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White Paper

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# Impacting Learning Outcomes: Scientific Evidence for Elsevier 360 for Nursing



# Impacting Learning Outcomes: SCIENTIFIC EVIDENCE FOR ELSEVIER 360 FOR NURSING

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The ultimate goal of any successful nursing program is to equip students with the knowledge, skills, and self-efficacy that will enable them to graduate and become successful nurses. The National Council Licensure Examination (NCLEX®) is a crucial step in the trajectory for students to become licensed to practice as nurses. The NCLEX measures the minimum required knowledge and skills for safe and effective entry-level nursing care (NCSBN, 2019). NCLEX pass rates are critical for student success and provide a useful indicator for program improvement and accreditation. Nursing programs face many challenges to educate practice-ready nursing graduates that can successfully pass the NCLEX on their first attempt (Roa et al., 2013), particularly with the impending transition to the Next Generation NCLEX (NCSBN, 2022). These challenges are further compounded by the shortage of preceptors and nursing faculty which also contribute to the lack of availability of clinical sites for students (AACN, 2020).

Nursing educators strive to adopt effective educational curricula, tools, and policies to support students' preparation (Opsahl et al., 2018). To meet this goal, many nursing programs have implemented a variety of educational approaches, including standardized testing, remediation plans, and progression policies (Quinn et al., 2018; Shah et al., 2022). The utility of these varied approaches is promising. However, if applied in an inconsistent and fragmented manner, the use of multiple strategies may hinder success. Furthermore, the COVID-19 pandemic has accelerated pedagogical shifts from traditional methods to the adoption of novel technological and instructional approaches.

At Elsevier, we are committed to empowering nursing programs with programmatic solutions to support students' NCLEX-RN readiness and clinical practice in health care settings. [Elsevier 360 for Nursing](#) is a comprehensive, personalized program solution that supports faculty in meeting their teaching, learning, and assessment needs using innovative pedagogical approaches and interconnected digital technologies. Our curriculum solution focuses on three primary areas to support these needs:



## Building Knowledge



## Applying Clinical Judgment



## Assessing and Reviewing

The Elsevier Applied Learning Sciences (ALS) team focuses on translating academic research into evidence-based practices to provide a foundation for product design. We also iteratively test the effectiveness, validity, and impact of Elsevier's digital solutions through academic-industry partnerships (see Shah et al., 2020 for additional information). This collaborative research plays an important part in bridging educational theories, program design and policies, and teaching practices to improve student learning in nursing education.

This paper reports evidence for the effectiveness of Elsevier 360 for Nursing. Findings are drawn from a selection of research conducted by the ALS team from 2020-2022, including studies conducted by the Shadow Health Education, Research, and Design team.

This paper focuses on evidence for products within Elsevier 360 for Nursing to demonstrate how its three primary areas align with seven student learning outcomes:



Self-Efficacy



Engagement



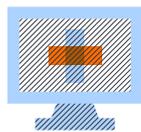
Efficiency



Academic Performance



Clinical Judgment



NCLEX-RN Readiness



Learning Experience

The three areas are presented as distinct categories for ease of communication to provide a simple way of communicating the primary focus of each solution. However, in practice, they overlap and complement each other to help nursing programs meet their learning, teaching, and assessment goals. We will discuss the synergistic effect of these areas in this paper.



## BUILDING KNOWLEDGE

The development of nursing students' conceptual knowledge is an important goal throughout the nursing curriculum, and a priority for preparing students to successfully pass the NCLEX-RN (Opsahl, et al., 2018). Elsevier provides nursing students with a range of content and tools (e.g. eBooks, EAQ, Sherpath) that enables them to build knowledge that they can practice, apply, and transfer to new contexts throughout their programs and in clinical practice.

Empirical evidence is growing regarding the effectiveness of **Sherpath** (DeBellis, 2021) and **Elsevier Adaptive Quizzing (EAQ)** in nursing education (Malkemes & Phelan, 2017; Presti & Sanko, 2018).

