The previous two installments of this series identified the pitfalls and the common design seductions that wreak havoc with interactive instruction. Having raised your sensitivity to woeful errors, we can now move on to the proactive things designers should do — must do, really — to create effective learning experiences.

To give learners the clearest view of information, their options, and your feedback, you need to get your screens into good shape. By good shape, I don’t mean simply pretty — although attractiveness is an asset. I mean good shape in the sense that they provide immediate support of learning activities; that they ease the learning effort — or perceived learning effort — and enhance the experience.

In general, all principles of good user-interface design apply to good learner-interface design, but user-interface design principles are arguably insufficient to guide us in learning application design. There are additional principles that are context-specific and that relate to the purpose of a software application. If, for example, an application is designed to help you select your seat on an airline, the interface needs to help you see what seats are available, what seat you currently have assigned, and how to make any changes you desire. Such an application is not focused on helping you remember how many rows are on the plane, how to perform safety checks, or how to evacuate under emergency conditions. Speed and simplicity are most important for seat selection, and, in contrast to e-Learning applications, the less thinking involved the better.

Continued on next page
e-Learning applications succeed when they cause learners to think and rehearse. It’s important, of course, that they think about the content and rehearse the behaviors you are intending to impart. Learner attention and energy must not be consumed by having to learn and operate the e-Learning application, or by searching for needed information which can leave little energy left over for acquiring targeted performance skills.

As much as possible, we want all aspects of the learner interface that relate solely to viewing and operating the e-Learning application to be transparent, i.e. to be instantly understood and effortless to use. This is not easy to achieve and often requires considerable design thought, development effort, experimentation, and evaluation. In this installment, we’ll look at some guidelines for screen design I have found to be practical and helpful in making the most of the learner’s time and energy.

**Feature learning activities, not navigation**

Navigation capabilities are certainly important. Indeed, many knowledge management tools of great value are nothing more than good navigation wrapped around stores of information. They quickly communicate what information is (and, just as helpfully, is not) available, leaving little uncertainty in the users mind. They may provide multiple indices of the same information to match various users’ points of view. And they may provide browsing facilities that provide lists of short excerpts of available items.

In both knowledge management applications and e-Learning, it is important to avoid distracting learners from what they need, but this is particularly so in e-Learning applications. Some navigation systems are distracting simply because of the strength of their graphic design. It is often easy to justify the extra time and effort to embellish navigation components because they are used repeatedly throughout an application. As a result, the visual refinement of navigation elements can draw attention away from the sometimes more utilitarian appearance of content.

Much worse, however, is when the navigation forces learners through bewildering contortions, consuming much too much thought. Sometimes learners muddle their way through learning applications feeling that they never truly mastered or understood the navigation capabilities. They just gave up and used the most essential ones because they were devoting too much of their learning time and energy to the navigation, rather than to the content. But they also wondered if they missed things they shouldn’t have and if there was an easier way to get through.

**Good things come in small packages**

Good e-Learning navigation takes the
space it needs and no more. It takes up very little precious screen real estate, leaving it available for instructional content. It is sometimes possible to collapse navigation panels or slide them off screen until needed, as long as learners can remain aware of their navigation options. This can make nearly 100% of the screen available for other uses, but it removes the benefit of reminding learners of helpful actions they might take — a service that navigation should provide. Navigation also needs a little space to keep learners oriented with respect to their position in and progress through learning experiences. Good designs do this in a very small space, which is appropriately sacrificed to meet the need. Here is one example.

**Example.** DialogCoach™ is an advanced e-Learning application that uses voice recognition to teach dialog-based performance, such as sales or supervisory skills. (See Figure 1 on page 2.) Through high fidelity simulations, it also teaches the use of client software systems used to capture data and recall information pertinent to the customer being served. Used in call center training, for example, operators simultaneously learn how to speak to customers and to operate account management systems. The systems trainees are learning to use are typically designed to take up the whole display screen, so the e-Learning design challenge was to provide navigation and multiple levels and types of skill training without sacrificing screen integrity and system realism.

