The Teachers of Quality Academy: A Learning Community Approach to Preparing Faculty to Teach Health Systems Science

Elizabeth G. Baxley, MD, Luan Lawson, MD, Herbert G. Garrison, MD, MPH, Danielle Walsh, MD, Suzanne Lazorick, MD, MPH, Donna Lake, RN, BSN, MEd, PhD, and Jason Higginson, MD

Abstract

**Problem**
Although efforts to integrate health systems science (HSS) topics, such as patient safety, quality improvement (QI), interprofessionalism, and population health, into health professions curricula are increasing, the rate of change has been slow.

**Approach**
The Teachers of Quality Academy (TQA), Brody School of Medicine at East Carolina University, was established in January 2014 with the dual goal of preparing faculty to lead frontline clinical transformation while becoming proficient in the pedagogy and curriculum design necessary to prepare students in HSS competencies. The TQA included the completion of the Institute for Healthcare Improvement Open School Basic Certificate in Quality and Safety; participation in six 2-day learning sessions on key HSS topics; completion of a QI project; and participation in three online graduate courses.

**Outcomes**
Twenty-seven faculty from four health science programs completed the program. All completed their QI projects. Nineteen (70%) have been formally engaged in the design and delivery of the medical student curriculum in HSS. Early into their training, TQA participants began to apply new knowledge and skills in HSS to the development of educational initiatives beyond the medical student curriculum.

**Problem**
One of the greatest challenges in medicine today is transforming the delivery system to improve patient safety and quality and to emphasize collaborative partnerships among health professionals and the patients and communities they serve. For medical educators, a major priority is preparing future physicians to meet Triple Aim goals (improving population health, and patients’ experience of care while reducing per capita costs). However, key reports have identified deficiencies related to patient safety, quality improvement (QI), interprofessionalism, and population health.

Although efforts to integrate HSS into health professions curricula are increasing, the rate of change has been slow. Few medical schools have instituted systematic curricular changes to prepare their graduates to provide evidence-based care, implement QI processes, and recognize and respond to errors and gaps in safety. A key challenge to addressing this is identifying faculty who understand, practice, and can teach students how to create optimal care environments, as most are not equipped with the knowledge and skills necessary to prepare for the emerging delivery system. Additionally, today's clinical faculty are challenged with teaching HSS at the same time as they are learning it themselves, while simultaneously delivering care in a rapidly changing environment.

Experiential learning that is aligned with organizational goals can help achieve improvements in quality and safety at the clinical level while also improving the education and competency of trainees. Yet, schools often lack the resources and infrastructure to develop faculty in these skills, and competing demands on time make it difficult for faculty to undertake comprehensive HSS training. Many existing training programs require travel and take time away from daily work. Additionally, course attendees come from different institutions, which limits their opportunity to learn these skills in the context of their clinical delivery environment. Some examples of intrainstitutional initiatives have been reported, such as the Quality and Safety Educators Academy and “innovation” or “value” institutes, but these are not widespread. Finally, effective planning and implementation of HSS training programs for faculty is limited by a paucity of robust evaluation strategies.

In this report we describe the Teachers of Quality Academy (TQA), an innovative professional development program designed to train an interprofessional...
group of faculty to become proficient in HSS in order to role model these competencies in their teaching and contribute to curricular transformation.

Approach

The Brody School of Medicine at East Carolina University (ECU) received a five-year award from the American Medical Association (AMA) to better prepare medical students for working in a changing health care delivery system. Using this award, we developed an initiative entitled REACH, for Redesigning Education to Accelerate Change in Health Care. The goal of this initiative was to implement an integrated, longitudinal HSS curriculum for all medical students. The REACH project team, responsible for the design and implementation of all components of the initiative, included six clinical educators from various specialties, one nurse faculty member, and one program manager.