Shah and colleagues (2022) demonstrated that there is a statistically significant relationship between preparation for the HESI Exit Exam (E2) and first-time pass rates on the NCLEX-RN. Nursing programs that reported **using EAQ as E2 test preparation had statistically higher E2 scores and first-time success on the NCLEX-RN.** Programs that reported using EAQ yielded positive outcomes for students scoring between 850-899 and 900 and above. Students also benefited from reviewing remediation content from HESI Specialty Exams taken in previous courses. These exams which mirror the NCLEX-RN, provide students with a deeper understanding of their areas of weakness and can guide an appropriate preparation plan.

Preliminary evidence is also burgeoning for Sherpath. Gouveia (2022) recently surveyed 38 faculty and 1937 students to gain a better understanding of their experiences with Sherpath and their perceptions of its effectiveness. The visuals in this section summarize faculty and student ratings and demonstrate that Sherpath successfully supports teaching and learning needs across multiple nursing content areas.

## BUILDING KNOWLEDGE

Responses from faculty indicated that Sherpath was moderately effective, effective, or very effective for:

**89%** Supporting students' overall success in the course

**87%** Bridging students' knowledge gaps

**87%** Improving students' exam preparation

**82%** Improving students' class preparation

### LEARNING OUTCOMES



Academic Performance

Learning Experience

NCLEX Readiness

Students' responses mirrored faculty ratings on the effectiveness of Sherpath. On average, students' ratings ranged from 81% to 91%, further confirming faculty perceptions. The visual below provides additional evidence for Sherpath and its impact on facilitating engaging experiences and promoting students' self-efficacy across multiple courses.

In addition, students reported that Sherpath:

**91%** Improved their understanding of course material

**89%** Increased their engagement with the course material

**86%** Boosted confidence in their ability to complete the course

**81%** Promoted their active class participation

### LEARNING OUTCOMES



Self-Efficacy

Engagement

Learning Experience

Overall, the findings described in this section illustrate how resources in Elsevier 360 for Nursing build knowledge. Faculty and students perceive Sherpath as effective in several areas, including improving students' understanding of course material, reducing gaps in knowledge, and ultimately promoting course success. Also, preliminary evidence for EAQ revealed that reported usage for E2 test preparation led to higher E2 scores and NCLEX-RN first-time pass rates.

## APPLYING CLINICAL JUDGMENT

Elsevier offers a range of digital solutions that nursing faculty can integrate in their curricula to facilitate clinical readiness. SimChart, Shadow Health, and Simulation Learning System (hands-on and virtual reality) provide a rich ecosystem of content and pedagogical tools that enable students to bridge theory and practice by engaging them in authentic and interactive experiences.

A recent white paper by Wilson and colleagues (2021) explored whether pre-licensure nursing students become more efficient in collecting subjective and objective patient data, applying therapeutic communication, and creating care plans.

From a sample of 2,246 pre-licensure nursing students who completed **Shadow Health's** Digital Clinical Experiences (DCE) throughout a Health Assessment course, analyses revealed that students demonstrated significant efficiency gains as measured by findings per minute from pretest to posttest assignments.

**82%** of students showed an increase in overall efficiency in overall patient data collection.

**62%** of learners showed a decrease in patient interaction time while assignment scores increased.

**67%** of students showed an increased education and empathy score.

**68%** of students showed an increased care plan score indicating an improvement in the quality of student care plans.

### LEARNING OUTCOMES



Efficiency

Clinical Judgment

In addition to engaging students in screen-based simulations such as Shadow Health, Elsevier also enables students' clinical readiness through Simulation Learning System (SLS) with Virtual Reality (VR). SLS with VR is an add-on to Elsevier 360 for Nursing. The ALS team has conducted extensive research on this simulation solution and found that an immersive simulation environment enhances student learning and clinical competencies. The appendix describes findings on how SLS with VR is positively impacting faculty practices, student experiences, and outcomes for clinical readiness.



