

THE PERSISTENCE SCALE FOR ONLINE EDUCATION:
DEVELOPMENT OF A PSYCHOMETRIC TOOL

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DOCTOR OF PHILOSOPHY

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University of Missouri - Kansas City, 2012

ABSTRACT

Despite the popularity of online education, lack of persistence and attrition are problems faced by many colleges. Although multiple studies have been published about the best teaching methods for the online education environment, little is known about how to identify the student who is at risk of dropping from an online course. The lack of persistence has been identified as an important factor that leads to attrition among online nursing students worldwide

The objective of this research was to psychometrically test the Persistence Scale for Online Education (PSOE). The PSOE was specifically developed to measure the ability of the online nursing student to persist and complete an online program. The specific aims of this study were to obtain sufficient and appropriate data to determine the psychometric properties of this new instrument. The sample included nursing students (n=101) from two Midwestern universities enrolled in an online course. This cross-sectional study used a convenience sample. Data was collected using SurveyMonkey[™], a web-based format that provides response confidentiality. Results of a concept analysis on persistence were used to develop four constructs hypothesized to serve as attributes and antecedents to persistence. Items within the PSOE were developed from this analysis; thus, the PSOE uses four constructs to describe online

experience and assesses persistence by responses to 23 Likert-scaled items. Potential participants received an email inviting them to participate in the study. Exploratory factor analysis was then used to determine the reliability and validity of the PSOE and the relationship of the constructs (inter-item correlations) hypothesized to contribute to persistence in the online student.

Results indicate that the persistent student may be characterized as enjoying discussion, confident on passing, confidence in friendly interactions, believing that a challenging course will help achieve goals, looking forward to interactions, and not frequently upset by unexpected events. Conversely, while the non-persistent student may have personal strengths and succeed in their goals, he or she does not believe the course will increase job opportunities, does not enjoy discussion, does not believe a challenging course will help achieve goals, and does not have confidence in friendly interactions. It was also found that the non-persistent student may have a high grade point average, be under the age of 27 years, have completed greater than nine courses, and be enrolled in a BSN completion program.

This study was conducted as a preliminary assessment of the ability of the PSOE to accurately discriminate between those students who are persistent and those who are at risk of dropping from an online course. Findings indicate the need for a larger sample size to increase generalizability and accurately conduct factor analysis.

The undersigned, appointed by the Dean of the School of Nursing, have examined a dissertation titled "The Persistence Scale for Online Education: Development of a Psychometric Tool", presented by Carolyn Hart, candidate for the Doctor of Philosophy degree, and hereby certify that in their opinion it is worthy of acceptance.

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DEDICATION

To My Husband,

Thank you for believing in me. Without you, I am lost.

Love has no other desire but to fulfill itself.

But if you love and must needs have desires, let these be your desires:

To melt and be like a running brook that sings its melody to the night.

To know the pain of too much tenderness.

To be wounded by your own understanding of love;

And to bleed willingly and joyfully.

To wake at dawn with a winged heart and give thanks for another day of loving;

To rest at the noon hour and meditate love's ecstasy;

To return home at eventide with gratitude;

And then to sleep with a prayer for the beloved in your heart and a song of praise upon
your lips.

- Kahlil Gibran

CHAPTER 1

INTRODUCTION

There has been a proliferation of on-line courses over the last eight years (Christensen, Horn, Caldera, & Soares, 2011). In 2003, an estimated 10% of students were enrolled in at least one online course, a statistic that grew to 30% in 2009 (Christensen et al, 2011). The availability of on-line nursing programs mirrors these statistics. The American Association of Colleges of Nursing (AACN) reports that from 2008 to 2009 there were 664 registered nurse (RN)-to-baccalaureate programs, with many programs being completely on-line (2010). In their 2010 annual report, the AACN (n.d.) reports that on-line nursing students experience a 10 to 20% higher likelihood of not completing a course, when compared to their face-to-face counterparts. The lack of persistence has been identified as an important factor that leads to attrition among online nursing students worldwide (Angelino, Williams, & Natvig, 2007). Persistence, as a concept, encompasses a variety of variables linked to student success. Despite the importance of persistence as a critical element for successful completion of a course in on-line nursing education, no objective measure exists to assess persistence among nursing students.

This study developed and evaluated the preliminary psychometric properties of the Persistence Survey for Online Education (PSOE), a tool to measure the ability of the student to complete an online course. An objective measure of persistence would allow nurse educators to identify students who may be at risk for the inability to complete a course. Identification of such students would provide an opportunity for intervention and prevention of drop out. Previous research has demonstrated that

persistence in an online course can be enhanced by communication with the instructor, motivation, and peer and family support (Atack & Rankin, 2002; Menchaca & Bekele, 2008; Müller, 2008; Park & Choi, 2009). Billings and associates (2005) and Bonnel (2008) purport that interventions focused on these variables are key components for student success. However, without a measure of persistence among online nursing students, nurse educators have no objective means of determining what evidence-based interventions are best suited to individual students. Often, nurse educators do not realize an online student is at risk for drop out until late in a course.

Background

As technology and internet capabilities have advanced, online programs and courses have experienced substantial growth. Results of a nationwide survey reveal that almost 4 million students were enrolled in an online course in the fall of 2007 (Allen & Seaman, 2008). Online courses have increased at a 12.9% rate, whereas higher education courses increased at only a 1.2% rate. Moreover, 33% of baccalaureate awarding institutions view online courses as critical to their strategic plan (Allen & Seaman, 2008).

In a literature review done by Wilson (2008), online students experience a 10 to 20% higher likelihood of inability to complete a course when compared to their face-to-face counterparts. Online students possess unique characteristics and perceptions that create the need for individualized interventions (Moisey & Hughes, 2008). Evidence-based interventions, such as course design strategies and motivational support, have demonstrated improvement in attrition rates (Park & Choi, 2009). Methods to assess students and determine need have yet to be developed. The PSOE

aims to identify areas of student weakness, allowing the educator to provide evidence-based interventions to enhance success in the online learning environment. Ultimately, providing evidence-based intervention(s) will increase student persistence and the ability to reduce attrition and achieve academic success. The ability to match student need to effective interventions is critical at this time of financial, resource, and labor constraints.

Colleges of nursing have embraced online education as a means of increasing educational opportunities for nurses (Bangert & Easterby, 2008). In 2007, the AACN stated that online learning is one teaching method capable of increasing the number of baccalaureate (BSN) prepared nurses. Several authors confirm that colleges of nursing are increasing their use of internet technology to providing course content (Billings, Connors, & Skiba, 2005; Grabb, Jeffers, & Campbell, 2004). Ali and colleagues (2004) posit that the use of online education may help meet the growing demand for nurses.

Lack of persistence has been associated with the inability to complete a course or to continue with a program of study (Muller, 2008). Numerous interventions have been proposed to increase persistence in the online student and therefore decrease attrition rates (Billings et al., 2005; Bonnel, 2008; Park & Choi, 2009). Despite a growing body of knowledge in course delivery and faculty interventions, attrition related to a lack of persistence, remains a significant problem. Oftentimes unrelated to knowledge, persistence has been identified as the sum of those factors needed by the student to complete an online course successfully (Park & Choi, 2009). The PSOE provides the means to identify the student at risk for persistence-related inability to complete a course. This allows an evidence-based intervention to occur.

Purpose and Research Questions

The purpose of this research is to develop and analyze the psychometric properties of the PSOE. Two research questions guided this study:

1. Is it possible to identify modifiable variables that contribute to the development of persistence among online nursing students?
2. Will the development and initial testing of the PSOE to objectively assess persistence lead to the ability to accurately discrimination between nursing students with high levels of persistence from those with lower levels of persistence?

Significance

If educators could assess persistence early in an on-line course/program, with a tool such as the PSOE, then educators could implement individualized, evidence-based interventions to enhance retention and academic success in the online learning environment. The value of a tool like the PSOE, for educators, is in its ability to assess persistence and identify the specific concern areas for a student at risk of failing to complete an on-line course. Instead of applying evidence-based interventions equally to all students, the educator can individualize efforts and invest time and resources on the students in need of intervention. Using the PSOE as a screening tool and as a guide for individualized interventions, will enhance online nurse educators' ability to retain nursing students, which will positively impact the ongoing nursing shortage.

CHAPTER 2

LITERATURE AND THEORETICAL FRAMEWORK

This chapter will present a review of the literature regarding persistence of the online student. Persistence, in the research literature, is viewed as a multi-faceted characteristic that will lead to successful completion of an online course and ultimately, of an online program of study. Little agreement has been reached as to what factors are critical in developing student persistence.

Although students generally report being satisfied with the online environment and learning outcomes are similar to those of the traditional classroom, challenges exist which can result in inability to complete a course, and in turn, inability to complete the program (Ivankova & Stick, 2007; Levy, 2007; Müller, 2008; Park & Choi, 2009). Various studies have been conducted to determine what factors are positively related to student success (Bunn, 2004; Harrell & Bower, 2011; Kemp, 2002; Levy, 2007). Other studies have assessed which factors interfere with success, and how students' attitudes are related to course and program completion (Holder, 2007; Müller, 2008; Park & Choi, 2009).

A difficulty in the literature is the lack of consistent terminology in addressing persistence, attrition, and success, as displayed in Table 1. Persistence has been variably defined as the antonym of attrition or as a constellation of factors that lead to completion of a course (Park & Choi, 2009). At times, the literature presents persistence as an outcome measure while at other times, it is viewed as a characteristic that leads to course completion. The use of the term persistence related to post-

secondary education first emerged in the 1980's, when persistence was merely the opposite of attrition or departure from a traditional college (Greer, 1980).

