Multimedia in Online Courses:
Bells and Whistles or Solutions?

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The *American Heritage Dictionary* defines multimedia as "the combined use of media, such as movies, music, lighting, CD-ROMs, and the Internet, as for education or entertainment." *Merriam-Webster Online* says that it is "using, involving, or encompassing several media."

Endless possibilities are available for presenting educational content through text, audio, video, animations and interactions to create meaningful learning environments that foster and support learning. Such an incorporation of multimedia can be used to address a variety of learning styles (Khan, 1997). New software, increased bandwidth, faster computers and the multimedia capabilities of the Internet have pushed online content beyond the bounds of hyper-linked.

But should multimedia be used just because it is the latest cool thing? Or is there a way to determine the "value-add" of a particular form of media for a given type of content? What are the issues that must be considered when designing multimedia for online courses? These are some of the questions addressed in this presentation.

Considerations

There are many things that need to be considered before you begin recording your audio or video, or creating your Flash animations or movies: Does the content change frequently? What are the different ways to present this content? How much time and what type of resources do you have available for content development? Is it absolutely necessary to produce a full-blown multimedia piece for all of the content or could you focus on important concepts and issues?

Why are the answers to these questions important? Consider this: Do you find it necessary to update your content every 12 - 18 months or is it fairly static? The development time for Flash movies is approximately 40 - 70 hours per 1 hour of finished movie, making frequents updates a colossal job. Audio development is much less, approximately 10:1, so you could update high-quality graphics and audio clips in much less time. Flash is not an easy program to learn, it requires some expertise with graphics and multimedia layout. If you want to do it yourself, the learning curve is high. If not, do you know someone with the expertise necessary? Even though you may want to present a full-length lecture in Flash, are there other types of media you can use to present the content just as (or more) effectively? With production times so enormous with certain types of media, you may want to think about other types with lower development times if your content changes frequently.

The examples of media that I am showcasing in this presentation were developed in The Center for Distance Education (CDE) at the University of Texas in Arlington (http://distance.uta.edu) and The Center for Distributed Learning (CDL) at the University of North Texas (http://www.unt.edu/cdl/about_cdl/index.htm).

Background

CDE was established, as a full-service center so instructors didn't use their course development time trying to learn html or how to create digital graphics. CDE works as a team with the instructor to providing necessary resources to develop high quality, media-rich content for the web. CDE's model: Each course has a project manager/instructional designer who coordinates all aspects of the development,

at least one tech/media specialist, a student support specialist and administrative support. Each instructor usually hires a graduate student to assist in the development process. Courses are designed as student-centered, content-driven courses.

This model is a highly collaborative process, from the beginning of the project when the designer and instructor start talking through the existing face-to-face course, to the end when the instructor and student helper review the course before release. Each course takes 9 - 12 months to develop.

In 1999, UT Arlington, UT Dallas, and UT TeleCampus began working together to put a Masters of Electrical and Computer Science Engineering online (http://www.telecampus.utsystem.edu/programs/Csee/csee.html). The joint venture includes 12 course developed by each of the two UT components and hosted by UT TeleCampus. Most of the examples used in this presentation are from this program, with some additional examples from other courses.

Text, Audio, and Graphics

The first two courses presented some challenges because of the number of equations used in the text. HTML doesn't support equations created in many of the equation editors, so we had to convert the equations to gifs and import them into the html. We had to work with the gifs and text to make them 'look' like they go together. We embedded short audio clips on each page to enhance learning and retention. CSE5311 - Design and Analysis of Algorithms - http://www.connectedcreativity.com/eli/Engineering/5311.htm)

Flash

But what if you want to highlight part of the equation in synch with the audio? Static graphics and text with audio clips just wouldn't do the job. The content in the Electrical Engineering courses presented an even greater challenge. Most of their content consists of complex equations and math. The teaching style of the EE instructors incorporates using a visual cue, such as highlighting, to lead the students through the math. Many times they also use diagrams to illustrate the concepts (Gillani and Relan, 1997). We decided that Flash would be an appropriate medium to produce this type of content. EE 5361 - Fundamentals of Telecommunication Systems - http://www.connectedcreativity.com/eli/Madison/Flash_1.htm

We recorded audio and animated over thirty hours of lecture for this course. This course took us over a year to develop, an enormous amount of development time that we could not easily afford. What did we learn? We put months of development time into the first two Flash courses, so we looked for ways to reduce the amount of Flash needed to develop, while at the same time still presenting the content fully and clearly. The next instructor wanted to focus on the database concepts only, so we targeted just the functions and animated them. Most of the lessons in this course have 5 - 10 short animations that are only a few minutes long, a big improvement over trying to animate full-length lectures.

Another technique that saved considerable development time is that we also encouraged him to write a script and rehearse before going into the studio. He read from his script, which helped cut down on the amount of time necessary to edit out the ums, ers and stumbles in his audio. The instructor commented that, although it took extra time to prepare before going into the studio, he felt much more at ease behind the microphone. CSE 5330 - Database Systems - http://www.connectedcreativity.com/eli/Madison/Flash_2.htm the development time for this course was about a third of the first two courses. We were extremely pleased.

Here is one of the last courses developed for this program. We kept getting better at this all the time. After viewing these movies for this course, the instructor said that they illustrate the concepts better than he can

ever imagine doing in the classroom. In fact, many of the instructors commented that they would like to use the media in their classroom as well as in their online course (Brooks, 1997). EE 5301 - Advanced Engineering Analysis - http://www.connectedcreativity.com/eli/Madison/Flash_3.htm in this second generation of the player, we added the frame around the movie and enhanced the graphic interface and functionality to include the scrolling copyright statement and timer window.

