

Computer-assisted Online Continuing Education offered at Washington State University

C. R. Dhein and M. A. Memon

Department of Veterinary Clinical Sciences, College of Veterinary Medicine, Washington State
University, Pullman WA. 99164-5110, USA

Email: memon@vetmed.wsu.edu

Abstract

This paper presents information on our experiences offering online continuing education courses at the College of Veterinary Medicine at Washington State University (WSU). Similar courses can be designed in other disciplines in need of continuing education for their professionals and practitioners.

The use of online continuing education overcomes the potential obstacles of time and distance and reduces expenses associated with continuing education. The asynchronous nature of the delivery system allows participants to spend as much or little time with the materials as they choose, allows them to start and stop when they wish (within the access duration) and gives them the ability to repeatedly access the materials during the available time frame. The online format breaks geographic barriers making it an excellent tool for international education.

Our experiences at WSU with online continuing education support that there is demand for online education by veterinary medical professionals as well as animal owners. The online delivery system, which has evolved at WSU, has been well received by the majority of participants. The design of the delivery system has been kept consistent and relatively simple in order to allow use by participants using a wide variety of computers and methods of internet access.

The team approach used in the development of these courses proved effective and provided for more expedient development of new courses. The content provider was not required to use advanced technical skills to participate. The site designer used templates created by an experienced computer programmer to build the site.

Keywords: continuing education, veterinary medicine, online courses

1. Introduction

Several studies cite time away from practice, travel distance and expense as the most common obstacles to veterinarians participating in continuing education courses [1-4]. Self-study using journals or videotapes, computer assisted learning and distance education has been proposed as methods to overcome or reduce the impact of these obstacles. There has been steady growth of the use of computer assisted and distance education ranging from collaborative telephone networks [5] and mailed floppy disks [6] to online discussions and presentations such as those available through the Veterinary Information Network (VIN) [7] begun in 1991 and the Network of Animal Health (NOAH) begun in 1994.

The wide accessibility of the internet presents unique opportunities to provide online continuing education. Six hundred and ten million people of the six billion-world populations access the internet [8]. Approximately a third of internet users are from English speaking countries.

Fee-based online education courses for veterinarians and for animal owners were offered from August 15, 2000 to Dec. 4, 2002 [9, 10]. During this time period 16 courses were offered, 10 for veterinarians and 6 for animal owners. Each course was offered from 1 to 3 times. There were 10 unique courses offered, 7 for veterinarians and 3 for animal owners. Additionally 9 of these courses were offered “on demand”, which means that they were available to individuals anytime they wished to take the course. Each course consisted of 2 to 7 modules. Each module was approximately one hour in duration.

2. Participants

There were a total of 317 participants in all courses; 142 were registered for veterinary courses, 173 were registered for courses advertised for animal owners and 2 participants registered for both type of courses. Registrants participated in from 1 to 6 courses (1.3 +/- 0.78) [mean +/- standard deviation]. The number of participants per course ranged from 4 to 56 (21 +/- 16). Eighty-six participants (17 animal owners and 69 veterinarians) took courses individually “on demand”. Table 1 summarizes the course offerings. Additional details for courses for veterinarians are available at <http://www.vetmed.wsu.edu/ce/> and at <http://www.vetmed.wsu.edu/pets/classes.htm> for the animal owner classes.

Table 1. Course Topics and Number of Participants

Course Name	Instructor Led 1*	Instructor Led 2	Instructor Led 3	On Demand
Animal Owners				
Alpaca and Llama Reproduction	49	4		7
Female Dog Reproduction	56	26		6
Stud Dog Reproduction	35	16		4
Veterinarians				
Patient Records	5			15
Small Animal Ophthalmology Topics 1	19			Not available
Small Animal Ophthalmology Topics 2	21			3
Small Animal Theriogenology	20	8	7	12
Small Animal Theriogenology 2	5	7		17
Vaccines Part 1	34			18
Vaccines Part 2	26			4
Totals	270	61	7	86
Grand Total				424

* 1, 2, and 3 refer to different sessions of the same program

Participants originated from 38 states (261 participants) and 13 countries (56 participants other than the United States). Tables 2 and 3 summarize the states and countries of origin. The largest group of participants was from Washington State and the largest group of non-US participants originated from Canada. An additional sixty-five people signed into the registration system without registering for a course.