DialogCoach’s main controller floats on top of simulated software screens. The learner can move it anywhere so it can be out of the way for any specific operation. (See Figure 2 below.)

Sometimes, the learner would prefer to see more of the screen and less of the controller, so the controller can be made more compact or expanded at will in true James Bond style. The controller can be reduced to a more abbreviated size, as in Figure 2, or shrunk all the way to the barest essential controls, as shown in Figure 3 below.

While expanding and contracting operations do take a little time to learn and some effort to perform, the approach achieves valuable goals and is worth the cost. First of all, learners easily understand the distinction between DialogCoach and the software systems they are learning. Second, they easily see that the intent of training is to reach a point where the underlying application screens are all they will need and that

FIGURE 1

The movable learner interface floats above the simulated software training screen.

**FIGURE 2** With no fixed portion of the screen assigned to e-Learning components, the background application appears 100% authentic — as it will on the job.

**FIGURE 3** When the learner can perform with very little assistance, DialogCoach’s interface shrinks to a small Swiss-army-knife size.

**FIGURE 4** The best placement method for navigation is to anchor it in one fixed screen division.

**FIGURE 5** A floating panel containing navigation controls can be moved by the learner as needed.
they are going to be fully familiar and comfortable with the system at that point. It will be what they have seen all along, just without the floating DialogCoach overlay. Finally, because it takes some effort to access learning aids if they have been collapsed, learners want to learn so they can move along quickly without seeking DialogCoach’s support.

**Maintain focus**

Ever look at a screen and wonder which of all the things there you should be attending to? With all the interactive and informative elements we can provide simultaneously, it becomes all too easy to overwhelm learners. There are valuable techniques that help learners focus on the right things. Generally, focus should be on interactions at hand, but this is a multifaceted thing that’s much more complex than it sounds. Learners must concurrently:

- remember options that are continually available (glossary, review, help, etc.),
- see and understand their specific options for the current interaction,
- be aware of the prevailing context (which may not be the same as for other interactions, and may not even be static within the interaction),
- perform activities with recognizable gestures,
- and notice feedback when it occurs.

That’s a lot to keep in balance, and learners need the assistance of good interface design.

**Placement**

There are two seemingly opposite approaches that both help differentiate navigation from content, and keep focus on the content: fixed screen divisions and floating navigation panels.

**Fixed divisions.** Anchoring navigation into a space continuously reserved for it is generally the best method. (See Figure 4 on page 3.) Once learners become accustomed to the navigation structures, they develop an ability to see past them and ignore them almost completely except when they need to select a feature. It’s what psychologists call accommodation, and it occurs when a stimulus becomes so familiar that it no longer draws our attention. Animation and sound effects can override accommodation and bring special attention to navigation components when needed. Otherwise, the navigation sits quietly.
helpful but transparent.

Floating panels. Sometimes the entire screen is needed for content components, such as when simulating a software application or operating system that normally commands the whole screen. In this situation, layering the screen can provide both screen division and the ability to see all areas, although not all at one time. (See Figure 5 on page 3.) The navigation panel should be designed to contrast with but not upstage information displays. It should be easy to move, because the learner may have to take an active role in moving the panel out of the way if the software can’t find a reliable basis for doing it automatically.

Animation

Just as unique or out-of-place things draw our attention, we are also predisposed to look at moving objects. Content can be animated in attention-getting ways that really help draw our attention.

In one large-scale project developed by DaimlerChrysler’s Quality Institute and undertaken to teach statistical process control, screens needed to display a variety of large charts, graphs, and tables. Instructive text had to be worked in and around the displays which dominated the screen. It would be easy for learners not to see important information among all the displayed elements.

A unique, animated technique was used to present new text. (See Figure 6 on page 4.) Each time text appeared on the screen, it smoothly dropped down as if on a window blind. The animation drew the learners’ visual attention to the area, and prepared them to both read and listen to the information (most text was also narrated to assist weak readers).

