Emergency Medicine Faculty Development Seminar

How to Turn Your Expertise into an Effective Online Educational Product

December 1, 2011
Growth of Online CME

Relative Market Share of Online CME

Lots of Room for Improvement

Specialty Menu

Instructions: Please select a specialty of interest, a subspecialty, then select from the Article list. Read an article, answer six questions correctly and receive 1.5 hours of medical education credits. You are allowed to retake the test until all questions are correct.

Dermatology
Emergency Medicine
Medicine, Int/Img, Psychiatry, and Surgery
Neurology
Ophthalmology
Orthopaedic Surgery
Otolaryngology and Facial Plastic Surgery
Pediatrics
Physical Medicine and Rehabilitation
Plastic Surgery
Pulmonology
Sports Medicine

Read an article, answer six questions correctly and receive 1.5 hours of medical education credits. You are allowed to retake the test until all questions are correct.
"The picture's pretty bleak, gentlemen. ... The world's climates are changing, the mammals are taking over, and we all have a brain about the size of a walnut."
"Americans can always be counted on to do the right thing...after they have exhausted all other possibilities."

Winston Churchill
Who Will Pay for Online CME?

CME Credits Offered

Total Revenues

New Business Model
Specifics

- **CA**: General internists and family physicians who have a patient population of which over 25 percent of the patients are at least 65 years of age, are required to complete at least 20 percent of their mandatory CME in the field of geriatric medicine.

- **CT**: 1 credit/year: (A) Infectious diseases, (B) Risk management, (C) Sexual assault, (D) Domestic violence and, (E) Cultural competency

- **FL**: 2 hours in prevention of medical errors education every 2 years.

- **MA**: 10 hours risk management every 2 years (at least 4 hours must be Category 1)

- **NV**: 2 hours of ethics every 2 years

- **PA**: 12 hours, either AMA Category 1 or 2, in patient-safety related CME or risk management

- **TN**: At least one (1) of the forty (40) required hours during each 2-year cycle shall be a course designed specifically to address prescribing practices

- **TX**: 2 hours of ethics or professional responsibility every 2 years
1. How to measure effectiveness?
2. What is the real role of the technology?
3. What is the role of social networking?
4. What is the best economic model?
MDI’s Experience with E-Teaching in Medical Schools

John M. Harris Jr., MD, MBA
President
Medical Directions, Inc.

Where to Find Technologies that Will Improve Medical Education

Medical schools, like most educational institutions, have used computers for more than 30 years, but computers have not yet revolutionized medical education. If you wonder why computer-based educational technologies have not improved the quality and reduced the cost of medical education in the same way that they have benefited other industries, the official explanation appears to be... "A lack of research data."

In 2007, the Association of American Medical Colleges’ Institute for Improving Medical Education issued a report describing several educational technologies, many of which have been in use in medical schools for a number of years, and their as yet unrealized benefits. This report observed that, "...our understanding of how these resources might best be incorporated into the curriculum is inadequate, as advances in what could be created often outpace our ability to understand how they should be developed or used" (AAMC, 2007). The report described the types of research data we need from our medical schools in order to advance the use of technology in medical education.

Do we really need more research data before we can use new information technologies to improve medical education? Maybe we are looking in the wrong places. Maybe we should stop seeking to replace anatomy and pharmacology classes with computers and direct our attention elsewhere.

In his 2008 book Disrupting Class, Harvard Professor Clayton Christensen also observed that new information technologies have not had much effect on education, but he presented a different hypothesis for the cause. He did not believe the lack of progress should be attributed to inadequate information on how computers could be developed or used in education. Instead, he placed the blame on well-intentioned efforts to cram computers into existing teaching and classroom models rather than to facilitate new approaches to education. He noted that real innovations in any industry are usually developed outside of the existing industry structure by new organizations, ones that meet the needs of consumers who are not well-served by existing organizations.