Participants registered for courses online. They had the ability to pay online using a secure credit card server or could submit payment information by FAX, phone, or standard mail. Participant registration profiles were retained to allow registration for additional courses without the need to enter demographic data a second time.

Table 2. States of Origin of Participants

	Unknown	Animal Owners	Veterinarians	Total
Alabama		1	2	3
Alaska		0	3	3
Arizona		6	1	7
California		20	4	24
Colorado		4	1	5
Connecticut		2	1	3
District Of Columbia		2	1	3
Florida		2	1	3
Georgia		3	2	5
Idaho		9	4	13
Illinois	1	1	0	2
Indiana		3	1	4
Iowa		3	1	4
Kansas		1	0	1
Maine		0	1	1
Maryland		2	2	4
Massachusetts		2	1	3
Michigan		6	3	9
Minnesota		3	1	4
Mississippi		1	1	2
Missouri		1	6	7
Montana		4	6	10
Nebraska		2	0	2
Nevada		1	2	3
New Jersey		5	1	6
New Mexico		1	0	1
New York		6	3	9
North Carolina		1	0	1
Ohio		3	1	4
Oklahoma		2	1	3
Oregon		5	2	7
Pennsylvania		7	0	7
Tennessee		1	4	5
Texas		3	1	4
Utah		1	0	1
Virginia	1	3	2	6
Washington		24	50	74
Wisconsin		5	3	8
	2	146	113	261

Table 3. Country of Origin of Participants

	Animal owners	Veterinarians	Total
Australia	2	1	3
Brazil	1	0	1
Canada	20	17	37
Hong Kong	0	1	1
Hungary	0	1	1
Israel	0	1	1
Italy	0	1	1
Japan	1	0	1
New Zealand	2	1	3
Portugal	1	0	1
Spain	0	2	2
Trinidad And Tobago	0	1	1
United Kingdom	0	3	3
Total	27	29	56

3. Course Design

Our online courses were designed and built by a team and course features evolved over the time period described in this manuscript as the need arose for new features. The first author of this manuscript served as the team leader and site designer. An experienced computer programmer created the administrative components of the project including the registration forms, site security, secure credit card site and content templates. The site designer gathered the raw materials (text, audio and graphics) from the content experts and used both the templates and a WYSIWYG (What You See Is What You Get) web-editing program (Microsoft's Front Page ^a) to build the site. Digitization of sound was contracted to a fee-based service unit within our college. Veterinary students were hired to type the transcriptions.

The course materials were developed for presentation in two formats 1) electronic notes enhanced by illustrations and 2) voice-annotated slide shows. The electronic notes were presented as standard hypertext markup (html) pages, and additionally as portable document format (PDF) files for improved print layout. Notes were generated using Microsoft's Front Page. Because the illustration enhanced notes were often large files, information was included at the course site regarding estimated download time based on the slowest anticipated connection speed using a 28 8 modem.

The second format available to participants was a voice annotated slide show. The slide shows had an appearance similar to a classroom presentation of a lecture. Initially these pages were developed as standard web pages (hypertext markup language or active server page) and later the slide shows were generated using Macromedia's Flash ^b. An experienced computer programmer developed a template for the lecture format. The lecture template allowed for lectures to be developed by the site designer who is not trained in advanced programming. A set of media controls was created in Flash which gave participants the ability to allow the Flash show to play from beginning to end automatically, or to page back and forth through the slides, or to reference a list of all slides by title with the ability to selectively jump to a particular slide in the lecture. The Flash files were packaged for display on a web page. Packaging reduces the ease with

which a slide show can be broken into its component parts, providing some degree of security for the images contained within the slide show. The Flash software program allows for different degrees of compression of sound and graphics, which influence the final file size of the packaged piece. Each slide show was available in three different resolutions to give participants the ability to select a resolution compatible with their speed of Internet connection. Some participants had such low connection speeds that they were unable to play even the lowest resolution slide shows. For the most recent course offering an ultra low resolution packaging of the Flash slide shows was created to address this problem. Participants were warned that the lowest resolution slide shows contained graphics that were somewhat grainy and sound that was hollow and often resulted in sibilant s's. Users could also choose the screen resolution (e.g. 640 x 480 pixels, 800 x 600 pixels, etc.) with which they viewed the voice-annotated lectures.

