faculty development date. A flyer was attached to the email indicating a one-time, 90 minute educational session (for faculty) or a one-time, 90 minute question and answer session (for LRC staff and administrators). The sessions were scheduled in an interactive television (ITV) classroom on campus during a faculty development date prior to the semester start date; although the sessions were optional and

did not offer credit in the form of CEUs, the Dean of Nursing provided an expectation for nursing faculty to attend.

Ethical Considerations

Prior to this quality improvement project, an Institutional Review Board (IRB) application was submitted to and reviewed by St. Catherine University. On December 14, 2018, this project was granted approval as a quality improvement process; therefore, no consent forms were necessary.

DNP Project Intervention

The DNP Project Leader created a workflow algorithm (see Appendix A) introduced during an educational session for faculty, LRC staff, and administrators. The workflow algorithm represents the main component of the educational intervention and was developed and implemented based on evidence from the literature review and project assumptions, including the following: early identification starts at admission, pre-identified characteristics of at-risk students, repeaters as at-risk students, and stakeholder input and participation. The algorithm is a one-page, detailed outline mapping the timeline and actions steps faculty follow for early identification and referral of at-risk students, starting on day one and throughout the course of the semester. The algorithm includes enough detail in a step-by-step process to guide faculty who have not previously used the early alert system for referrals.

An educational intervention session was held during faculty development dates to introduce the workflow algorithm and to initiate faculty understanding of the early identification and referral process for students at risk for academic performance issues. The DNP project leader presented an audio-visual slideshow during a 90-minute, interactive session with faculty, staff, and administrators during Week 1 of the semester. The delivery format allowed for the

conversational flow of information between participants and the DNP Project Leader. In addition to the live presentation, participants received a printed handout of the proposed workflow algorithm (see Appendix A) and a recorded voiceover slideshow via email for future reference.

Cycle One Purpose and Findings

The purpose of PDSA Cycle One was to introduce a workflow algorithm (see Appendix A) through an educational session that included both nursing faculty and LRC staff, focusing on faculty development in order for them to understand the early identification process for students at risk for performance issues. The established cycle one objectives included faculty and staff participation in an educational session and completion of a survey questionnaire. An educational slideshow presentation included the following components:

- background and significance on attrition in nursing
- data on recent theory pass rates
- purpose of a workflow algorithm
- description of at-risk student characteristics
- early alert system referral entry example
- planned PDSA cycles
- student success plans for midterm implementation
- research theories supporting Starfish Retention Solutions software as an intervention
- proposed timeline of implementation including evaluation checkpoints

A survey (see Appendix B) was distributed following the educational session to evaluate whether participants felt they had sufficient information to execute this early identification/referral process, identify barriers that continued to impede their ability to implement this process

consistently and accurately, discern what aspects of this process were most helpful, and any recommended changes. The survey questionnaire was administered with paper and pencil to measure faculty and staff satisfaction with the proposed workflow algorithm. This seven question survey was developed by the DNP student, incorporating questions modeled from evidence-based literature for capturing faculty attitudes and barriers toward project implementation. Immediately following the educational session, participants were invited to complete surveys anonymously and asked to place them in an envelope marked “Completed Surveys” after the DNP Project Leader left the room. An assistant from the classroom transported the envelope back to the office of the DNP Project Leader where results were secured in a locked file. At the completion of PDSA cycle one, the DNP Project Leader evaluated participant response through interactive conversation and analysis of the anonymous survey questionnaires.

During the educational session it was apparent that this student attrition is a concern for nursing faculty and LRC staff, where a lack of communication between each department represents potential system barriers contributing to this dynamic. Learning Resource Center staff shared their appreciation when receiving student names early in the semester, primarily because it allowed access to students and the possibility of effective interventions. This was not clear to nursing and a lack of streamlined communication channels was determined to be problematic for students.

In addition to initiating remediation services, LRC staff also felt it was valuable to meet all new nursing students early in the semester and provide tours of the LRC facility space, describe study room availability, answer questions, and reduce any anxiety students might have about seeking assistance there. Both groups expressed willingness to collaborate and a desire for

workflow processes where communication channels are clearly articulated. Faculty and staff stated, “We are here for students.” This is consistent with current literature on faculty attitudes and barriers; faculty tend to have a positive attitude toward change and are likely to comply with change as long as it is toward the shared goal of student success (Faulconer et al., 2014; Gambino, 2017; Kotcherlakota, Kupzyk & Rejda, 2017; Sieve, 2016).

A finding related to this DNP project cycle was the importance of creating spaces where various programs and departments can work collaboratively and communicate openly. For example, this educational forum provided an opportunity for designing creative and innovative approaches to support student success, such as establishing study groups, organizing peer tutors, and engaging in other support services available at the beginning of the semester. Overall, the session provided an opportunity for faculty and LRC staff to exchange personal experiences each has had with practical nursing students.

