

Creating Online Lessons: A Faculty Development Seminar Series

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Abstract: The World Wide Web is being used increasingly to deliver instruction in medical education. Consequently, there is a need to train faculty in developing and implementing online instruction. We developed and implemented a seminar series to teach faculty to create educationally sound, well-designed online instruction.

Instruction was delivered to 15 participants via a six-session seminar on developing web-based lessons, supplemented with web-based instruction. First, the participants learned the basics of instructional design via a web-based module. They then completed content outlines for their online lessons prior to the first seminar. Lesson development, web site development and the use of a web-based instructional shell to implement the online lessons were each taught in two two-hour sessions.

Eight participants developed online lessons and four actually implemented them. Feedback was mostly positive, with suggestions for improvement. All eight participants who completed the series said they would recommend it to their colleagues.

Because a longitudinal workshop type of seminar series requires a large amount of participant time outside of class, a six-month seminar series may be too long. It is important at the beginning of the series to help participants select topics suitable for online instruction and to help them narrow their topics. We may change the attendance guidelines so faculty would attend only the session on instructional design and have their staff attend the technical sessions on web site design, HTML editing and online course delivery systems. This would better match the actual practice of faculty designing the instruction and staff developing it.

The movement to situate family medicine clinical education in community settings is well documented.¹ Medical students may find themselves in geographically dispersed settings, often far from the academic medical center. In order to deliver high quality instruction at a distance, the World Wide Web is being increasingly used to deliver instruction in medical education.² Consequently there is a need to train faculty in developing and implementing online instruction.³

Many institutions are offering faculty development in the area of distance education.^{4,5} These offerings range from workshops to manuals, from face-to-face to online instruction, from explanation of instructional technology to explanation of instructional theory. We decided to limit our workshops to creating one online lesson from start to finish rather than an entire course, so participants could have a workable product to take away with them at the end of the series. This one completed lesson could then serve as a template for the other lessons, which participants could develop after the seminar series was completed.

There are reports in the literature describing faculty development programs on the design of distance learning. Many of these reports focus on smaller aspects of the instruction, such as the use of course delivery techniques.⁶ Some reports use the instruction as a vehicle for describing other aspects of distance learning, such as challenges and strategies for delivering distance learning,⁷ and the support needed for distance learning.⁸ Our report describes the seminar series in detail and offers a set of lessons learned, for those who might want to undertake a similar set of seminars.

We performed an internal needs assessment, which revealed considerable faculty interest in creating web-based, online instruction. So with the encouragement of the Senior Associate Dean for Academic Programs, the Office of Medical Education Research and Development at Michigan State University decided to create a series of faculty development seminar sessions to address the topic. We developed and implemented a six-session seminar series to teach faculty to create educationally sound, well-designed online instruction.

Table 1: Syllabus for *Creating Online Lessons*

SESSION	OBJECTIVES	MATERIALS
Preliminary Work Complete before Session 1	Identify the topic of your online course, unit and lesson. Create a brief outline of the test, practice and explanation of essential content for your lesson.	<ul style="list-style-type: none"> ◆ Pretest on instructional design concepts ◆ Overview of Seminar Series ◆ Online lesson: <i>The Secret of Instructional Design</i> ◆ Examples of courses using Lecture Online
SESSION 1 Instructional Design Basics I	Begin to develop a test, practice and content for a lesson of your choice.	<i>Lesson Development Templates</i> <ul style="list-style-type: none"> ◆ Fact lesson template ◆ Concept lesson template ◆ Principle lesson template ◆ Skill lesson template
HOMEWORK: Complete Lesson Development Templates prior to Session 2		
SESSION 2 Instructional Design Basics II	Complete development of a test, practice and content for your lesson.	<i>Introduction to Principles of Website Design</i> (paper-based tutorial)
HOMEWORK: Complete website design prior to Session 3		
SESSION 3 Creating Web Pages I	Begin to develop content web pages using HomePage 3.0.	<ul style="list-style-type: none"> ◆ <i>Introduction to HomePage 3.0</i> ◆ <i>Introduction to Website Management</i> (Paper-based tutorials available in PDF format to participants.)
HOMEWORK: Continue drafting website pages prior to Session 4		
SESSION 4 Creating Web Pages II	Complete development of content web pages using HomePage 3.0.	
HOMEWORK: Complete drafting website pages prior to Session 5		
SESSION 5 Creating an Instructional Website I	Begin to create an instructional website using Lecture Online.	<i>Introduction to Lecture Online</i>
HOMEWORK: Continue developing Lecture Online lesson website prior to Session 6		
SESSION 6 Creating an Instructional Website II	Complete your instructional website using Lecture Online. Plan for pilot test of web site.	

The committee that designed, developed and taught the seminar series had four members, three of whom were faculty with doctorates in educational psychology. The fourth was the departmental technology coordinator, who had also earned a master's degree in instructional design. All four had designed online lessons and had a special interest in instructional design and distance learning. A fifth person, a faculty member who had designed and taught an online course in the college, acted as a consultant during the design of the series.