Table 1

Definitions

Term	Definition	Synonyms
Persistence	The ability to complete an online course despite obstacles or adverse circumstances	
Attrition	As the antonym of persistence, attrition is withdrawal from an online course for academic or non-academic reasons	Dropout Withdrawal Non-completion
Persister	A student who completes an online course	Completer
Non-persister	A student who withdraws from an online course	Non-completer Withdrawer

Berger and Braxton (1998) used ‘intent to return’ as a measure of persistence in first-year students enrolled in face-to-face courses. In online education, persistence has evolved as a more complex set of factors that is unrelated to knowledge that results in student success (Park & Choi, 2009). In this review, persistence will be treated as a multi-faceted phenomenon that leads to completion of an on-line program of study. Although several studies have examined the relationship between persistence and on-campus student success, little consensus exists for which factors are significant towards

persistence in the online student (Levy, 2007; Müller, 2008). Articles included in this review, along with the research question or purpose and sample characteristics, are presented in Table 2.

Table 2

Summary of articles retained for review

Author, Year Title	Research Question or Purpose	Sample
Bunn, 2004 Student persistence in a LIS distance education program	What factors enable students to persist despite barriers in library and information science (LIS)?	This study included distance students in the master of library and information studies at Victoria University of Wellington, New Zealand. Focus groups contained 6, 7, and 5 participants, respectively. Group 1: former distance students; Group 2: distance students in 2 nd or 3 rd year; Group 3: first year distance students.

Continued

Table 2

Summary of articles retained for review

<p>Dupin-Bryant, 2004</p> <p>Pre-entry variables related to retention in online distance education</p>	<p>Are there pre-entry variables that distinguish individuals who complete university online distance education courses from those who do not?</p>	<p>For this study, 1000 students from various academic programs enrolled in an online course at Utah State University were invited to participate with 464 useable surveys returned.</p>
<p>Harrell & Bower, 2011</p> <p>Student characteristics that predict persistence</p>	<p>Which student characteristics (learning style, locus of control, computer, previous online experience, demographics) can be used to best predict persistence?</p>	<p>225 online students from five Florida community colleges were enrolled in this study.</p>
<p>Holder, 2007</p> <p>An investigation of hope, academics, environment, and motivation.</p>	<p>To what extent do measures of students' hope, as well as academics, motivation, and environment, predict persistence in online learning? (p. 249)</p>	<p>209 online undergraduate and graduate students in degree-completion programs in a Midwest university, with 209 classified as persisters and 50 as nonpersisters.</p>

Continued

Table 2

Summary of articles retained for review

<p>Ivankova & Stick, 2007</p> <p>Students' persistence in a distributed doctoral program in educational leadership in higher education: A mixed methods study</p>	<p>Identify factors contributing to students' persistence in the ELHE program by obtaining quantitative results from a survey of 278 current and former students and then following up with four purposefully selected individuals to explore those results in more depth through a qualitative case study analysis. (p. 95)</p>	<p>270 current and former Doctoral students in the Educational Leadership in Higher Education program at the University of Nebraska-Lincoln, including students who withdrew. Four purposefully selected individuals exploref survey results.</p> <p>Groups: (1) 78 students who completed 30 or fewer credits (2) 78 who completed more than 30 hours (3) 26 former students who graduated and (4) 25 former students who withdrew or were terminated from the program.</p>
<p>Kemp, 2002</p> <p>Persistence of adult learners in distance education</p>	<p>Investigate the relation between persistence, life events, external commitments, and resiliency.</p>	<p>121 First-time undergraduate distance students at Athabasca University, Canada.</p>

Continued

Table 2

Summary of articles retained for review

<p>Levy, 2007</p> <p>Comparing dropouts and persistence in e-learning courses</p>	<p>The aim of this study was to look at the two main constructs proposed by literature (academic locus of control and students' satisfaction) and their impact on students' dropout from e-learning courses. (p. 190)</p>	<p>108 students who completed a course and 25 students who did not complete a course from 18 undergraduate and graduate e-learning courses at a major state university in the southeastern United States.</p>
<p>Müller, 2008</p> <p>Persistence of women in online degree-completion programs</p>	<p>Why do women persist in online courses? Why do they fail to persist or stop out? How do factors affect women learners' persistence? (p. 3)</p>	<p>A purposive sample of 20 female online students from undergraduate (n=9) and graduate degree (n=11) completion programs at a college in the northeastern United States.</p>

Continued

Table 2

Summary of articles retained for review

<p>Muse, 2003</p> <p>The Web-based community college student: An examination of factors that lead to success and risk</p>	<p>In terms of computer confidence, enrollment encouragement, need for support, preparation, computer skills, tenacity, study habits, Web skills, motivation, study environment, background confidence, and external locus of control, which of these factors will be used to compute a student's ability to successfully complete a Web-based course?</p> <p>Using a survey, does a weighted combination of the critical factors indicate which students are at risk for failing to successfully complete the Web-based class?</p> <p>Do age, gender, GPA, number of hours currently worked, years since last college course, number of previous distance learning courses taken, educational level, and number of credits in the current semester significantly affect successful completion of Web-based classes?</p> <p>What reasons are reported most often for student dropout in Web-based classes? (p. 245)</p>	<p>276 students completing a Web-based class at Montgomery College, Maryland with 22 students randomly selected for follow-up interview</p>
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Continued

Table 2

Summary of articles retained for review

<p>Ojokheta, 2010</p> <p>A path-analytic study of some correlates predicting persistence and student's success in distance education in Nigeria</p>	<p>What predictors enhance persistence and student success?</p> <p>To what extent to the predictors, taken collectively, enhance distance learners' effective learning?</p>	<p>1245 students from 200 - 400 level courses in two distance teaching institutions located in Nigeria.</p>
<p>Park & Choi, 2009</p> <p>Factors influencing adult learners' decision to drop out or persist in online learning</p>	<p>Do the dropouts and persistent learners of online courses show differences in their individual characteristics, external factors, and internal factors?</p> <p>What factors are significant to predict learners' decision to drop out of online courses? (p. 209-210)</p>	<p>147 students who either completed or dropped out of one of three online courses offered by a large Midwestern university.</p>

Continued

Table 2

Summary of articles retained for review

<p>Stanford-Bowers, 2008</p> <p>Persistence in online classes: A study of perceptions among community college stakeholders</p>	<p>Which factors regarding persistence are most important among faculty, administrators, and students?</p> <p>Where do perceptions of persistence among the three groups of stakeholders converge?</p>	<p>Thirty-nine volunteers from 10 community colleges in Alabama were recruited to participate in a faculty, administrator, or student capacity. Eligibility was determined by completion of an online questionnaire by the potential candidate.</p>
<p>Sullivan, 2001</p> <p>Gender differences and the online classroom: Make and female college students evaluate their experiences</p>	<p>Is there anything about the online classroom that has made it easier for you to learn, achieve your academic goals, or participate in class discussions?</p> <p>Is there anything that made it harder?</p>	<p>195 students from the Connecticut Distance Learning Consortium who were able to successfully complete an online course.</p>

Persistence as a Phenomenon

Researchers have identified variables that serve as both facilitators and barriers to persistence for online student success (Bunn, 2004; Ivankova & Stick, 2007; Levy, 2007; Park & Choi, 2009). Facilitators are those factors that positively correlated to development of persistence, as shown in Table 3. Negative correlations, as synthesized in Table 4, have been identified as barriers to persistence and when present, make it difficult for the student to complete a course. Finally, a factor may either positively or negatively affect persistence, depending on the circumstance. For example, the presence of family support can increase the level of persistence whereas the lack of family support can decrease student persistence, thus leading to failure to complete an online course.

Facilitators of Persistence

College Status and Graduating Term

As proposed by Levy (2007), college status and graduating term are related factors. College status refers to the student placement within a program (freshman, sophomore, junior, senior) and graduating term indicates when the student expects to graduate (last term, this term, next term, in two terms, more than two terms). Students who are at a higher status and closer to graduation (within the next term) are more likely to persist in their program of study (Levy, 2009). Dupin-Bryant (2004), in reporting similar findings, postulates that prior educational experience may augment confidence through increased familiarity with the online environment.

Flexibility, Asynchronous Format, Time Management

Müller (2008) reports that women engaged in an online program of study find the flexibility and convenience of the schedule to be a positive aspect in their learning. Although several participants favored residential experiences in education, all note being able to complete work when convenient as imperative to managing family and work demands (Müller, 2008). Ivankova and Stick (2007) support this finding, citing this flexibility as one means of obtaining an education that might not otherwise be possible. Sullivan's 2001 study finds this flexibility equally important to both male and female students.

Bunn (2004) notes that a heavy academic workload is not necessarily problematic, as long as students have a realistic expectation of what will be involved. Furthermore, the author notes that students who actively plan to accommodate workload tend to be persistent. Holder (2007) notes that students with good study habits, the ability to stay on task with assignment and readings, and are able to successfully manage time are more apt to persist compared to non-persisters. Stanford-Bowers (2008) agrees with this, stating that administrators, faculty, and students acknowledge the importance of time management in its contribution to persistence.

Goal Commitment

Ivankova and Stick (2007) cite goal attachment and commitment to graduation as a quality found in all levels of online students except those who withdraw from a course. While graduates are the most motivated in terms of goal attachment, matriculated and beginning students are also positively motivated. Students who ultimately withdrew from the course were the least motivated to complete their degree

(Ivankova & Stick, 2007). Müller (2008) finds that persistent students viewed their education as important to goal attainment and valued the career or financial outcomes of their education.

Grade Point Average

Harrell and Bower (2011) report grade point average (GPA) as significantly predictive of successful student completion of an online course. The authors postulate that students with a higher GPA are better able to maneuver within the online environment and more savvy in successful academic behaviors than students who withdraw. Furthermore, Harrell and Bower (2011) note that this finding is consistent with previous evidence that lower GPA is associated with a higher rate of withdrawal. Muse (2003) reports similar evidence with the combination of GPA, age, and years since previous college course successfully discriminating between those students who will and will not complete an online course.

Table 3

Facilitators of persistence

Facilitators	Author, Year	Synthesis of Studies
College status, graduating term, comfort with online course work	Bunn, 2004 Dupin-Bryant, 2004 Levy, 2007	The closer to graduation, the more persistent the student. This may be related to becoming more technologically savvy and comfortable with online instruction.