We deemed having a critical mass of faculty with expertise in HSS competencies as a necessary prerequisite to the implementation of the new curriculum. So in January 2014, we established the TQA with the dual goal of preparing faculty to lead frontline clinical transformation while becoming proficient in the pedagogy and curriculum design necessary to prepare students in HSS competencies. Similar to various Academy of Medical Educators models found at other schools, the objectives of the TQA included supporting faculty as educators, fostering teaching excellence, accelerating curricular innovations, and expanding educational scholarship.26 Unique to the TQA were the linkage between medical education and the health system, participants' collective participation in the development of a common HSS curriculum, and provision of a forum for faculty to exchange ideas across departmental and institutional lines all within the context of the clinical environment in which they practice and teach. Additionally, to mitigate the silo effect in which health professions students are often trained, we recruited faculty from other health professions schools to the TQA to establish an interprofessional learning community.

The selection of the first TQA cohort began with informational sessions for health science deans, chairs, and faculty (held in November 2013) that emphasized the high value placed on this training by medical school and health system leadership and the desire for representation from all clinical departments to promote training through all domains of medical education. Interested faculty were asked to apply by December 2013 and were required to be formally nominated by their department chair or dean, underscoring the importance of sponsorship by institutional leaders.

A lead-in period from January to mid-March 2014 allowed participants to independently complete the Institute for Healthcare Improvement Open School Basic Certificate in Quality and Safety to ensure a shared foundational knowledge framework. Six 2-day learning sessions followed (from March to November 2014), covering key HSS topics (Figure 1). The TQA training design used a mix of online, didactic, small-group, and experiential learning coupled with the completion of a QI project to hardwire the concepts from the learning sessions into the context of daily work.

Support from the affiliated teaching hospital administration was instrumental in the success of the TQA, which included involvement of the health system's chief quality officer and other quality and patient safety experts and analysts who supported ongoing clinical improvement teams. These partners assisted participants with data needs for QI projects, endorsed QI staff involvement for hospital-based projects, taught about patient safety and QI principles and practices in learning sessions, and served as judges for the QI symposium (see below).

TQA participants worked in small groups, mentored by REACH project team members, to provide peer feedback and support for QI projects between sessions. Scholarly products related to both QI activities and HSS curriculum development were encouraged and facilitated by a partnership with the ECU’s institutional review board through which criteria for the review of QI projects were developed. Most TQA participants formally presented their work at a campus-wide QI symposium on January 21, 2015.

ECU’s College of Education partnered with REACH to create a Credential in Medical Education that provided skill development for designing a curriculum and creating new pedagogical methods for delivery. Three distinct online graduate courses (from June 2014 to May 2015) promoted faculty skills in educational leadership, curriculum development, and assessment of educational effectiveness (Figure 1). Learning in these courses was enforced through the development of new curricular products with input from participating peers and course leaders. All TQA participants completed a curricular innovation related to HSS for presentation at the newly implemented ECU Medical Education Day (April 22, 2015).

Faculty were motivated to participate in the TQA by the imperative to improve patient outcomes and implement an HSS curriculum (purpose), the ability to select their own clinical and educational project focus (autonomy), the acquisition of new skills (mastery), and the creation of a broader learning community (relatedness). In addition to these motivations, we provided specific incentives: faculty release time, on-site professional development, continuing education credit, ability to earn additional credentials, internal school-wide promotion, and support for scholarship activities.

The total budget for the TQA was $500,187, with $414,044 funding faculty release time, $57,000 supporting REACH project team planning and mentoring efforts, and $29,143 covering materials, honoraria, and other logistical needs. Funds provided by the medical school supported faculty release time, while TQA expenses and release time for REACH project team members were supported through AMA grant funds.

Program evaluation includes tracking ongoing work on QI initiatives, the incorporation of educational modules into the curriculum, and the production of scholarly products during and one year after completing the TQA, as well as immediate and one-year pre- and posttraining surveys assessing participants’ knowledge, attitudes, and behaviors in QI, patient safety, and interprofessional practice and education. These results are being compared with a matched control group of nonparticipating faculty who were recruited at the start of the TQA process.
Detailed program evaluation results will be reported elsewhere.

**Outcomes**

**Intended outcomes and impact**

Thirty-one faculty committed to the TQA after the initial learning session; the subsequent attrition of 4 (13%) faculty members due to competing time demands resulted in 27 (87%) TQA participants from four health science programs completing the program. Demographic characteristics of the TQA participants are shown in Table 1. Twenty-six (96%) participants completed the Institute for Healthcare Improvement Open School Basic Certificate in Quality and Safety to ensure a shared basic knowledge framework. Together these made up the content portion of the TQA. The process portion of the TQA consisted of three graduate courses (from June 2014 to May 2015) and the submission of scholarly products for publication.

