

10 Tips for Using Graphics in e-Learning

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I think we would all agree that e-Learning courses benefit from graphics, even if the topic you are presenting is dry. Nobody likes to read large amounts of text on-screen. Using graphics to break up text gives the eye something to rest on before continuing to read. Below are some tips for using graphics in e-Learning development, so without any further adieu, let's get started.

1. Graphic Size

Sure, you may want to make your course more inviting by adding graphics, but don't go overboard! Depending on your audience, you may have users with slow connections or older hardware. You'll want to deliver your course content to them as quickly as possible, and adding hi-resolution graphics will only slow things down.

- ➔ Be sure to optimize all of your graphics so that they load quickly.
- ➔ Use [Photoshop™](#) or [Fireworks™](#) to squeeze down the size of your images.
- ➔ Be sure that you are using the right formats for your images.
- ➔ Try not to crowd pages with multiple graphics.
- ➔ Avoid images that strongly contrast with their surroundings.

If you are using a continuous-tone photograph, be sure to save the file as a [JPEG](#) (Joint Photography Experts Group). JPEG compression can bring a weighty image down in size. The downside to JPEGs is that the compression scheme that is built into the file format (what makes the file size smaller) is *lossy*, meaning that the more compression you apply, the more image quality you sacrifice. There's a fine balance between file size and quality, so make image files as small as possible, while still looking crisp.

Any flat graphics, charts, and graphs with solid colors should be saved as [GIF](#) (Graphic Interchange Format) files. The algorithm in the GIF file format looks for common occurrences of color, and groups those colors together into a *palette*. The palette can contain 256 colors or less. GIF compression is also *lossless*, so GIF conversion doesn't introduce artifacts and aberrations, like the JPEG scheme can.

GIF files have two additional tricks up their sleeves: they can have transparency and can be animated. The transparency adapter in the GIF file format is only 1-bit transparency, meaning that only 1 color of the whole palette can be transparent. Usually, that color is white, but you can make any color the transparent color. The GIF 89a format allows multiple frames in a single file for animation. You can get really creative with GIF animations now, with the new animation panel in [Photoshop CS3](#). This, however, doesn't mean you should have spinning logos and flashing graphics everywhere. But an animated series of steps can be very useful, when used in conjunction with explanatory text.

Although a page can benefit from a few graphics, adding too many images of varying sizes, qualities, and colors can really cause problems for readers. The size and complexity of the graphics is also an important factor, when considering the number of images to use per page. A sophisticated wiring diagram, with all of its legends and explanations, will probably tax a reader's eye for quite some time, whereas a picture of an ocean would have a different effect.

Also, your course may have a shell or structure with its own colors and shapes. Choosing images that strongly contrast with those colors and shapes may not be a good idea. You may be thinking that if the image stands out, it will attract more attention. That may be true, but it might not be the kind of attention

you really want. If at all possible, homogenize your color scheme across all graphics. There may be acceptable variations of color between screen locations, such as highlights, arrows, gradients, and other effects that can help to draw attention to specific areas of a screen image or product shot.

2. Visual Hierarchy

A visual hierarchy sets the order of importance on a page. You can achieve maximum visibility and results by using a simple and consistent visual hierarchy. Every item on a page has visual importance, but you can control that importance based on the nature of those items. For example, a newspaper has a clear hierarchy: its headlines draw readers' attention because the headline text is larger than any other text on the page. Somewhat smaller subheads fall under the headlines, and help readers scan for chunks of information that might interest them. Then, even smaller body text follows. But despite this clear formatting hierarchy, just one quarter-page-sized image would completely dominate the entire page, and draw readers' eyes away from the text. Similar design hierarchies are seen in other publications as well, and this is just one example.

The systematic ordering of importance through a hierarchy will guide students through a course, and help them achieve their objectives more quickly.

3. Text Breaks

As mentioned before, facing large amounts of dense on-screen text is not an optimal situation. In print, designers try to help readers by breaking up text using columns, paragraphs, first-line indents, tabs, and other conventions. Line length is another important tool. Usually, the eye is most comfortable reading from 41 to 50 characters per line. But this also depends on the optical characteristics of the font being used and on its size. It has been shown that *sans-serif* fonts, like Arial and Verdana, are easier to read on-screen than *serif* fonts, like Times New Roman and Georgia.

As we said before, graphics (either embedded in the text or running alongside) can provide a visual break for the eye as it moves through a story. Of course, size and placement are important; you want to use graphics, but also retain continuity. Diagrams and figures that relate to the story are especially valuable.

Visuals can also add motivation. For example, a course that presents exact steps for completing a software task will benefit greatly from screenshots that support each step. Nothing is more frustrating than to have text-only instructions for a visual task. If something requires a lot of hand-eye coordination, then the course should include screenshots, diagrams, simulations, or even video of the steps being completed. And using screenshots from the latest version of the software is mandatory.