The evaluation process for cycle one included an assessment of the group dynamics, as well as the results of the survey questionnaire. There was robust discussion between nursing faculty and LRC staff when the two groups became united through a shared passion for student success. The faculty group voiced concern about “over-referring” students to the LRC if they included a referral for every student repeater during the first week of the semester, as per the workflow algorithm criteria. The LRC staff responded by saying they were “happy” to receive the referred student names and investigate the students’ anticipated needs early in the semester before they were in danger of failing the course.

The results of the survey questionnaire revealed a positive response from participants; however, due to the nature of select-all-that-apply questions, the results are somewhat limited in scope. From the participant group of 8 total nursing faculty and LRC staff, a sum of 6 surveys

were returned, making the survey response rate acceptable at 75 percent. The two administrators who participated in educational sessions were not intended to complete the survey as they would not be making referrals into the early alert system. It was necessary to evaluate stakeholder attitudes through use of a survey tool to identify potential system barriers in order to proceed with the planned quality improvement initiative. Because of the anonymous nature of survey questionnaires, faculty and staff are awarded the freedom to honestly share feedback that might be construed as negative. This method of data collection is consistent with a mixed methods approach in which interviewing is combined with survey questionnaires to gather broad information on attitudes and barriers.

In an attempt to learn whether participants were familiar with the Starfish early alert, it was interesting to note that the majority had previous experience using this referral system. It was important to learn why some individuals use this system while others do not, therefore survey questions gathered information about helpful features as well as barriers to its use. Findings suggest ease of Starfish system use and numerous helpful features, such as efficient communication and documentation of student issues. Faculty responses indicated the workflow algorithm was clear, helpful, and easy to follow; furthermore, participants responded they were very likely or somewhat likely to follow the workflow process. An unexpected finding occurred when participants could not identify any barriers to use, i.e., the “none” response was marked, nor did participants offer suggestions for improving the workflow process, i.e., space provided was left blank.

The DNP Project Leader was guided and informed by the principles of Lewin’s change theory throughout data collection for this initial and critical PDSA cycle. In the disequilibrium phase of change, participants can feel overwhelmed and experience anxiety; therefore these “late

adopters” may voice opposition and retreat back to known ways of doing (Schriner, 2010; Shirey, 2013). Only participants who are “early adopters” are expected to jump on board. Newer faculty are more likely than long-term faculty to embrace innovative technology changes (Gambino, 2017; Kotcherlakota et. al, 2017). The DNP Project Leader is tasked with obtaining “buy-in” from participants by exploring attitudes and existing barriers in nursing faculty and LRC staff.

Cycle Two Purpose and Findings

The purpose of PDSA Cycle Two was to interview LRC staff through a face-to-face question and answer session during Week 4 of the semester, in order to identify gaps in services and determine any unmet needs. Together with the DNP Project Leader, participants reviewed the process for identifying and referring students at risk for academic performance issues, determine whether the LRC has the capacity to respond to and support students at risk, and review the communication process outlined in the Workflow Algorithm for ongoing dialogue between students, faculty, and LRC staff. Communication occurred simultaneously within the Starfish early alert system, as all referral entries generated email notifications to students, faculty, and LRC staff. No gaps or unmet needs were reported.

Next, the DNP Project Leader evaluated the adequacy of institutional resources to support the student referral process. The DNP Project Leader evaluated the effectiveness of this project element through a series of questions outlined in PDSA Cycle 2 (see Appendix D). LRC staff reported sufficient capacity to serve students, with proper staffing and resources to respond to all referrals in a timely matter, stating “We would like to see students in the LRC even earlier in the semester to introduce them to our tutors and show them private rooms where they can study with peers in small groups and ask our staff for assistance when needed.” Staff

acknowledged that in the past semesters, referrals were made “too late” in the semester to result in a positive outcome for students.

Another evaluation component was regarding communication effectiveness and efficiency; there were two major problems identified. The first issue occurred following the educational session when faculty attempted to access their class lists in the Starfish early alert system and were not able to do so; this technology glitch presented a system barrier that interfered with the ability to follow the workflow algorithm as written. Populating class lists is the most efficient way to enter referrals within a theory class. Therefore, faculty contacted the LRC staff and a workaround was created via direct email referrals to LRC staff with student names and issues. It took approximately two weeks to resolve the technology issue. Not only were nursing faculty frustrated with this process, it also created a delay in entering referrals immediately following the first exam of the semester. There is no way to measure the specific impact this may have had on overall faculty satisfaction and adherence regarding the workflow algorithm.