Eleven (41%) participants presented their work at nine national meetings, and seven (26%) served as faculty in two of the TQA learning sessions. Nineteen (70%) have been formally engaged in the design and delivery of the medical student curriculum in HSS, including the integration and evaluation of educational modules contributed by TQA participants.

**Unanticipated outcomes and impact**

Several outcomes of the TQA exceeded our initial objectives. Early into their training, a number of TQA participants began to apply their new knowledge and skills to the development of educational initiatives in HSS beyond the medical student curriculum. This impact was demonstrated by new modules for resident hand-off training, the integration of systems analysis into morbidity and mortality conferences, the enhanced use of the patient safety reporting system by residents, and the development of QI electives for residents and nursing and public health students (List 1). Six (22%) participants became chapter authors for a textbook on HSS that
Table 1
Demographic Characteristics of Teachers of Quality Academy Participants, Brody School of Medicine at East Carolina University, January 2014 to May 2015

| Characteristic | Participants (n = 27) |
|----------------|----------------------|
| **Profession/school, no. (%)** | |  
| Medicine faculty | 18 (67) |
| Medicine residents/fellows | 2 (7) |
| Nursing faculty | 4 (15) |
| Public health faculty | 1 (4) |
| Allied health faculty (health services management) | 2 (7) |
| **Academic rank, no. (%)** | |  
| Assistant professor | 7 (26) |
| Associate professor | 13 (48) |
| Professor | 2 (7) |
| Resident/fellow | 2 (7) |
| Medicine faculty | 16 (59) |
| Other | 3 (11) |
| **Gender, female, no. (%)** | |  
| 15 (56) |
| **Ethnicity, Hispanic/Latino, no. (%)** | |  
| 1 (4) |
| **Race, no. (%)** | |  
| Asian | 4 (15) |
| Black/African American | 8 (30) |
| White | 16 (59) |
| Other | 1 (4) |
| **Age, mean** | | 46 |
| **Years since terminal degree, mean** | | 14 |

was supported by the AMA's Accelerating Change in Medical Education Initiative. Two (7%) are contributing to the development of a national examination focused on HSS concepts.

Additionally, the Credential in Medical Education gained attention across the ECU's health science division, leading to the approval and implementation of an ongoing campus-wide Credential in Health Professions Education. New interprofessional education efforts across the health science campus, including an annual QI Olympics for medical and nursing students, highlight the impact of enhanced interprofessional education collaboration.

Recognition of the TQA as having developed new QI experts is evidenced by the subsequent appointment of one participant as the senior medical director for quality for Vidant Medical Center and another as the associate medical director of ECU Physicians, leading QI efforts for the Brody School of Medicine's clinical practices. A case that exemplifies the program's impact is illustrated by one TQA participant's implementation of an early recovery after surgery program that resulted in dramatic reductions in cost for selected procedures while maintaining high-quality outcomes. The subsequent spread of this intervention to other surgeons and cases, as well as medical student engagement to help assess its long-term outcomes, demonstrates the clinical and educational impact of the TQA.

Twenty-five (93%) participants completed the posttraining survey. Twenty of the 25 (80%) respondents expected to continue their work leading future QI projects. Twenty-three (92%) respondents were either comfortable or very comfortable teaching QI principles. Asked about incorporation of QI principles going forward, respondents expected to do so in their respective clinical (18/19; 95%), teaching (21/25; 84%), and scholarly (18/24; 75%) activities to a significant or substantial degree.

**Next Steps**

Prior to instituting an HSS curriculum for medical students, we deemed a cohort of faculty prepared to teach HSS concepts necessary. We designed the TQA to address this critical need. We recruited a diverse, multispecialty cohort of interprofessional faculty to this learning community to participate in a 15-month interinstitutional training program. As described and implemented, the TQA achieved the dual goal of preparing faculty to lead frontline clinical transformation while becoming proficient in the pedagogy and curriculum design necessary to prepare students in HSS competencies. Enthusiasm for the program resulted in outcomes and impact that exceeded our initial objectives, suggesting that interest in this area is widespread.