Continued

Table 3*Facilitators of persistence*

Flexibility, asynchronous format. Time management	Bunn, 2004 Holder, 2007 Ivankova & Stick, 2007 Müller, 2008 Stanford- Bowers, 2008 Sullivan, 2001	The flexibility of an online course is very attractive to student attempting to balance work and family demands. The asynchronous format allows control over one's schedule and course work can be accomplished with less disruption to work and family schedules. Persistent students tend to have better study habits and complete work in a timely manner.
Goal Commitment	Ivankova & Stick, 2007	Desire to attain goals (degree completion) is a powerful motivator in the online student. This intrinsic motivation of pursuing a dream is often coupled with personal challenge, an appreciation of learning, and personal responsibility.
GPA	Harrell & Bower, 2011 Muse, 2003	Students with a higher GPA are often able to better maneuver through the electronic environment and adopt successful behaviors that allow them to excel in the online course. It may be that success in one class positively motivates the student to work.

Continued

Table 3*Facilitators of persistence*

Quality of interactions and feedback	Ivankova & Stick, 2007 Ojokheta, 2010	Feedback that is constructive and adds meaningful input into learning is viewed as valuable by the students and will contribute to persistence. Ambiguity in content or communication can be difficult for the online student to process, thus increasing the importance of quality interactions with faculty and other students.
Satisfaction and relevance	Ivankova & Stick, 2007 Levy, 2007 Müller, 2008 Park & Choi, 2009	Satisfaction as a facilitator of persistence is a consistent finding when included as a variable. Persistent students voice satisfaction with the quality of the program, interactions with students and peers, the relevancy of the course to individual needs, and satisfaction with the learning environment itself.
Self-efficacy, personal growth, self-motivation	Bunn, 2004 Holder, 2007 Ivankova & Stick, 2007 Kemp, 2002 Müller, 2008 Park & Choi, 2009	Although goal attainment is a powerful motivator for online students, on a daily basis personal resolve and determination contribute significantly to persistence. Students with high personal expectations and self-efficacy and those who enjoy the online challenge tend to be more persistent. These characteristics may lead the student to engage more, ask searching questions, and constructively work through problems.

Continued

Table 3*Facilitators of persistence*

Social connectedness or presence	Ivankova & Stick, 2007 Kemp, 2002 Müller, 2008	Increased comfort with the virtual social interactions of an online environment may increase persistence. When these social connections are transient (i.e. vary by course), they may not create a significant source of support, but instead may create an encouraging environment. The persistent student is able to form connections within each course, increasing the positive nature of the experience. An encouraging faculty presence also viewed contributes to persistence.
Support	Bunn, 2004 Holder, 2007 Ivankova & Stick, 2007 Kemp, 2002 Müller, 2008 Park & Choi, 2009	The role of family, friends, co-workers, and fellow class members in student persistence is well documented. Understanding from family and co-workers in behaviors needed to manage academic workload contributes to persistence. Other class members can provide support and encouragement to continue with studies despite hardship. This virtual community provides a sense of camaraderie and can assist students in troubleshooting problems. Faculty may also increase perceptions of support through feedback and social presence.

Quality of Interactions and Feedback

Ivankova and Stick (2007) find positive and encouraging feedback to be important to the development of persistence in the online student. Qualitative findings indicate that in addition to promptness, the quality of feedback and the willingness of faculty to meet student needs are viewed as important to student persistence. Quality feedback was also seen to be protective in the absence of support from an advisor (Ivankova & Stick, 2007). Ojokheta (2011) also find feedback pattern to have a direct effect on student ability to successfully complete an online course. In this study, Ojokheta (2011) postulates that feedback provided by faculty will have an impact on student perceptions of course content. This linkage of learning environment, motivation, feedback, and perceptions directly leads to positive student outcomes (Ojokheta, 2011).

Satisfaction and Relevance

Ivankova and Stick (2007) postulate that the further a student progresses in an online program, the higher their satisfaction, reporting amounts of 92.3% in graduated participants, 71.8% in matriculated students, and 57.7% in beginning students. Conversely, the withdrawn/inactive group reported a 20% satisfaction rate. Levy (2007) also finds satisfaction to be a significant predictor of student completion of an online course. Within the literature review, Levy (2007) notes an association between satisfaction and learning, suggesting that institutions should place major emphasis on student satisfaction as a means of promoting levels of persistence. Müller (2008) finds that when students are not satisfied with faculty or learning they are more apt to be less successful than their persistent counterparts. Park and Choi (2009) support this finding

with persistent students rating relevance and satisfaction significantly higher than those who drop from an online course.

Self-efficacy and Personal Growth

Holder (2007) finds self-efficacy to be one of three criteria that will differentiate the persistent student from one who will not complete an online course. Self-efficacy for learning and performance appears to correlate with higher confidence of the student to successfully complete a course as well as a higher expectation to do well (Holder, 2007). Bunn (2004) supports this premise, suggesting that personal resolve and determination to succeed strongly contributes to the development of persistence.

Kemp (2002) observes an association between resiliency skills and persistence, also commenting that resiliency directly relates to self-efficacy and motivation. Noting previous work by Pajares and Miller (1994), Kemp states that this higher level of self-efficacy will positively affect the effort expended on studies and increase resiliency in the face of obstacles to course completion. Likewise, Müller (2008) reports that increasing proficiency in academics and computer skills contribute to a sense of personal growth, thereby increasing a sense of accomplishment and enabling persistent behaviors.

Ivankova and Stick (2007) hypothesize that persistent students are generally highly motivated to complete their program of study while students who are less motivated will likely withdraw. This finding is replicated in Park and Choi's 2009 study. Ivankova and Stick (2007) view self-motivation as the intrinsic motivation to complete a program, as well as the personal challenge and responsibility. Thus, self-

motivation becomes one of the factors used to discriminate between persistent and non-persistent students (Ivankova & Stick, 2007).

Social Connectedness or Presence

Studies assessing social connectedness find persistent students believe social relationships can be established in the online environment. Ivankova and Stick (2007) report persistent students being comfortable with the discussion format of an online course with non-persistent students being the least satisfied with their comfort level in this environment. This sense of a virtual community contributes significantly to a model used to discriminate between persistent and non-persistent learners (Ivankova & Stick, 2007).

Findings from Kemp's 2002 study on resiliency indicate that students who are more adept in forming positive social relationships in the online environment will likely be persistent. Müller (2008) provides evidence to support this stance, citing students with stronger social connections to peers will derive support and encouragement to persist.

Support

Emotional support can be derived from family, friends, or peers (Holder, 2007). Holder (2007) reports a feeling of camaraderie within the classroom will significantly contribute to the development of persistence. Ivankova and Stick (2007) and Park and Choi (2009) report persistent students perceive family and friends to be supportive of their educational endeavors with non-persistent student reporting less support. Kemp (2002) notes that persistent students tend to score higher in having supportive partners and in maintaining healthy relationships. Müller (2008) also cites support from

classmates and faculty as imperative to student persistence, noting that feedback and social connections with peers and faculty contribute to the ability to complete a course despite hardships.

Technical support consists of practical assistance with computer and technology. Bunn (2004) notes that as students have varying levels of computer skills, tutorials outside of the regular course may be helpful. Bunn (2004) also notes that the perception of being unsupported is more of an issue than an actual technical difficulty. While Ivankova and Stick (2007) did not find technical support to be predictive of successful course completion, the authors do report that non-persistent students were the least satisfied with support services. Conversely, Ojokheta (2011) did find technical support to influence the ability of the student to complete an online course.

Barriers to Persistence

Auditory Learning Style

Harrell and Bower (2011) find auditory learning style to be a significant predictor of non-persistence in the online student, stating this is congruent with previous research (Ho & Tabata, 2001; Mathes, 2003). The authors postulate that a decreased ability to process verbal information contributes to this finding. Moreover, Harrell and Bower (2011) anticipate that a disconnect between learning style and the nature of the online environment could lead to frustration and eventual withdrawal.

Basic Computer Skills

Harrell and Bower (2011) report that while basic computer skills enhance persistent behaviors in the online student, an increased level of computer skill is associated with a subsequent increase in course withdrawal. The authors propose three

possible reasons for this finding. Students may simply overestimate their computer ability or underestimated the level of skills required in an online course. The data is collected via self-report and thus reflects the perception of ability rather than a direct measurement of computer skill. Students with higher computer skills may also be distracted by the internet and have less focus on course content. It is possible that these students are engaged in internet activities as opposed to completion of coursework. Harrell and Bower (2011) also note the possibility that this finding is a statistical anomaly related to the small sample size. Further research is recommended to determine the effect of computer skill on successful completion of an online course.

College Status and Graduating Term

In contrast to facilitating factors, Levy (2007) postulates that students who are at a lower college status and further from graduation are more likely to drop out from a program of study. This finding has been replicated by Dupin-Bryant (2004). Students who did not complete a course were more likely to be graduating in more than two terms (Levy, 2007). Levy (2007) draws the conclusion that students with less experience in online learning are more apt to withdraw than the student who is nearing completion of a program of study. In an anecdotal note, Levy (2007) observes that students, when faced with less than an optimal grade, may electively withdraw from a course and retake the course a later time. Presumably, this strategy would be employed by those students not yet ready to graduate.

Difficulty in Accessing Resources

Bunn (2004) reports difficulty in accessing resources, primarily the electronic library, as problematic for students. Once having a negative experience with the

electronic library, students are often disinclined to problem solve and typically make alternate arrangements. Dissatisfaction with resources also extends to difficulties in obtaining course materials (Bunn, 2004). Furthermore, Bunn (2004) finds that lack of a single point of contact is viewed as contributing to dissatisfaction with support.

Isolation

Bunn (2004) cites two types of isolation: (a) isolation from faculty and (b) isolation from fellow students. This barrier is somewhat mitigated by alternate means of interaction, such as those possible in an electronic environment or via audio-conferencing (Bunn, 2004). Ivankova and Stick (2007) find that non-persistent students were less satisfied with the online environment, citing a lower comfort level compared to persistent learners. Bunn (2004) also notes that strong peer connections may limit the extent or impact of isolation as a barrier.