Additionally, a second major obstacle occurred early in the semester when LRC staff noted a very poor student response rate to their initial contacts, starting with the first set of referrals. In response to the poor response rate, LRC staff suggested that nursing faculty either encourage or affirm the expectation for students to respond to LRC contact so that staff could document the students’ response. Overall, staff reported consistently and accurately following the intervention as designed, but lacked power in establishing initial contact.

An interesting development occurred during cycle two that may be connected to the poor student response rate. A number of weather cancellations had delayed the first theory exam into Week 3 of the semester. At the same time, one of the practical nursing instructors expressed a

desire to self-remediate nursing students who failed the first exam, with the rationale that one exam failure is too early for referral based on the overall number of points in the course.

Because the students had a total of 7 scheduled theory exams plus a final exam, it makes sense that they might perceive they still had plenty of future exam opportunities to improve their grade. However, this does not explain why the referred repeating students did not respond to LRC contact.

Cycle Three Purpose and Findings

The purpose of the third and final PDSA cycle was to evaluate the adequacy of services post-student referral to the LRC. As such, a process was organized for faculty group review of all personalized student success plans. At the beginning of this cycle, a reminder email was sent to practical nursing faculty immediately prior to the midterm date at the conclusion of Week 8. The email was a reminder for faculty to proceed with individualized student success plans for any students averaging less than 80 percent in the theory course, as well as a (re)referral to the LRC. This email correspondence had an attached sample template of a written student success plan created by the DNP Project Leader (see Appendix C). The faculty was expected to connect face-to-face with the student, allowing the student to guide completion of the plan, to establish ownership as well as accountability for his or her own learning process. The faculty was asked to assign this task to an alternate faculty, or to the DNP Project Leader, if she or he was not able to find time to complete these success plans. Faculty was asked to complete this process during either Week 8 or 10, with the understanding that Week 9 was the scheduled Spring Break holiday.

An evaluation session in an interactive television (ITV) classroom on campus occurred during Week 11, after practical nursing faculty returned to campus and had sufficient time to

enter midterm grades and meet with students requiring success plans. The DNP Project Leader met with faculty during this session to discuss all semester referrals as well as the ongoing implementation of individualized student success plans. In reviewing numbers of actual student referrals and personalized student success plans across both campuses, it was reported that 27 student referrals were made over the course of the semester and a total of 8 success plans were initiated at midterm alone. Faculty expressed lack of time as a barrier to following up on the success plans and felt this was the students' responsibility. The total number of referrals this semester was an improvement from standard practice as compared to 2018 spring and fall semester data. The number of referrals in the 2018 spring semester was one, and in 2018 fall semester it was seven.

In the final stage of evaluating the adequacy of services, other objectives included creating a mechanism to communicate regularly with LRC staff about the effectiveness of remediation services and creating an evaluation mechanism to identify other system issues impacting student performance. The DNP Project Leader evaluated the effectiveness of this project element through a series of questions outlined in PDSA Cycle 3 (see Appendix D). During this discussion, faculty stated that the communication mechanism built into the early alert system was sufficient to inform and update all involved parties about referral progress, as each system entry generated an email thread.

Although faculty reported a high level of satisfaction with the designed workflow algorithm, they admitted they did not consistently and accurately adhere to the process as designed, stating the desire for faculty autonomy in choosing to self-remediate students. Faculty felt this was a major barrier to making referrals. Faculty asked the question, "When can we remediate our own students and when do we have to refer them to the LRC?" Due to small class

sizes and assessment opportunities outside of the theory classroom, i.e. clinical patient care, faculty stated they felt they had a better vantage point in providing student feedback than the student would receive in the LRC. Nursing faculty reported that they were able to identify students at risk for academic performance issues in a timely fashion, and that all students received assistance from their individual instructors. A few students also pursued help from LRC staff resources.

Of note, there were a number of positive outcomes on both campuses that contributed to faculty satisfaction, rather than adherence. Faculty identified additional categories of at-risk students and expressed an interest in obtaining assistance from LRC staff early in the semester for student study skills, organization, and time management. Student peer tutor volunteers were identified by faculty as potential contacts for study group formation. Students on one campus reportedly sought out former students for tutoring experiences. Furthermore, it is possible that the end of semester outcomes, i.e. theory pass rates, will influence future faculty adherence to the workflow algorithm, especially if these pass rates have improved as compared to 2018 data. One faculty member reported feelings of excitement over two students whose exam scores improved markedly following the initiation of the individualized student success plans at midterm. Faculty were open and honest with their feedback during this evaluation process.

Recommendations

After careful consideration of the quality improvement project findings, the DNP Project Leader proposed recommendations for faculty, staff, and administrators in a community college regarding student success in the practical nursing degree program (see Table 1). These suggestions address system barriers and are categorized into three groups: faculty, LRC staff, and administrators.