Using the administration program and content templates developed by a programmer, each course was setup by the site designer and required approximately 5 hours to setup the administrative components, web layout, glossary, examination and evaluation form. Each 60 minute module required approximately 18 to 20 hours to complete including the tasks of digitizing and editing the audio tracks, transcribing the audio to text, editing images, creating the electronic notes and creating the Flash slide shows.

4. Course Availability

The first time that a course was offered it was made available for a time period of 7 to 14 The course dates were entered into the course administration program so that the course would automatically be made accessible and close on the times and dates specified. If technical difficulties occurred during the active course period, the time period was extended to assure that all participants had adequate time to access the course materials. If for personal reasons a participant was unable to access the course during the allotted time frame, access to the course could be extended for an individual. The course administration program allows for extension of access time for all participants or for a single participant, depending upon the reason for the extension.

During the course period, participants could log on and access the course materials anytime. Our format for online course delivery is totally asynchronous which means that there are no timed events requiring participants and instructors in are online at the same time.

5. Interactions between the Course Participants & Instructor

During the course offering, instructors answered questions from participants using a threaded discussion forum. Initially the threaded discussion was developed using the discussion forum native to Microsoft's Front Page. Compatibility issues of the discussion forum with non-Microsoft web browsers' lead to our decision to custom write a discussion forum. The forum can be viewed and tried at <http://webdev.vetmed.wsu.edu/discussions/OnlineCourses/Demo/view.asp>. Instructors were asked to respond to questions in the discussion forum within 48 hours during the duration of the course offering. Because participants could access the course materials any time during the open course period, they may not see all the questions and answers posted. Therefore at the conclusion of the course, all the questions and answers generated during that course period were e-mailed to course participants using an e-mail list generated automatically from the registration program. The e-mail list was also used to introduce the

class at the beginning of the course period, to address any anticipated technical problems, and to announce any changes in the available dates for the course.

6. Course Support

Supporting materials available to participants included a content-specific glossary and technical help. Glossaries were generated from the course notes using a glossary development tool created at Washington State University. <http://www.vetmed.wsu.edu/glossary/glossary.asp>. Technical help was provided in several formats. Each course site included a link to a help page, which addressed anticipated problems. The help file at <http://www.vetmed.wsu.edu/ce/help.asp> provides an overview of the course format as well as trouble-shooting tips. Email links to the Instructional Technology Unit of the College of Veterinary Medicine were available throughout the course web site for assistance with specific problems. For later courses we contracted with a larger group on campus called the student help desk, which provides technical assistance to students, faculty, and staff at Washington State University.

7. Examination and Continuing Education Credit

At the conclusion of each course a multiple choice examination was posted in the courses for veterinarians. The access to the course materials was extended an additional two weeks to allow participants to take the examination, so in reality, participants had access to all course materials for approximately four weeks, but only direct access to the instructor for the first 7 to 14 days. The discussion forum was turned off at the end of the two week period and in its place was substituted a list of questions and answers generated during that course period. Participants received continuing education credit if they received a passing score on the test. It was the responsibility of each participant to determine from their State licensing organization whether continuing education credits for their state could be fulfilled by online courses. Upon receipt and grading of the examination, participants received an email notice that contained a link to an individualized continuing education certificate they could print for their records. One hundred and thirty six examinations were submitted electronically. A technical problem in the exam module resulted in the submission of a small number of examinations by FAX or in the body of an email message and these submissions are not included in the total of 136.

8. On-Demand Course Offerings

After the first offering of the course, some courses were offered a second or third time. Additionally, courses were made available on demand. On demand offerings allowed individuals to sign up to access the course materials for a two-week block of time of their choosing. They did not have access to a discussion forum to ask questions, but they did have access to previously asked questions and answers. The on demand courses required that the participant interact with the course materials and take the examination within the two week period, although the course administration program allowed us to easily grant extended access when necessary.