Table 4

Barriers to persistence

Barriers	Author, Year	Synthesis of Studies
Auditory learning style	Harrell & Bower, 2011	As preference for an auditory learning style increases, so too does withdrawal from an online course. This is believed to be a consequence of the inherently written format of online learning. Difficulty in processing verbal information by the auditory learner can lead to frustration and attrition.

Continued

Table 4

Barriers to persistence

Basic computer skills	Harrell & Bower 2011	Advanced computer skills negatively related to persistence. The authors postulate that the student with advanced skills may be distracted by the internet and spend less time with actual course work. It must be notes that this was a small sample and could be an anomaly.
College status and graduating term	Dupin-Bryant, 2004 Levy, 2007	The less experience a student has with education, the more likely they are to withdraw.
Difficulty in accessing resources	Bunn, 2004	Hindered by an unclear understanding of who to contact, students experiencing difficulty in accessing online resources may become frustrated with the course and decide to drop. Access to an online library and technical support was considered problematic (either inadequate access or vague points of contact) online students who ultimately withdrew from the course.

Continued

Table 4

Barriers to persistence

Isolation	Bunn, 2004 Ivankova & Stick, 2007	Online students may feel alienated from classmates or faculty, resulting in decreased interaction and an increased risk of attrition. Feelings of isolation may be mitigated by stronger social connections and the use of personalized feedback.
Lack of computer accessibility	Stanford-Bowers, 2008	Students enrolled in an online course may be more concerned with the end goal (degree completion) and the convenience of the online format. These students may be less inclined to pursue institutional solutions with technology-related problems.
Non-academic issues	Bunn, 2004 Ivankova & Stick, 2007 Park & Choi, 2009	Non-academic issues include a wide array of factors and events such as work and family responsibilities, job changes or loss, bereavement, illness, and financial difficulties. Pressures from these issues may fuel the decision to withdraw from an online course, but can be mitigated by the presence of strong support and social connections within the course.

Continued

Table 4

Barriers to persistence

Poor communication	Bunn, 2004	Communication problems may stem from late, inadequate, or lack of notification of changes to the program, slow or contradictory feedback from faculty, and an inability to contact staff or support services.
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Lack of Computer Accessibility

Following employment of the Delphi technique for consensus reaching, Stanford-Bowers (2008) finds that administrators, faculty, and students view computer access and accessibility as contributing to persistence in an online course. This finding is a practical concern, as the nature of an online course logically demands the ability to access and interact with course content. It is interesting to note that computer accessibility emerged as a round one concern only for administrators. It was only in the final round of consensus reaching that accessibility was retained as a concern across all groups (administration, faculty, and students) although students did not rate its' importance as high as the other two stakeholders (Stanford-Bowers, 2008).

Non-academic Issues

Balancing work and family demands is a recurring theme in the literature (Bunn, 2004; Ivankova & Stick, 2007). Coping measures included decreasing leisure activities or socialization with friends (Bunn, 2004). Ivankova and Stick (2007) also find the asynchronous format of an online course allowed students to maintain family and work schedules. This flexibility to pursue further education in an asynchronous format is a strong advantage to online learning (Ivankova & Stick, 2007).

Poor Communication

Students strongly view incomplete or ineffective communication as a barrier to the development of persistence (Bunn, 2004). Lack of (or late) communication regarding changes, slow feedback, difficulty in contacting faculty and staff, and limited communication with faculty were specific issues reported by Bunn (2004) as contributing to this sense of a barrier.

Literature Summary

Three of the reviewed studies were multisite; data for the remaining articles were limited to one setting. Sample characteristics for each study are presented in Table 3. The review of the literature for those factors that increase or strengthen persistence are multi-faceted and complex. This limits the generalizability of results and a more geographically diverse sample may yield different results. Other questions arise from this, including the determination of how results may vary with student from different programs of study or different demographic characteristics.

Persistence is universally viewed as a complex variable. While several studies attempt to ascertain what strengthens persistence, others contrast persistent students to those who fail to complete a course. Although numerous factors are viewed as important to course completion, those that are critical to the development of student persistence have yet to be identified. As a result of the preceding literature review, the following definition of persistence is proposed. Persistence in online education is the ability of the student to overcome obstacles or hardships in completing a course, and leads to the ability to successfully complete an online education program; therefore, persistence is an antecedent to student success. Persistence, as both a characteristic and

an attitude, allows the student to attain educational or career goals, and successfully complete an online course. A lack of persistence will result in student withdrawal from an online course.

Theoretical Perspectives

Kember (1989) expanded on Tinto's interactionist model to create a framework more appropriate for non-traditional online students. This model recognizes that student factors will change over time, thus, students will grapple with persistence questions multiple time within a program of study. Kember's work marks a beginning in understanding the complex interplay of variables associated with student persistence. While recognizing the social and academic integration needed for the development of persistence, Kember (1989) also notes the mediating effect of student characteristics.

Park (2007) proposed a student model of learner characteristics (age, gender, education, employment status), external factors (scheduling conflicts, family issues, financial problems, personal issues), and internal factors (social and academic integration, technology issues, motivation) as the factors leading to either dropout or successful completion of an online course. This model captures the complexity of persistence while recognizing that a variable's degree of influence will change over time (Park & Choi, 2009).

The literature review and concept analysis identified the consistent presence of social connectedness, perceived stress and support, self-motivation, and goal attachment as contributing to persistence in the online student. While other factors contribute to persistence as indicated in Figure 1 these four constructs are hypothesized, based on the literature, to serve as the modifiable attributes and

antecedents to course completion. Specifically, these constructs are alterable, with instructor-initiated intervention. The constructs provide a framework for the PSOE and its ability to determine evaluative, objective outcomes for levels of persistence.

Certain variables identified in the literature as contributing to course completion were not considered amenable to instructor intervention. These variables include demographic characteristics, financial support, and native language. Although these factors may affect levels of persistence, the instructor is not able to effectively change these student qualities. Thus, they are not included in the model. Students who do persist will succeed, obtaining both career goals and satisfaction. Levels of student persistence may be influenced through instructor interventions that target perceptual characteristics, skills, and interactions. Inadequate support for the student through positive interactions on perceptual characteristics, skills, and interactions may result in failure to persist.

Facilitators: Non-Modifiable	Barriers: Non-Modifiable	Facilitators: Modifiable	Barriers: Modifiable
<ul style="list-style-type: none"> • Asynchronous Format • Time Management • GPA 	<ul style="list-style-type: none"> • Learning Style • Computer Skills • College Status • Graduating Term • Access to Resources 	<ul style="list-style-type: none"> • Feedback • Communication • Motivation • Goal Commitment • Social Connectedness • Perceived Support 	<ul style="list-style-type: none"> • Isolation • Communication • Perceived Stress

Figure 1. *Facilitators and Barriers to Persistence*

Identifying Modifiable Constructs

Numerous non-modifiable variables that influence persistence were identified in the literature. These include age, GPA, learning style, graduating term, computer skills,

and access to resources. Park's (2007) theoretical model presents additional non-modifiable factors such as financial problems, personal issues, scheduling conflicts, employment status, and education.

Eight modifiable variables were presented in the reviewed literature and supported by theoretical perspectives. These factors include goal commitment, feedback, communication, motivation, social connectedness, perceived support, isolation, and perceived stress. For development of the PSOE, these variables were assessed for commonalities and grouped into the following constructs: Social Connectedness, Perceived stress and support, Self-motivation, and goal attachment.

CHAPTER 3

INSTRUMENT DEVELOPMENT AND PSYCHOMETRIC ANALYSIS

Instrument

Items within the Persistence Scale for Online Education (PSOE) were initially developed from a review of the research literature focused on empirically testing each of the four constructs. Items from previously validated surveys formed the basis of items on the PSOE. Item identified were altered and re-worded, making them reflective of the four constructs under investigation and appropriate to those enrolled in an online nursing course.

Face validity occurs when, upon review, items appear to be an appropriate measure of the construct (Schutt, 2011). Four experienced nurse educators and a researcher with instrument development expertise determined content validity of the PSOE, based on their on-line educational expertise. These individuals reported that the items appeared to measure the constructs under investigation, were clearly written, and unambiguous. The use of previously validated instruments, as listed in Table 5, adds to the face validity for items on the PSOE.

Measurement validity was established by demonstrating that the proposed scale related to measures that were theoretically derived (Schutt, 2011). Constructs were based upon an in-depth literature review and grounded in theory. Thus, the PSOE was theoretically driven. Discriminate validity, is attained when the researcher can demonstrate that scores from individual measures are not strongly related to measures of other constructs (Schutt, 2011). Discriminate validity will be determined following data collection.

Feasibility testing, using a study population of nursing students enrolled in an online course, was used to evaluate the four constructs, wording of the PSOE, and the ability of the demographic questions to collect desired information. Results from this study determined that the PSOE was reliable, obtaining a Cronbach's alpha of 0.85. Based on feedback from these activities, the PSOE was revised. Revisions included addition of a question regarding intent to persist, collection of data regarding number of previous online courses and history of ability to persist, and clarification of wording for level of education. Criterion validity, most particularly structural validity, will be presented within the results of this study.