Faculty Recommendations

Nursing faculty have abundant opportunities to impact student success through interactions with students across a variety of settings, including: classroom, clinical, skills laboratory, simulation experiences, and advising appointments. The first recommendation for nursing faculty is to designate at least one Project Champion for Starfish Retention Solutions early alert system in the nursing department. This individual would act as a “point person” for early identification and referral of students at risk for academic performance issues. The most important initial step is a collaborative effort between the Project Champion, the Dean of Nursing, and the Director of Nursing to modify existing written materials, i.e. Course Syllabi and the current Nursing Student Handbook, to include the following:

- A description of Starfish Retention Solutions early alert system used in the Nursing Department as a method of supporting student success
- The expectation that all nursing students respond promptly, i.e., within 24-48 hours, to raised concerns as consistent with the professional behaviors expected in nursing students
- A description or example of the midterm Student Success Plan for students who are failing

Next, nursing faculty should continue to develop the list of characteristics that place students at-risk for academic performance issues and update the workflow algorithm (see Appendix A) each semester. To improve their understanding of early alert system benefits, faculty can consider joining the Starfish online listserv and receive regular email updates on educator experiences at other institutions. Because improving student retention is a stated goal

across college departments, faculty should include a brief verbal report at bi-monthly staff meetings on the number of current students at risk for academic performance issues.

Since an important finding was faculty desire to exercise autonomy in remediating students within the department rather than entering a referral to the LRC, it is imperative to determine as a department which circumstances, if any, would merit individual faculty-student remediation in place of referral to LRC support services. Oftentimes, students report coping difficulties and other emotional or personal problems that faculty feel qualified to handle individually. A potential problem can occur when faculty counseling sessions replace early referrals to the LRC; if students continue to struggle academically after a counseling session, precious time has been lost and this delay might lead to a negative outcome for the student. Faculty one-on-one counseling is a valuable intervention; however, it is recommended that any faculty counseling occur simultaneously with a referral to the LRC.

Final recommendations for nursing faculty are directly related to pre-admission criteria. Faculty could consider stricter admission criteria, such as higher TEAS scores. Another suggestion is for faculty to conduct admission interviews for practical nursing student applicants as an additional opportunity to assess learning needs. As faculty continue to make adjustments in the nursing department toward a goal of student success, it will be necessary to update admission personnel and student recruiters about these program changes.

Staff Recommendations

Staff and tutors in the learning resource center are at the heart of student support services, especially academic support. The first recommendation made for staff is to designate of a “Project Champion” for student success through utilization of an early alert system, i.e., Starfish. This individual could be self-appointed, peer-nominated, or assigned by leadership. It would

likely be the department head, the head tutor, or an LRC employee passionate about proactively meeting student needs by collaborating with faculty and to facilitate early and ongoing referral communication throughout the semester. Other duties of the “Project Champion” would be to consult with the Starfish representative to troubleshoot technology glitches, modify software to meet organizational needs, and educate staff regarding system usage and upgrades.

The second and final recommendation for staff is to invite students and faculty for face-to-face introductions and a tour of the learning resource center facility during week one student orientation. As one staff tutor stated, “I want to show students where they can access peer study rooms and meet our tutors face-to-face so they can see we are friendly to reduce any anxiety they might have about coming in for help.” Another tutor stated that the first few weeks of the semester were typically “a ghost town” and “students could really benefit from using the quiet study areas early in the semester.”

Administrator Recommendations

Administrators at community colleges are vested in student enrollment, including recruitment and retention efforts, and inclusion of students from diverse backgrounds. These individuals assist in crafting and advertising the organizational mission, vision, and values to the greater community. Part of this outreach message includes promoting success strategies designed to improve student outcomes, such as, on-time progression, program completion, licensure exam pass rates, and job placement percentages.

The first recommendation is for college administrators to designate a Project Champion for early identification and referral of students at risk for academic performance issues. The role of the Project Champion would be to facilitate the remaining recommendations in the administrator category, and to act as a “point person” for ongoing communication around early

alert system functionality and the tracking student success outcomes. It is also suggested that administrators modify collegiate written materials to include mention of the retention strategy known Starfish Retention Solutions early alert system, to create awareness and describe expectations for faculty, staff, and student participation.

Furthermore, administrators who schedule content for faculty development dates should make a provision for the timing of early alert system technology training at the beginning of each semester. Finally, it may be useful to authorize the instructional technology (IT) department to create a Starfish link outside of the electronic platform known as Desire to Learn (D2L) for accessibility, in case of D2L log in issues which might occur for newly-hired faculty and staff, adjunct faculty and staff, or during D2L system outages.

Across all groups of faculty, staff, and administration within the system, it is recommended to utilize a shared system electronic drive for student success materials provided by the DNP Project Leader. These include the workflow algorithm, the voice-recorded educational slideshow, and the Table of Recommendations.