Since completing the TQA, participants have been modeling a team approach to patient care, leading QI initiatives and patient safety efforts, and contributing the building blocks of the emerging longitudinal HSS curriculum. Participants have also disseminated their learning and accomplishments through multiple scholarly presentations.

Important next steps for TQA participants and program planners include (1) further incorporation as faculty advisors and contributors to the full implementation of the longitudinal HSS curriculum; (2) expanded involvement with the Leaders in Innovative Care Scholars student leadership distinction track; (3) continued in-depth evaluation of the impact of TQA participation on patient care, teaching, and role modeling; and (4) the recruitment of the next cohort of TQA participants (a necessity for achieving a critical mass of faculty with HSS expertise).

Optimizing health care outcomes will require educators to learn and teach HSS principles that support the alignment of medical education and health care delivery reform. The early outcomes from the TQA suggest that implementing a faculty development learning community focused on HSS competencies can engage a diverse cohort of participants, add value to the institution by building requisite faculty knowledge and skills, and create new interprofessional partnerships across health professions programs. The design of our TQA could provide a practical road map for others wishing to replicate such a program at their medical school.
Innovation Report

Academic Medicine, Vol. 91, No. 12 / December 2016

List 1
Quality Improvement (QI) Initiatives and Medical Education Products of Teachers of Quality Academy (TQA) Participants, Brody School of Medicine at East Carolina University, March 2014–May 2015

TQA Participant QI Initiatives

Inpatient Focused
- Reducing readmissions among geriatric patients in an academic family medicine practice through improved management of transitions of care
- Reducing hypoglycemia and harm through education and increased use of order sets on an internal medicine inpatient service
- Improving transitions of care for patients at risk for suicide in an academic psychiatry practice
- Improving handover procedures from postanesthesia care unit to pediatric intensive care unit to reduce delays in medication administration
- Increasing utilization of the safety intelligence reporting system by residents on a pediatric ward service
- Improving integration of a clinical ethics perspective in multidisciplinary inpatient rounds

Acute Care Focused
- Improving the radiographic ordering process for acute appendicitis in children under 12 years of age
- Increasing appropriate medication reconciliation among boarding psychiatric patients in a regional hospital emergency department
- Improving surgical history and physical documentation among residents
- Implementing an enhanced recovery after surgery protocol among patients with pancreatic resection
- Improving reliability of patient-consented surgical sterilization resulting in tubal ligation on an academic obstetrical service
- Enhancing screening for obstructive sleep apnea on an inpatient rehabilitation unit
- Utilizing nursing protocol orders to decrease length of stay in a children's emergency department

Ambulatory Practice Focused
- Reducing no-show rates at three clinical practice sites (family medicine, endocrinology, and child psychiatry—these were three distinct, but related, projects and teams)
- Standardizing dose objectives for radiotherapy in breast cancer
- Reducing discrimination and improving care for Spanish-speaking patients in the ECU Pediatric Outpatient Center
- Enhancing home visit referrals for infant and postpartum assessment
- Reducing inappropriate use of transesophageal echocardiography in evaluation of suspected infective endocarditis

TQA Participant Medical Education Products

Problem-Based Learning/Team-Based Learning Cases
- Recognizing and acknowledging medical error
- QI/patient safety of inpatient insulin dosing
- Cancer care: medical error, interprofessional education, and evidence-based medicine
- Poverty, privilege, and professionalism
- Team-based care with ECU College of Nursing students

Educational Modules
- TeamSTEPPS training and QI Olympics
- Flipping the clerkship didactic on patient safety
- Simulation modeling of patient flow through system
- Safe prescribing practices and medicine reconciliation
- Creating high-value, cost-conscious care

Exercises/Simulations
- Improving transitions of care simulation
- Improving safety in the surgery clerkship: a system's approach
- Simulated root cause analysis to teach error analysis and QI
- Social determinants of health and community resources exercise
- Hotspotting exercise in PCMHs, with interprofessional education and population health aspects

Abbreviations: ECU indicates East Carolina University; TeamSTEPPS, Team Strategies and Tools to Enhance Performance and Patient Safety; PCMH, patient-centered medical home.
Funding/Support: This study was prepared with financial support from the American Medical Association as part of the Accelerating Change in Medical Education Initiative. The contents reflect the views of the authors and do not necessarily represent the views of the American Medical Association or other participants in this initiative.