Table 5

Instrument Sources for Development of the PSOE

Construct	PSOE Item	Source	Reliability
Social	5	Roff et al., 1997	.91
Connectedness			
Perceived	6	Cohen, Kamarck, &	.85
Stress/Support		Mermelstein, 1983; Roff et al., 1997	.91
Self-Motivation	7	American Institutes for	.95
		Research, 1994; Sundre & Moore, 2002	.80 to .86
Goal Attachment	5	Roff et al., 1997	.91
Continued			

Table 5

Instrument Sources for Development of the PSOE

Additional items:		Literature supporting inclusion:
Intent to Persist/GPA	2	Berger & Braxton, 1998
Previous Online Experience	3	Ali, Hodson-Carlton, & Ryan, 2004
Social Desirability	1	Crowne & Marlowe, 1960
Demographics	3	

The PSOE consisted of 32 items; six of these items were descriptive, allowing each participant to self-describe student characteristics and previous experience with online courses, and 26 are four-point Likert-scaled items with a possible neutral response. Five items assess social connectedness, six items assess perceived stress and support, seven items assess self-motivation, and goal attachment is assessed by five items. Responses to these Likert-items allowed each participant to self-describe their perception for each of the constructs under consideration. The remaining three items assess (a) GPA, (b) intent to persist, and (c) social desirability.

Social desirability, first proposed by Crowne and Marlowe (1960), improves instrument development in nursing with the addition of a control for social desirability during final testing of the instrument (Waltz, Strickland, & Lenz, 2010). Responses to the social desirability item were used to determine the tendency of these individuals to project themselves as favorable (Johnson & Fendrich, 2002).

Psychometric Analysis

Research Design

This cross-sectional, descriptive study used a convenience sample. Participants were recruited from registered nursing students (RN) enrolled in an online course within a baccalaureate program (BSN), BSN completion program (RN-BSN), or accelerated option BSN program (AO) offered at two Midwestern Universities. An introductory email was forwarded from the principle investigator (PI) to each potential participant. This email explained the study purpose, time requirement for study participation, and provided a direct link to SurveyMonkeytm as the platform for data collection.

SurveyMonkeytm provided a format in which study participation may occur without revealing the individual's internet protocol (IP) address, increasing the confidentiality of responses. The IP address, a unique number assigned to every computer that connects to the internet, could be used to identify the individual completing the survey. Therefore, using a format that separates an IP address from the response ensures confidentiality of responses. Use of SurveyMonkeytm, a web-based format, facilitated anonymous study participation, prevented participation coercion, and provided control for each student to participate when and where they desired.

Subjects and Settings

The target population is undergraduate nursing students enrolled in an online course that is required within their program of study to obtain a degree. Two Midwestern universities with online nursing programs served as recruitment sites. Historical data indicated that a combined total of 684 students were enrolled in these

programs in the 2011 academic year. Prior to conduction of the study, Institutional Review Board (IRB) approval was obtained from both study sites.

Data were collected using convenience sampling techniques. The literature abounds with suggestions for an adequate sample size in factor analysis, but with little agreement as to how this should be determined (Gorsuch, 1983; Zhao, 2009). While Nunnally (1978) suggests at least 10 subjects per item, Tabachnick and Fidell (2001) recommend at least 300 subjects. When the variables of interest have high loadings ($> .80$), a smaller sample size may suffice (Tabachnick & Fidell, 2001). Zhao (2009), in addressing difficulties presented when the available sample is small, recommends emphasis on the quality of data over an arbitrary number of cases. Thus, while the target sample size for this study will be 230, data was also reviewed for quality as outlined by Zhao.

Procedure

Following institutional review board (IRB) approval from both institutions, study recruitment occurred using the University supported password protected email system at each study site. Each potential participant received an email from the PI following the 5th week of class. This email invited them to participate in the study, described the study, and outlined the steps (accessing the survey, study time requirement) associated with study participation. Data were collected utilizing SurveyMonkey[™] to provide confidentiality for the responses. This is an important consideration when working with students, a potentially vulnerable population. The results of exploratory factor analysis provided a framework for a methodical review of

the constructs to enable formulation of interventions that address specific concerns in the online student (Pett, Lackey, & Sullivan, 2003).

Data Management and Analysis

Following the data collection period, the SurveyMonkeytm survey site was closed. Data was then transferred from SurveyMonkeytm to a Statistical Package for the Social Sciences (SPSS) 18.0 file. Survey responses were then screened for completeness. Of the initial 106 responses, 3 surveys missing more than 50% of the responses were discarded, as more than a 10% omission rate may introduce bias (Polit & Beck, 2012). Six surveys were missing one response and one survey was missing three items, with no one item missing more than two responses. Imputation, or mean substitution as outlined by Tabachnick and Fidell (2001), was used to complete data on those seven surveys.

Likert responses on the PSOE were transformed to numerical data. Thus, strongly agree scored as a four, agree was scored as a three, disagree scored as a two, and don't know was scored as a zero; strongly disagree, as an absolute response, received no score. Opposite scoring occurred for the reverse-worded items (items 3, 6, 7, 8, 9, 11, 14, 18, and 20, where strongly disagree is the desired response). A description of the study population was then developed by aggregating the self-disclosed responses to the descriptive items in the PSOE.

Reliability is the ability of an instrument to accurately measure what it intends to measure. As changes occur in the phenomenon itself, scores on the instrument will correspondingly change (Schutt, 2011). Reliability for the PSOE was first assessed by determining Cronbach's Alpha for the instrument as a whole as well as for each

construct. A correlation matrix was generated using SPSS and subsequently evaluated for significant relationships. Following this step, non-modifiable factors, or demographic and descriptive data, were assessed via frequency tables.

Factor analysis techniques can be used to develop instruments that provide a sensitive assessment of the constructs of interest (Pett, Lackey, & Sullivan, 2003). Factor analysis, as a means of data reduction, examines a pattern of correlations among the measured items to assess the underlying constructs (DeCoster, 1998). First, determination of the assumptions of independent sampling, normality, outliers, linear relationships between pairs of variables, and the variables being related at a moderate level were tested. For this analysis, four factors were requested, based on the theoretical premise that the items were designed to measure four constructs: social connectedness, perception of stress and support, motivation, and goal attachment. Pett et al. (2003) argue that determination of the number of factors to extract should not be based solely on statistical criteria, and factor extraction should be grounded in the underlying theoretical structure of the instrument.

The ability of the PSOE to distinguish between students who do and do not have persistence was assessed on a component matrix. Factor extraction was completed using Principal Axis Factoring (PAF). Principal Component Analysis (PCA) uses linear combinations of original items to determine components. Further, PCA assumes that the variance that exists will be fully explained by the extracted factor. This method does not allow for “errors of measurement from shared variance and may therefore overestimate the linear patterns of relationships” (Pett et al., 2003, p. 102).

PAF is based upon the squared multiple correlation coefficient which is then used to estimate communalities. Unlike PCA, PAF includes errors of measurement. The drawback to this method is that the coefficient values may be sample specific and thus vary between studies (Pett et al., 2003). Thus, future research for the PSOE will necessarily include diverse sample populations, both in terms of demographic and educational program variables.

Varimax, as an orthogonal rotation method, was employed due to the lower correlation of factors (Pett et al., 2003). Following rotation, each factor was evaluated for contribution to variance. Cronbach's Alpha was computed for the overall instrument as well as each component. A correlation matrix was then used to summarize the interrelationships among the variables via Pearson's product. Prior to rotation, a component matrix was used to determine the PSOE's ability to distinguish between those students who do possess higher levels of persistence from those students who possess lower levels.

CHAPTER 4

RESULTS

From the 684 potential participants, 106 online students submitted surveys to SurveyMonkeytm. This represents a 15.5% response rate. Response rates for Web-based surveys vary, with a standard response rate yet to be determined. Polit and Beck (2012) report that Internet questionnaires generally receive a 50% response rate. In a metaanalysis of online survey research, Hamilton (2011) determined that reported response rates ranged from 32.52% to 41.21%, with a standard deviation of 29.40%. Given this discrepancy, the demographic characteristics of the respondents become a better determining variable with respect to the validity of these data. Assuming that the study population is homogeneous and results are not intended to be applied to other populations, a representative sample is sufficient for a valid sample (Engel & Schutt, 2005). Therefore, results of this study may not generalize beyond the study population.

Demographic Data Analysis

The demographic profile of the 101 respondents is presented in Table 6. Of these respondents, 45% were age 18 to 27, 29% were age 28 to 37, 17% were age 38 to 47, and 8% were age 48 to 57. Females comprised 88% of the study population while males accounted for 11%.

Table 6

Description of Population

Variable	N	%
Gender		
Female	90	88
Male	11	11
Age (years)		
18-27	46	45
28-37	30	29
38-47	17	17
48-57	8	8
58+	0	0
Program of Study		
ASN	1	1
BSN	26	26
Graduate	4	4
BSN Completion	61	60
BSN Accelerated Option	9	9
Previously dropped a course		
Yes	10	10
No	91	90

Continued

Table 6

Description of Population

Registered but did not start

Yes	7	7
No	94	93
GPA		
2.1 - 2.5	1	1
2.6 - 3.0	3	3
3.1 - 3.5	38	37
3.6 - 4.0	60	59
Intent to Register		
Strongly Disagree	6	6
Don't Know	5	5
Disagree	9	9
Agree	25	24
Strongly Agree	57	56

Analysis of Psychometric Properties

The purpose of this study was to develop the Persistence Scale For Online Education (PSOE) and begin to analyze its psychometric properties. The research questions were: (1) Is it possible to identify modifiable variables that contribute to the development of persistence among online nursing students?, and (2) Will the development and initial testing of the PSOE to objectively assess persistence lead to accurate discrimination between nursing students with high levels of persistence from

those with lower levels of persistence? The preliminary results of reliability and validity are presented, followed by the findings of the research questions.

Participants in a survey may answer truthfully or, when attempting to project themselves in a favorable manner, may provide in what is perceived to be a socially desirable response (Pett, Lackey, & Sullivan, 2003). To address these concerns, several social desirability measures have been developed. The PSOE includes a social desirability item from the Marlowe-Crowne Desirability Scale (Crowne, & Marlowe, 1964). If bias has occurred from social desirability, items on the scale would correlate to the social desirability item. In assessing the PSOE, the social desirability item correlates to item 12 (*I have personal strengths*) ($p=.02$). As this is preliminary testing, item 12 was retained. In final testing of an instrument, those items which participants tend to answer in a socially desirable manner, indicated by a significant correlation, would be deleted from the instrument.