Table 1 Recommendations for Faculty, Staff, and Administrators**Faculty**

- Designate a Project Champion(s) for Starfish in the nursing department
- Modify written materials, i.e. Syllabi and Nursing Student Handbook, to include the following:
 - Description of the Starfish early alert system as a method of supporting student success
 - Expectation that nursing students will respond to raised concerns, i.e. flags, as consistent with professional behaviors
 - Description of Student Success Plan to be used at midterm for students who are failing
- Continue to develop the list of characteristics that place students at-risk for academic performance issues and update the workflow algorithm (see Appendix A)
- Join the Starfish listserv email for updates on educator experiences in other institutions
- Include report at every faculty meeting on current students (names/numbers) at risk for academic performance issues
- Determine as a department which circumstances, if any, would merit individual faculty-student remediation in place of referral to LRC support services
- Consider stricter admission criteria, such as a higher TEAS score
- Consider an admission interview for practical nursing applicants, as an additional opportunity for early assessment of learning needs
- Update admissions personnel and student recruiters about these program changes as needed

Staff

- Designate a Project Champion(s) for Starfish in the Learning Resource Center (LRC)
- Invite students (and faculty) to the LRC for face-to-face introductions and tour of facilities during week one of the semester

Administration

- Designate a Project Champion(s) for Starfish in administration
- Modify written materials in three key areas to include mention of the Starfish early alert system as a method of supporting student success:
 - Collegiate Student Handbook
 - Recruitment and Retention Plan
 - Diversity and Inclusion Plan
- Arrange Starfish orientation and training during faculty development dates on campus
- Create a Starfish referral link outside of D2L so that access to D2L is not a barrier
- Utilize shared drive technology for Student Success materials, including the DNP Project Leader's workflow algorithm (see Appendix A) and recorded slideshow presentation

Discussion**Strengths and Limitations**

This quality improvement project had strengths and limitations that are now apparent.

The most notable strength of the project was the stated enthusiasm of participants in addressing a problem area of the program, particularly as it pertained to student success. Faculty and staff

were receptive to working together toward a goal of student success. Overall, faculty, staff, and administrators were eager to contribute to a quality improvement project which could benefit students. Another strength was the project involvement and contributions of all practical nursing faculty and all learning resource center staff, in addition to the dean of nursing and the dean of student services.

On the other hand, a limiting factor was a minor timeline disruption which occurred during the initial timing of the educational session, on the faculty development date in January. A morning session keynote speaker ran long and interrupted the time organized for the educational session; therefore, it was re-convened on the following two work days and did not occur in one complete large group as planned. One participant was absent and reviewed the voice-recorded slideshow prior to giving feedback to the DNP Project Leader. In a similar fashion, a system barrier occurred during the first referrals when a glitch in the early alert system software prevented faculty from seeing class lists. This disrupted the referral process and required a workaround communication technique, resulting in a delay. The early alert system consultant was able to correct this issue within 1-2 weeks of the initial report of complications.

Faculty adherence was limited by the desire of faculty to self-remediate students. This was an unexpected finding. The DNP Project Leader assumed that referrals would still be made in these cases because the workflow algorithm was adopted by the department and supported by the Dean of Nursing. The faculty stated a desire to exercise autonomy in this regard unless a change was made to the handbook requiring them to act differently.

It is difficult to ascertain the effect of the current staff turnover on faculty satisfaction and adherence to early identification and referral of at-risk students. The loss of one of our academic support services Project Champions during the first week of implementation was a setback for

the overall morale of faculty within the nursing department. At the same time, there were additional vacancies that prompted remaining employees to accommodate larger workloads and institutional responsibilities within their positions, i.e. having more than one job title.

Furthermore, there were multiple weather-related college cancellations that prompted changes in the delivery of theory course content as well as the exam schedule for the semester. These extraneous variables may have contributed to faculty and staff anxiety levels and performance issues. Finally, although student pass rates were not a measurable outcome variable of this quality improvement project, it is unclear as to how the above factors impacted student success.

Social Justice Implications

Attrition is a system-wide issue and at-risk students are bearing the brunt of these barriers; for example, faculty are not following the algorithm as designed, system glitches interrupted referrals, and class content was rescheduled, omitted, or condensed to compensate for campus weather cancellations. In addition, the scheduling of the first semester exam was delayed, removing some opportunities for early identification of at-risk students. To further complicate matters, exam scores are the only points that count toward a passing grade and routine quizzes and other assessments have been mostly eliminated from course content as a result.

