Expanding Improvement Science Competencies in the Nurse Workforce: Successes & Challenges
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Purpose
The purpose of this initiative was to expand improvement science competencies in the nurse workforce through implementation of a focused course in a graduate nursing program. Specific competencies addressed related to the design, implementation, evaluation, and documentation of improvement projects.

Relevance/Significance
Competencies in improvement science are needed to support transformation of the healthcare system but were not traditionally taught in academic programs for healthcare providers to include nurses. Further, many practice settings lack the resources to support development of improvement skills. Therefore, a significant proportion of the nurse workforce is ill-prepared to maximize the use of clinical tools and strategies to drive transformation and achieve the goal of patient-centered care.

Strategy/Implementation
This initiative involved implementation of a graduate course tailored to meet the American Association of Colleges of Nursing Master’s Essentials and Quality and Safety Education in Nursing graduate competencies related to quality and safety. Principles of the flipped classroom are applied to facilitate skill acquisition. Didactic content is primarily presented through reading assignments and completion of the Institute for Healthcare Improvement (IHI) online basic certificate courses. Content is reviewed at the beginning of each class but the majority of class time is devoted to hands on quality circle activities to include development of the following: project charters and projected timelines; PDSA cycles for learning, testing, and implementation; and implementation checklists. Further, students must incorporate specific quality tools (e.g. fishbone diagrams and process maps) and graphical displays of data (e.g. run charts, Pareto diagrams, and process control charts) into the PDSAs.

Evaluation
Students (60) completed pre (T1) and post (T2) course self-assessments on 30 competencies using a 10-point scale. Scores improved for all competencies (T1 mean=3.2, SD=1.1; T2 mean=8.4, SD=.9). The degree of improvement ranged from 2 to 7 points; mean improvement=5 points. Competencies with the lowest T1 scores (FMEA, PDSA, Fishbone, Pareto, Project Charter, and Gantt) improved the most by T2. Graphical presentation of findings attached.

Implications for Practice
Education programs are needed to enhance improvement science competencies in the nurse workforce. Enrollment of nurses in programs that combine focused didactic content with structured quality circle activities and development of improvement competencies among graduate faculty must be encouraged.

Key Words: Performance Improvement, Quality, Safety, Nursing Education
**Pre-Test and Post-Test Mean Scores**

**Mean Scores by Cohort**

- **Spring 2015**:
  - Pre-Test: 3.81
  - Post-Test: 8.67

- **Fall 2015**:
  - Pre-Test: 3.26
  - Post-Test: 6.40

- **Spring 2016**:
  - Pre-Test: 2.88
  - Post-Test: 9.26