IT 7210

Distance Education

Best Practice: Media Usage

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## Introduction

As technology plays an increasingly dominant role in the design and delivery of distance education, so has the potential for increased cognitive load through inappropriate use of media, in attempts to increase interactivity between the learner and the content.

The focus of this paper, therefore, is around the best practice for media placement to create meaningful interactivity in distance education. Two factors are contributing to the increased use of interactive media in distance education. The first is 'cheap' and readily available network bandwidth to ensure that performance is not negatively impacted by forcing the learner to wait for a media file to load (either from the Web or a CD). This is also attributable in part to the proliferation of faster, higher performance PC's. The second factor is the availability and use of highly sophisticated authoring environments, making it easier to produce interactive media objects, and then embed them in learning content.

## Risks

Just because it is easy to add graphics to content, doesn't mean you should. We're all familiar with the cliché, "A picture is worth a thousand words". The caveat to this, according to Chopeta Lyons, is that it has to be the right picture and, sometimes, getting the right picture still isn't enough. Even highly relevant graphics, if executed poorly or laid out haphazardly will not enhance learning, but can quite possibly depress it. In a 1989 study, Robert Rankin reported that 92% of learners' comprehension mistakes about graphics were caused by four reasons:

1) layout-related difficulties;
2) lack of caption/picture correspondence;
3) unfamiliarity of the graphical convention; and
4) misinterpretation of the graphical layout.

Research indicates that learners can be overloaded with too much stimuli in computer or Web-based courses. For example, both watching an animation

and being presented with a textual description to read at the same time results in cognitive overload because the visual channel is required to view both—the animation and the text. Cognitive load may be reduced by replacing the text in this example with an audio narrative, thereby distributing the two messages along two separate channels, visual and auditory (Moreno and Mayer, 2002). A word of caution is warranted, to say that more technology is not always better. The selection of media and technology should be driven by the required skills that the learner is supposed to gain, in addition to the complexity of the content to be presented.

## Opportunities

In an excerpt from the *Principles of Best Practice for 21$^{st}$ Century Education*, Mark Nichols summarizes the best practice of Meaningful Interactivity as providing opportunities for students to enhance or apply what they are learning. Nichols believes that it is not enough to just have students active in their learning; any tasks they perform as a part of their learning process must be carefully formulated so that they are somehow meaningful and educationally useful. Meaningful interactivity requires students to actively process information and apply it to real world contexts, perhaps through simulation and problem-solving. However meaningful interactivity need not involve expensive technologies.

## Best Practice

Michael Allen offers two general guidelines for using media effects (text, sound, graphics, photographs, animation, color, and timing) to create meaningful interactivity in instructional content. The first is to use each medium and each media element for a reason. Restraint is generally good advice with media. So is being purposeful. That is, don't do things just because you can. Use media for defined purposes, or don't use them at all.

Allen's second guideline, related to the first, is: take it off. It takes discipline to avoid creating unnecessary elements and even more discipline to delete them once they've been created. If there is no reason for media elements to be

included, they will probably do learners a disservice if you leave them in. Quite often, less is truly better.

Allen provides a set of five criteria for effective use of graphics, which are summarized in the table below.

| | |
|---|---|
| **Comprehensible** | Images should be visually clean and crisp. |
| **Meaningful** | Images must be understandable at the learner's level of knowledge. |
| **Compatible** | Styles and colors should complement and fit in with other design elements. |
| **Consistent** | Graphics should be consistent in terminology (callouts, labels, etc.). |
| **Valuable** | If providing redundancy, graphics should reinforce either hard-to-understand content or things that are important to remember. If graphics are delivering the message, they should be nontrivial lest learners conclude all graphics are superfluous and ignore them. |

## Conclusion

The primary medium for distance education has historically been text. Words provide a quick and inexpensive means for communicating content. Research has demonstrated that learning can be enhanced by using other types of media (e.g., photographs, images, audio, video), as well as other medium for delivery in either synchronous or asynchronous formats.

The downside is that learning (i.e., transfer of knowledge) may be inhibited by redundancy and the use of non-integrated graphics. One way to ensure that interactive media is effective is to employ sound instructional design practices. Graphics must be designed to promote the formation of the new mental models that will support the goals of the instruction. Specifically, always use media purposefully and only when it enhances the learning experience (this requires some understanding of the types of learners.) When in doubt as to how much interaction with content is appropriate, follow the axiom that less if probably more.

## References

Nichols, Mark, Palmerston North, New Zealand. *Educational Technology & Society* 5(2) 2002.

Lyons, C.L. More Than Just Eye Candy: Graphics for e-Learning. *The eLearning Developers' Journal*, September 15, 2003. www.eLearningGuild.com

Rankin, R.O. (1989). The Devlopment of an Illustration Design Model. *Educational Technology Research and Development*, 37 (2), 25-46.

Allen, M. The Garden of Good and Media. *The eLearning Developers' Journal*, July 28, 2003. www.eLearningGuild.com