

Student Achievement and NCLEX-RN Success: *Problems That Persist*

JO ANNE CARRICK

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DVANCEMENTS IN THE SCIENCE OF MEDICINE AND A GREATER EMPHASIS ON PATIENT SAFETY HAVE LED TO AN INCREASE IN COMPETENCY REQUIREMENTS FOR THE GRADUATE NURSE

ENTERING PRACTICE AT THE BASIC LEVEL. These trends have contributed to greater rigor in the NCLEX-RN[®] licensure exam and higher passing standards (Wendt & Kenney, 2007). Despite efforts by nurse educators to predict success on the NCLEX-RN exam, addressing the needs of students at risk for failure is an ongoing problem (DiBartolo & Seldomridge, 2008). THIS ARTICLE USES TWO THEORIES, SYSTEMS THEORY AND THE STUDENT'S APPROACH TO LEARNING (SAL) THEORY, TO ANALYZE THE COMPLEXITY OF LEARNING AND IDENTIFY EFFECTIVE INTERVENTIONS. BASED ON THIS ANALYSIS AND EVIDENCE FOUND IN THE LITERATURE, STRATEGIES TO ADDRESS THESE PROBLEMS ARE IDENTIFIED.

Systems Theory: Teaching and Learning In systems theory, the whole is greater than the sum of the parts. Systems theory diverges from the reductionist, "snapshot" view of complex systems and provides a framework for seeing interrelationships and dynamic patterns. Interrelationships are viewed as circular or continuous, rather than linear, and acknowledge multiple interrelated effects rather than a single cause and effect (Senge, 2006). For example, with systems theory, a nursing program is more than faculty and students; it is a system of interdependent processes used for teaching and learning.

Senge's systems diagram shows how reality can be seen as a circular process. Filling a glass of water could be described as a linear process; a person turns the faucet on and fills the glass. But from a systems perspective, this act is circular, with more steps, influences, and interrelationships. While turning the faucet on and filling the glass, our mind monitors the gap between our thirst, the flow of water, and the level of the water in the glass. Five variables now comprise this water-regulation

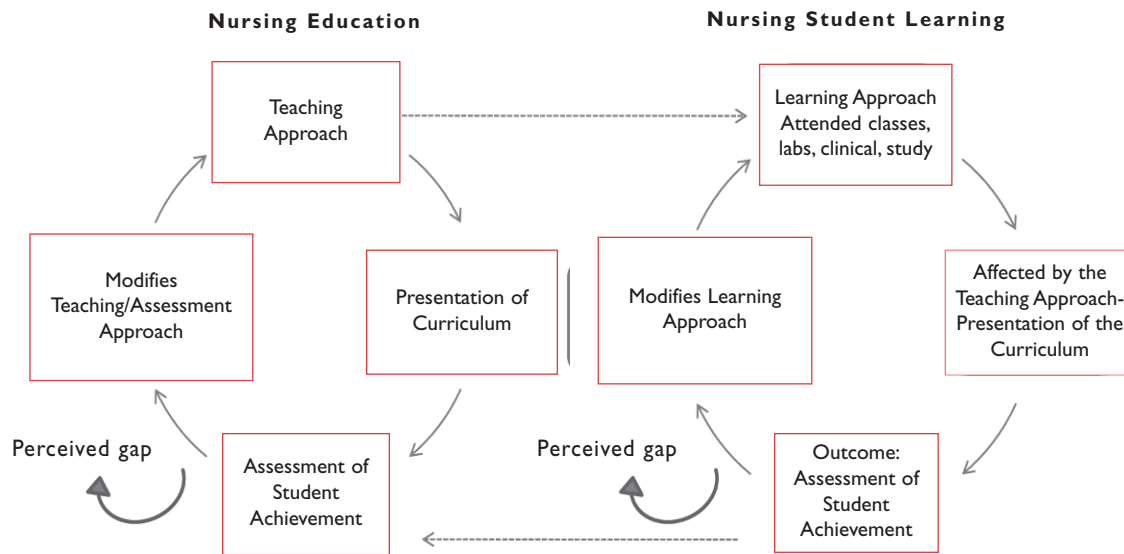
system: the faucet, the water flow, the desired water level, the current water level, and the gap between the desired and the current level (Senge, 2006).

