Multi-disciplinary Medical Case Study Development For First Year Medical Students

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Project Goal

To teach medical informatics skills to 232 first-year medical students using three online medical case studies developed with the collaboration of librarians, physicians, and instructional designers.

Abstract

The first formal medical informatics class at Jefferson Medical College was created in 1987. Initially a traditional combination of lectures and hands-on workshops, the course was redesigned in 1996 to be a single two-hour lecture and 9 self-paced computer-based learning hours.

In 2003 the Jefferson Medical College curriculum was changed from a traditional core study in the basic sciences during the first year to a system-based model. At this time many free-standing courses such as medical informatics were integrated into a new course, Medical Practice for the 21st Century. The content presented in the new course included medical informatics, medical ethics & humanities, biostatistics, health policy, and clinical history and examination skills. Each of these courses presented relevant content in synch with the body system functions of the new combined gross anatomy, histology, biochemistry, and physiology course, Human Form and Development.

This poster will describe the history of the medical informatics course and the process of designing the case studies to fit into the new course management system, and will review the experiences of the librarians involved.

History

- The existing medical informatics course was a 2-hour presentation of concepts and a demonstration of the resources required to complete two required online case studies.
- All first-year medical students were required to complete the two case studies on their own within two weeks.
- The case studies were developed using a combination of HTML and Oracle database programming, to track student progress and collect answers to the questions posed during the case.
- In Fall of 2003, the first-year curriculum changed to a systems based learning model of education.
- Five librarians were assigned four groups of 10-12 first-year medical students to facilitate in Problem-Based Learning exercises, some of which included library/journal research activities.
- A third case study was designed for students to complete and the two existing cases were redesigned to use the Blackboard Learning Community framework, with each librarian offering personal feedback on responses.
- Handouts and tutorials were developed to help students learn on their own.

Process

- The Dean of the Medical College challenged the Curriculum Committee to consider current, best teaching practices in medical education and change the curriculum if indicated.
- The Library's Education Services Director is a member of the Curriculum Committee and participates in course reviews and planning. The committee saw an increased need for case-based learning experiences and believed the students would benefit from searching and evaluating medical literature. Participation in this committee helps keep the library and technology services in step with changes in UGME, GME and CME.
- Librarians were assigned the role of “Library Liaisons" to support small groups during the case-based learning assignments.
- We contacted and recruited faculty that were impressed with our library workshops to help us write case studies (PowerPoint, Reference Manager, etc.).

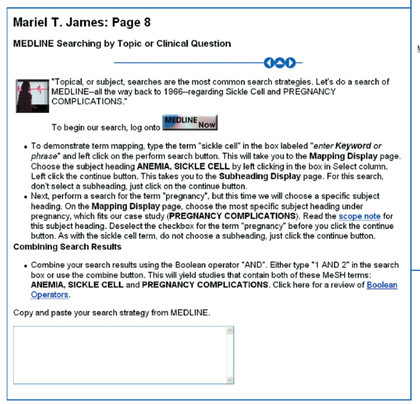
Experience

The following proved to be challenges:

- Finding physicians to develop credible case studies (we also got help from a nurse and dietician)
- Adapting the case studies to a commercial course management system
- Grading answers from 232 medical students
- Providing personalized feedback to at least 3 out of 14 questions per student
- Dealing with technical issues (such as access problems)
- Developing questions/answers that could assess hard-to-measure search strategies and skills (and be graded automatically)
- Taking into account that databases are a moving target (search results can change from day to day)

HTML/Oracle Version

Short self-evaluation quizzes helped students decide if they should take the optional tutorial before continuing with the case.



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MEDLINE Searching by Topic or Clinical Question

"Topical, or subject, searches are the most common search strategies. Let's do a search of MEDLINE--all the way back to 1966--regarding Sickle Cell and PREGNANCY COMPLICATIONS."

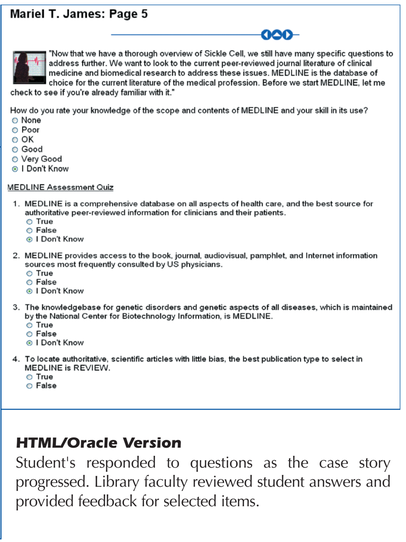
To begin our search, log onto MEDLINE Now

- To demonstrate term mapping, type the term "sickle cell" in the box labeled "*enter Keyword or phrase*" and left click on the perform search button. This will take you to the **Mapping Display** page. Choose the subject heading **ANEMIA, SICKLE CELL** by left clicking in the box in Select column. Left click the continue button. This takes you to the **Subheading Display** page. For this search, don't select a subheading, just click on the continue button.
- Next, perform a search for the term "pregnancy", but this time we will choose a specific subject heading. On the **Mapping Display** page, choose the most specific subject heading under pregnancy, which fits our case study (**PREGNANCY COMPLICATIONS**). Read the scope note for this subject heading. Deselect the checkbox for the term "pregnancy" before you click the continue button. As with the sickle cell term, do not choose a subheading, just click the continue button.