The text, surrounded by strong graphic content, took on a helpful prominence because of the way it systematically made its entrance. And yet, while it remained static on the screen after its animated entry, it didn’t interfere with other content elements surrounding it.

Note: Animate for a purpose. A bit of a warning here: The power of animation to draw our attention is valuable, but this same power can also be used for both good and ill. It’s fun to watch a fascinating animation and fun to create them. To spruce up e-Learning applications, developers often moved to drop in some animations. A swirling module number, a pulsating QUIZ button, or a joyous progress indicator can provide feel-good ornamentation, but they can be difficult to accommodate and therefore become distracting and annoying to learners. Such animations should be used sparingly and stop fairly quickly. Moreover, if there’s time to create some animation, why not use it in ways that truly assist learning? Animation is a powerful tool for explaining how a process, system, or mechanism works. Or use it to draw attention as was done in the DaimlerChrysler example or to provide more powerful navigation as was shown in the DialogCoach example.

Creating more space by grouping

There is a tendency to put too much information on the screen at one time. Indeed, even with today’s high resolution color displays, it’s a challenge to effectively present as much information as can be done well on a printed page. We need to keep in mind that it is very easy to overload — to dazzle — the learner with too many displayed content items, interactivity options, and navigation controls. Still, the context of the information we are presenting is important, and dispensing with context isn’t a good solution to a clutter problem. It obviously wouldn’t do to present a graphic on one screen followed by its description on the next. Interactivity designers are constantly grappling with the need to make the most effective use of the space.

Grouping is a good way to reduce the perception of clutter and to increase the amount of information that can be dis-
played. Leaving blank space between groups of items helps to set them off and draws the eye to them more effectively. Remember that blank space is not a waste of space, but a very valuable use of screen real estate if it helps learners see more clearly what is being displayed. Leaving some expanses of space, often called white or negative space by designers, and increasing the proximity of related items can actually increase the amount of usable display space.

Notice in Figure 7 on page 5, how the upper screen seems completely full and cluttered. You would have to train your eye a bit just to count the number of elements on the screen. You certainly wouldn’t want to add any more information, and you might well feel compelled to delete some items. But the lower screen makes it easy to see all the screen contents — the same number and size as in the upper screen. The lower screen even has space for additional information, perhaps for some helpful descriptive text. But even this space isn’t idle. It’s helping to frame elements, provide a foundation, and give the eye a place to rest.

**Text headings**

Text headings gain utility from good spacing and grouping. They should often be much larger than the body of text they label to establish hierarchy and to break up the monotony of text walls. But their relationship to text and the hierarchical structuring breaks down as the distance between them and the text increases. It’s important to keep headings closely grouped with their respective text to keep the eye from wandering. The benefits are double: the relationship is strengthened and space is released, possibly for other uses.

Note that all of the items in the left column of Figure 8 on page 5 appear also in the right column, but see how much easier it is to read the right column and to assimilate the organization. Meticulous grouping is especially important in situations like these:

- **Many items of dissimilar visual characteristics**: provide an anchor for the eye.
- **Many items of dissimilar value**: convey value through meaningful organization.
- **Important relationships among items**: express the relationships spatially without adding more display elements.
- **Many, many items**: provide relief.

Don’t fence it in

Simple alignment is powerful. As we’ve seen in earlier examples, it often reduces the visual complexity and releases valuable space. It can be more powerful than drawing lines, rules, or boxes.

Novice designers have a propensity for drawing lines and boxes, presumably with the intent of creating order and the hopes of cramming in more content. In many cases, the technique backfires (see Figure 9, at left.) Adding lines adds more things to the screen. The more things on the screen, the more critical and yet more scarce white space will be. There are many alternatives to consider.