4. Appropriate Imagery

Some educators draw on libraries of stock photography and “found” images for their course graphics. More often than not, these images are only *marginally* related to the course content. True, they add visual breaks in the story, but they often fall short in supporting course content. A common example that we’ve all seen is business courses that use stock photos of executives and secretaries sitting at desks and talking on phones, but who are not actually *doing* anything related to the course material.

The challenge here is to build cost-effective courses. A typical photo shoot, with all of its models and studio expenses, can be quite pricy. But there are some great traditional stock-photography agencies that sell royalty-free photos for reasonable prices. The web has also become a tremendous source of content-specific images. The [Stock Xchange](#), [iStockPhoto](#), [Creatas](#), [Veer](#), and other agencies have a wide variety of image categories related to specific areas of business. Most times, you can order these photos

online, download comps, and use an online lightbox to view and select graphics. Of course, **be careful to follow appropriate copyright guidelines when acquiring online imagery!**

Over the years, [SyberWorks](#) has built its own library of in-house photos, which continues to grow. These images are a great resource for our courses, but if we need something more, we ask the client if they have a library of pertinent photos. Some larger corporations, for example, use their own targeted marketing images for sales collateral. If available, your own organization's images may lend themselves well to a related course.

Finally, more and more public-domain photos are becoming available. Often, they have outlived their copyrights and are now freely available. You should especially consider public-domain photos if you are building a historical course.

5. Figures for Learning

Figures and diagrams with supporting text can really help learners accomplish your course objectives. [Edward Tufte](#) has written several superb, classic books about the effectiveness of figures, diagrams, charts, and graphs. Tufte single-handedly changed information design, as it is called, with the publishing of "*Visual Explanations*." Creating figures and diagrams to support courses is a craft in itself. Basically, the most effective supporting graphics can quickly convey important information that their corresponding text descriptions cannot. It is extremely important that such graphics be appealing, easy to understand, and adequately labeled.

These images should help learners achieve specific instructional goals. A plain image of a semiconductor with supporting text may be enough for some learners, but the same image, with labels and arrows that are referenced in the text, can be much more effective for others. So always target your image presentations toward all appropriate learning levels.

Specific features of these graphics should be considered for effectiveness. Line weight, color, legends, and other features should all directly relate to, and support, course material. If there are multiple graphics within a course, consistency in design is important. Far too often, colors and styles will shift from graphic to graphic, and present a continuously changing look and feel. Learners may easily construe this stylistic meandering as a shift in topic or objective. Consistency of style and color can support broad themes, help learners to know when they are in a topic, and alert them when they move on to the next subject.

When labeling graphics, it is important to use contrasting colors and color fields behind the labels. Consider layering the labels and ordering them appropriately. Legends for color associations are very useful for charts and graphs, and the same holds true for figures and diagrams.

6. Charts and Graphs

Charts and graphs are very useful for conveying statistical or historical information. Most people can create charts and graphs in [Microsoft Excel](#) or [PowerPoint](#), but these quick charts will always benefit from some additional work. For example, a pie chart that expresses a target sales quota may be presented with a specific piece of the pie enlarged, extruded, or in some other way more prominent than the other pieces. For quickly showing the relative importance of data, this is a visual parallel to the text hierarchy that we already mentioned.

Again, style and consistency throughout a course is important. You may have a series of column charts that express specific sales quotas from city to city across the country. Each chart might use gray bars for all states that are not currently being discussed and a blue bar for the state that is being discussed.

The width and height, (and now with 3-D) the depth of bars can be exaggerated, to bring attention to specific parts of a chart. Adding dimension, shading, and drop-shadows to a chart, although appealing, should be done only after the chart's basic information is being conveyed effectively.

Be sure to adequately label charts, and make sure that the labels don't obscure other information or data. Legends are useful guides for reading a chart, and should be both adjacent to the chart and clearly labeled.

Another way of improving charts is to use imagery that is directly related to their topics. For example, a bar chart about populations could use silhouettes of people (instead of rectangles) for its bars. A bar chart about oil prices could use barrels of oil instead of rectangles. Every chart should be examined first for clarity and accuracy of its presentation, and then examined for alternate methods of presentation that might be employed.

7. Color Choices

We've already mentioned color several times, but it can be a touchy subject because it is so subjective. You may be driving down a street where every house sports a muted shade *except* for the bright purple one with lime-green shutters! It may make your skin crawl, but to the person who painted the house, it's beautiful.

Color is a science of its own. At the core of color theory is the *color wheel*, which basically displays and organizes the entire rainbow. The *primary* colors are red, yellow, and blue. From these, we can create the *secondary* colors, like orange, green, and purple. *Tertiary* colors are a mix of secondary and primary colors, and complete the color wheel. The color wheel also shows different color *shades*, from the outside to the inside, going from dark to light values.