THE NURSING EDUCATION SYSTEM In a systems diagram for nursing education, the faucet represents the curriculum and teaching methodology. Flowing from the faucet are curriculum delivery processes to prepare students for the nursing role. Embedded in these processes are course content, sequence patterns, emphasis, and teaching approaches. (See Figure.)

The nursing curriculum is developed to follow the format and content blueprint of the NCLEX-RN exam and to meet the standards of the profession and accrediting agencies. Curriculum delivery is based on theory and research in teaching and learning, both in education and the clinical practice of nursing. Gaps in the process are twofold in nature: relevance of the curriculum (content) and the effectiveness of curricular delivery (teaching process). Faculty characteristics and expertise add further complexity to this system because they affect the development of

ABSTRACT While most nurse graduates are successful on the NCLEX-RN licensure examination, certain students continue to be at risk for failure. To understand the complexity of at-risk students and NCLEX-RN failure, systems theory was used to analyze the interdependency of the nursing education system and the nursing student learning system. From this perspective, these problems relate to flaws in perceived learning gaps and student outcome measures. Predicting NCLEX-RN success is further complicated because students leave the teaching system prior to taking the exam, making them vulnerable to other influencing variables. The student's approach to learning (SAL) theory was used to aid in identifying effective strategies. The literature supports this theoretical approach, which targets changing the teaching and learning environment. However, there is limited research on the nursing student's approach to learning, on the benefits of innovative student-centered learning environments, and the most effective use of NCLEX-RN assessment products.

Figure. Systems Diagrams of the Nursing Education and the Nursing Student Learning Systems



Note. Nursing Education and Nursing Student Learning are interdependent systems in which teaching and learning outcomes are affected by a complex set of variables. The two systems are parallel and linked by the student's achievement of the learning outcome and the nurse educator's impact on this outcome by the teaching approach.

curricular content and the processes chosen for teaching.

Student outcomes — tests scores, grade point average, attrition, standardized assessment test scores, and NCLEX-RN performance of graduates — serve as feedback loops, determining the effectiveness of the nursing education system. A minimum percentage of graduates from a nursing program must pass the NCLEX-RN exam. This level must be maintained for a school of nursing to stay open and is set by the state board of nursing. For example, the Pennsylvania State Board of Nursing (PASBN) passing standard had been set at 40 percent before a school was placed on probationary status. An increase to 80 percent, which went into effect in 2010, demonstrates how nursing education systems are under pressure to ensure higher student outcomes (PASBN, 2008).

THE NURSING STUDENT LEARNING SYSTEM The second part of this teaching and learning system, the nursing student's learning system, sits parallel to the teaching system in the Figure above. Here the faucet represents the content and processes available to students to acquire the knowledge, skills, and clinical judgment competency to practice safely as entry-level RNs. As a student participates in the education experience, the faucet flows with learning activities. These typically include attending class, participating in clinical experiences and skills/simulation labs, reading, and studying.

Monitoring learning gaps is accomplished by the student's self-monitoring process and by assessments of academic achievement. Like the nursing education system, the learning processes

are intended to lead the student to success on the NCLEX-RN exam and satisfactory transitioning as an RN in a practice setting. For most students, this works quite well. The assumption is that the feedback is accurate, thorough, and effective.

Students' Approaches to Learning For decades, educational psychologists have studied the associations between perceptions of learning, learning outcomes, and the teaching of context. These associations include the student's approach to learning, personal factors such as motivation and preferred learning styles, and the interactions between these constructs and their effects on learning outcomes.

This discussion focuses on the student's approach to learning (SAL), a theory that is well established in education but not well known in nursing education. Learning approaches are best described as how students go about learning and studying, thereby affecting the learning outcome (Biggs, Kember, & Leung, 2001; Snelgrove, 2004). Personal and situational factors influence approaches to learning. The Biggs presage-process model of student learning identifies personal characteristics (presage) such as as the student's personality, locus of control, ability, background, conceptions of learning, attitudes, and general experience. Situational factors (process) include the learning context, nature of the task, time pressures, teaching method, assessment, and perception of institutional requirements. Together, presage and process affect the quality of the learning outcome through the chosen learning approach.

