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Integrating the Academic Electronic Health Record Into Nursing Curriculum: Preparing Student Nurses for Practice

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Key Points:

- Enhance student learning through innovation and technology.
- Purposeful integration of the AEHR across the nursing curricula.
- Utilize the AEHR to prepare students for safe and efficient nursing practice in the 21st century.

The initiative of the US federal government to move healthcare to the 21st century requires that all healthcare providers, including nurses, develop knowledge and skills in computer literacy and information technology.¹ As of 2004, it was a stated goal of the Bush administration that all US residents should have an electronic health record (EHR) by 2010. The current US administration under President Obama continues to support this goal with an extended implementation date of 2014.

The American Association of Colleges of Nursing recently published the *Essentials of Baccalaureate Education for Professional Nursing Practice* (2008). The *Essentials* document requires that information management and application of patient care technology be a core competency for baccalaureate-prepared nurses.² Furthermore, in 2009, the Technology Informatics Guiding Educational Reform (TIGER) Informatics Competencies Collaborative released a set of recommendations for all practicing nurses and graduating nursing students on informatics competencies. Under the TIGER Nursing Informatics Competencies, practicing nurses and nursing students must be able to demonstrate basic computer competency, information literacy, and information management.³

The College of St Scholastica has taken active steps to implement informatics technology into nursing and other health science curricula. An academic electronic health record (AEHR) system is available at the College of St. Scholastica. The AEHR is an EHR used for teaching purposes. It contains all of the capabilities of a true EHR used in professional practice. The AEHR is interoperable, secure, and contains all of the functionality required of an EHR. The AEHR provides extensive hands-on experience using state-of-the-art EHR and information systems to provide students with learning opportunities in patient assessment, clinical knowledge, decision-making, and documentation competencies. This article describes the work of the School of Nursing to continue the purposeful integration of the AEHR across the nursing curricula within the traditional undergraduate the baccalaureate and graduate programs at the College of St. Scholastica in Duluth, MN.

BACKGROUND

In 2002, the College of St Scholastica received a Title III grant from the US Department of Education to integrate computer-based clinical information system applications into the curricula of the health sciences professional programs including nursing. The project was multidisciplinary in scope in order to develop cross-disciplinary practice competencies. This was a 5-year initiative named by the College of St Scholastica, as the *Advancing Technology in Healthcare Education Now* at St Scholastica (ATHENS) Project. The ATHENS Project was implemented through a partnership with Cerner Corporation of Kansas City, MO, which provided computer application development and support of the AEHR for student learning.

As the ATHENS Project grant came to an end, a task group of five nursing faculty was assembled by nursing administration to continue with the work that was started by the ATHENS Project. The nursing faculty task group consisted of five members: two graduate-level faculty members and one undergraduate faculty member from the sophomore, junior, and senior level. The goal of this newly formed group was twofold: to increase the utilization of the AEHR in the classroom and to design a nursing curriculum that increases collaboration of faculty across all nursing programs.

DESIGN PROCESS

The project started with the faculty group participating in a weeklong immersion conference by the Collaboration for the Advancement of College Teaching and Learning's Collaboration Summer Institute for Academic Innovation, 2008. The conference participation was funded by the original ATHENS Project grant. The conference provided the venue to start the process of curriculum design. Throughout project development, the nursing task group was guided and supported by the staff of the institute.

Early in the project, the group started with an intensive brainstorming exercise known as the "deep dive." Deep dive is a novel brainstorming activity developed by IDEO, a design and innovation consulting firm that deeply immerses participants into a problem with the goal of producing innovative solutions. The group agreed that there should be no limiting rules regarding the ideas generated with this activity.

The focus of the deep dive exercise was to use backward design to identify descriptors of how student learning will look as a result of the project. In backward design, goals for learning are set before the activities or

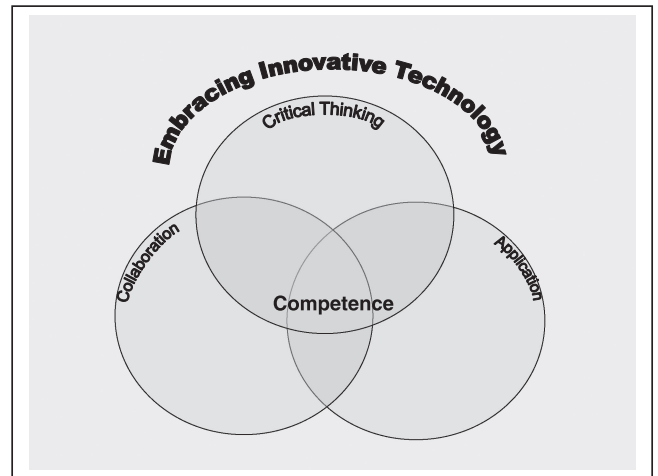


FIGURE 1. Framework.