Reliability was determined for each construct within the PSOE. As this is a preliminary study, the constructs were evaluated as theoretically defined, rather than on the basis of factor loadings. Reliability testing for the PSOE as a whole indicates a Cronbach Alpha of .799 (range .779 to .800).

Face and construct validity were established by four experienced nurse educators and a researcher with instrument development expertise, based upon their online expertise. Face validity was further increased through the use of previously validated instruments in the development of the PSOE. Measurement validity was established by relating the PSOE to theoretically derived measures (Schutt, 2011) and forming constructs based upon an in-depth literature review and relevant theory.

Discriminate validity was established for the PSOE as scores, with the exception of item 12 and discussed above, were unaffected by social desirability.

The five items to assess Social Connectedness achieved a Cronbach Alpha of .797 (range .741 to .791). Values between .70 to .90 are well-accepted guidelines for values of Cronbach's Alpha, with numbers higher than this indicating redundancy of items (deVet, Terwee, Mokkink, & Knol, 2011). The correlation matrix indicates statistically significant correlations exist within this construct. Confident interactions positively correlates with discussions ($p=.000$), anything in common ($p=.000$), reading posts ($p=.000$), and interactions ($p=.000$). Discussions positively correlates with anything in common ($p=.000$), reading posts. ($p=.000$), and interactions ($p=.000$). Anything in common positively correlates with reading posts ($p=.000$) and interactions ($p=.002$). Reading posts positively correlates with interactions ($p=.000$).

Reliability for Perceived Stress and Support is .685 (range .579 to .718) for the six items within this construct. The correlation matrix indicates statistically significant correlations. Frequently upset correlated positively with unable to control events ($p=.017$), more stress ($p=.001$) and increasing difficulties ($p=.000$). Unable to control events positively correlates with more stress ($p=.000$), family and work demands ($p=.002$), and increasing difficulties ($p=.000$). More stress positively correlates with family and work demands ($p=.001$) and increasing difficulties ($p=.000$). Family and work demands positively correlates with increasing difficulties ($p=.000$) and additional education ($p=.016$).

Reliability for the seven items within Self-Determination is .582 (range .483 to .657). The correlation matrix indicates statistically significant correlations. Personal

strengths positively correlates with succeed in goals ($p=.000$), confident will pass ($p=.017$), and achieve ($p=.001$). Succeed in goals positively correlates with confident will pass ($p=.005$), worldview, ($p=.004$), and achieve ($p=.000$). Confident will pass correlates with quality education ($p=.001$), and achieve ($p=.002$). Quality education positively correlates with worldview ($p=.001$) and achieve ($p=.003$).

The five items to assess Goal Attachment achieved a Cronbach Alpha of .433 (range .160 to .628). The correlation matrix indicates statistically significant correlations exist within this construct. Career goals positively correlates with clinical applicability ($p=.007$) and challenging course ($p=.014$). Clinical applicability positively correlates with challenging course ($p=.000$) and job opportunities ($p=.020$). Challenging course positively correlates with job opportunities ($p=.000$).

All assumptions, as outlined in the methodology were tested and met with the exception of the presence of outliers. A Mahalanobias Distance exceeding the Chi-square value indicates that outliers exist within the data. If this were final instrument development, these data would be deleted and a Mahalanobias Distance re-confirmed. However, the purpose of this dissertation is to psychometrically test the PSOE, thus retaining all data is appropriate. The theoretical framework used to guide this study was developed for all online students. In the subsequent studies planned for final instrument development, it may be found that including students, other than those majoring in nursing, may influence the ability of the PSOE to assess a student's level of persistence. Because of its theoretical basis, these activities should be performed prior to altering the PSOE.

The item means, standard deviations, and interitem correlation matrix are presented in Table 6. On a 5-point scale, where 4 = *strongly agree* to 0 = *strongly disagree*, the means ranged from 1.3 (item 20: *Secure employment*) to 3.6 (items 10 and 15: *Additional education; Confident will pass*). Examination of the correlation matrix indicated that all items correlated $\geq |.01|$. No interitem correlation exceeded $r = .68$, thus indicating no problems with multicollinearity.

Table 7

Item means, standard deviations, and interitem correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	$\bar{\chi}$	SD		
1	1																								3.3	0.81	
2	0.56	1																								3.1	0.74
3	0.38	0.43	1																							3.3	0.7
4	0.42	0.51	0.36	1																						2.8	0.99
5	0.46	0.45	0.31	0.58	1																					2.7	1
6	0.33	0.41	0.36	0.33	0.32	1																				2.7	0.87
7	0.15	0.16	0.07	0.13	0.05	0.24	1																			3.1	0.67
8	0.12	0.14	0.16	0.13	0.12	0.32	0.41	1																		2.7	0.96
9	0.07	0.01	0.01	0.13	0.09	0.15	0.3	0.34	1																	2.3	0.86
10	0.02	0.03	0.06	0.04	0.1	0.01	0.09	0.03	0.24	1																3.6	0.68
11	0.18	0.35	0.32	0.29	0.13	0.39	0.48	0.43	0.37	0.11	1															2.8	0.88
12	0.13	0.14	0.16	0.01	0.01	-0.06	0.18	0.22	0.12	0.16	0.12	1														3.4	0.5
13	0.11	0.04	0.27	-0.02	0.01	0.05	0.23	0.23	0.05	0.13	.18.	0.67	1													3.4	0.49
14	-0.13	-0.18	-0.07	-0.01	-0.02	-0.35	-0.31	-0.10	0.00	0.21	-0.18	0.48	0.98	1												1.9	1.1
15	0.43	0.53	0.33	0.21	0.33	0.39	0.33	0.16	-0.01	0.08	0.23	0.24	0.28	-0.17	1											3.6	0.61
16	0.19	0.37	-0.03	0.25	0.29	0.29	0.09	0.14	0.15	0.04	0.15	0.06	0.17	-0.09	0.33	1										3.2	0.76
17	0.13	0.18	0.17	0.15	0.27	-0.07	0.01	0.01	0.02	-0.02	0.08	0.12	0.28	0.76	0.11	0.32	1									3	0.87
18	0.12	0.15	-0.06	-0.08	0	0.1	0.18	0.02	0.12	0.1	-0.01	-0.03	-0.05	-0.09	0.24	0.15	0.07	1								3.5	0.67
19	0.16	0.13	0.03	0.04	0.01	0.07	0.18	0.2	0.17	0.13	0.12	0.32	0.41	0.04	0.3	0.29	0.18	0.33	1							3.5	0.58
20	-0.03	0.08	0.05	0.03	0.05	0.16	-0.05	0.19	-0.01	-0.1	0.12	-0.11	-0.04	-0.00	-0.05	0.07	-0.07	-0.07	-0.04	1						1.3	1.1
21	0.34	0.41	-0.01	0.27	0.44	0.19	0.24	-0.01	0.07	0.12	0.08	0.02	0.06	-0.72	0.45	0.48	0.4	0.4	0.21	-0.09	1					3.1	0.89
22	0.44	0.34	0.07	0.23	0.41	0.4	0.22	0.25	0.14	0.03	0.19	-0.08	0.03	-0.75	0.3	0.47	0.16	0.24	0.19	0.09	0.46	1				3.4	0.67
23	0.38	0.31	0.19	0.24	0.41	0.28	0.04	0.18	-0.14	-0.1	0.1	0.05	0.11	-0.01	0.27	0.12	0.06	0.14	0.14	-0.02	0.23	0.52	1			3.2	0.97

Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy were used to evaluate the strength of the linear association among the 23 items in the correlation matrix. Bartlett's test of sphericity was significant ($\chi^2 = 795.537, p = .000$), which indicate that the correlation matrix was not an identity matrix. The KMO statistic (.741), which is an index that compares the magnitude of the observed correlations with the magnitude of the partial correlation coefficients, was just "middling" according to Kaiser's (1974) criteria. These results suggest that, although a factor analysis was appropriate and could be expected to yield common factors, there was some concern for the few numbers of items ($N = 23$) in the correlation matrix.

For the 23 items within the PSOE, the measures of sampling adequacy (MSA) statistics range from .359 (item 13) to .839 (item 20) with all off-diagonal items $<.242$. While the majority of MSA statistics are less than "middling" according to Kaiser's (1974) criteria, the negative partial correlations are not high. Thus, an underlying factor structure should be able to summarize the relationships among items (Pett et al., 2003). Increasing the sample size may mitigate this concern.

The item-to-total scale correlations ranged from .03 (item 20: *Secure employment*) to .62 (item 2: *Enjoy discussions*). This range of item-total correlations was considered to be acceptable (Nunnally & Berenstein, 1992). No items were eliminated because of redundancy or lack of homogeneity within the construct. Cronbach's alpha for the total 23-item scale was .799.

Research Question One

Initial testing indicates that the PSOE is able to identify modifiable variables that contribute to persistence among online nursing students. The descriptive statistics are

presented in Table 7. This table presents the descriptive statistics, between-factor correlations, and alpha coefficients for the four generated subscales of the PSOE. The correlations between the subscales ranged from .064 (for subscales 1 and 3) to .211 (for subscales 2 and 3). The reliability estimates presented in parentheses (Table 8) on the diagonal of ranged from .43 to .80 with a total scale coefficient alpha equal to .80.

Table 8

Factor Correlations and Factor Alpha Coefficients for the PSOE (N = 102)

Factor	M ^a	SD	1	2	3	4
1. Social Connectedness (<i>u</i> = 5)	15.17	3.20	(.80)			
2. Perceived Stress and Support (<i>u</i> = 6)	17.18	3.09	.123	(.68)		
3. Self-Motivation (<i>u</i> = 7)	22.94	2.51	.064	.211	(.58)	
4. Goal Attachment (<i>u</i> = 5)	14.40	2.44	.185	.127	.142	(.43)

Note: Reliability estimates appear in the parentheses on the diagonal

Table 9 presents the variance explained by the extracted factors in the rotated model. As indicated, the four constructs extracting a total of 49.14% of the variance, with each factor adding 22.84%, 10.04%, 8.73% and 7.53%.

