Give your Training a Visual Boost

By Ruth Clark

Why do we see so many slides or screens filled with text, as in the example in Figure 1? If you are like most trainers, you are comfortable in a world of words—since preschool you have focused on verbal literacy.

In comparison, most of us have had no training in visual literacy. We think and communicate with words rather than visuals. So it will take some time and effort to begin to think visually as you plan your training materials.

Guidelines

1. Beyond the pumpkin slide.
You are rushing to put together the slides for your pilot class on the new copier features for a sales meeting. As you ponder all of the slides of text, you realize that Halloween is approaching. You quickly do a clip art search and find some great jack o' lanterns to add to your slides. While they do make your slides look more enticing, what effect will they have on learning?

"Pumpkin graphics" is my terminology for "decorative" visuals. They are intended to add visual interest or humor to the material but do not enhance the instructional message. Figure 2 shows a slide that includes an attractive photograph that loosely relates to the topic, but that does not serve any instructional purpose.

2. Decorative visuals defeat learning.
We have evidence showing that decorative visuals, even visuals related to the topic, can depress learning. Richard Mayer and his colleagues evaluated learning from two lessons on how lightning forms.

A basic version included text and visuals that illustrated the process of lightning formation. A spiced up version added some interesting visuals and discussion about lightning. For example a visual of an airplane struck by lightning was accompanied by a brief description of what happens to airplanes in the presence of lightning. Several interesting visuals of this type were added. Which version do you think led to more successful learning?

Whether presented as a paper-based version or via computer, the basic versions that omitted the interesting visuals led to better learning. In fact learners who received the basic version scored 105 percent better on the

problem-solving test than those who received the extended lesson.

3. Plan explanatory visuals.

If decorative visuals don't help, what kind of visuals should you use? Plan visuals that illustrate your content relationships. For example, in Figure 3, you can see a graphic designed to illustrate the ideas expressed in the text. The text is communicating the movement and conditions of movement of gift certificates, from the safe, to the counter, to the customer. A visual that reflects that basic idea is more helpful than the decorative visual used in Figure 2.

4. Explain your visuals effectively.

Once you have a visual representa-
tion, you will usually need to explain it with words presented in text, audio, or both. It's a common misconception that learning has more success with two sensory modalities rather than just one. Therefore, presenting words along with *both* text and audio would seem to be a better approach than presenting them with either one alone.

However, research that compared learning from visuals explained by text sentences, audio sentences, or text plus audio of that text, found that audio alone led to the best outcomes, followed by text alone.

The least successful learning resulted from text and audio repetition of that text. In 12 experiments summarized by Richard Mayer and colleagues at the

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Figure 1 | Slide contains text only and makes no use of visuals.

Figure 2 | A graphic is added, but the visual used is essentially a 'pumpkin graphic'—it adds aesthetic appeal, but no learning benefit.

Figure 3 | On this version, the visuals are relevant illustrating the concept of single and dual control.

Figure 4 | Learning is improved by explaining the relevant visual with audio narration rather than text.

University of California Santa Barbara, learning was more successful with words presented in a single mode—not both. Take a look at Figure 4 to see how an explanatory visual with limited on-slide text is most effectively explained with audio narration.

For situations in which you cannot use audio narration, display limited amounts of text in close proximity to the visual. Call-outs containing text, layered with visuals, represent an effective way to closely integrate text and visuals.

Who benefits from visuals?

One of the common myths in the training field is the idea that some learners are "visual" while others are "auditory." In reality, all learners who are new to a content area benefit from a relevant visual. However, learners who are already experienced in a domain do not gain much from visuals added to words.

Why? Imagine that you have worked with bicycle pumps and are familiar with them. As you read a text description of how the pump works, your brain can readily visualize the words. In other words, you are able to generate your own visual representation as a result of your prior knowledge. In contrast, the novice does not know enough about bicycle pumps to form her own images.

Several experiments have shown that visuals that benefit novices don't help experts. Brewer and his colleagues compared comprehension of judicial instructions presented with words alone (audio instructions) with words and visuals (audio-visual instructions). Judicial instructions are the verbal summaries judges give to the jury about the legal aspects the jury should consider when debating the case.

The experiment included two types of mock juries: one made up of typical citizens and a second composed of law students. The judicial instructions consisted of approximately 10 minutes of a judge's auditory instructions to the jury for a self-defense trial. The visual version added a flow chart and explanatory visuals that corresponded to the judge's explanations. After hearing, or hearing

and viewing, the instructions, all jurors were tested with a self-defense scenario. The scores of novice jurors (who used the audio-visual version), but not legal students, were much better. In fact, novice jurors given visuals reached the same comprehension levels as law students.

Graphics boost learning.

What evidence do we have that visuals can improve learning? Mayer et al have run many experiments that compared learning from a lesson delivered entirely with words to learning from the same lesson that added visuals to the words.

After completing the lesson, university students took a problem-solving test. In all cases, the lesson with visuals led to better learning, with a median effect size of approximately 1.4, which is a strong effect.

Ruth Clark is president and principal of Colorado-based Clark Training and Consulting. Her latest book is Building Expertise: Cognitive Methods for Training and Performance Improvement: 3rd ed.; *www.clarktraining.com.*

Checklist:
Leveraging Visuals for Learning

☑ Start a collection of images that effectively communicate ideas. Remember that most images are copyrighted. However, the goal of your collection is to be creative with visual techniques that can be adapted to your own content and learning goals.

☑ Use your cell phone or digital camera to capture images as you do your job analysis. For example, capture sketches that subject matter experts make when explaining their ideas. Take photos of equipment or work-relevant settings.

☑ Check out your organization's resources. You might be lucky enough to have access to a graphic artist who can help you translate your ideas into images. You might also have a corporate repository of work-relevant images that you can repurpose into your lesson.

☑ Make quick sketches of visuals that you find effective in presentations and lessons. Consider how you can adapt the idea to your content.

☑ Evaluate your instructional message for relationships and consider how to use explanatory visuals to illustrate and reinforce those relationships.

Resources:

Brewer N, Harey S, and Semmler C [2004]. Improving comprehension of jury instructions with audio-visual presentation. *Applied Cognitive Psychology*; volume 18, pp 765-776

Clark RC [2008]. *Developing Technical Training, 3rd Edition*. San Francisco, Pfeiffer

Clark RC, Lyons C [2004]. *Graphics for Learning*. San Francisco, Pfeiffer

Mayer RE [2009]. *Multimedia Learning, 2nd Edition*. New York, Cambridge University Press, chapters 4, 6, 11, and 12

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