Marton and Säljö (1976a, 1976b) described levels of processing information as the deep/surface approach to learning dichotomy. Entwistle, Tait, and McCune (2006) expanded the definition of students' learning approaches to deep, surface, and strategic. Deep learning seeks to understand and extract meaning whereas surface learning is the memorization of information and tasks. The strategic, or organized, approach is used by the student with the intent to do well and get good grades.

Learning approaches, therefore, are multidimensional, with students using no single approach exclusively. However, research consistently indicates that students who use deep and strategic learning approaches have better learning outcomes. Conversely, those who employ a predominant surface learning approach experience less than optimal academic outcomes (Broderson, 2007; Carrick, 2010; Entwistle et al., 2006; Leung, Mok, & Wong, 2008; Snelgrove, 2004).

While some argue that students tend to adopt the same approaches to learning for different tasks, other researchers have found that the student's approach to learning responds to the learning environment (Biggs et al., 2001; Entwistle et al., 2000). Thus, a student's learning approach is dynamic and open to change rather than fixed (Biggs & Tang, 2007; Snelgrove, 2004). This understanding opens the door for interventions targeted at changing the learning environment to support a deeper approach.

Sometimes, a single factor in the Biggs presage-process model will contribute to the student's achievement problems. If working too many hours takes away from study time, an obvious intervention — reducing work hours — would be appropriate. However, when a student is studying for long hours and not achieving, the analysis is most likely to reveal that both student learning and teaching approaches are flawed. Interventions must be directed at both systems if improvements are to be sustained in the long term. The following discussion illustrates this type of situation.

The Student Who Is at Risk for Failure The depth and breadth of learning the required body of knowledge in nursing and applying this using clinical judgment are expansive and overwhelming for new nursing students. As students attempt to navigate this learning experience, many find it difficult to differentiate between what is necessary to learn and what is less important. Furthermore, new nursing students often lack experience in nursing that could help them make sense of the information and discern appropriate applications.

Students will often use prior learning strategies that, in this new setting, are no longer effective. An example is a student who is doing well in other courses but struggles to achieve a

grade higher than a “C” in nursing courses. The student is conscientious, meets regularly with faculty to go over tests, participates in a study group, and spends a great deal of time studying. But the student reports high test anxiety, and even with anxiety counseling, struggles to find ways to improve. Assessment tests along with course exams show lower level performance. By definition, this is a student at risk for failure.

A typical response by faculty in such situations is to tell the student to study more, assuming the problem is lack of knowledge. It is tempting to apply familiar solutions — quick fixes — to problems, pushing harder while fundamental problems persist or worsen. When analyzed from a systems perspective, the student's lack of achievement is an outcome of the interdependent processes in the nursing education and student learning systems. Therefore, the problem lies not only with the student, but also with the teaching approach. For this reason, two factors must be considered when looking for interventions.

Using the Biggs presage-process model, the first factor is student-related personal factors. For example, a student may choose to learn and study from a surface approach, memorizing content, since this strategy has been effective in the past. The student may achieve passing grades on nursing tests while failing to develop in the area of clinical judgment required for nursing practice. A learning gap will then surface on achievement tests where clinical judgment is emphasized.

A recommendation for faculty is to ask the student to identify key words in an NCLEX-type question or rephrase what the question is asking. If the student struggles, the faculty member can probe further to identify whether the student's approach to studying is primarily mastering facts and knowledge, a method that will ultimately prevent a deep understanding of nursing concepts. From a systems perspective, what is most important is that the student does not perceive a gap in the learning process. All the student knows is that studying does not lead to better test scores. Therefore, test scores alone provide feedback that is unclear, elusive, and, worse, creates a high state of anxiety and lack of confidence that compound the problem. Sometimes, with redirection, students will change their approach to learning and will improve on the next exam. However, to sustain this gain and to reach other at-risk students, aspects of the teaching situation that foster surface learning will need to change.

