Sharing the Educational Wealth: A Nursing and Health Informatics Program Collaboration

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With the passage of the Affordable Care Act (ACA) in 2010, health information technology became identified as a strategic focus for improving patient care and lowering health care costs.[1] Health care needs are projected to require significant expansion of the informatics workforce.[2] A CompTIA workforce study of 1,061 global information technology (IT) managers found that the majority of organizations felt that gaps in IT skill sets significantly affected their business operations.[3] Educational programs must provide the training to meet those workforce needs, covering the full range of IT expertise and skill sets required to fill those identified gaps. These programs must be able to provide hands-on training in functioning health care sites to be effective[3], and must include components of data quality management, confidentiality and security, and secondary uses of clinical data and information.[4]

Securing appropriate clinical sites is a challenge for every educational program, but becomes especially difficult when the targeted clinical expertise involves access to protected health information (PHI). George Mason University's College of Health and Human Services has developed a unique and effective approach to providing clinical experiences for health care informatics technology (HIT) students by forming a collaboration between the School of Nursing and the Health Informatics program. This collaboration was piloted in the summer of 2015, and involved three undergraduate Health Informatics students working with the data manager of the Mason and Partner (MAP) clinics.

The pilot placement of informatics interns into primary care clinics is an example of

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the transdisciplinary model of care that the Association of Clinicians for the Underserved advocates for optimal care to the underserved (ACU, clinicians.org). Not only were the interns taught the daily operations of a clinic system supported by federal, state, and private grant funds, they were also able to see the realities and challenges of using the data generated. They also profited when they transmitted what they had learned to others: There is no better "real world" experience for an intern than observing and teaching the other clinical students how to use an EHR system.

Mason and Partner Clinics

Since October 2013, the George Mason University School of Nursing, located in Fairfax County, Virginia, has successfully launched three academic nurse-managed health clinics in partnership with Fairfax County, Prince William County (Virginia), the local school systems, community centers, the local health department in Prince William County, and the Medical Reserve Corps in these two counties. The purpose of the MAP clinics is to provide a network of weekly health care clinics managed by nursing faculty with collaborative care provided by Mason nursing students and students from various other health-related disciplines. The clinics provide community-based health care to low-income, uninsured, immigrant, and other vulnerable populations using an interprofessional treatment team approach. The clinics have two main goals: To provide interprofessional practice sites in community-based settings for student clinical/field experiences, and to increase access to low-cost primary health care with an emphasis on education and referral to improve health care measures.

These clinics are staffed by Mason nurse practitioner (NP) faculty (primary care and behavioral health), other faculty acting in support roles (pharmacy and education), and students (graduate and undergraduate) in clinical practicums for a variety of programs, including nursing, psychology, nutrition, and social work. Each MAP clinic provides care to approximately 25 patients each day. Over the course of the 200+ days the clinics have operated, they have provided health care services to over 3,800 unique patients, ranging from newborn to age 96 years, speaking 32 languages, and encompassing all race categories.

This academic-community clinic requires unique IT setup and support. The IT setup and data management are performed by a single data manager and are designed to provide a mobile, self-contained IT solution (i.e., the computers and Internet access are transported to the site each clinic day and configured/scaled securely to support the specific services to be provided). Each day, three to 10 undergraduate nursing and health informatics students help provide IT support ranging from computer system setup to patient intake processing.

The clinics serve as the implementation sites for multiple federal grants. Each of these grants has specific and complex data reporting requirements. The MAP program uses a free electronic health record (EHR) system that has limited data reporting capability. To support the extensive and varied data reporting requirements, the clinics depend primarily on text mining, which requires accurate and consistent text data entry. Oversight by experienced personnel is always required.

The Opportunity

The major focus of health informatics is "big data," which are "data sets that perform beyond the capabilities of traditional software programs to store, manage, and analyze."[5[p.297]] These large data sets inform health care research, data mining, and machine learning. However, it is important to recognize that "big data" originates with "small data," which is the systematic and consistent collection of data from individual clinic sites. Most Accountable Care Organizations (ACOs) do not contribute to big data because they lack the skills and technology to support contributions to the larger set.[6] For these ACOs and smaller clinics, the focus is on the data required for day-to-day operations.

In response to the focus on big data, the most widely available internship sites for HIT students are at large health care entities in which the IT functions are well established and compartmentalized, with policies and procedures in place.[3] Unfortunately, students placed in these internships are exposed only to the IT components specific to the organization to which they are assigned. This may result in a fragmented experience, limiting their exposure to the continuum of HIT services required to support daily operations.[3]

The MAP clinics offer a different experience. The mobile nature of the clinics, fluctuating IT requirements, student involvement, community partnerships, and interprofessional participation coalesce to create a very fluid, dynamic, and challenging environment from every point of view. This setting offers opportunities to experience the full continuum of HIT in a real-world environment. The clinics are currently at a Meaningful Use stage 1 level, working toward stage 2 requirements. Computer setup, data capture, data cleaning, SQL (structured query language: a special-purpose programming language for managing certain types of data) queries, use of pivot tables, and data visualization for analysis and reporting are components of daily clinic operations.