9. Evaluations

Each course had a voluntary evaluation form questioning participants about content, design, and technical issues. Participants were asked to rate each lecture. Table 4 presents information related to satisfaction of participants with content and format of the course. Veterinarians and thirty-nine by animal owners submitted thirty-one evaluations.

Table 4: Evaluations by Participants (Reported as Percentage)

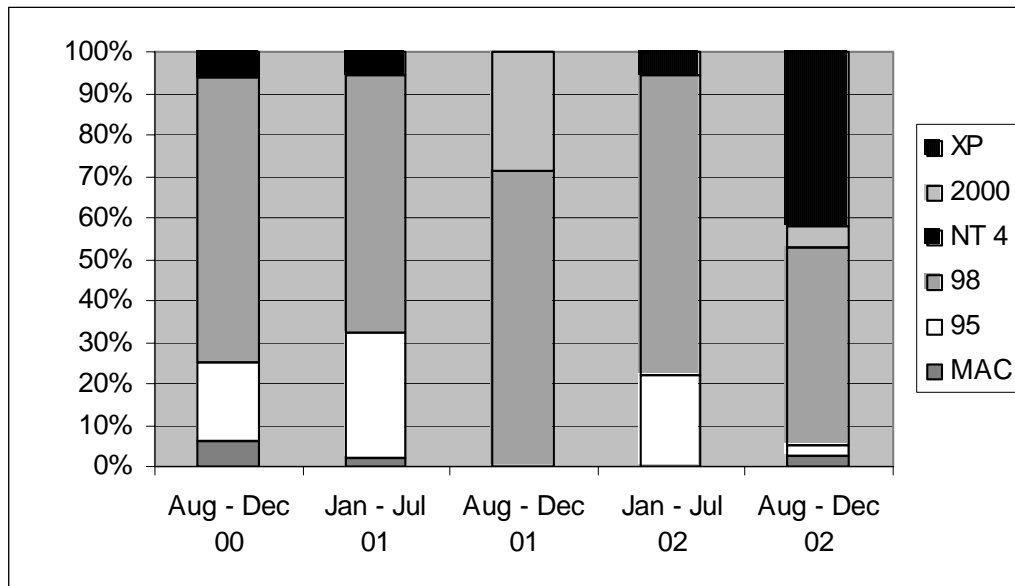
Animal Owners		
	Lectures	Format
Excellent	58.6	59
Good	35.8	28.2
Fair	5.5	12.8
Poor	0	0
Veterinarians		
	Lectures	Format
Excellent	54.3	58.1
Good	36.4	35.5
Fair	7	3.2
Poor	0.8	3.2

10. Technical Issues

Most technical problems were related to slow internet connections resulting in long delays in file downloads and sound tracks skipping or not playing. The administration program captured information about each user's operating system and browser type and version. We gathered this information in order to trouble shoot technical problems and if indicated, to tailor the courses to the needs of participants. The majority of users accessed our courses using a windows-based computer and the Internet Explorer (IE) browser. Most participants used relatively current operating systems and browser versions. Table 5 presents an overview of operating systems and browsers. Each participant should view this information only for its trends so that if a participant took more than one course, their computer system profile reflected the most current operating system and browser they used, over writing older data.

Users could choose the screen size used to view the voice annotated lectures as well as the screen resolution (e.g. 640 x 480). In the evaluation participants were asked which video resolution and screen size they used. Ten used the high-resolution file, eleven used the medium resolution and twelve used the low resolution. Two used a screen resolution of 640 x 480 pixels, twelve used a resolution of 800 x 600 pixels and seven used a resolution of 1028 x 768 pixels.

Table 5. Trends in Operating Systems



Release Dates of Operating Systems

- 1995: Windows 95
- 1996: Windows NT 4
- 1998: Windows 98
- 2000: Windows 2000
- 2001: Windows XP

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Footnotes

- a. Microsoft Corporation, One Microsoft Way, Redmond, Washington 98052
b. Macromedia Inc. 600 Townsend Street, San Francisco, CA 94103