In addition to clustering items together, which is an obvious, lineless solution, grouping can be accomplished in numerous other ways also, such as through the organizing use of:

- size
- color or contrast
- shape
- font
- time of appearance
- motion
- texture
- complexity

The effectiveness of grouped items is often increased dramatically when multiple, redundant methods are applied. Multiple but conflicting methods of grouping, on the other hand, can cause cognitive havoc. Although designers don’t intentionally create chaotic e-Learning displays, it’s easy to find them. (And many of them were earnestly created in an effort simply to beautify the screen.) Variety isn’t always a beautiful thing.

**Asymmetrical screen designs**

In dividing the display space, it’s almost always best to use asymmetrical divisions. (See Figure 10, left.) Asymmetrical designs are more comfortable to view and more effective in communicating with learners than are symmetrical designs. Contrasting proportions also help define spaces and give them functional identity.

It can be difficult to know what divisions are going to work best at the start of a new project unless content elements and their requirements are known...
in specific detail. For this reason, it’s often best in the first prototypes to divide display real estate as follows:

- A standardized heading area that might also show progress and/or current position within the application
- One large primary area, perhaps taking about half the screen
- One smaller secondary area that is itself significantly larger than any remaining spaces
- An area reserved for instructions
- Area(s) reserved for prompts, alerts, helps, scoring, and other miscellaneous items
- An area reserved for navigation

As prototypes evolve, the appropriate numbers and sizes of reserved spaces will become clear. It’s very easy to underestimate space requirements. If you’re not careful with space allocations early on, it becomes necessary to sacrifice spacing and, with the pressure on, screens become overfull and unlike anything originally intended.

Layering

Good designers must work vigilantly to overcome the disadvantages of electronic displays and challenges to learner comprehension. They are, however, armed with some powerful capabilities unique to the medium. In addition to such capabilities as animation, interactivity, and audio, layering provides another display dimension to help learners work within display space constraints. Layering, in effect, provides additional display space by allowing display elements to be moved temporarily out of the way, visually beneath items of greater present need. Layering can also help separate such components as content, learning aids, and navigation.

A glossary utility or a scientific calculator, for example, can float in a collapsed size over content displays. In their minimized size, these tools won’t significantly diminish space needed for ongoing interactivity. And they remain readily available, so learners don’t have to learn special steps just to retrieve the tools. Further, the visual cues remind learners that the support tools are available (and probably should be used).

Design for handheld devices

Just a quick word about designing for small-screen devices: The guidelines given in this section are applicable for a wide range of display devices, regardless of their size, resolution and color capabilities. Personal Digital Assistants (PDA’s) and other very small screen devices are increasingly being used for e-Learning. Although many of these devices use familiar interface protocols established for desktop computers, a particular challenge for e-Learning is maintaining context.

It is often necessary to burden learners using small devices with remembering context elements that cannot be dis-
displayed continuously from screen to screen. In other words, display inertia is considerably compromised and learner memory burden is increased. Easy recall of related information must therefore be a design priority.

Unfortunately, adding buttons for the convenient recall of information further reduces available display space. In this case, it is usually best to use a single command to recall a menu of navigation buttons even though this begins to make the interface more hierarchical. Perhaps voice recognition will come to the rescue in the near future to empower e-Learning on very small devices.

More

As with the other topics touched on in this series, my intent is neither to duplicate readily available information, nor to oversimplify essential knowledge and skills e-Learning designers must have. You should read and keep handy some of the excellent available resources that can guide and inspire your design work. For example, in addition to resources I cited previously, very good screen design principles, on-screen typography guidelines, and ideas on aesthetics can be found in the books listed in the sidebar below.

Keep in mind as you use these resources that e-Learning applications are particularly demanding with respect to user-interface. As I outlined in my own book, the responsibilities of the learner interface are to:

- Minimize memory burden
- Minimize errors
- Minimize effort
- Promote use of provided features
- Contribute to the learning process

Next time

In the next installment, on July 28, we’ll look at the effective use of media — text, graphics, sound effects, narration, music, and video.
AUTHOR CONTACT

Dr. Michael Allen is the primary architect of Authorware, the founder and former chairman of Authorware, Inc.—which merged with MacroMind/Paracomp to form Macromedia, Inc., and the Chairman & CEO of Allen Interactions. Michael is widely respected for his abilities to define, design, and build tools that allow creative individuals to harness the potential of evolving interactive multimedia technologies. In recent years, he has concentrated on creative application design and defining unique methods for developing meaningful and memorable learning applications that fully “engage the mind.”