A number of other external influences affect student success. Students admitted to this program are often burdened with non-academic personal and environmental challenges, such as financial and literacy concerns, mental health issues, childbearing and rearing, and food and housing insecurities. All of these issues affect academic performance and yet we do not list these on any algorithm for at-risk students. In the event students fail a course, many individuals choose to re-sequence and repeat the course at a later time. This scenario contributes to a further

progression problem because the student repeating the theory course remains removed from the clinical setting for an entire semester. Delayed re-entry into the clinical setting is associated with the following undesirable outcomes: weak proficiency in clinical skills, decreased program peer availability and social support due to a cohort change, increased cost of an additional semester, and a higher risk of academic failure.

Nurse educators are guided by ethical codes adhered to as nurses and standards aspired to as educators in preparing the next generation of nurses. Fortunately, nurse educators have multiple opportunities to assess and evaluate students face-to-face in a variety of settings, including classroom, skills laboratory, simulation laboratory, and direct patient care clinical experiences. The Guide to the Code of Ethics for Nurses (2008) addresses the role of the professional nurse with regard to this specific project in its listed provisions seven and eight, which describe, in part, the advancement of the profession through contributions to education and practice as well as collaborating with other health professionals in promoting community efforts to meet health needs (p.163-164).

Likewise, the National League for Nursing (NLN, 2018) defines *Core Competencies for Nurse Educators*, including an ethical responsibility to engage in teaching and learning strategies that identify individuals in need of individual support systems to be successful. Therefore, nurse educators are both equipped and compelled to identify at-risk students and implement appropriate intervention strategies toward a goal of student success.

Contribution to Nursing Practice Knowledge

Although published research abounds on the topic of student success and retention, there is a gap in the literature regarding best practices for nursing faculty processes for early identification and interventions for practical nursing students at risk for academic performance

issues. In other words, barriers to student success have been extensively studied; however, we lack evidence-based solutions. The Doctor of Nursing Practice (DNP) investigator is uniquely equipped to analyze systems, apply change theory, and engage stakeholders to lead quality improvement projects. This DNP project focuses on the role of nursing faculty and the timely execution of a workflow algorithm geared toward early identification, referral, and follow-up process for practical nursing students with academic performance issues.

The proposed faculty workflow algorithm utilizes current technology grounded in education research, i.e., Starfish Retention Solutions, to track obstacles to student success and to provide a method of communication connecting referring faculty with LRC personnel. Through this process, the nursing faculty will become adept at connecting students with resources early in the semester while there is still time for interventions to result in a successful outcome. In future semesters and other institutions, the algorithm can be adapted to include further criteria for identifying at-risk students, such as demographic data. For example, the student population on both campuses includes foreign-born students who speak English as a second language (ESL). This is especially notable on our northern campus, located within one hour of a metropolitan area population of 3.5 million (Pioneer Press, 2016).

This educational intervention for nursing faculty is both feasible and sustainable. It is low cost, requiring mostly the energy and enthusiasm it takes to assess and intervene on behalf of at-risk students. There is excellent support from the Dean of Nursing, Director of Nursing, nursing faculty, learning resource center personnel and institutional leadership. Students are cooperative and regularly participate in providing feedback to instructors with an interest in improving their own situation as well as for future students. Furthermore, nursing program

faculty are interested in documented interventions that contribute toward the requirements of program accreditation.

Additionally, there has been a national movement toward mobilizing nursing faculty efforts in utilization of innovative technologies in nursing education. A number of important recommendations have emerged from a variety of sources, including: the IOM report, *Quality and Safety in Educating Nurses*, the TIGER initiative, and the Benner et al. (2010) *Call for Radical Transformation*.

The investigator hopes for a broader positive outcome and direct impact to nursing practice in direct patient care settings. A focus on the role of faculty in student success, retention, on-time progression, and program completion will provide a direct contribution of practical nursing graduates who are prepared to achieve licensure and enter the workforce to combat the national nursing shortage.

Significance of Interprofessional Collaboration

The DNP Project Leader facilitates collaboration by applying the principles of change theory to assist in identifying driving and restraining forces within the organization's various interprofessional groups, including nursing faculty, LRC staff, and administrators. These stakeholders are united by the shared mission, vision, and values of the institution, which acts as a major driving force for a quality improvement initiative. The mission involves a keen focus on student success strategies that promote student retention and successful program completion. Faculty, staff, and administrators at community colleges are motivated by student success, much like members of the health care system are motivated by the achievement of improved health outcomes for patients.

For this specific project, it was imperative for the DNP Project Leader to employ effective communication to engage system-wide stakeholders in early and ongoing conversations to facilitate the desired change. Nurses do not work in silos; our profession is dependent upon the constant input and participation of other system participants. Administration was an integral part in securing funding for the early alert system and providing support for the departments by ensuring adequate staffing and training for those involved. Furthermore, the regional nursing advisory council meets regularly for updates from this department of nursing on program changes, class sizes, pass rates, and the number of graduates available for licensure and hire. This unique group meets regularly and is made up of nursing directors, recruiters, and educators representing both health care employers and nursing schools in the surrounding area. All of these professional groups have a vested interest in the quality and productivity of the practical nursing program students, faculty, and staff, toward larger established goals and objectives for health outcomes in the region.