Research studies of nursing students' approaches to learning are limited, with many conducted in countries outside the United States. However, recent studies of nursing students have shown that a deeper approach to learning correlates with

higher levels of academic performance (Brodersen, 2007; Carrick, 2010; Snelgrove & Slater, 2003). Brodersen conducted a study on baccalaureate nursing students' study tactics and found that the predominant study approach was strategic learning, which was attributed to the volume of information to learn and the students' comfort with this approach. Conversely, there was a positive, significant relationship to GPA when deep learning study tactics were used. Similarly, associate degree nursing students who employed both strategic and deep learning approaches had better academic outcomes (Carrick). However, more research is needed to examine the relationship of a nursing student's chosen learning approach to academic outcomes, including performance on the NCLEX-RN exam.

Creating a Better Approach to Learning To create a better teaching approach, nursing programs across the country have incorporated the use of human patient simulation (HPS) in their learning and skills labs. This teaching approach places students in active learning situations to practice patient care. The high-fidelity simulator mirrors human physiology and real-life health problems. Participating in a scenario, the student provides care, practices skills, and can learn from mistakes that do not harm real patients.

Early research has documented benefits described by students and faculty indicating that HSP builds confidence and improves learning through self-reflection, a deep-learning strategy. During the debriefing session, students examine how they applied their knowledge of patient care in the simulated environment. It appears that the use of HPS provides a promising strategy to enhance student learning. But again, more research is needed on this teaching strategy and its effect on clinical judgment development and student achievement (Lasater, 2007).

Today, lecture still dominates classroom teaching in nursing, especially in large enrollment courses, even though past research has shown that lecturing, especially to larger groups, is one of the least effective methods of teaching (Bligh, 2000). Furthermore, lectures cannot be relied upon to inspire or change students' attitudes. Interactive teaching strategies and formative assessments have demonstrated significant improvements in student learning (Biggs & Tang, 2007; Haggis, 2003), leading to calls for a student-centered learning environment. To cultivate deep learning, teaching methods must be targeted to generate higher order thinking.

A successful strategy gaining momentum is the classroom and teaching redesign known as SCALE-UP (student-centered activities for large enrollment university programs). A SCALE-UP

classroom has round tables rather than individual desks or large auditorium seating. The teacher does not lecture, and there is no front podium. Students work in small groups, participating in interactive, instructor-designed learning activities that they prepare for by doing assignments outside class. As students work in groups, the instructor walks around, answering questions and guiding the learning process.

Research on the SCALE-UP approach is showing major benefits for student learning. Early studies showed impressive gains in conceptual learning and problem-solving (Beichner et al., 2007). The impact of this classroom design and teaching pedagogy has also shown a dramatic reduction in failure rates of women and minorities and a significant reduction in at-risk students (Beichner et al.). SCALE-UP has been used predominantly in STEM disciplines (science, technology, engineering, and mathematics), but has yet to be used in nursing. However, given its success and impact on student learning, important questions are raised about its possible use with at-risk nursing students. There is also the possibility that its use would improve the learning environment for all students. SCALE-UP has merit for consideration.

Predicting NCLEX-RN Exam Success It is not uncommon to hear faculty comment, "I would have never predicted that student to fail. Grades were good and assessment tests were OK." Faculty will question what they could have done better when a student fails the licensure exam, but will soon conclude there are no easy answers — the problem lies with the student and is related to factors not in control of faculty. This may, indeed, be true. After the student graduates and leaves the direct influence of the nursing education system, factors from other systems may affect the student's performance on the exam. Often, graduates will not take the test for several weeks after graduation, during which time they may experience personal problems or drift away from their NCLEX-RN study plan. However, what if something could have been done while students were under the influence of the nursing education system that could better assure success? To answer this question requires going back to the nursing education and student learning systems to analyze the nature of the problem.