Michael is the author of Michael Allen’s Guide to e-Learning. He holds Ph.D. and M.A. degrees in Educational Psychology from The Ohio State University and a B.A. degree in Psychology from Cornell College. Contact Michael by email at mallen@alleni.com.

ONLINE DISCUSSIONS

Extend your learning beyond the printed page! If you are looking for more information on this topic, if you have questions about an article, or if you disagree with a viewpoint stated in this article, then join the online discussions and extend your learning.

Follow these easy steps to participate:
2. Click on the Online Discussion link on the left-hand navigation menu.
3. Select this article by title from the e-Learning Discussions list, or use the Search Subjects/Post box to find it.
4. Click on Add A New Message.
5. Enter your message. It will be posted as soon as you hit the Add Message button on the form.

Additional information on the topics covered in this article is also listed in the Guild Resource Directory.

About the Guild

The eLearning Guild™ is a Community of Practice for designers, developers, and managers of e-Learning. Through this member-driven community, we provide high-quality learning opportunities, networking services, resources, and publications. Community members represent a diverse group of instructional designers, content developers, web developers, project managers, contractors, consultants, and managers and directors of training and learning services—all of whom share a common interest in e-Learning design, development, and management.

The eLearning Developers’ Journal™

The Guild publishes the only online “e-Journal” in the e-Learning industry that is focused on delivering real world “how to make it happen in your organization” information. The Journal is published weekly and features articles written by both industry experts and members who work every day in environments just like yours. As an active member, you will have unlimited access to the Journal archive.

People Connecting With People

The Guild provides a variety of online member networking tools including online discussion boards, and the Needs & Leads™ bulletin board. These services enable members to discuss topics of importance, to ask others to help them find information they need, and to provide leads to other members.

Become a member today! Join online at www.eLearningGuild.com.

THANK YOU TO THESE GUILD ENTERPRISE SPONSORS

CLARK Training & Consulting (CTC) is a global leader in instructional design offering both training and consulting services. Our award-winning seminars are based on the latest research in instructional psychology and human performance improvement.

www.clarktraining.com
Contact: Kimberly Perkins
602-230-9190

Spectra Interactive Learning is a unique, full service, e-Learning consulting company — growing and expanding in North America and Europe to meet the growing need for expertise in e-Learning strategy development, instructional design and program implementation.

www.spectrainteractive.com
Contact: Brenda Pfau, President
bpfaus@spectrainteractive.com
Ottawa, Canada (613) 230-9978

Because the most dramatic learning happens through first-hand experience, everything we do is focused on creating experiences — engaging, challenging and yes, fun, experiences — that people will take back to work and use every day to improve their performances.

www.alleninteractions.com
Contact: Jackie McMillan
jmcmillan@alleninteractions.com
800.204.2635

Resources, Resources, Resources

The Guild hosts the e-Learning industry’s most comprehensive resource knowledge database. Currently there are over 2,300 resources available. Members have access to all of these resources and they can also post resources at any time!

Guild Research

The Guild has an ongoing industry research service that conducts surveys on 20 topics each year. These topics are identified by the Research Advisory Committee. The data collected is available for all members.

It’s About Leadership

The Guild draws leadership from an amazing Advisory Board made up of individuals who provide insight and guidance to help ensure that the Guild serves its constituency well. We are honored to have their active engagement and participation. The Guild has also established three committees made up of active members who help steer its editorial, events program and research efforts.

Discounts, Discounts, Discounts

Guild members receive discounts on all Guild conferences and on other selected products and services. Your Guild membership will save you 20% off the list price of Guild events!

To learn how to become a Guild Enterprise Sponsor, please contact David Holcombe at dh@eLearningGuild.com or call 707.566.8990.