Conclusion

Nurse educators, along with learning resource center (LRC) staff and tutors, are interested in pursuing workflow processes that will have a positive impact on student success, i.e. retention. Following the introduction of a workflow algorithm and an educational session outlining the research in support of early referral methodology, nursing faculty found it challenging to refer at-risk students to academic support services early in the semester. These were the identified barriers: the desire to act as a personal resource within the nursing department and the lack of institutional handbook guidelines defining and requiring early referral as an expectation. Additionally, both faculty and LRC staff noted a low rate of student response to

initial referral, and suggested that students be expected to respond so that documentation could be completed in a manner that demonstrated “closing the loop” through the follow-up process. Despite these barriers, the total number of student referrals improved this semester, and faculty expressed an increased awareness in referral timing along with a desire to continue participation in this workflow process. Nurse educators are in a unique position to perform early and ongoing assessment of students and intervene to connect at-risk students to academic support services. Nursing faculty have great potential to impact retention and to prepare qualified practical nurses for immediate entry into the workforce.

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Provision 8. “The nurse collaborates with other health professionals and the public in promoting community, national, and international efforts to meet health needs.”

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Appendix A Faculty Algorithm for Student Success

1. Faculty identify a student at-risk for poor academic performance in HEAL 1701, defined as:
 - Day 1 of the semester, if any student is repeating HEAL 1701, or
 - If any student scores <80 % on an exam, or
 - If a student self-identifies as needing additional academic assistance



2. Take these steps as shown to enter a concern:
 - Screenshot: D2L home Press “Starfish” tab, then
 - Screenshot: Starfish home page Click on box to enter student first/last name, then
 - Screenshot: Starfish concern page Click on grading concern and enter comment (i.e. “repeating student in this course” or “exam score <80 %”). Click submit.



3. LRC personnel responsibility for initial referral: respond to flags by contacting the student and resolve flags through discussion with the student.
 - Historically this occurs on the same day as the entry is made, almost immediately. LRC will document the discussion, plan going forward as appropriate, and resolve the flag. Nursing faculty will receive an email communication summarizing the student’s response.



4. Faculty identify a student at-risk for poor academic performance in HEAL 1701, defined as:
 - If any student receives a subsequent score of <80 % on an exam, or
 - If a student self-identifies as needing additional academic assistance, then repeat steps 2 and 3



5. At Midterm, if the student has an exam average of < 80 %, then:
 - a. Refer student to the Director of Nursing and copy Dean of Nursing on email. Director of Nursing documents verbal exchange with student in Starfish.
 - b. The lead faculty for HEAL 1701 creates an individualized performance improvement plan because he/she is in contact with the student bi-weekly for the theory course and has assessment knowledge of the student’s specific academic challenges.
 - c. If faculty is unable to complete this step, he/she is responsible for delegating this task to another nursing faculty member or LRC staff. The faculty will document the plan in Starfish.
 - d. The student is responsible for following the outlined performance improvement plan and seeks assistance as needed.

Each student has a Starfish file which is open and active throughout their nursing semesters. The Starfish Retention System communicates all student interactions for academic assistance via email to keep Nursing faculty and LRC staff informed.

Appendix B Faculty Survey Post Educational Session

Faculty Questionnaire following an educational session on student success:

1. Have you utilized the Starfish Retention System software for any reason prior to today?

No › if no, proceed to Question 3
 Yes › if yes, how many times have you utilized Starfish.

1-4 times
 5-9 times
 10 or more times › proceed to Question 2

2. As someone with experience using the Starfish Retention System, what features do you find most helpful (please select all that apply)?

Easy way to refer students at-risk for academic success
 Creates a system response for managing students at-risk for academic failure
 Effectively links students to the LRC
 Provides an efficient communication channel between faculty and the LRC
 Documents student academic issues and strategies for ensuring success
 Evidence-based strategy for remediating student achievement
 Other, please describe _____

3. If you have never used the Starfish Retention system before, please describe why (select all that apply)

Lack of time
 Unsure of process
 Unaware of resource
 I was never oriented to this software
 I have a different process for managing students at-risk for academic failure
 I do not see this as my role
 Other, please describe _____

4. Is the Faculty/Student Success Algorithm clear and easy to follow?

Yes, this process is clear
 Yes, this process is easy to follow
 Yes, I find this process helpful
 No and I still have some questions about (please describe) _____

