

A Case Study: Knowledge Management Systems to Enhance a Nursing Curriculum

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Poster Text in Order of Presentation

ABSTRACT

To accommodate the rapid changes occurring in health care, web-based instruction is increasingly utilized in mainstream higher education. This case study describes the implementation of a prototype knowledge management system developed by PETTT, a research group at the University of Washington aiming to apply the sciences of learning to develop technology-based educational approaches. Collaborating with the Center for Health Sciences and Interprofessional Education and Research, PETTT investigated this educational tool in the context of an interprofessional curriculum with strong nursing participation. The knowledge management system aims to enhance student learning by: acting as a scaffold for reflection, providing an opportunity to create content, teaching effective patient education, reaching learners-at-large on the Web and participation in a knowledge building community.

In this particular application of the knowledge management system, students divided into small groups to create on-line patient education materials using dynamic templates addressing either Diabetes or Alzheimer's. Questions within the template prompted students to not only consider their discipline specific knowledge, but to consider other disciplines perspectives to create patient education materials that are holistic in nature. PETTT research staff observed students' uses of the knowledge management system and administered a survey investigating their perceptions of the tool at the completion of the course.

We conclude that the knowledge management system enhanced students understanding of how to communicate with patients in effective ways, increased collaboration and knowledge sharing among students, and increased their ability to approach patient education holistically by considering other health care disciplines. We also learned that students appreciated clear instruction on how to use the tool, defined a need to be taught information literacy skills, and described effective instructional methods for faculty to implement. Finally we were able to evaluate the usability of the system and are using this feedback to continue the iterative process of developing the knowledge management system.

INTRODUCTION

As the use of computer and information technology in health care continues to increase, so will the applications of such technology in nursing practice and patient education.¹ Innovative teaching strategies incorporating technology-based teaching and learning assignments have increased student achievement, including retention, motivation, and class participation; improved learning and critical thinking, provided instructional consistency, and enhanced clinical education.² Furthermore, creating nursing curricula that links people and information resources into a web of learners fosters professional community, communication, and group collaboration as the nursing student engages in their journey from a student to a novice practitioner.³

A primary role of the nurse as a health care provider has been one of patient educator. In result, nurse professionals and nurse educators need to examine how the nursing profession can use the potential of the Internet to redesign patient education and transform nursing practice.⁴

FIGURE 1. Screen shot of template to guide content creators in the development of complete and relevant information within the knowledge management system.

MATERIALS AND METHODS

In this case study the knowledge management system was integrated into a Health Sciences and Interprofessional Education and Research course. Students convened in small groups to create on-line patient education materials addressing either Diabetes or Alzheimer's using dynamic templates adapted from the health information web site. See Figure 1. PETTT research staff observed students' uses of the knowledge management system and administered a survey to investigate their perceptions of the technology at the conclusion of the course.

THE CONCEPTUAL FRAMEWORK: KNOWLEDGE MANAGEMENT SYSTEMS

The conceptual framework work of this educational technology is based on the oxymoron: Knowledge Management. Being that knowledge is largely cognitive and highly personal, while management involves organizational processes, it must be understood how these two contrasting concepts are intertwined.

WHAT IS KNOWLEDGE?

Throughout the literature "knowledge" is similarly defined. According to Webster's Dictionary, knowledge is the fact or condition of knowing something with familiarity gained through experience or association.⁵ It is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and

incorporating new experiences and information.⁶ Key concepts of knowledge include experience, truth, judgment, and rules of thumb.⁶

Knowledge is embodied in people, and acquired on an individual basis. Therefore the entirety of knowledge on any one subject is usually impossible to obtain. No one person can take responsibility for collective knowledge.⁷ It goes beyond any single discipline: knowledge is a function of collaboration.⁸

WHAT IS KNOWLEDGE MANAGEMENT?