Table 9

Total Variance Explained by the Four Extracted Factors of the PSOE

Factor	Initial Eigenvalues			Extracted Sums of Squares Loadings		
	<i>Total</i>	<i>% Variance</i>	<i>Cumulative %</i>	<i>Total</i>	<i>% Variance</i>	<i>Cumulative %</i>
I	5.25	22.84	22.84	4.15	18.05	18.05
II	2.31	10.04	32.88	2.59	11.28	29.33
III	2.01	8.73	41.60	2.37	10.29	39.62
IV	1.73	7.53	49.14	2.19	9.52	49.14

Factor loadings for include four items with excellent item-to-factor loadings (items 2, 5, 12, and 15), five items with very good loadings (items 1, 4, 11, 19, and 21), five items with good loadings (items 3, 7, 8, 15, and 16), and nine items with fair loadings (items 6, 9, 10, 14, 17, 18, 20, 22, and 23). This data is presented in Table 10. Comrey and Lee (1992) suggest that items with loadings less than .30 should be excluded from the scale as less than 9% of that item’s variance is shared with the factor. However, Comrey and Lee (1992) caution that fair loadings in a pilot study may be related to a small sample rather than the characteristics of the factor.

Table 10

Factor Loadings From the Rotated Component Matrix for PSOE: Principle Axis Factoring with Varimax Rotation

<i>PSOE Item</i>	<i>Factors</i>			
	1	2	3	4
1. Social Connectedness				
I am confident	.65	.10	.08	.14
Enjoy discussions	.73	.17	.05	.14
Anything in common	.58	.16	.21	-.35
Reading posts	.64	.13	-.04	-.02
Interactions	.71	-.01	-.03	.16
2. Perceived Stress and Support				
Frequently upset	<u>.48</u>	.50	-.11	.07
Unable to control	.04	.61	.20	.21
More stressed	.11	.60	.19	.02
Family and work demands	-.05	.43	.12	.14
Additional education	.01	.06	.20	.09
Difficulties increasing	.25	.67	.14	-.06
3. Self-motivation				
Personal strengths	.05	.07	.74	-.08
Succeed in goals	.09	.08	.87	-.05
Positive feedback	-.10	-.31	.15	-.03
Confident will pass	<u>.48</u>	.20	.27	.28
Quality education	.31	.09	.13	<i>.49</i>
Worldview	<u>.25</u>	-.15	.27	.23
Achieve	.04	.13	.47	.36
4. Goal Attachment				
Career goals	-.03	.12	.03	.67
Secure employment	.07	<i>.16</i>	-.13	-.11
Clinical applicability	.42	-.04	.08	.67
Challenging course	.44	.22	-.07	.52
Job opportunities	<i>.46</i>	.03	.03	.18

Note: Underlined values indicate a double-loading on two or more factors. Loadings highlighted in bold indicate the factor on which the item was placed. Italicized values indicate where item actually loaded when this occurred in a different construct.

Research Question Two

Initial testing of the PSOE indicates that with further refinement, the PSOE may be able to objectively assess persistence and lead to accurate discrimination between nursing students with high levels of persistence from those with lower levels of persistence. The component matrix indicates seven extractable components with Eigenvalues greater than one. Despite this, two components can be used to explain 33%, or the maximum amount of variance among the items as identified by Pett and associates (2003). The first component, labeled successful student, may be described as enjoying discussion (.731), confident on passing (.677), confidence in friendly interactions (.664), believe a challenging course will help achieve goals (.641), looking forward to interactions (.633), and are not frequently upset by unexpected events (.610). The second component, labeled as the unsuccessful student, may be described as succeeding in their goals (.678) and having personal strengths (.666), yet not believe interactions will be motivating (-.380), does not like reading posts (-.299), does not believe the course will increase job opportunities (-.253), does not enjoy discussion (-.241), does not believe a challenging course will help achieve goals, (-.232), and does not have confidence in friendly interactions (-.221).

Non-modifiable factors, or demographic information, can further identify the student at risk of not persisting. Quartiles can be used to assist in this identification. Students who fall within the upper quartile would be expected to persist in an online course. Those with scores outside of the upper quartile would be at risk of failing to complete the course. In this study, students with scores outside of the upper quartile and thus at risk of non-completion, can be described as younger than 27 years of age (60%),

self-reporting a grade point average between 3.6 to 4.0 (on a 4.0 scale) (52%), having taken greater than nine courses (54%), in an bachelor's undergraduate degree completion program of study (BSN completion) (62%), reporting a previous course drop (17%), and completing the PSOE in a social desirably manner (74%). Conversely, the student with scores below the upper quartile, or at low risk of not persisting, may be characterized as greater than 27 years of age (68%) and not reporting a previous course drop (98%).

Application of the non-modifiable factors to the results of the factor analysis allows one to preliminarily ascertain the student at risk from within the study population. It is notable that the student with a high grade point average, or one that has completed greater than nine courses, if young (under the age of 27 years) and within a Baccalaureate completion program, remains at risk for non-completion of the course. Additionally, male study participants (n= 11) encompassed 11% of the study population, yet 73% of this study subgroup achieved PSOE scores indicating a risk for not persisting. These data have not been reported elsewhere and do not reflect the typical student believed to be at-risk. Thus, despite their demographic information, assessment of these individuals needs to occur.

CHAPTER 5

DISCUSSION

Preliminary testing indicates that, with further refinement, the Persistence Scale for Online Education (PSOE) may be a valid and reliable instrument in assessing levels of persistence in the online nursing student. The Cronbach alpha of the instrument as a whole is high (.80) with lower reliability statistics of the subscales (range .43 to .80). This indicates that the subscales are interrelated and represent a stronger measure of persistence when assessed together.

At 15.5%, the response rate in this study was low. However, this is based on the number of students enrolled in a program and not the number of students actually taking a class. Matriculation among students often incurs breaks in enrollment. Students enrolled in clinical courses may not be required to access their course using any on-line format. Thus, the true response rate may be higher. Also, study data were obtained mid-semester, which may be a particularly stressful time for students, who then opt not to participate in the survey.

The sample size of 103 was below the targeted number of responses set forth in the research design. Zhao (2009) purports that adequacy of sample size should be determined by communality of the variables, degree of overdetermination of the factor, size of loading, and model fit. In this study, the Kaiser-Meyer-Olkin (KMO) is .741. This exceeds Zhao's recommendation of .60 and indicates a moderate level of sampling adequacy.

The minimum value of all communalities is .161 with a maximum value of .641. The mean value of communalities is .458 with a standard deviation of .13. Ideally,

communalities would be greater than .50. Of additional concern is the cross loading that exists among two items within the PSOE. Using a standard of .60 as recommended by Zhao (2009), factor one has four variables that have strongly loaded, factor two has three, and factors four and five each have two. While this would indicate a moderate degree of overdetermination for factors one and two, concerns exist for factors three and four.

These statistics indicate that sampling adequacy may be lacking, with the alternative interpretation that items may need to be eliminated from the instrument. It is difficult to determine the correct course of action based upon this study and the most prudent course of action would be to repeat the study with a significantly higher number of participants.

Research Questions

In answering the first research question (Is it possible to identify modifiable variables that contribute to persistence among online nursing students?), results of this study indicate that the constructs within the PSOE, social connectedness, perceived stress and support, self-motivation, and goal attachment, work in combination to ascertain levels of persistence in the online nursing student. The total scale alpha of .80 is strong, with 80% of the variance of the total scores attributable to reliable, or systematic, variance (Pett, Lackey, & Sullivan, 2003).

Factor loadings range from 14 items with good to excellent factor-to-item loadings and 9 with fair factor-to-item loadings. The smaller sample size of this pilot study may falsely mask characteristics of the factors, as postulated by Comrey and Lee (1992). The strong loadings indicate items that are most similar to the construct, with

weak loading indicating those items which are least similar. No items will be excluded until further testing with a larger, more representative population has occurred.

The constructs of social connectedness and perceived stress and support load most strongly. The literature and theoretical models presented in Chapter 2 support this, with much evidence for their inclusion in an instrument measuring levels of persistence. Item 10 (Additional Education) did not load strongly and would need to be further evaluated for inclusion in the final instrument. Surprisingly, only three items loaded strongly in motivation and in goal attachment. Again, this may be reflective of a low sample size or sample limited to students enrolled in a nursing program. All items included in the four constructs were based upon evidence in the literature and in theoretical models. While this may indicate a disconnect between theory and clinical data, it must be remembered that the literature reflected all types of online students while this study was composed of nurses.

The second research question (Will the development and initial testing of the PSOE to objectively assess persistence lead to accurate discrimination between nursing students with high levels of persistence from those with lower levels of persistence?), is answered by the ability of the PSOE to discriminate between the persistent and non-persistent student. The student who does not possess strong levels of persistence and is at risk of non-completion of a course may not be readily apparent to the instructor. In this study, results of the PSOE indicate that students less than 27 years of age and having a grade point average (GPA) of 3.6 or higher are at higher risk of non-completion. This student will likely consider themselves to be succeeding in obtaining their goals and having personal strengths. Likewise, they will not find online interactions to be

motivating or enjoy the discussion, may not believe that the course is beneficial to increasing their job opportunities, and is not confident that they will be able to form friendly interactions within the online environment.

Because the at-risk student has a high GPA and will have successfully completed previous online courses, additional data are needed by the instructor to assist in prospective identification. Administration of the PSOE at the start of a course will provide this information and allow the instructor to apply evidence-based interventions on an individualized basis. These interventions, such as communication, feedback, and social presence, may augment the modifiable factors of social connectedness, perceived stress and support, self-motivation, and goal attachment. The literature and theoretical models, as presented in Chapter 2, support the use of interventions targeting these constructs. In turn, this may increase a student's ability to persist in the online environment.