5. How likely are you to follow the Starfish workflow process presented during today's educational session?

Very likely

Somewhat likely

Somewhat unlikely

Unlikely. Please explain your response

6. What continued barriers influence your ability and/or willingness to follow processes outlined in the Faculty/Student Success algorithm? (select all that apply)

None

Lack of time

System is difficult to navigate

Unclear understanding about the interface between faculty and LRC staff

Uncertainty about my role when remediating students at-risk for academic failure

Belief that academic success is the student's responsibility

Belief that when a student demonstrates poor performance, Starfish is unhelpful

Personal beliefs about the effectiveness of this system. Please explain

Past experiences using the Starfish System that were not helpful

Lack of administrative support and/or clarity

Other. Please describe _____

7. Is there anything the Faculty/Student Success algorithm has not addressed? If so, please describe and provide suggestions on ways to improve this workflow process. _____

Appendix C Student Success Plan

Today's Date _____

Student name _____

Faculty name(s) _____

<p>Student-guided changes and achievement objectives:</p> <hr/> <p><i>Example:</i> For the remainder of the semester, or until grade is $\geq 80\%$, the student will actively participate in the following activities: (select as many as needed to reach goal of course completion and on-time progression to program completion)</p> <ul style="list-style-type: none"> <input type="radio"/> Remediate next exam 1:1 with instructor, after class remediation occurs <input type="radio"/> Improve attendance in theory class <input type="radio"/> Come to class prepared by having read all assigned readings and having taken notes ahead of time <input type="radio"/> Ask questions during class when information is not easily understood <input type="radio"/> Seek assistance from academic support services in the Learning Resource Center (LRC) <input type="radio"/> Obtain an ongoing tutor in the LRC or from the PN2 cohort <input type="radio"/> Form a study group with a peer(s) <input type="radio"/> Decrease work hours and/or outside commitments <input type="radio"/> Enlist social support from family and friends <input type="radio"/> Daily self-care <input type="radio"/> Effective coping strategies <input type="radio"/> Daily stress-relief <input type="radio"/> Mental health counseling <input type="radio"/> Financial aid counseling <input type="radio"/> _____ <input type="radio"/> _____
<p>Potential dates for instructor and student conferences to evaluate progress:</p>
<p>Timeframe: (<i>Example:</i> the remaining semester weeks)</p> <p>Week__</p> <p>Week__</p> <p>Week__</p> <p>And so on...</p>
<p>End date:</p>
<p>Other:</p>

Appendix D PDSA Goals, Objectives, and Evaluation Criteria

Cycle # 1: Faculty development and understanding of the early identification and referral process for students at risk for performance issues

- All faculty assigned to HEAL 1701 will participate in a one-time educational session
- Faculty will describe the process for identifying and referring students at risk for academic performance issues. This process includes early identification of students at risk for academic performance issues, entering referral information into Starfish, communicating with LRC staff using the system communication tools inside Starfish, and developing/implementing a personalized student success plan.
- This process will also articulate how the personalized student success plan guides academic performance in HEAL 1701 and faculty expectations about how this plan is enforced.
- An algorithm of this process will be reviewed and distributed to all attendees

Following completion of this educational session, attendees will respond to the following questions:

- Do you have sufficient information to execute this early identification/referral process?
- What barriers impede your ability to implement this process consistently and accurately?
- What aspects of this process do you find most helpful?
- What changes do you recommend to this process?
- What is your understanding of your role in the screening and referral process?

Cycle # 2: Evaluate the adequacy of institutional resources to support the student referral process

- Review the process for identifying and referring students at risk for academic performance issues with key individuals in the LRC
- Explore whether LRC has the capacity to respond to and support students at risk
- Develop a communication process that ensures ongoing dialogue and feedback between the student, faculty member, and LRC

Following completion of this cycle, the following questions evaluate the effectiveness of this project element:

- Are there any gaps in services?
- Are there any unmet needs that the LRC does not address?
- Is the communication process effective and efficient?
- What changes does LRC recommend to this process?
- Is the LRC consistently and accurately following the intervention as designed?

Appendix D PDSA Goals, Objectives, and Evaluation Criteria

Cycle # 3: Evaluate the adequacy of services post-student referral to the LRC

- Create a process for reviewing all personalized student success plans as a faculty group (define the who, what, when, and where of this process)
- Create a mechanism to communicate regularly with the LRC about the effectiveness of remediation services
- Create an evaluation mechanism to identify other system issues impacting student performance

Following completion of this cycle, the following questions evaluate the effectiveness of this project element:

- Review all personalized student success plans for consistent application, timely interactions, and revisions based on student performance
- Are all faculty consistently and accurately following the algorithm as designed?
- Are faculty satisfied with the screening and referral process?
- What issues or barriers are faculty reporting with its use?
- What issues or barriers is the LRC reporting?