## ASSESSING & REVIEWING

Elsevier provides a variety of HESI RN exams, including the HESI Admission Exam (A2), HESI Specialty Exams, and HESI Exit Exams (E2), that provide formative and summative testing at course and program levels to track and measure student performance at key points throughout the program. These exams have been successful measures for benchmarking program outcomes, guiding remediation, and determining NCLEX-RN readiness (Barton et al., 2014; Riley & Gouveia, 2022).

A substantial body of literature has established the validity and reliability of the **E2** (Riley & Gouveia, 2022). In studies conducted over 20 years with over 68,000 students, the E2 has consistently predicted NCLEX-RN success. A recent study by Shah and colleagues (2022) confirmed that performance on the E2 at 850 and above continues to predict first-attempt success on the NCLEX-RN. Specifically, **students who achieved an average E2 score of 850 and above had a NCLEX-RN pass rate of 96.33%. The pass rate was 97.29% for students whose average E2 score was 900 and above. This study also extended research in new directions by examining the role of E2 policies in supporting students' NCLEX-RN success.**

Another study examined the value of integrating **HESI Specialty Exams** throughout nursing curricula with the E2. Gouveia, Thielk, and Sportsman (2021) explored whether the number of HESI Specialty Exams given throughout students' course of study predicts their E2 score. Examining the correlation of HESI Specialty Exams taken and E2 scores is important, given that predictive validity of the E2 and HESI Specialty Exams for predicting NCLEX-RN success (Kim et al., 2019; Zweighaft, 2013; Zweighaft, 2018). **The results showed that students who took more HESI Specialty Exams across the curriculum performed better on the E2 and were more likely to achieve E2 scores of 850 or 900.** These findings were used to inform predictive models for the **HESI Readiness for NCLEX Dashboard**. Faculty can use the dashboard to identify at-risk students early, monitor cohort and student-level progress, determine NCLEX-RN readiness, and improve program outcomes.

**HESI Compass** is a virtual NCLEX-RN preparation course that uses content review, learning activities, and personalized coaching to support students' exam readiness. Quizzes and case studies enable students to practice, apply, and synthesize their knowledge. HESI exams are administered as critical checkpoints in the course to establish a baseline of performance, identify areas of improvement, and track progress. HESI Compass also enables students to gain familiarity with the NCLEX-RN test plan, master relevant test taking strategies, and self-reflect on their performance and self-efficacy. The visuals in this section outline the impact of HESI Compass for engagement, self-efficacy, learning experiences, academic performance, and NCLEX-RN readiness.

### LEARNING OUTCOMES



NCLEX-RN Readiness

Self-Efficacy

Engagement

Learning Experience

Academic Performance



## ASSESSING & REVIEWING

Gouveia and colleagues (2021) investigated the effectiveness of HESI Compass for a for-profit nursing program.

+85

The average E2 pre-post increase was 85 points (791-876), a statistically significant improvement.

94%

Students also reported having a positive experience and relatively high and stable levels of self-efficacy. Overall, students became well-prepared for the NCLEX-RN with a passing rate of 94%.

In a larger study across four US institutions in Spring 2020, Gouveia and colleagues (2021) examined the impact of HESI Compass on 235 undergraduate nursing students' exam readiness. More specifically, they examined change in students' E2 pre-test to post-test scores as they used HESI Compass.

+111.9

Students' E2 scores increased an average of 111.9 points and the proportion of students scoring over 850 or 900 doubled.

Gouveia and colleagues (under review) examined the impact of HESI Compass on 500 nursing students' NCLEX-RN outcomes. They also explored the relationship between HESI Compass usage data and NCLEX-RN outcomes to determine which learning activities contributed to students' success.

97%

of students scoring between 900-949 on the HESI Final Exam passed the NCLEX-RN on their first attempt.

+74

Students had an average score gain of 74 points from the HESI Pretest to Final Exam, with the highest mean score increase of 306 points for students scoring 599 and below.

+26.07

Students who completed more types of activities within HESI Compass were more likely to pass the NCLEX-RN. Each additional activity type tried by a student increased their odds of passing the NCLEX-RN by 26.07%.