Christensen suggested that the best place to find "disruptive" educational innovations that can dramatically improve education is not by forcing computers into existing classrooms, but by looking to technologies that meet the needs of underserved or non-served students. To illustrate his point, he offered the example of companies providing customized, online Advanced Placement (AP) preparation courses to high schools. These programs do not compete with existing AP classes; instead they allow high schools to offer an AP option to students who would not otherwise have one.
In this paper, we use our experience teaching intimate partner (domestic) violence (IPV) management skills to medical students at Kansas University to illustrate Christensen's point. We show how e-Teaching * technologies can meet the needs of underserved consumers (i.e., medical students). Our experience also offers a glimpse into the future of "blended" medical education. In this future, a medical school's most costly educational resource, its faculty, will be able to focus its effort and talent on educational goals that cannot be met by technology.

Why We Did This Work

When we did this study, we were collaborating with a Kansas University School of Medicine (KUSOM) faculty member, Dr. Zita Surprenant, to develop and evaluate an online education program to teach physicians how to recognize and manage IPV in their patients. Dr. Surprenant was (and is) an active national speaker on IPV issues in health care. She also presented a ½ day workshop on IPV several times yearly to 4th-year KUSOM medical students. In doing this, she periodically traveled 320 km from her home in Kansas City, Kansas to present the IPV workshop to KUSOM students taking their clinical rotations in Wichita, Kansas.

Recognizing that her travel to Wichita was difficult and that many medical schools lacked faculty who could adequately teach IPV skills, Dr. Surprenant asked MDI to test the online IPV training program with KUSOM students in Wichita to measure acceptability and learning outcomes.

How the Kansas University Experiment Was Done

Our Kansas University study was approved by the University's Institutional Review Board and took place between February and April, 2004.

- We compared a live workshop led by a national educator to a comprehensive online program developed by the same educator - The live IPV workshop had been taught by Dr. Surprenant three to four times annually, at Kansas City and Wichita, during the 4 years prior to the study period. Students received no formal IPV education prior to this experience. Student evaluations historically rated this workshop as one of the most positive parts of the 12-week health of the population (HOP) clerkship. The case-based, online IPV program was developed by a group of national IPV experts led by Dr. Surprenant. It was later shown in a controlled trial to result in long-term improvement in the IPV knowledge, attitudes, beliefs, and self-reported behaviors (KABB) of practicing physicians (Short, 2006a). Students were required to complete the section of the online IPV program pertaining to their clinical interest (i.e., family medicine, obstetrics-gynecology, emergency medicine, or pediatrics) via either the University's computer lab or their personal computer any time during their HOP rotation.

* For a discussion of why we prefer the term "e-Teaching" to the more widely used "e-Learning," please see MDI's white paper, Why We Need E-Teaching, Not More E-Learning.
The student groups were comparable - All students completed the same medical school curriculum during their first 2 years in Kansas City. After this, they either selected or were assigned by lottery to Kansas City (2/3 of class) or Wichita (1/3 of class) for their final 2 years of clinical training. Students in Kansas City and Wichita have historically had comparable entrance examination scores, grades in the first 2 years of medical school, test scores in the clinical years, and National Board of Medical Examiner scores. The educational experience in the two settings was similar and students typically selected one location versus another based on geographic preference.

The outcome measures were reliable and valid - The primary educational outcome measures were pre-posttest scores on eight scales of a self-administered IPV survey developed to evaluate important IPV KABB in physicians. This survey was found to be reliable in practicing physicians and correlated with measured physician practices (Short, 2006b). For this study, the survey was modified (by Drs. Short and Surprenant) to remove items that were not relevant to medical students and then recalibrated to ensure stability.

What We Learned and How the Findings Might Affect Medical Education

There were 68 students who participated in the live IPV workshops and 41 students who took the online IPV program. The groups were demographically similar. The mean age of both groups was 27 years and both groups were approximately 50% men and women. There was no significant difference in the amount of prior IPV training between the groups. Multiple analysis of variance (MANOVA) results confirmed similar baseline IPV survey scores in the groups.