content for teaching is selected. Each member of the group engaged in a free-flowing exploration of thoughts and innovative ideas. Then the group came together to share ideas and to identify key descriptors of student learning outcomes. The student outcomes identified were collaboration, critical thinking, and application. The group identified embracing innovative technology as an important overarching concept, with student competence as the central objective. These descriptors became the framework for the vision and the learning outcome measures of the project as shown in Figure 1.

VISION

The vision developed was "purposeful integration of innovative technology that promotes competent professional nursing practice and critical thinking through application and multidimensional collaboration."

ADVANTAGES AND OPPORTUNITIES FOR IMPROVEMENT

After the group had defined the framework and the vision of the project, the next step was to identify the strengths and weaknesses of the project. Because this project was a continuation of the previous ATHENS Project, the group had some data and firsthand knowledge of some of the advantages and challenges in utilizing the AEHR as an innovative teaching tool.

The goal of this curricular design was to increase the decision making and practice competence of nursing and health science graduates by providing them with

the technology and tools to access patient data and best practices guidelines at the point of care. These core competencies in technology and informatics are based on the 2008 Essentials of Baccalaureate Education for Professional Nursing Practice and the TIGER Nursing Informatics Competencies.

The computerized academic health record provides clinical cases for students to use as they evaluate and interpret physiological and diagnostic findings. For these case studies, students also document in the AEHR their complete assessment, treatments, and findings. These case-analysis activities encourage students to develop their critical-thinking and problem-solving skills within each of their professional disciplines. Many of the cases that are built into the system are true-to-life clinical cases that were donated by patients to the College of St Scholastica. When these cases are entered into the database, personal identifying data are removed to protect the identity of the donors. These cases are named "Pristine" cases to distinguish them from other medical records in the EHR.

Students have access to wireless technology, desktop computers, traditional laptop computers, and notebook-style computers. Computer notebooks offer increased portability for student use and are stored on carts that can be relocated to any classroom or laboratory on campus. The notebooks can be easily utilized by students at the point of care, in a nursing skills laboratory, simulation laboratory environment, or actual educational health clinic. Access to the AEHR is available on and off campus, 24 hours a day, 7 days a week, via a secured Internet connection.

Key advantages identified by the group evolved around the following concepts: learning/knowledge, critical thinking, collaboration, skill performance, satisfaction, and support. The cases that were built into the AEHR database provide students with unique learning opportunities that allowed them to investigate a disease process along with the collaborative disease management as it applies to an actual patient. Patient assessment data including reports, laboratory values, and diagnostic test results are available for the students to review.

A comprehensive reference database and best practice guidelines are also built into the AEHR system to provide the students a pathway for a safe and efficient clinical decision-making process. Access to patient information is at the point of inquiry, which is at the bedside in a simulated laboratory situation, thus challenging the students to critically think as they problem solve a specific clinical scenario. The realism provided by the pristine cases create an emotional connection for the students promoting a meaningful and memorable learning experience.

As the students explore the cases in the AEHR, they are also developing the necessary skills and competencies

to successfully navigate and use the clinical applications of an EHR. Adoption of the AEHR cases by all health science programs also provides virtually unlimited opportunities for professional and interdisciplinary collaboration. Other advantages identified by the task group included strong support from administration and the enthusiasm of some faculty who are currently using the AEHR database in the classroom.

■ CHALLENGES FOR THE PROJECT

The task group also identified several challenges for this project. These challenges became evident during the implementation phase of the ATHENS Project. They included faculty concerns about the quality of the cases, technical support and system capabilities, as well as faculty time and energy. Strategic measures were implemented to address these issues, and all stakeholders of the project were engaged in meaningful discussions to move the project forward. Some nursing faculty members adopted specific AEHR cases that were pertinent to their course content and embedded them with additional clinical materials, thus making the case scenario robust and meaningful for nursing education. Super users of the technology were also identified. They became the go-to individuals and the driving force of the project. Technology support on and off the campus was enhanced to address student access issues. Wi-Fi technology was made available in the classrooms to allow easy access of the case-study scenarios. There are ongoing discussions with administration to adjust faculty teaching load for those who are using the AEHR in their curricular design and scholarly work.