PowerPoint

One of our instructors had all of his lectures in PowerPoint presentations, complete with extensive animations. We worked with PowerPoint to sync the audio with the slides, but the end product was not cross-platform. So we created Flash movies that resembled the look and function of PowerPoint while giving us the flexibility to sync audio and add detailed highlighting. CSE 5348 - Multimedia Systems - http://www.connectedcreativity.com/eli/Madison/pptflash.htm. Our development times were still very high, so we continued to look for another solution.

A year after finishing CSE 5348, another professor came to us with fully developed PowerPoint lectures. Again we looked at PowerPoint as a way to present content that would not incur the vast amount of development hours of Flash. We discovered a way to sync the audio with the PowerPoint slides and create a QT movie that is cross-platform and cross-browser. The development time for this type of media is about half of the time to develop Flash. The only problem was that development had to be done on a Mac.

Shortly after we completed this course, we came across a nifty little program called LiveSlideShow (http://www.liveslideshow.com/) that automated this exact process, speeding up development time to 8 hours per 30 minutes of content, and it was cross-platform for the development stage. Quite an improvement!

Well into our Flash development learning curve, we also were able to create some really cool stuff. We continue to look for better ways to present our content and make it more interactive. We created an interactive self-quiz mechanism for a basic Math course. Students are able to check their understanding of the concepts using this player. http://www.connectedcreativity.com/eli/Madison/coolstuff.htm.

Lessons Learned and Considerations

We learned many things as we developed these courses. The most important lesson learned was how much time it takes to produce various types of media. Because we struggled with development times with almost every course, we became more discerning in our decisions of which type of media to use. We always used a balance of: What does the content need? What does the instructor want or need? What are the options? What are our available resources? Ultimately, if the content really demanded that we use Flash, we devoted as many resources to that course as possible to get them completed on time.

To get a grip on the different types of media available and the development times for each, we created a matrix that can be used as a guide for instructors and designers in making media decisions- Media Matrix - http://www.connectedcreativity.com/eli/Madison/matrix.htm. The information on this matrix contains our best estimates for development times based on our experiences**.**

What other issues need to be considered when deciding to use a type of media? Let's go back to the questions posed earlier. Is this content changing frequently? With development times for Flash at between 50 – 70 hours per hour of Flash, you wouldn't want to use Flash for content that needs to be updated every 6 months, unless there is no other way to display the content clearly and understandably. If this is the case, build extra development time into your overall timeline.

What are the different ways to present this content? Even though Flash may be a beautiful way to present the content, are there other ways that do not require the resources or time of Flash that will be just as effective? The example from EE 5361 demonstrated why we went the 'distance' with Flash for this content. How much time and what type of resources do you have available for content development?. If you don't have the skills to use Flash, where can you find them? Graduate Students, Librarians, Art Students, others? There are professional Flash developers, with a going rate of around $100 per hour.

Is it absolutely necessary to produce a full-blown multimedia piece for all of the content? The reason I bring up this question is because we animated 22 1½-hour lectures for our first two courses. No wonder it took us over a year to finish! But we learned our lesson and from that point forward started working with the instructors to whittle down what they perceived as 'lectures' to just the concepts. Try animating just the concepts that really need animation. Mix and match audio, text, animated graphics and Flash to give a good presentation of the content and give the students many ways to play with it.

What Are the Do's and Don'ts of Using Multimedia?

Do explore opportunities to create and incorporate various types of media into your courses. Don't be afraid to experiment! Do seek out resources on your campus that you can use to accomplish this. Is there a TV studio where you can record short video clips and audio clips to get high-quality files? Are there people on campus who would be willing to collaborate with you on your project? For example, is there a theatre student who will record voice-overs for your lectures if you don't think you sound good when recorded?

If you are recording audio or video to be used in your multimedia, don't go into the studio un-prepared! Write a script; rehearse your script and STICK TO IT when you are recording. You will waste valuable time during recording and the resulting editing process if you don't rehearse. Also, being prepared helps you sound much more professional. English was not the native language of many of the instructors I worked with. Most of them found that they were much more comfortable with the recording process and felt they sounded better when they followed a script.

Have all of your materials prepared ahead of time. Do not try to draw diagrams or write notes during the recording session. Even a couple of seconds of lag time translates into deadly silence in the finished product.

Suggestion: Prepare the media for one piece of content and put it all together into one complete lesson to see if it works (and to see if you like it). This will also reveal how much time is will really take for development and what issues are going to arise.

Bells and Whistles or Solutions?

Is using multimedia in online courses effective pedagogy or just bells and whistles? I hope that I have demonstrated that multimedia can be extremely effective in online courses, and that I have brought to light many of the issues and considerations that must be addresses before one decides to jump into development (Hall, 1997). I also hope that the examples I've shown illustrate that even though much effort is necessary to produce quality multimedia, it is definitely worth it.

References

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Biographical Sketch

Eli Collins-Brown has been involved in web development and online learning for the past five years. Most recently, she completed a three-year project at The Center for Distance Education at the University of Texas at Arlington as the Project Manager and Instructional Designer for an online masters in Electrical and Computer Science Engineering. Prior to that she was part of the Intranet Development Team for Harris Methodist Health Plan where she wrote and taught a Web Design course for employees. Currently she is working on four courses through the Center of Distributed Learning at the University of North Texas. Eli has been an active member of the Texas Distance Learning Association (TxDLA) for four years, serving in many capacities, most recently as the association's website manager and on the board as the Chief Information Officer. Eli received her M.Ed. in Educational Research from Texas Christian University in 2001. She will start working on her doctorate in Curriculum and Instruction at Illinois State University Fall 2003.

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