

# **Overcoming the Challenges of Building Distance Learning Programs in Higher Education**

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## **Abstract**

Developing an online program requires overcoming many obstacles. First, people need to be able to access learning from their homes or at work - wherever they feel most comfortable engaging in learning. This means using the Internet and all the disadvantages that it entails: bandwidth issues, student resistance to technology, lack of faculty trained in instructional technologies, and the enormous price tag associated with online training. This paper will address how a Distance Education Program at the University of Louisville overcame or is currently overcoming these obstacles in order to deliver high quality, nationally certified programs for teacher training in the United States.

## **1. Introduction**

The University of Louisville (UofL) Department of Special Education started offering distance education courses in 1993. The decision to convert from traditional face-to-face delivery to distance learning formats was not voluntary; it was forced. Funding cuts on the national and state level had a devastating impact of programs for low-incidence disabilities, such as visual impairment or severe developmental disability. These programs traditionally attracted only three to four graduate students a year. The university was no longer willing or able to support programs with such low enrollment, so the Department of Special Education was faced with a choice: either lose the programs or find innovative ways to boost enrollment. The Department of Special Education, under the leadership of Dr. Denzil Edge, Chair, initiated the Distance Education Program and began the process of converting the department's courses to an interactive satellite delivery format.

Since 1993, the Distance Education Program has grown to 50+ courses per year serving Kentucky and attracting an increasing number of out-of-state students. The program originally delivered courses via interactive satellite television. However, disadvantages inherent in the satellite delivery technology limited student enrollment. First, students needed access to a downlink site. Students without access or unable to get to the site during broadcast times (generally late afternoon to early evening) could not enroll. Second, the targeted audience consisted of older persons with careers, families and limited time. These students wanted access to learning from their homes, at their convenience. Therefore, in Spring 1998, the distance education staff began exploring online learning technologies.

Developing an online program required overcoming many obstacles. The objective was to reach as wide an audience as possible; specifically, to reach people in their homes or at

work - wherever they felt most comfortable engaging in learning. The online approach meant using the Internet with all of its attendant disadvantages: bandwidth issues, student resistance to technology, and the enormous price tag associated with online learning. This paper will address how UofL has overcome or is currently overcoming these obstacles in order to deliver high quality, nationally certified programs for teacher training in the U.S.. The narrative is illustrated with finished products that readers may access at the URLs provided.

## **2. Using media**

Bandwidth was one of the most technologically challenging issues. Most of the targeted audience connects to the Internet at 28.8 or 56K. How could they receive a multimedia-rich course at this speed? The Distance Education Program had already dabbled in video streaming. Satellite broadcasts were simultaneously digitized and sent over the web for students unable to access a satellite downlink site. In fact, many students preferred participating at home via video streaming rather than staying late at their workplace/school equipped with a downlink. Thus, the online program was initiated with video streaming. Unfortunately, it is still technologically unfeasible to cram a video down a phone line. Video streaming of anything more than a talking head requires attention to learning objectives and careful selection of tools.

The satellite classes were filmed in the university's studio by professionals. The classes also included pre-taped video clips from local schools and agencies as well as PowerPoint slide presentations. Therefore, the beginning product was of high quality. The signal was captured and encoded using Windows Media technology. The choice of encoding was dictated by finances; specifically, the server component of Windows Media tools is free.

The streamed version of the televised broadcasts produced relatively clear audio and video when the professor and guests were featured but quickly grew indecipherable during PowerPoint presentations and the pre-taped roll-ins due to image size and buffering. Some of the more active scenes, such as children taped during an activity, often rendered a swirl of colors rather than a picture.

Sample of streamed media

<http://reflector-1.louisville.edu/burke0418.asx>

Clearly, video streaming was not the quality of video desired for online classes. However, the Distance Education Program had a library of thousands of hours of archived video that illustrated points essential to the courses' learning objectives. Rather than eliminate essential content from course development, a decision was made to alter the video substantially. The Distance Education Program team came up with a number of solutions, which will be presented here with examples.

*Solutions illustrated with sample media*

- slow down the frame rate;  
Normal video is recorded at 30 frames per second. When video is compressed to accommodate the Internet, it loses image quality. Lowering the frame rate to five frames per second allows the encoder to capture better quality images and, although the motion becomes jerky, the resulting clip is clear to the viewer.
- use pictures and audio stream;
- have the professor do slide narrations;
- use the film strip approach;
- incorporate longer clips to be sent by CD to classroom set-up.