■ STUDENT OUTCOMES

To address some of the identified challenges to sustaining the ATHENS Project, the task group further developed student outcomes and key student learning activities for faculty guidance. Using the three key concepts of collaboration, critical thinking, and application from the conceptual framework, the task group developed student outcomes within each academic level of our nursing program. The academic levels include sophomore, junior, senior, and graduate courses.

The task group considered the professional work of Patricia Benner⁴ in the development of the novice to expert nurse. The student outcomes were purposefully designed to address student learning from basic to complex. The key areas targeted for enhanced student learning were collaboration, critical thinking, and application.

Table 1 Student Outcomes

	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>	<i>Graduate</i>
Collaboration	Identify various professionals, caregivers, and family and their potential roles that impact patient care.	Initiate collaborative relationships in developing a plan of care.	Participate in (or contribute to) and implement interdisciplinary plan of care.	Facilitate interdisciplinary team meetings and family conferences (shared decisions).
Critical thinking	Examine pertinent patient data in the AEHR.	Interpret patient data to develop a prioritized plan of care.	Anticipate and plan for actual and potential problems based on relationships and trends in AEHR.	Analyze and synthesize the AEHR and resources when designing and modifying care management.
Application	Navigate AEHR and its linked resources.	Use AEHR and its resources to develop a plan of care that focuses on a single health issue.	Integrate AEHR and resources to develop a comprehensive plan of care for clients with complex healthcare needs.	Utilize AEHR to design and appraise an evidence-based plan of care.

They are shown together with the leveled student outcomes in Table 1.

To acknowledge and address integration issues related to faculty time and energy, the task group designed several action strategies for utilization at each academic level. Specific AEHR cases were selected with suggested teaching-learning activities to meet the identified student outcomes. These teaching-learning strategies were intentionally designed and placed at the appropriate developmental level to promote deep student learning.

Beginning nursing students must have the basic knowledge and experience to build a strong foundation for learning and practice. The cases and assignments in the first semester of the nursing program have been purposefully selected to provide the novice nursing student with initial knowledge retrieval and application, utilizing various aspects of the AEHR. The cases and assignments become more challenging throughout the semester to encourage critical thinking and application of knowledge and skills learned. As the student progresses through the program, cases and assignments continue to become more rigorous to engage student learning at a higher level. The expert nursing student is working with complex patient cases, including interdisciplinary work, care management, and quality-assurance investigation.

The integration of the AEHR into the nursing curriculum has made our nursing students better prepared

to use this technology in their professional practice. Junior nursing students acknowledge the added value of the AEHR during their summer internship experience. The integration of the AEHR into our curriculum is also embraced and supported by our clinical partners.

IMPLEMENTATION TIMELINE

The task group projected a timeline for implementation of the AEHR integration plan over the next 2 years (Table 2). Faculty members who are currently using the AEHR as an innovative teaching tool are identified as super users. Super users are essential to the successful implementation of integrating the AEHR into the curriculum.⁵ It is also very important to support and encourage new faculty users. Another important facet is the ongoing communication with existing technology support personnel and administration as the project moves forward.

FUTURE WORK

As the timeline indicates, there is internal work to be accomplished within the College of St Scholastica nursing program. To date, the implementation has been on schedule and successful from both student and faculty perspectives. The task group has initiated research to measure student learning related to the identified outcomes. Baseline student data have been obtained from

the sophomore level and will continue to be obtained each year for comparison. Two faculty members have already participated in poster presentations, both

Table 2 Implementation Timeline

2008–2009

Fall

- Continue current level of use
- Information session for School of Nursing faculty
- School of Nursing faculty orientation education work groups

Spring

- Implement new sophomore plan
- Seek faculty feedback
- Obtain baseline student survey data

2009–2010

Fall

- Implement junior and senior plan
- Integrate more fully into graduate programs

Spring

- Evaluate student outcomes (all levels)
 - Seek faculty feedback
-

national and international, related to the task group's work on integrating the AEHR across the nursing curricula. Faculty from the task group recently presented the project to the 2009 AEHR Summer Institute at the College of St Scholastica.

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