All students completed their required instruction - All students who were assigned to the live workshop attended the workshop. All students who were required to take the online program completed the minimum online program requirements.

Both approaches were well-received by students - Student ratings were comparable for how well the programs met learning objectives and how relevant they were (4.4-4.6 on a 1-5 scale, P>0.05). Both programs were highly rated in terms of overall quality; however, the live workshops were rated more highly than the online program (4.64. vs. 4.36 on 1-5 scale, P=0.04).

Both approaches were associated with significant improvement in student IPV knowledge, attitudes, beliefs, and self-reported behaviors - The survey that was used to measure IPV KABB had eight scales, such as Perceived IPV Preparation, Actual IPV Knowledge, and Self Efficacy. Analyses of mean survey scores before and after the live workshop and the online program showed that there were significant positive changes on all eight scales for both groups (P<0.01).

The one area where a live workshop outperformed the online distance learning program was self-efficacy - Our analysis found no differences in survey scores based
on program attended/used except that the final score on one scale, self-efficacy, was significantly greater (P<0.01) following the workshop than the online program.

This experience demonstrates how a new, potentially disruptive educational technology met the needs of students who could not be served by an existing, classroom-based approach. Our results suggest that the asynchronous online program Dr. Surprenant and her colleagues created was almost as effective as she was in person. The online program was inexpensive to distribute and learner-centric. It allowed students to complete the material when they were ready and in the clinical area that was most meaningful to them.

The one educational outcome where this online program was not as effective as Dr. Surprenant's live workshop was self-efficacy. This is understandable. Self-efficacy, a student's sense of confidence and ability to manage IPV, typically comes from actually performing IPV tasks in a real clinical setting. The second best thing is probably peer group discussion and personal reassurance from a live role model that one will be able to meet the challenges of IPV when one sees them. As part of a blended learning approach, medical schools might use faculty members to address self-efficacy, leaving the online program to deal with other IPV training issues. This could be accomplished by having an experienced nurse, social worker, or law enforcement official, rather than an expert physician IPV educator, meet with groups of students after they have taken the online IPV program. By breaking the instructional task into its components, one can see areas where live group instruction may be essential, where online training might be used, and the goals that each instructional modality should target.

If e-Teaching is to be a disruptive innovation in medical education, it can (and should) be used to first meet the needs of students who are not served by the existing system. There are plenty of opportunities for this. Medical schools know how to teach anatomy, physiology, biochemistry, pediatrics, and the other core topics. However, they are increasingly expected to also teach IPV, cultural competency, and research ethics. There are many niche topics such as these where medical schools may lack trained faculty, but students must still receive training. By using asynchronous, case-based e-Teaching in these underserved areas, schools can meet student needs and then build on this experience to develop truly innovative approaches that can be applied to their core curriculum.

References


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Using Interactive Online CME to Teach Quality Improvement in a Medical Center – An Economic and Educational Success Story

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Abstract

An online patient safety module, originally developed for physician CME, was integrated into an interprofessional quality improvement and patient safety curriculum. CME learners rated the program highly, and CME funds generated revenue to support educational initiatives. Learners in the QI program felt the CME module added additional value.

Introduction

Medical educators are challenged to keep pace with multiple environmental changes. Even as we attempt to develop expertise in non-traditional subjects to meet changing societal needs and adapt to new educational technologies, we are challenged to find new sources of revenue to support our educational mission.

In 2006, University of Missouri-Columbia (MU) began jointly training small groups of health care students and health professionals in quality improvement (QI) and patient safety skills. Shortly after beginning this work, we were asked to develop an online CME program to help physicians meet regular CME requirements in patient safety. The resulting online CME program has subsequently been used to improve our internal QI teaching, reach additional physicians outside of our state, and provide an ongoing source of revenues to support our teaching mission.