Limitations

Pett and associates (2003) assert that an instrument is ready for dissemination when the researcher can articulate the conceptual basis for the instrument, the reliability and validity, and the context in which the instrument may be used. The constructs within the PSOE are theoretically derived and validated through an extensive literature review. Reliability and validity have been preliminarily established. Further testing is needed to verify this and to identify the context in which the PSOE may be effectively used.

Bartlett's test of sphericity was significant, indicating that the correlation matrix was not an identity matrix. The KMO statistic verified the appropriateness of factor analysis for the PSOE, but also identified some concern for the few numbers of items (N

= 23) in the correlation matrix. Additionally, the measures of sampling adequacy (MSA) statistics were slightly less than “middling”, suggesting less than ideal conditions for factor analysis. Increasing the sample size may decrease this concern.

It must also be noted that the instrument developed for this study was theoretically driven. As little data exists regarding measurement of persistence, constructs and factor names were derived from the review of the literature. Results indicate that differences exist between theory and clinical data. Although the items within the construct of social connectedness and perceived stress and support loaded strongly, self-motivation and goal attachment possess items with double-loadings. Further, several items within these two constructs loaded weakly, indicating the need for more extensive evaluation of their contribution to persistence.

Future Research

The results of this study are descriptive, seeking to assist in identifying the student who is at risk of not completing an online course. A longitudinal study to determine the accuracy of the PSOE in predicting those students who are not able to complete an online course should be completed. This information may be used to develop intervention(s) aimed at the source of decreased persistence. Supplemental Instruction (SI) programs provide a blueprint for the implementation of such a program. SI programs, required or optional, are available for the identified student at risk for not completing a course related to the need for additional instruction time, testing, or supplemental course work.

Sample size and generalizability are limitations of this study and future testing would need to involve a larger and more demographically diverse sample. As

recommended by Tabachnick and Fidell (2001), a sample size of at least 300 is needed to complete factor analysis of the instrument. This increased sample size would allow a more responsible analysis of sampling adequacy using the methods outlined by Zhao (2009). At that time, factor analysis techniques and assessment of sampling adequacy can be based on sufficient data to enable subscale formation and item deletion as per standard factor analysis techniques. This larger sample would allow identification of redundant items and facilitate development of a more parsimonious instrument that could multiple populations.

It may also be found that results vary by program of study, with nurses in a generic bachelor of science in nursing (BSN) program differing from those in an registered nurse (RN) completion program, for example. Following this, the revised survey should be administered to college student who are not declared nursing majors. This would determine the application of the PSOE to identify the student at-risk in any course delivered in an online format.

Implications for Practice

Preliminary testing of the PSOE indicates that further refinement of the instrument is needed prior to use in online courses by educators. When completed, use of the PSOE will allow the educator to identify the student at risk of dropping form a course. Knowledge of this will facilitate focused evidence-based interventions such as therapeutic communication, feedback, or social presence to assist students in successful completion of a course of study.

APPENDIX A

The Persistence Scale for Online Education (PSOE)

The Persistence Scale for Online Education (PSOE)

Answer the following:

Select one: Gender: Male Female

Age: 18-27 28-37 38-47 48-57 >57

Current program of study:

Associate Degree

Baccalaureate Degree

BSN Completion Program

Graduate Degree

Other (Please explain)

Number of courses completed in this program to date:

0-2 3-4 5-6 7-8 9 or more

I previously dropped out from an online course: Yes No

I previously registered for an online course and did not start the class:

Yes No

I am confident I will have friendly interactions with students in this course	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know
I enjoy discussions with differing opinions	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know
I don't have anything in common with other students and am concerned this will negatively impact discussions	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know
I look forward to reading other posts on the discussion board	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know

Know				
I believe interactions with others in the course will motivate me to learn	Strongly Agree	Agree	Disagree	Strongly Disagree
Know				Don't
I am frequently upset by things that happen unexpectedly	Strongly Agree	Agree	Disagree	Strongly Disagree
Know				Don't
I feel unable to control important events in my life	Strongly Agree	Agree	Disagree	Strongly Disagree
Know				Don't
Generally, I believe I am more stressed than other people	Strongly Agree	Agree	Disagree	Strongly Disagree
Know				Don't
I am concerned that my family and/or work demands will make this course difficult	Strongly Agree	Agree	Disagree	Strongly Disagree
Know				Don't
My family (support system) believes this additional education is a good thing	Strongly Agree	Agree	Disagree	Strongly Disagree
Know				Don't
I feel as though my difficulties are increasing, affecting my ability to cope	Strongly Agree	Agree	Disagree	Strongly Disagree
Know				Don't
I have many personal strengths	Strongly Agree	Agree	Disagree	Strongly Disagree
Know				Don't
When I set goals, I tend to succeed	Strongly Agree	Agree	Disagree	Strongly Disagree
Know				Don't
I need positive feedback from my instructor to feel good about my work	Strongly Agree	Agree	Disagree	Strongly Disagree
				Don't

Know				
I am confident I will pass this course				
Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know
I believe this institution is committed to providing quality education				
Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know
Attending college is changing my view of the world				
Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know
My current GPA is:				
4.0 - 3.6	3.5 - 3.1	3.0 - 2.6	2.5 - 2.1	2.0 or less
Completing this program is optional; it will not further my career goals				
Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know
I am achieving what I set out to achieve				
Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know
Secure employment is my priority				
Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know
I believe the content of this course will have clinical applicability				
Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know
I intend to register for another class in this program				
Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know
Even if this course is challenging, it will help me achieve my goal				
Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know

This course will help increase my job opportunities				
Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know
I am always polite, even when others are discourteous				
Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know

APPENDIX B
STUDY INVITATION

Study Invitation

You are invited to participate in a research study open to all nurses currently enrolled in an online course within an RN-to-BSN completion program. The purpose of this study is to allow you to describe your experience with online education. Participation in this study is voluntary at all times. You may choose to not participate or to withdraw at any time. To do so, simply exit the survey without submitting your answers. Deciding not to participate will not result in any penalty. Your course grade will not be affected in any manner through participation or non-participation. If you elect to exit the survey prior without submitting your answers, your answers will not be collected as part of this research.

To participate, please use the following link to Survey Monkey:

<https://www.surveymonkey.com/s/LQ2BBCD>

To participate, simply click on the link provided to move to the SurveyMonkey™ screen. No IP addresses will be collected nor will you be asked for a personal identifier. Thus, your answers will not be able to be linked to your identity.

No risks are anticipated from participation in this study. However, if any concern or distress occurs, please see your advisor. If needed counseling services are available at no charge to the student. There are no physical risks associated with survey completion.

While every effort will be made to keep confidential all of the information you complete and share, it cannot be absolutely guaranteed. Individuals from the University of Missouri-Kansas City Institutional Review Board (a committee that reviews and approves research studies) , Research Protections Program, and Federal regulatory agencies may look at records related to this study for quality improvement and regulatory functions. However, as no IP address has been collected this data will not be linked to you as an individual.

If you have any questions about this study, please contact:

Carolyn Hart, PhD (c), RN
Office: (417) 820-5039
Cell: (717) 575-4964

Thank you for your participation!

APPENDIX C

UNIVERSITY OF MISSOURI - KANSAS CITY IRB APPROVAL



October 13, 2011

Carolyn Hart, RN
8183 N. State Hwy 125
PO Box 75
Bradleyville, MO 65614

Amendment Approval Date: 10/13/2011

Expiration Date: 1/5/2012

Dear Ms. Hart,

Your Amendment dated 9/26/2011, to research protocol IRB #SS10-103X entitled, "Persistence: The variable leading to success in the online nursing student" was given an expedited review by a member of the UMKC Social Sciences Institutional Review Board (SSIRB).

The IRB approves your amendment, dated 10/13/2011, to research protocol IRB # SS10-103X as submitted. You are granted permission to conduct your study as revised. The date for continuing review remains unchanged at 1/5/2012, unless closed before that date.

The approval includes the following:

- Addition of new items to the PSOE to better capture information about online students
- Change of population to include all undergraduate nursing students taking online courses
- Addition of two funding sources

Any further changes to the study must be promptly reported and approved. Please contact the administrative office of the SSIRB (email: umkcssirb@umkc.edu; phone: 816-235-5927) if you have questions.

Thank you,

SSIRB Administrative Office

PLEASE NOTE:

If a signed copy of this letter is needed, please contact a member of the IRB staff.

This e-mail is an official notification intended only for the use of the recipient(s). If you have received this communication in error, please return it to the sender immediately and delete any copy of it from your computer system.

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VITA

Carolyn Hart (nee Soma) was born and raised in Scranton, Pennsylvania. Her primary education was received through the private, Catholic school system. After graduation, she married her husband Tim and for the next decade, was a stay-at-home mother for their four children: Michelle, Sara, Matthew, and Philip. During this time, Carolyn and Tim re-located their family to Lancaster, Pennsylvania and also decided to go to nursing school. Carolyn is a diploma graduate of Lancaster General School of Nursing. Her first job as a nurse was as a circulator on the Cardiothoracic Surgical Team. After a year, she moved to Trauma Neurosurgical Intensive Care. It was during this time that she received the Weidman Award for Excellence in Nursing.

After six years of work in trauma, Carolyn and her husband decided to become travel nurses. They were able to work in prestigious hospitals such as Johns Hopkins and Georgetown University. With encouragement from her husband, Carolyn elected to pursue her Bachelor of Science degree in nursing. Becoming hooked on teaching, Carolyn then completed her Masters degree in nursing education at South University and accepted a faculty position at Southwest Baptist University in Springfield, Missouri. Carolyn and her husband now live south of Springfield, Missouri and are very involved in conservation work. With the state and federal governments, they are working to restore the natural beauty of the glades and open woodlands on their 200 acres.

Upon graduation from South University, Carolyn was accepted in the PhD program at the University of Missouri - Kansas City. Carolyn is a member of Sigma

Theta Tau International. Her dissertation was funded by Sigma Theta Tau and the National Leagues for Nursing. She has published an article and presented at National Conferences. She has also been accepted into the 2012 Sigma Theta Tau International Leadership Academy.