Overall, findings in this section on assessing and reviewing outline major findings for the validity and impact of HESI Exams in predicting success on the NCLEX-RN. In addition, the comprehensive multi-activity preparation in HESI Compass is particularly useful for achieving NCLEX-RN success. HESI Compass helps students achieve substantial performance gains, provide a positive experience, high and stable levels of self-efficacy, and ultimately become well-prepared for the NCLEX-RN.

## CONCLUSION

The purpose of this paper was to review selected study findings from the ALS team's ongoing research program that examined the impact of products within Elsevier 360 for Nursing for the following student outcomes:



Self-Efficacy



Engagement



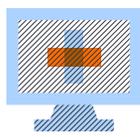
Efficiency



Academic Performance



Clinical Judgment



NCLEX-RN Readiness



Learning Experience

The paper provided continuing evidence for the validity and effectiveness of Elsevier 360 for Nursing to help nursing programs meet their learning, teaching, and assessment goals. These findings also provide nurse educators with evidence of effectiveness to inform their testing, NCLEX-RN preparation, and remediation processes. Nursing programs' unique qualities such as student and faculty characteristics, curricula, and testing policies should be considered when generalizing the impact of these results on their programs.

The ALS team is continually building a program of research that provides nursing programs and faculty with rich insights about the effectiveness of our products. In the future, the ongoing research program will extend previous work and examine how multiple products work together to impact teaching and learning outcomes.

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**APPENDIX: SIMULATION LEARNING SYSTEM WITH VIRTUAL REALITY**

Simulation Learning System (SLS) with Virtual Reality (VR) for RN was created for faculty to facilitate immersive clinical experiences alongside lab-based simulation education practices. The ALS team, in collaboration with experts within and beyond Elsevier, has conducted many studies to examine and communicate the effectiveness of SLS with VR (Shah, Gouveia, & Barakat, in press). Shah, Siebert-Evenstone, Eagan and Holthaus (2021) investigated the effect of SLS with VR on the practices of nursing faculty for facilitating clinical education experiences. Nursing faculty orchestrated simulation experiences through their expertise in the discipline (e.g., Fundamentals of Nursing) and through the affordances of SLS with VR (e.g., situational distractions, interactive virtual characters) during the pre-briefing, simulation, and debriefing phases. This paper established that faculty could make connections between elements of the NCSBN Clinical Judgement Measurement Model (NCJMM) and Quality and Safety Education for Nurses (QSEN) in different ways for and with their students through their technological pedagogical content knowledge while using SLS with VR.

Recently, Shah and colleagues (2021) have focused on examining students' outcomes of practicing cognitive, social and psychomotor clinical skills. They described how faculty can use SLS with VR scenarios to support prelicensure nursing students' clinical competencies in a comprehensive manner. Specifically, students can be supported to identify with professional nursing roles that reach far beyond tasks, skills, and procedures. They can be supported to develop a beginning awareness of safety and quality in the context of a health care system, nurse-sensitive quality indicators, and local and national safety initiatives impacting health care delivery (Shah, Siebert-Evenstone, Moots & Eagan, 2021). Furthermore, students can practice the range and complexity of clinical skills (i.e., NCJMM, QSEN) required to become practice-ready through participation in SLS with VR pre-briefing, simulation and debriefing phases as early as in Fundamentals of Nursing courses (Shah, Siebert-Evenstone, Eagan & Moots, 2021).

Finally, the group examined the impact of immersive VR experiences for faculty and students. Shah and Bennet (2021) described the educational benefits of using VR simulations; namely, authentic experiences, dynamic clinical situations, multiple skill development, heightened learner engagement, and cost-effective curricular solution. They elaborated on these benefits using illustrative quotes from 10+ nursing faculty and 200+ students across the U.S. who have used SLS with VR. Shah, Gouveia and Babcock (under review) reported statistically significant gains on their understanding of content, ability to make clinical judgments, provide individual patient care, function as a member of the healthcare team, promote safety for patient, self and others, and identify factors that influence quality of care as a result of participating in SLS with VR simulation scenarios.