Program

In 2006, the MU academic health center began offering an annual QI and patient safety training program to health professional students and providers. Learners and health professionals are trained jointly on interprofessional teams, using short didactic bursts and interactive team exercises, augmented by participation in a quality improvement project. Fundamental QI and patient safety skills, such as root cause analysis, are covered during the training. The training program is resource intensive.

Knowing about this program, a small business that performs NIH-supported research in medical education asked MU to develop an online program that would meet the licensing needs of physicians required to complete CME study in patient safety or prevention of medical errors. The company offered MU a royalty for providing the program content and the CME sponsorship. The company required that the online program be case-based, interactive, relevant to practicing clinicians, self-contained (asynchronous), and able to be completed at a single sitting.
We developed an online CME program, *Preventing and Responding to Medical Errors*, that was launched in 2008. We prepared the program content in MS Word. The small business handled editing, converting it to HTML, Web deployment, marketing, and e-commerce.

The program contains five cases, dealing with a missed diagnosis of prostate cancer, a surgical error, a medication error, a missed drug allergy, and management of ICU bloodstream infections. It contains 12 interactive questions for students, 16 links to QI resources and 51 links to PubMed abstracts. The key teaching points deal with root cause analysis, active and latent causes of adverse events, implementing a QI culture, and a systems approach to patient safety. The program offers 2 CME credits.

Since 2008 we have developed two other comparable online CME programs. These programs deal with the human side of medical errors and using systematic procedures to prevent medical errors.

In 2008-2009, participants in the MU QI training program were offered the opportunity to supplement their classroom training with completion of the two hour online *Preventing and Responding* program. This training occurred following presentation of patient safety topics in classroom discussion in the preceding weeks. Following completion of the online program, participants completed a brief anonymous survey, providing feedback on its value, using a five point Likert scale (1 = strongly disagree to 5 = strongly agree).

**Results**

Thirteen students and health professionals completed the online CME program and provided anonymous feedback (Table 1). Respondents felt that the online program successfully demonstrated the use of the RCA in investigating health care errors (mean score 4.3) and that they gained new information from completion of the modules. Respondents felt that the online program complemented the material taught in class, and 11 of 13 respondents recommended that the online program be continued in subsequent years, in addition to the classroom patient safety presentations.

The online program also proved popular with physicians completing it for CME credit, with the average feedback score on the initial CME module (1 = Poor to 5 = Excellent) being 4.61. So far, the three online programs have been used by 3,400 physicians to meet CME requirements in seven states. Once developed, the CME modules require very little work to maintain. Royalty revenues to the University have increased every year, exceeding $10,000 in 2010, with the likelihood of doubling this figure in 2011.

**Closure**

An online patient safety program that was originally developed as a stand-alone CME program has proven successful in this capacity, generating favorable user reviews and generating substantial royalty income to support educational programs at MU. The material has also been successfully integrated into a live, interprofessional QI and patient safety curriculum, with users perceiving the online program as a value-added portion of the curriculum that complements
classroom learning. The online program enhances our students’ learning without using additional faculty time. The successful creation of on-line educational content that simultaneously serves internal and external learners, while generating additional revenue for the institution, is a model that MU may expand in the future.

Table 1. Responses of Participants in QI Training Program to Completion of an Online Patient Safety Training Module (n=13)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean Likert Score</th>
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<tbody>
<tr>
<td>The module successfully demonstrated the use of RCA in investigating health care errors</td>
<td>4.30</td>
</tr>
<tr>
<td>I learned new information or gained better understanding of information from the completion of the module</td>
<td>4.15</td>
</tr>
<tr>
<td>I think the module complemented the material presented in class</td>
<td>4.46</td>
</tr>
<tr>
<td>Should the module be used in this course next year, in addition to the classroom teaching of patient safety material?</td>
<td>Yes: 11</td>
</tr>
<tr>
<td></td>
<td>No: 2</td>
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