Knowledge management is the explicit and systematic organization of vital knowledge and its associated processes of finding, selecting, organizing, distilling, and presenting information in a way that improves an individual's comprehension of a specific area of interest.^{5,8} It requires turning personal knowledge into knowledge for learners-at-large through the organization of information across disciplines. Initiatives when managing knowledge generally focus on two fundamental objectives: enabling knowledge sharing and using knowledge to generate community.⁹

Specific knowledge management activities that have been implemented within the business model have facilitated an organization to focus on acquiring, storing, and utilizing knowledge for such things as problem solving, dynamic learning, strategic planning and decision making.^{5,9} This knowledge management conceptual framework is highly adaptable to the higher educational environment.

THE KNOWLEDGE MANAGEMENT SYSTEM

FIGURE 2. Example of article from website.

With the interest of developing a technology with the appropriate infrastructure to support learning, the KMS was adapted from the informational web site, developed by the Department of Orthopaedics and Sports Medicine. See Figure 2. This site aims to serve as a knowledge-building community, a knowledge management tool, and a source of information and education regarding orthopedic conditions, arthritis, and sports injury.¹⁰ The website is a successful system to create and provide high quality, easy-to-find information for learners-at-large: this knowledge source is visited once every 20 seconds by individuals from over 40 countries each day.

All articles within this site have a logical and consistent internal structure based on research informed templates. The resulting information is based on real questions patients ask regarding health conditions.¹¹

Development of these templates was an iterative process. Multiple data collection mechanisms were used to determine what questions patients have when visiting a health information website. These methods included:

- web site visitors' feedback
- log file analysis

- empirical research
- observations
- consultations with experts in the condition addressed in the templates
- literature research

The resulting templates aid students to create articles regarding health conditions that are extraordinarily complete, and functional for multiple health conditions.

{turn into a more graphic bulleted list}

Properties of templates:

- (1) Provide the author with an outline and an example of appropriate language and knowledge sought by patients.
- (2) Store the content in a searchable web-based database.
- (3) Automatically convert the content into a web-based article.

RESULTS

Effective Patient Education

The knowledge management system provided students an opportunity to practice composing professional communication using correct and pertinent medical terminology to express conceptual knowledge, rationale for therapeutic interventions, and general patient education information.

“I learned how to best explain complicated issues to others.”

-Graduate Nursing Student

“I found myself getting thick with science, [I had to ask myself] what are the most important things and how do I express them?”

-Graduate Nursing Student

Knowledge Sharing and Collaboration

The KMS enhanced knowledge sharing and collaboration among the nursing students, assisting students to bring their personal expertise and life experiences to one another through the development of complete and relevant content within the templates. This successful collaborative work helped students integrate their collective nursing theory with clinical practice.

“I used the templates to observe my groups work.”

-Graduate Nursing Student

Holistic Perspectives

“We each contributed to different topics individually.”

-Graduate Nursing Student

Questions within the template prompted students to consider nursing knowledge and theory as well as other disciplines' perspectives on the health issue to create patient education materials that were holistic in nature. This indicates the KMS may reinforce the importance of a robust and collaborative health care team within the clinical care environment.

Information Literacy

Students expressed a concern that by creating content within the KMS they were duplicating efforts already made by other health information sites. Often students placed web addresses at the end of their content to prompt visitors to engage in further research. This finding confirms the necessity to integrate lessons to enhance students' information literacy skills among the higher educational environment, particularly when on-line technologies are integrated into the curriculum.

Clear Instruction

Students emphasized the importance of clear instructions on how to effectively use the technology. The PETTT research team taught students how to use the technology in a computer lab, pairing verbal instruction with hands-on experience. Students described this method of instruction as an effective instructional strategy and necessary to feel competent with the technology.

CONCLUSION

This case study demonstrates how the knowledge management system can amplify the effect of superior instruction. Teaching remains the important and vital task, but technology such as the knowledge management system can be a powerful tool for professional nursing education⁸. Our results have identified compelling benefits to using this technology in higher educational curriculums and publishing this student-created content on the web.

The knowledge management system acted as a web of learning with a foundation comprised of effective:

- communication
- collaboration
- knowledge sharing.

These characteristics of the KMS enable students to develop a critical thinking process that is methodical and intentional, resulting in improved clinical reasoning. Integrating the knowledge management system as an educational technology into nursing curricula is a dynamic and innovative teaching strategy.

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