Other disclosures: None reported.

Ethical approval: None reported.

Previous presentations: An earlier version of this article was presented at the American Medical Association/University of Texas System Conference on Medical Education and Learning Technology, Austin, Texas, December 10–11, 2014; the Institute of Medicine Global Health Education Forum, Washington, DC, April 23, 2015; the American Medical Association Medical Education Meeting, Chicago, Illinois, October 1, 2015; and the Association of American Medical Colleges Medical Education Meeting, Baltimore, Maryland, November 12, 2015.

E.G. Baxley is senior associate dean for academic affairs and professor of family medicine, Brody School of Medicine at East Carolina University, Greenville, North Carolina.

L. Lawson is assistant dean of curriculum, assessment, and clinical academic affairs and assistant professor of emergency medicine, Brody School of Medicine at East Carolina University, Greenville, North Carolina.

H.G. Garrison is associate dean for graduate medical education and professor of emergency medicine, Brody School of Medicine at East Carolina University, Greenville, North Carolina.

D. Walsh is associate professor of surgery, Division of Pediatric Surgery, Brody School of Medicine at East Carolina University, Greenville, North Carolina.

S. Lazorick is associate professor of pediatrics and public health and health services researcher, Brody School of Medicine at East Carolina University, Greenville, North Carolina.

D. Lake is clinical associate professor of nursing, Graduate Nursing Sciences and Leadership Concentration, East Carolina University College of Nursing, Greenville, North Carolina.

J. Higginson is associate professor of pediatrics and chief, Division of Neonatology, Brody School of Medicine at East Carolina University, Greenville, North Carolina.

References
1 Pines JM, Farmer SA, Akman JS. “Innovation” institutes in academic health centers: Enhancing value through leadership, education, engagement, and scholarship. Acad Med. 2014;89:1204–1206.
2 Cooke M, Irby DM, O’Brien BC. Educating Physicians: A Call for Reform of Medical School and Residency. San Francisco, Calif: Jossey-Bass; 2010.
3 Tregunno D, Ginsburg L, Clarke B, Norton P. Integrating patient safety into health professionals’ curricula: A qualitative study of medical, nursing and pharmacy faculty perspectives. BMJ Qual Saf. 2014;23:257–264.
4 Interprofessional Education Collaborative. Core Competencies for Interprofessional Collaborative Practice: Report of an Expert Panel. Washington, DC: Interprofessional Education Collaborative; May 2011. https://www.aamc.org/download/186750/data/core_competencies.pdf. Accessed January 17, 2016.
5 Institute for Healthcare Improvement. Approaches to Training Faculty at Academic Medical Centers to Ensure That Clinical Trainees Become Effective Improvers: IHI 90-Day R&D Project Final Summary Report. Cambridge, Mass: Institute for Healthcare Improvement; October 2011. http://www.ihi.org/resources/pages/publications/trainingfacultyatamcsihi90dayrdproject.aspx. Accessed January 17, 2016.
6 Clay MA 2nd, Sikos AI, Lypson ML, et al. Teaching while learning while practicing: Reframing faculty development for the patient-centered medical home. Acad Med. 2013;88:1215–1219.
7 Myers JS, Tess A, Glasheen JJ, et al. The Quality and Safety Educators Academy: Fulfilling an unmet need for faculty development. Am J Med Qual. 2014;29:3–12.
8 Stille CJ, Savageau FA, McBride J, Alper EI. Quality improvement “201”: Context-relevant quality improvement leadership training for the busy clinician–educator. Am J Med Qual. 2012;27:98–105.
9 Headrick LA, Barton AJ, Ogrinc G, et al. Results of an effort to integrate quality and safety into medical and nursing school curricula and foster joint learning. Health Aff (Millwood). 2012;31:2669–2680.
10 Cooke M, Irby DM, Debas HT. The UCSF Academy of Medical Educators. Acad Med. 2003;78:666–672.