The Pilot Program

HAP 498: Health Administration Internship is a course in the undergraduate Health Informatics program under the Health Administration and Policy (HAP) department at George Mason University, taken in the final semester before graduation. The goals of the internship are stated in the course syllabus and University catalog as follows:

> Provides variety of applied management experiences in a health systems or related organization (field agency), under the direction of a HAP faculty member and a preceptor in the field. Students integrate and apply critical-thinking, project-planning, and management and communication skills in the internship experience and toward completion of an approved internship project. (2015–2016 University Catalog, catalog.gmu.edu)

The internship builds upon IT and informatics skills covered over the student's course of study, ranging from technical computer skills and basic data analysis to understanding of information flow, patient care, and health care systems. Undergraduate students

are ideally positioned for support functions in the health care industry with education focused on skills and ability to perform specific tasks in health care settings.

The pilot program involved three undergraduate students in HAP 498. Over a 12-week period, the students worked with the MAP data manager, with each student assigned to a different clinic site. The interns provided direct support for all parts of daily clinic operations, including oversight of data entry; tracking faculty, student, and staff members providing service at the MAP clinic each day; setting up the computers and wireless service for charting in the EHR; and helping with IT-related questions. At the end of each clinic day, the students performed data-cleaning to identify and correct data errors.

As part of the major project for the course, the students were assigned a HIPAA Risk Assessment at their assigned site, which involved a thorough assessment of the potential risks and vulnerabilities to the confidentiality, integrity, and availability of protected health information (PHI). Each was assigned a different Healthcare Information and Management Systems Society (HIMSS) Risk Assessment tool; they then contrasted and compared the assessment methods. The risk assessment projects helped MAP ensure compliance with HIPAA's administrative, physical, and technical safeguards. The projects also helped reveal areas in which the clinic PHI could be at risk.

Perspectives

MAP Clinic Data Manager: The MAP clinics require significant support across the IT continuum, ranging in skill level requirements from zero to very high. This allowed the interns to be productive members of the team from the minute they walked through the clinic door, starting with computer and internet set up. They quickly progressed to providing essential support, allowing me to focus on the more intricate details of the clinic IT needs. They assisted with data entry, cleaning, extraction, and analysis to support a grant report due during the intern period. It was interesting to look at the MAP clinic through the lens of people new to the field and environment. These students stepped into a very busy, challenging, and adaptive setting—and thrived.

It is anticipated that the continued collaboration between Mason's School of Nursing and Health Informatics will lead to a stronger interprofessional health care workforce. The goals of the two organizations align to support a common desired outcome—which is ultimately the improved health of our patient population.

HIT Interns: During the summer of 2015, we worked as interns at the Mason and Partner's (MAP) clinics as students of Heath Informatics. The internship at the MAP clinics was a great experience. Since the clinics are interprofessional, we were able to meet health care workers with different backgrounds and roles. They were all very helpful and eager to show us different skills. We were exposed to many areas, which helped us in understanding what employers will expect in an entry-level position. Specific duties included tracking of faculty, students, and staff through Excel spreadsheets, setting up secure wireless access, data-cleaning, and assisting with general IT support. We gained knowledge and experience working with an EHR, Practice Fusion, acting in a variety of roles, including support staff and EHR administrator. We were exposed to a number of HRSA grants, and worked with a relational database (MS Access),

using SQL queries to prepare data for analysis and reporting. It was eye-opening to work with this uninsured, underserved, and very diverse patient population. Out of sheer necessity, we picked up some Spanish along the way. We enjoyed working in a professional environment, and gained an extensive amount of hands-on experience.

HAP 498 Faculty: Being able to work across academic departments to create an internship for health informatics students is a win-win for all involved. These three interns are some of the first undergraduate students in Mason's new degree in Health Informatics. Prior to placement in the senior year, the curriculum offered limited to no "hands-on" exposure to electronic medical records, workflow, and data analysis. The MAP clinic experience offers the students the opportunity to work with an EHR, data and the clinical team in an educational environment. Given all of the training and privacy and security requirements to access the electronic health records in larger systems, some internship placements have not been able to provide this at the undergraduate level. This partnership is an ideal teaching experience for the entire team. The "see one, do one, and teach one" model is active in each weekly clinic session with the student. By semester's end, informatics students can begin to see themselves as the "data experts" on the team.

Conclusion

The pilot project demonstrated collaboration that is mutually beneficial, providing a great HIT experience for the students, and much needed assistance at the MAP clinics. Given the breadth of the IT support requirements at the clinics, ranging from low to advanced skill levels, the students were productive members of the team from the start of the internship. Over the course of the summer, their skill levels advanced to the point where they had the ability to serve in the primary IT role at the clinic sites.

The experience also revealed that this internship would be beneficial for students at the graduate level. George Mason University's graduate Health Informatics programs (Masters of Science and PhD) reinforce IT skills with deep conceptual knowledge and advanced skills development. They focus on advanced data analytic techniques (including big data), as well as training of health analysts who specialize in front-end services and consulting. The MAP informatics internships are an ideal environment to provide exceptional experience to students at both levels: Those who intend to enter the workforce at the bachelor's level and those who enter graduate school to supplement their IT knowledge and skills.

This internship collaboration continues in Spring 2016.

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