Program Design

Participants, who were faculty and staff from the College of Human Medicine at Michigan State University, were required to come with a need to develop online instruction and an identified topic area. We surveyed the participants before the series began and asked them what they wanted to get out of the series. Respondents indicated the following interests:

- Obtain tools for delivering effective online instruction,
- Learn instructional design for the web, and
- Understand the process and tasks needed to get a lesson to the web and the mechanics of the technology and products used to do this.

We structured the seminar series into six two-hour sessions delivered once a month for six months. The core content of the seminar series was the principles of instructional design and of web site design. During each session we presented a didactic lesson followed by in-class work by the participants. Between sessions participants completed the work begun during the session. The syllabus for the series is shown in Table 1.

Principles of Instructional Design

All four seminar designers felt that instructional design was the key to developing effective online instruction, so we decided to devote two sessions to that. In the first session we taught the participants how to design instruction to be delivered online. Before the first session the participants were asked to go through a web site we created called *The Secret of Instructional Design* (adapted from Yelon, 1996).⁹

This web site explained the principles of instructional design, provided examples, tested the participants' knowledge and gave them feedback on their answers. During the explanation the web site was used as a model of how to design online instruction and how to lay out web pages. Figure 1 shows part of

the explanation page of the *Secret of Instructional Design* web site.

The principles of instructional design can be described on two levels: a macro level that describes the entire lesson or even the entire curriculum, and a micro level that describes elements within an individual lesson.

At the macro level the elements of instruction are the goal, objectives, content, methods of instruction and learner evaluation strategies. The goal describes what the learner will be able to do after completing the instruction. The objectives describe what the learner will learn during the lesson. The content describes what will be taught in order to achieve the objectives and the methods of instruction describe how the content will be taught. The learner evaluation strategies describe how the learner will be evaluated to see if he or she has obtained the objectives.

At the micro or lesson level are the elements found in the lesson plans. These can be categorized by where they occur during the lesson. At the beginning of the lesson the objectives and an overview of the main ideas to be learned are stated. The instructor also states the motivation for learning the content, the prerequisites the learner needs in order to learn the content, and the agenda for the lesson.

During the lesson the content will be explained and demonstrated, then the learner will practice doing what the instructor demonstrated (recalling facts, identifying concepts, predicting by using principles, or performing a psychomotor skill). The instructor will provide feedback on the practice and, if necessary, remediation. At the end of the lesson the instructor summarizes what was learned, integrates the lesson with the previous and next lessons, restates the objective, and tests the learner.

The "secret" of instructional design is that *all instructional elements must be consistent with each other*. The content taught should be what the objectives specified, the tests should cover what was taught, and all should be consistent with the goal. Teach what you say they will learn, and test them on what they were taught. In the same way, the lesson-level elements must be consistent with each other and with the macro-level elements.

Templates for Lesson Design

We provided four templates for creating lessons, one for each type of knowledge being taught: facts, concepts, principles and skills.¹⁰ Each type of

Figure 1: The Secret of Instructional Design Web Site

The Secret of Instructional Design

Motivation: Why is this important?

You will be able to use the simple model presented in this brief lesson every time you teach in the classroom or online.

This approach will provide the foundation for your Web-based lesson.

If you apply the secret of instructional design your lesson will be clear to your students.

Objective for this lesson

You will be able to write a rough draft of the most essential elements (explanation, practice and test) to be used in your Web-based lesson according to the secret of instructional design

Overview of the main ideas

The major elements of a lesson, the lesson goal, objective, content, method, and evaluation must be purposefully integrated and consistent.

Prerequisite review: Here are some ideas that are useful to know before you begin this lesson

What is an instructional goal?

An **instructional goal** is a description of the expected performance in a context outside of school of someone who has learned well from the lesson.

For example, a goal is to be able to effectively manage a patient with cancer pain such that the pain is relieved and the side effects are minimal. This is the performance expected after residents have completed a rotation on pain management and palliative care.

knowledge should be taught differently. When learning facts, learners are expected to be able to recall them, so the facts are presented in an organizing framework and learners are given practice recalling the facts. For example, the list of bones in the body can be organized by location in the body, use, size, and so on.

Concepts are categories, and learners are expected to be able to identify items as examples or non-examples of a category. Concepts are taught by providing a definition of the category with defining characteristics, then comparing the characteristics of items to see if they fit the category. For example, a

bone with osteoporotic characteristics is a category, so learners would be taught to identify a bone as having or not having those characteristics. First the characteristics would be described in detail, then learners would be given practice with examples and non-examples of bones with those characteristics.

Principles are rules that allow one to make predictions, explain phenomena or infer cause. Learners are expected to predict or explain by referring to a principle, or else they are expected to infer cause by looking at a case and applying the relevant principle. For example, one can estimate the probability of os-

teoporosis given a person's gender, age, and amount of calcium in the diet.

The instructional design templates provided a fill-in-the-blank framework for writing the lesson elements. After learning how to teach the different types of knowledge and what the lesson elements were, the participants in the seminars completed the appropriate template or templates for their lesson. The first page of the Concept Lesson template is

shown in Figure 2.