In choosing a solution, it is important to keep in mind the purpose of the video clip, i.e. the learning objective. In the clip of Mrs. Wishy Washy (Clip A), the motion is important. It illustrates a full-body participatory activity and the inclusion of the child into the activity. Clip B focuses on the modifications made to the child's environment. Here pictures and an audio stream clearly demonstrate how the child is included (see Figure 1). In clip C the main point is conveyed by dialog; therefore, the cartoon approach works well.

Chart 1. Alternatives to streamed video.

Examples are available at

[www.louisville.edu/edu/edsp/distance/department/conferences.html/](http://www.louisville.edu/edu/edsp/distance/department/conferences.html/)

Clip	Learning Objective	Possible Solution	Example
Talking head	Impart information in lecture style	This should be avoided. Use slide narration.	Shawna Ely
Motion illustrates point	Student sees how to perform an action, how to use physical space,	Slow down frame rate to 5 frames/second, keep clip length to maximum of 4 minutes	Clip A-JCPS: Kindergarten
Images important	Illustrations of an object	Use pictures inserted into text with audio stream or use slide narration	Camp Taylor Figure 1
Interview or conversation	Information contained in dialog addresses learning objective	Printed text, pictures + text, film strip, slide narration	Camp Taylor Figure 1
Demonstration: long clip	Enhances student's concept	CD-ROM plus text background and instructions	Unavailable

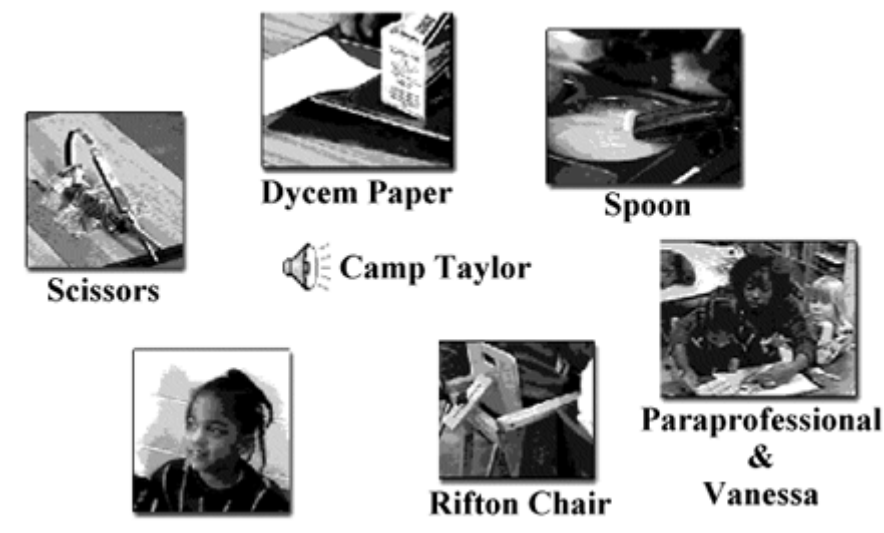
A brief description and its specific purpose should introduce the media. To further engage the student, an activity or task involving the media should also be included. An example follows.

### Figure 1. Example of film strip

Camp Taylor Elementary Head Start Program

Many low tech, low cost modifications can be made to help the child with disabilities participate in all activities, both in and outside the classroom. In the example below, Vanessa, a pre-schooler with multiple disabilities at Camp Taylor Elementary, joins her non-disabled peers in the cafeteria and the classroom with the help of a rifton chair, dycem paper, an adapted spoon and scissors.

View and listen to the multimedia presentation below and then list examples of low-tech modifications that you have made or seen at your school. Submit your examples to the forum, under the thread entitled Modifications.



### 3. Overcoming student resistance

The Distance Education Program's targeted audience is older and less technologically savvy than the average college student is. Additionally, when a course was converted to a distance learning format, that became the only delivery option thereby compelling on-campus learners to use the same distance learning technologies. Resistance to the delivery format was met by providing services superior to those on campus. University offices (i.e. Admissions, Registration, Bookstore and Library Services) collaborated to provide convenient, quality support for distance learners. Distance Learning Library Services (DLLS), for example, provides remote access to the full-text of library material in licensed electronic databases. When desired library resources were not available online, DLLS personnel obtain the items from other sources and delivered them via the student's preferred delivery method: first-class mail, fax, or email [1].