Certain colors can evoke emotions or convey moods. *Active* colors are yellows, oranges, reds, and purples. These are ideal for highlighting parts of a course and calling attention to details. Think of the color of a stop sign. The color red is arresting and contrasts well with just about any background. So it's a natural choice for an icon that commands students (at least in the U.S.) to **STOP**. *Passive* colors are greens, blues, and lighter purples. These are often used in hospitals and detention centers, because they are calming. You can use passive colors as background colors and in supporting graphics for courses. If your courses will be delivered internationally, also be aware that your other students' cultures may influence color selections. For example, due to our traffic signage, American students easily perceive red as an indication to stop. But in some countries, red conveys danger, and sometimes even death. So unless you really want to convey a sense of danger (as in **DON'T EVEN THINK ABOUT PUSHING THIS BUTTON ON THIS MACHINE FOR ANY REASON, PERIOD!**), you may want to avoid red graphics in courses for international audiences.

We can't discuss color without talking about *contrast* – the relationship between colors in a given scenario. Black text on a white background is easy to read because those colors contrast well with each other. But yellow text on a white background or blue text on a black background is hard to see; there isn't enough contrast between figure and ground to make the text legible. However, always apply common sense and good taste: green text on an orange background may contrast strongly, but this combo is hard to read, and painful to look at. The same considerations also hold true for graphics.

Color is a powerful tool when used correctly. It can convey meaning, add a mood, be playful or serious, and carry a lot of weight in delivering the content at hand.

8. Navigation Aids

Throughout your course, you'll use on-screen controls to let users navigate through the material. These controls can be either textual (like hyperlinks) or graphical (like buttons). If you employ such navigation graphics, be sure that they are clearly labeled and easy to use. If at all possible, you'll want to use a combination of both graphic and text elements to ensure ease-of-use. Button graphics should follow known human-interface guidelines, meaning that they should behave like buttons. Their appearance should change when they are rolled over with the mouse and clicked. This provides visual (and often audible) confirmation that the button action has been triggered.

- ➔ Be sure to follow these simple tips for creating navigation controls:
- ➔ Buttons should be clearly labeled.
- ➔ Contrast is important.
- ➔ Use complimentary or active colors to highlight button functionality.
- ➔ Place and use navigation controls consistently throughout the course.

Other useful tools that you can use in courses are *breadcrumbs* or *area indicators*. For example, the state of a button within a navigation system should change appearance whenever a certain section is reached. And the **Previous** and **Next** destinations should always be visible near the **current page indicator**. Every course navigation system must be easy to use, and allow students to always see where they just came from in the course, where they are now, and where they can go next.

And be sure to actually *test* your course and lesson navigation, to be sure that it is clear and that anyone can use it. Use several testers, and note and address any tie-ups or pitfalls that they find.

9. Functional Communication

When choosing graphic vehicles for conveying a series of steps, the *style* of graphic you choose (animation, static image, video) isn't as important as the images *accurately presenting* the steps. Research has shown that a series of steps delivered as line drawings, animations, and videos are all assimilated equally well by learners. The true effectiveness of these graphics depends on both adequate labeling and the use of graphic features that *show* the progression or movement.

Un-illustrated text or unlabeled graphics do not carry much weight, and are not effective. Using even simple graphic devices, such as descriptive labels, sequential labels, highlights, and directional arrows, will help users to follow step-by-step tutorials. [Adobe Captivate](#) and other simulation software allow you to add these features to any recorded presentation – either automatically, or manually. Either way, adding descriptors to communicate functionality will go a long way toward successfully presenting a series of tasks.

10. Student Gestalt

There's more involved in the overall training and learning processes than one might think. It's important to strategically use thematic elements to tie a course together, in a consistent and appropriate *gestalt*. "Gestalt" is a German term, often used in graphic-design circles, that implies "the overall sense or aim of a user experience."

Here's an example of how a bad graphic gestalt can cause problems. A British design agency was asked to create signs for a coal mine in Africa. Due to the mine's non-English-speaking workers, the designers used pictures of carts being loaded with coal. But when the signs were installed, the workers started *unloading* the carts, rather than loading them. The "gestalt" problem was that the designers assumed a left-to-right reading method, whereas the workers read right-to-left.

In the same way, making assumptions about your learners' experiences, without actually testing the course goals, objectives, and results can lead to disaster. Be sure that you have a full understanding of your target audience. Take a student sampling and test your courses on them. You may find specific details that need to be ironed out. But more importantly, you should collect feedback about your students' entire learning experience. If a course is objectively factual, but bores students to tears, it should be re-worked to make it more interesting. And if the course simply doesn't meet its objectives, you should use a survey to gather feedback about the course materials. Perhaps there were too many distractions or unclearly labeled graphics. Revisit all problem areas with a critical eye.

Of course, not everyone comes to a course with the same learning ability, and different students will have varying aptitudes. So you'll want to collect information from as wide a group as you can, to gauge your course's effectiveness for all students. Gauging gestalt is like stepping back from painting, to view its overall composition before continuing.

Article Summary

Courses without graphics can feel empty and tedious. Graphics can really enhance course materials and possibly open up more opportunities for students to engage with your material. You'll want to use a balance of instructional graphics, figures, and diagrams, without overusing them. Consider the overall user experience when deciding on color, contrast, hierarchy, and other devices discussed in this article. Consistency is extremely important in delivering a cohesive learning experience.

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