Principles of Website Design

It is important to develop the instructional design of the online lesson before designing the web pages that will hold the lesson. The participants brought to session two the instructional design of their online lesson they had developed during session one, in which the principles of web site design were ex-

Figure 2: Partial Template of Concept Lesson

Title of Concept Lesson: _____
Objective: In this lesson you will learn to identify:
Overview: Put most simply, _____ can be defined as:
Motivation: Why learn to identify _____?
1. When are the times and where are places where you would have to identify _____?
2. What are the consequences of properly (or improperly) identifying _____?
Review of prerequisite ideas: To completely understand the explanation of _____ recall these ideas:
Agenda: Outline of the lesson
1. Definition of _____
2. Examples and non-examples of _____
3. How to identify _____
4. Practice in identifying _____
5. Test on identifying _____
Explanation: What is _____?
1. Here is a definition of _____:
2. Here is the best or most typical example of _____.
3. Here is an explanation of how the characteristics of the example are like the defining characteristics noted in the definition.
4. Here are some non-examples that you must distinguish from examples.
5. Here is an explanation of how the characteristics of each non-example are different than the characteristics noted in the definition.

Table 2: Principles of Web Site Design

Content Layout Principles

- Organized: whole and parts clearly related
- Lean: expressed in most efficient way
- Mapped: laid out for quick comprehension
- Accessible: related information is linked
- Navigable: information is easy to find within and between sections

Delivery Principles

- Offer help configuring learners' browsers.
- Make sure everything in your website works and is up to date.
- Pilot test with different platforms, browsers, resolutions and with target learners.
- Refine and retest.

plained. Designing a web site is different than designing instruction: Instructional design involves deciding what to teach, how to teach it, and how to evaluate what the students have learned. Web site design involves deciding how to display text and graphics on a web page, how to organize the content pages, and how to provide navigation through the site.

The principles of web site design were organized into four categories: content layout, page layout, navigation, and delivery. The content layout principles state how to organize the information to be presented. The page layout principles describe how to design the web pages. The navigation principles describe how to place the links. The delivery principles describe how to test the site so it is deliverable to its intended audience. The web site design principles are listed in Table 2.

Upon completion of session two the participants worked on the design of their web page. In sessions three and four the participants learned how to use the HTML editor HomePage to create their web pages. We decided to use HomePage because it was inexpensive and easy to use and it was cross platform (both Windows and Mac). We demonstrated how to create web pages with HomePage, then had the participants work on creating their own web pages based on the web site design they did for session two.

The participants brought their completed web site to session four, where they learned how to upload

Page Layout Principles

- Provide structural cues.
- Keep important information at the top of the page.
- Clearly indicate where users are in the site. Title all pages.
- Include author and copyright information.
- Make a design choice: short or long pages.
- Make your site usable by people of different abilities according to ADA guidelines.

Navigation Principles

- Clearly identify selectable areas (hot spots).
- Indicate progress made.
- Select and place links carefully.
- Label links appropriately.

it to a web server and test it on different browsers and platforms.

In sessions five and six the participants learned to use LectureOnline (LOL), an online course delivery system developed at Michigan State University. We decided to use it to manage the participants' online lessons because it had a robust testing module and a simple interface, and it was free and locally maintained.

Implementation

We implemented the "Creating Online Lessons" seminar series in the fall of 2000. Of the 15 faculty who started the series, eight completed it and four actually implemented their online lessons, but we did not gain access to these. All who completed the series liked the materials, methods, and the sequence of the content and agreed they would recommend it to their colleagues. One participant commented that: "My idea changed as I learned more about what could and what could not be accomplished through the online stuff." The most common reason given for failure to finish the series or complete the online lesson development was that work got in the way and that they had only a little time to work on it. One suggestion was that we provide more information on the other products used to create online lessons, such as HTML editors and course management software.

Discussion

We learned from this series that lots of participant time outside of class is required and that perhaps a six-month seminar series is too long. It is important to determine what schedule would make the sessions not too far apart so that content is not forgotten, yet not too close together so that assignments could be completed.

It is important at the beginning of the series to provide help to the participants on narrowing their topic and thinking it through. They must think about the topic and its suitability for the web before the first session. It is also important to have the support of senior administrators so that faculty will participate.

We are currently determining if there is a further need for and interest in this training among faculty, and if they have the time to participate and to do the homework. We will assess participants' schedules to see how we can better accommodate them.

We are considering changing the attendance guidelines so that the faculty would attend only session one on instructional design. Then they could send staff to attend sessions two through six, the technical sessions on web site design, HTML editing and online course delivery systems. This would better match the actual practice of faculty designing the instruction and staff developing it. When we present this series again, we will ask for access to the completed lessons so we can include a description of them in our report.

Given the increasing use of the web to deliver instruction to geographically dispersed learners, it is incumbent upon offices of medical education and other units responsible for faculty development to prepare faculty and staff to design, develop, and deliver high-quality instruction via this remarkable medium. The faculty development seminar described in this article offers one possible mechanism to prepare faculty and staff for this task.

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