High interactivity was essential in order to disarm the common complaint about online learning's lack of humanity. Learners in the Distance Education Program communicate more with faculty and classmates than most on-campus students. How the Distance Education Program has fostered a highly interactive environment and how students' attitudes have changed toward distance learning will be discussed. Software applications for interaction will be demonstrated.

Know your audience; know what motivates its members. The Department of Special Education audience consists of teachers. Teachers are motivated by a need for continuing education and by a desire to move up the pay scale at their school. Most teachers are older, working professionals with families and busy schedules. Therefore, the ability to access educational opportunities from their homes and schools meets their needs. Post-course evaluations indicate that most students would willingly take another distance learning class with the primary reason being "convenience."

Members of this potential audience of teachers are, initially, highly resistant to distance learning. They are often technologically challenged: they don't use e-mail; they don't surf the Net; and they don't recognize basic computer terminology. Resulting initial phobias must be overcome for successful learning to occur. When online classes were introduced, the required technical skills for successful learning quadrupled. Before tackling course content, students must learn how to communicate by e-mail, participate in the forum and chat rooms, upload and submit assignments electronically, and navigate the World Wide Web. In order to keep the technology from overwhelming them, they must master these technical skills before tackling course content.

Students were originally brought in for a face-to-face orientation, which included the use of technology. As the out-of-state student base increased, it became unreasonable to expect students to attend an on-campus event. Subsequently, a series of online materials was developed for the two-day orientation. At first, the printed materials were delivered to the students; however, print turned out to be costly and ineffective. Students often scanned the printed items and then promptly forgot much of the content as evidenced by subsequent phone questions about material that had been included in the printed documents. Placing the materials on the Internet where they were available "on demand" when the student felt the need for the information seemed much more efficient. Students are also expected to engage in online library tutorials, review library help sheets, and complete library skills tests [1].

A tutorial unit that acted as a prerequisite for the course content was designed for the online courses. Students cannot enter the first course unit without completing the tutorial. Within the tutorial, a separate module trains and tests students on each necessary skill. The tutorial is also available throughout the course for review and reference. The tutorial needed to be informative and to train rather than just provide information; it also needed to be engaging enough to motivate student learning. The tutorial contains a fictional character named Cold War Connie, who is inadvertently sent back in time to find herself trapped behind enemy lines. At Connie's request, the student performs a series of tasks,

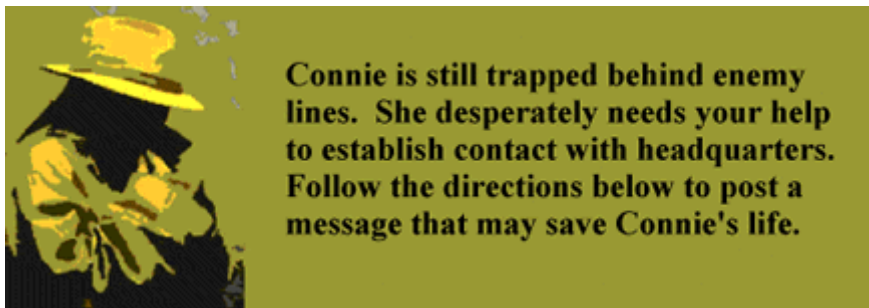
which in turn allows the student to master a skill needed for the course. Figure 2 contains an excerpt from the module on navigating the forum.

## **Figure 2: Tutorial**

### Using the Forum Effectively

The forum is an electronic bulletin board that facilitates communication among students and the instructor. You will often be asked to post responses to readings and possibly assignments to the forum. Remember that any message posted to the forum can be read and responded to by all participants in your course. Below you will learn how to find threads, i.e. topics, in the forum and respond to messages.

Connie, who as you will remember, was accidentally transported back in time to find herself caught in the middle of a war and recruited as a spy, will assist you in mastering the forum.



Connie has embedded a secret message entitled Introductions for you within the forum. You must find her message and respond by introducing yourself so that she will know you are on "our" side.

### Instructions

Click [here](#) to open a new browser window for the forum.

Click on List Messages by Thread as seen below.

Look for Connie's message entitled Introductions. You may need to move from page to page to find the appropriate thread. At the top of the page are navigation links: previous, next or numbers [41] [42] [43], etc. Clicking on these links will take you to the corresponding page.

