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Misa Mi, *University of Toledo*

Marlene A. Porter, *University of Toledo*

Jolene M. Miller, *University of Toledo*

Jodi Jameson, *University of Toledo*

Gerald R. Natal, *University of Toledo*



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# Improving Medical Students' Learning Outcomes: Teaching a Web-Assisted Elective Course for 4th Year Medical Students

Misa Mi, MA, MLIS, AHIP; Marlene A. Porter, MLn; Jolene M. Miller, MLS, AHIP; Jodi Jameson, MLIS; Jerry Natal, MLIS  
The University of Toledo, Mulford Health Science Library; 3000 Arlington Ave. MS #1061; Toledo, OH 43614

## Introduction

Since 1997, the Mulford Health Science Library at the University of Toledo Health Science Campus (formerly the Medical College of Ohio) has been offering a 3-credit-hour elective course for 4th year medical students. The goal of the course is to provide students with skill sets that are important for them to develop as current students and future health care practitioners.

## Purpose

The purpose of this poster is to demonstrate the process of redesigning the elective as a learner-centered course; and to evaluate the effectiveness of the course on students' learning and learning outcomes.

## Methods

The two-week elective is offered three times each spring. Five library faculty instructors were involved in teaching the course spring 2008. Each of them taught 2 two-hour sessions for each block (a total 20 hours of class time).

This is an evaluation study. A convenience sample of 4<sup>th</sup> year medical students taking the course in spring, 2009, participated in the study (n=16).

The students' knowledge, skills, and attitudes were evaluated to identify any effect of the course on the their learning process and learning outcomes.

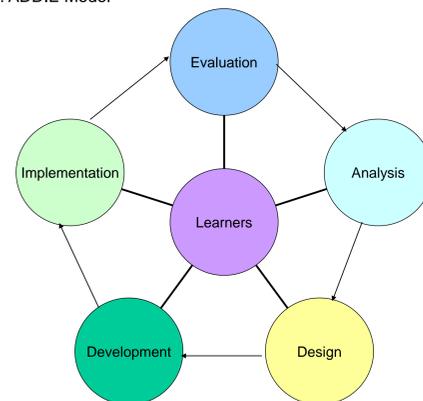
Figure 1: Web Site in Blackboard



## Application of ADDIE Model

An instructional systems design model, ADDIE, was applied in redesigning the elective course for optimal learning outcome. The model consists of 5 phases (Figure 2). How the model was applied was described briefly as follows:

Figure 2: ADDIE Model



### Analysis

- Examining learner characteristics
- Considering unique needs of the students in searching medical literature effectively
- Needs assessment done on the first day of the course

Table 1: Course Content

Mon	Tue	Wed	Thu	Fri
Introduction and Publication Cycle	Intro to Evidence-Based Practice	EndNote	PubMed and Web of Science	Web Searching and Evaluation
Search Practicum and Statistical Resources	Creating a Poster	Learning about Copyright	Keeping up with the Literature	Web 2.0 Tools

### Design

- Creation of a Blackboard Website involving a multidisciplinary team of librarians, instructional designers, graphic designer, and registrars (Figure 1)
- Designing assignments, instructional strategies, evaluation methods

## Development

- Creating a web site in Blackboard
- Updating previous session content (Table 1)
- Adding new session content (Table 1)
- Writing quiz questions
- Creating evaluation questionnaires

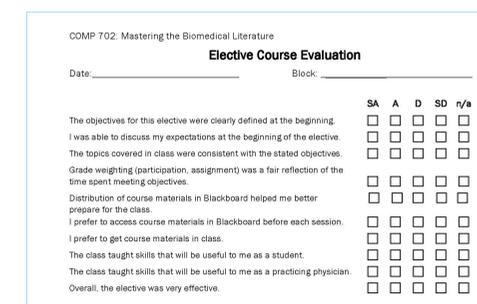
## Implementation

- Blackboard training provided by an instructional designer for librarian instructors
- Librarians teaching two sessions of the course and uploading course materials in Blackboard

## Evaluation

- Observation of performance through class activities and session assignments
- Mini-paper of search analysis
- Quiz in Blackboard to test students' newly-acquired knowledge and skills
- Session evaluation questionnaire
- Course evaluation questionnaire: question items rated on a Likert-type scale from strongly agree (SA) to strongly disagree (SD) (Figure 3)

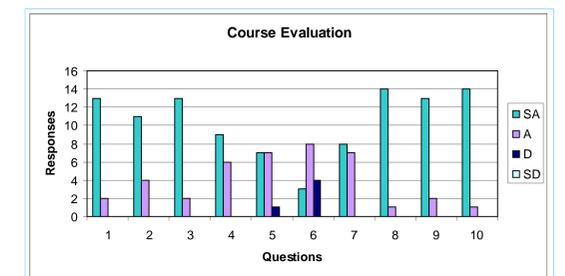
Figure 3: Course Evaluation Questionnaire



## Results

- Instructors observed that the students were attentive, interested, and engaged in class activities.
- Fifteen students received a final grade of "Honor" and one a final grade of "High Pass".

Figure 4: Responses to the Course Evaluation Questionnaire in Figure 3



- A majority of the students rated the course content as very valuable and reported the skills learned will be very useful to them as a student and a practicing physician (Figure 4).
- The students had mixed opinions on access to course materials in Blackboard before each session (Figure 4).
- Compared with students' comments from previous evaluations, all students in the study had very positive comments about the course.

## Discussion/Conclusion

- Students' needs and expectations were considered when designing and developing learner-centered library instruction.
- Students' learning was evaluated through different ways to triangulate data on their learning.
- Blackboard could be explored further as a tool to enhance students' learning process.
- The results of the study suggest the implication for librarians in using instructional design models in designing and providing other library classes for students' optimal learning outcome.

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## Contact Information

Misa Mi  
misa.mi@utoledo.edu  
419-383-3634