Combining Search Results

- Combine your search results using the Boolean operator "AND". Either type "1 AND 2" in the search box or use the combine button. This will yield studies that contain both of these MeSH terms: **ANEMIA, SICKLE CELL** and **PREGNANCY COMPLICATIONS**. Click here for a review of Boolean Operators.

Copy and paste your search strategy from MEDLINE.



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"Now that we have a thorough overview of Sickle Cell, we still have many specific questions to address further. We want to look to the current peer-reviewed journal literature of clinical medicine and biomedical research to address these issues. MEDLINE is the database of choice for the current literature of the medical profession. Before we start MEDLINE, let me check to see if you're already familiar with it."

How do you rate your knowledge of the scope and contents of MEDLINE and your skill in its use?

- None
- Poor
- OK
- Good
- Very Good
- (•) I Don't Know

MEDLINE Assessment Quiz

1. MEDLINE is a comprehensive database on all aspects of health care, and the best source for authoritative peer-reviewed information for clinicians and their patients.
   - True
   - False
   - (•) I Don't Know
2. MEDLINE provides access to the book, journal, audiovisual, pamphlet, and Internet information sources most frequently consulted by US physicians.
   - True
   - False
   - (•) I Don't Know
3. The knowledgebase for genetic disorders and genetic aspects of all diseases, which is maintained by the National Center for Biotechnology Information, is MEDLINE.
   - True
   - False
   - (•) I Don't Know
4. To locate authoritative, scientific articles with little bias, the best publication type to select in MEDLINE is REVIEW.
   - True
   - False

HTML/Oracle Version

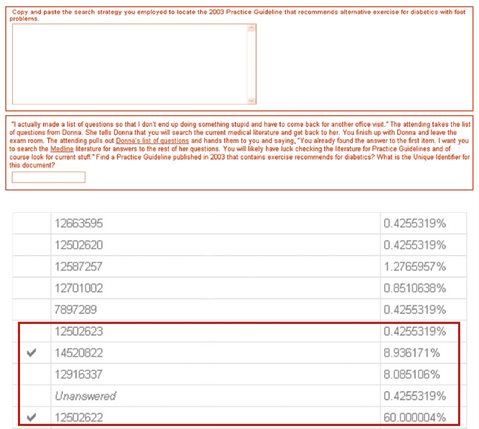
Student's responded to questions as the case story progressed. Library faculty reviewed student answers and provided feedback for selected items.

Test Question Dilemma

In the latest version of the course we only designed three questions (out of 14) to require manual grading by a librarian.

Since there were a range of reasonable search strategies possible, we knew that this answer would need to be examined and graded manually. But, when we created this question, we thought there was a clear single best answer, which would allow the course management system to grade it automatically.

While we were expecting just the one correct response, the students performed searches in ways we hadn't expected and got other (not quite as good, but still valid) results. The original answer was found using Practice Guideline as a “publication type” limit. Using Practice Guideline as a MeSH term, however, returned two totally different citations! Although the course management system had an online gradebook feature it could not automatically update grade results for items we changed to accept alternative answers. We had to go back into every student's record and manually assign credit for the alternate answers.



Copy and paste the search strategy you employed to locate the 2003 Practice Guideline that recommends alternative exercise for diabetics with foot problems.

"I actually made a list of questions so that I don't end up doing something stupid and have to come back for another office visit." The attending takes the list of questions from Donna. She tells Donna that you will search the current medical literature and get back to her. You finish up with Donna and leave the exam room. The attending pulls out Donna's list of questions and hands them to you and saying, "You already found the answer to the first item. I want you to search the Medline literature for answers to the rest of her questions. You will likely have luck checking the literature for Practice Guidelines and of course look for current stuff." Find a Practice Guideline published in 2003 that contains exercise recommends for diabetics? What is the Unique Identifier for this document?

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	12502620	0.4255319%
	12587257	1.2765957%
	12701002	0.8510638%
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Lessons Learned

- Network to recruit physicians to help develop case studies (through the Curriculum Committee, by contacting physicians who attended past library workshops, etc.)
- Improve the process of writing test questions. Try to ask questions without ambiguity (or with less!)
- Try to understand and manage the wide range of information literacy skills of the students
- Meet the challenge of constructing realistic case study exercises with the limited range of features and imposed structure of a course management system

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