[\[Previous\]](#) [\[41\]](#) [\[42\]](#) [\[43\]](#) [\[44\]](#) [\[45\]](#) [\[46\]](#) [\[Next\]](#)

[Article Review \(Humpty Dumpty 4-09-00\)](#)

[Re: Article Review \(King's Man 4-25-00\)](#)

[Re: Article review \(King's Horse 4-27-00\)](#)

[Unit 10 Videos \(Scorese 4-21-00\)](#)

[Re: Unit 10 Videos \(Bernardo Bertolucci 4-22-00\)](#)

[Introductions \(Connie 4-29-00\)](#)

#### 4. Cutting costs

Online learning is expensive. An enormous initial expenditure is required to develop and upload the equivalent of a one-semester course. Estimates range from \$15,000 to \$30,000. At UofL, we knew that we could not afford to offer whole programs via distance learning technologies unless we developed procedures that would drastically reduce expenses. Services already on the market were investigated [2]. Approaches used at various other institutions for implementing distance learning were reviewed [3]. Many of the examples presented added burden to the user: user-end hardware or software that would further alienate an already resistant target audience. Others placed additional burdens on the institution/program: high learning curve for instructors, server maintenance, and 24/7 help desk service. Because the Distance Education Program enrolls students from across the United States, the distance learning technologies needed to be created for the Internet not an Intranet. The motivation was to design and implement a very cost-effective way of converting traditional courses to media-rich online instruction.

One of the simplest ways to reduce cost is to obtain the course content from the subject matter expert in the required format. During the planning stage, an instructional designer meets with the instructor to outline the materials needed and to develop a timeline for the project. The instructor is expected to submit the following materials in electronic format:

- course syllabus,
- assignments with due dates,
- tests and quizzes,
- text broken down into units and modules,
- web sites,
- citations for library material needed for reserve,
- video footage with clearly marked in and out times,

content for slide narrations.

These materials are then separated into video components and text components. The text components are cut and pasted into eFormatics, an online learning software application developed in the UofL Distance Education Program. The eFormatics software, based on nearly a decade of experience with distance learner needs, was designed to incorporate many "next generation" features [4]. Student assistants, hired for ridiculously low wages, do most of the physical cutting and pasting. The multimedia, including slide narrations and digitizing and editing video, is also done in-house. Multimedia is produced on a Macintosh G-3 with a 36-gigabyte hard drive, utilizing MotoDV (video capture), Adobe Premiere (editing), Media Cleaner Pro, and Windows Media Authoring Tools (encoding and publishing).

## **5. Summary**

Challenges of building distance learning programs in higher education include: producing high-quality media that can be delivered via the Internet over 56K (or lower speed) modems; overcoming student resistance to mastering additional technology skills; and providing interactivity while, simultaneously, finding ways to cut the costs of production and delivery. The UofL Distance Education Program has met these challenges by: obtaining course content from instructors in the required format, developing alternative solutions for the incorporation of media; using student labor for media production; and developing collaborative relationships with other units of the university (e.g. library). Additionally, based on nearly a decade of experience with the needs of distance learners, the UofL Distance Education Program has developed the eFormatics software system. The eFormatics distance learning software platform enables the delivery of highly interactive, media-rich course content that enables distance learning via the Internet in a cost-effective manner.

## **6. References**

[1] Edge, S. and D. Edge, "Building Library Support for Distance Learning" in *Libraries Without Walls 2: The Delivery of Library Services to Distance Users*. Library Association Publishing, London, England, 1998, pp. 14-32.

<http://www.louisville.edu/library/distance>

[2] Reisman, S. and D. Edge, "Strategies of Adoption of Web-based Distance Learning in Institutions of Higher Education," *Proceedings of the Association for Information Systems 2000 Americas Conference on Information Systems (AMCIS 2000)*, August 10-13, 2000, Long Beach, California (in press).

<http://www.csulb.edu/web/conference/ais2000>

[3] Tschritzis, D.T., "Reengineering the University," *Association for Computing Machinery. Communications of the ACM* (42:6), 1999, pp. 93-100.

[4] McHenry, B.A., "New Features for Learning Management Systems," *ALN Magazine* (3:2), 1999. [http://www.aln.org/alnweb/magazine/Vol3\\_issue2/McHenry.htm](http://www.aln.org/alnweb/magazine/Vol3_issue2/McHenry.htm)

## **7. About the Authors**

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