One of the most important areas in the nursing education and student learning systems is the assessment of learning outcomes. When it is determined that outcomes are not sufficient, the nursing education system is likely to implement solutions that seem effective in the short term. For example, to prepare students for the NCLEX-RN exam, faculty may adopt testing practices that raise academic rigor, removing lower

level taxonomy questions that measure only knowledge and replacing them with higher level questions to test analysis and application. Given that higher level questions are the primary format for the NCLEX-RN exam, this change would seem appropriate. However, implementing change without effectively preparing students to modify not only their test taking strategies, but also their approach to learning could contribute to failure for students who have the potential to succeed. So, while the intent is to improve academic performance, the opposite effect occurs. In this case, the burden of the problem is shifted to the student — take harder tests to be better prepared for NCLEX-RN — without addressing the student’s underlying learning needs. And when student outcomes continue to be substandard, other personal and situational factors in learning, such as anxiety and frustration on the part of the student, come into play.

Interventions that can help address students’ needs and result in improved performance on the NCLEX-RN have been identified. Many studies cite the use of assessment testing as an important tool for student learning and preparation for the NCLEX-RN exam. A variety of NCLEX-RN readiness assessment test products are available that include suites of self-study modules, practice tests and proctored content mastery, and NCLEX-RN readiness tests. These products undergo rigorous reliability and validity testing and have reported good predictive value (Nibert & Young, 2001; Spurlock & Hunt, 2008). However, there are diverse approaches to their use, and research on the best ways to universally improve NCLEX-RN predictions and student results is limited.


From a systems analysis point of view, the problem of predicting success on the NCLEX-RN exam is more than the student’s lack of knowledge or preparation. SAL theory points out that both personal and situational factors affect student outcomes. To provide comprehensive support for desired learning outcomes, interventions must be targeted at multiple factors.

In the past, researchers attempted to identify only academic variables to predict NCLEX-RN success, but it became clear that no definitive model of academic achievement predicted success. More recent research has supported a multifaceted approach (Firth, Sewell, & Clark, 2006). The most common intervention strategies found to be successful are outlined in the Table below (Anderson, 2007; Davenport, 2007; Firth et al., 2006; McDowell, 2008; Morton, 2006; Norton et al., 2006; Sewell, Culpa-Bondal, & Colvin, 2008). These studies, despite limitations in design and sample size, report improvements in NCLEX-RN exam performance of nurse graduates. Still, the need remains to identify consistent models and practices that work across all settings.

Conclusion Systems theory has demonstrated that the persistent problems of student achievement and passing the NCLEX-RN exam result from the complexity of two interdependent systems — the nursing education system and the students’ learning system. In addition, SAL theory and the Biggs presage-process model illustrate that a combination of interventions is necessary to address the multiple factors that influence students’ learning outcomes. On the horizon are innovations in

Table. Interventions to Improve NCLEX-RN Exam Results

ACADEMIC POLICY	CURRICULUM AND TEACHING APPROACHES	ASSESSMENT OF LEARNING OUTCOMES	REMEDATION AND STUDENT SUPPORT
High academic standards for admission	Curriculum models the NCLEX test blueprint	Inclusion of NCLEX-RN question formats in course testing	Early identification of at-risk student Test anxiety counseling
Academic progression policies – prohibit multiple attempts after failing nursing courses	Revision of course sequencing Use of active learning activities, such as case studies, simulation	Assessment of test products throughout program – proctored and practice tests, study modules, NCLEX-RN readiness tests	Support groups Mentoring sessions – ratio 1 faculty to 8 students, meet weekly during semester prior to graduation to review study plan, assessment test scores, and student learning needs
Raising minimum passing scores for nursing courses	Instruction on test taking skills and study tactics	Assigning assessment test score as part of course grade	Peer tutoring Structured learning assistance
Minimum score on NCLEX-RN readiness tests as criteria for graduation	NCLEX-RN review course Faculty development – test writing, teaching strategies, how to identify students at risk		

student-centered learning environments that may prove effective in resolving the problem of student achievement. However, further research is necessary to better understand student learning, to validate the benefits of new teaching strategies, and to identify best practices for using NCLEX-RN assessment products. So, while these problems may continue to persist a little while longer, this is certainly not the time to give up. 

About the Author Jo Anne Carrick, DEd, RN, CEN, CNE, is senior lecturer and campus coordinator for nursing programs at Penn State Erie, the Behrend College, Erie, Pennsylvania. Contact her at jam39@psu.edu.

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