1 Design Magic

I don't know about you, but good interface designs fascinate me. Good interfaces energize me and make me feel a bit more powerful because with them I am more powerful. I can do more, discover more, and achieve more with less effort. Sometimes designs, although no more efficient than others, are just amusing or creative enough to justify their break with conventions and set new expectations. I like that, too. Sometimes interface designs tell me what I need to think about before it would otherwise have occurred to me. Such hints can prompt as much learning as any other component in e-learning. Excellent!

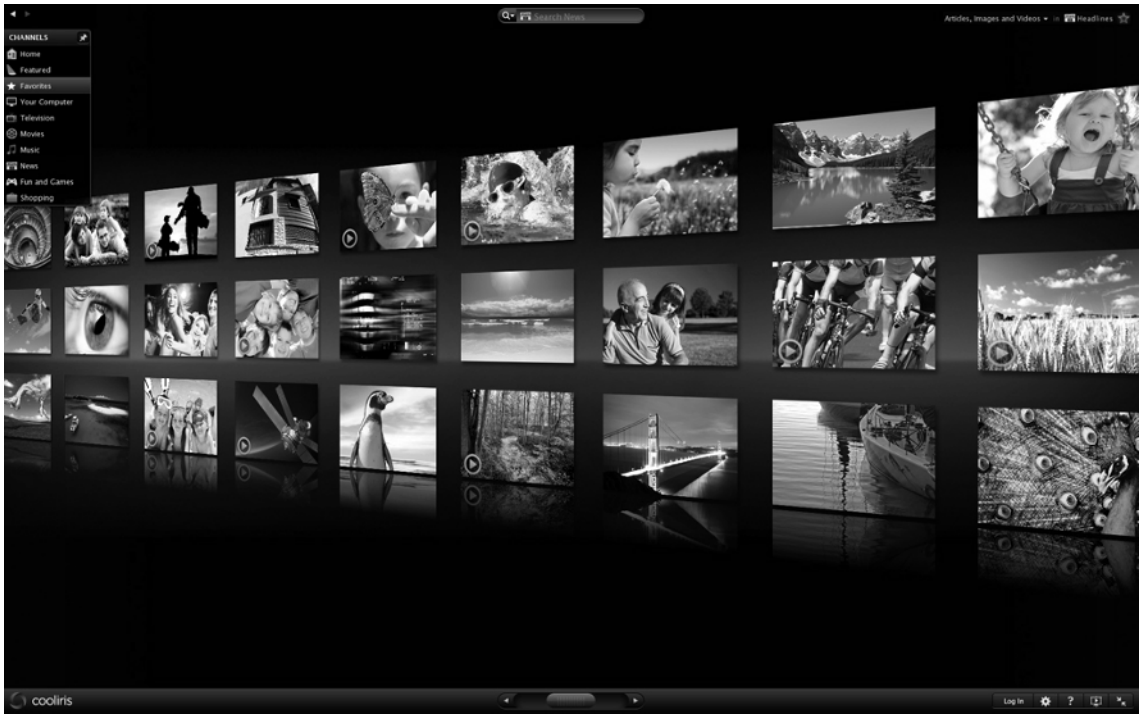
I discovered Cooliris a while ago. As you may know, Cooliris quickly and dramatically creates a visual wall from a pile of images. The company calls it an "infinite 3D wall" that lets you browse content without clicking page to page. Drag its scrollbar and you'll discover an amazingly rapid means of reviewing a very large amount of data in a quick and fascinating way that's hard to describe. When you drag quickly, the wall slants away from you to provide a means of seeing a larger number of images to scan. As you slow down, the wall confronts you straight on. Fewer images are now in view, but they are larger and clearer. Press the space bar to see the center image enlarged, use the arrow keys to select neighboring images, or drag the scroll bar at various speeds forward and back to scan as you wish.

Use it with Google image search, for example, and you'll get an instant sense of how many images matched your search criteria and what the range of styles and items is. The very question that's in your head, *"I wonder what's out there,"* will be answered with instant clarity. You'll want to do more searches just because of the power you have and the pleasantness of the experience.

In the time between my writing and the publication of this book, Cooliris will undoubtedly have evolved. Others will see alternatives and shoot out competing designs. Variations on this theme exist already.

Rapid reader

- User interface design is about efficiency. Don't make me think.
- Learner interface design is about making people think, learn, and perform.
- Context is the foundation for interactive learning.



Screen capture courtesy of Cooliris, Inc.

When someone has broken through a conceptual barrier, cool things frequently spawn a whole family of forward-stepping inventions.

A variant of Cooliris is Apple's Safari Web browser.

This is what design magic is all about. It's as fun as it is useful.

Good user interface designs enable computers to assume an effective and, hopefully, a desirable role in our lives. They take the raw power of computers and networks and turn it into services we can use and appreciate. They can elevate the quality of our lives by helping us make more productive use of precious time, be creative, find and access information when it's needed, and communicate more effectively and expressively with each other. When done well, interface designs adapt computer power to our needs. When done poorly, interface designs require users to adapt to them, reset expectations, and sometimes even combat entrenched behavior patterns to avoid errors.

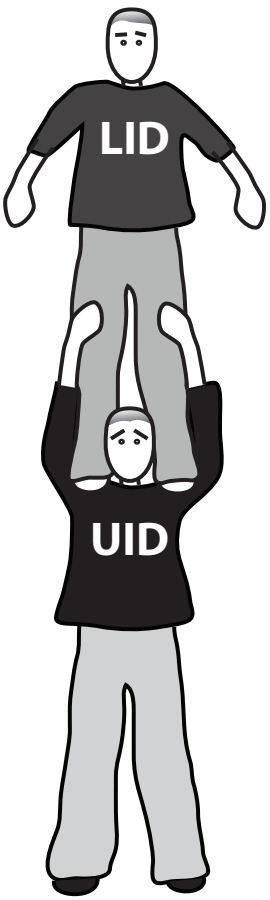
The Big Message

The big message is this: e-learning needs good user interface design to work. We can little afford to have attention and focus whittled down by confusion and frustration with the mechanics of using a computer. Even without such distractions, we designers are challenged to keep learner attention and focus, without which learning experiences fail.

Even with excellent design, computers exact a price. Learners have to express themselves through the limited gestures the hardware perceives and the software understands. Tomorrow's computers, of course, will recognize more gestures than simply keyboard and mouse inputs. My laptop now recognizes both touch and stylus input directly to the screen. It also has a video camera that can see me, but the software doesn't yet have facial recognition features to scoot me around password-protected identity barriers (although my fingerprint reader does sometimes). I don't yet have capabilities for multi-touch input, yet alone for recognizing hand or facial gestures (but I expect to see them in my lifetime). In short, the limited vocabulary of today's usable gestures significantly limits the things learners can do under the mentorship of software. This is an unfortunate penalty of using technology that otherwise has so many advantages.

Since e-learning events must often be used on devices of various configurations, assorted gesture recognition limitations are even more constraining. We have to work with capabilities common to all delivery devices we might need to use. Those common capabilities are typically lower-end capabilities that use less computer power but demand a bit more of the learner's attention—a demand that is easily inflated by poor design. Our designs therefore have a lot to overcome and achieve.

Learner Interface vs. User Interface



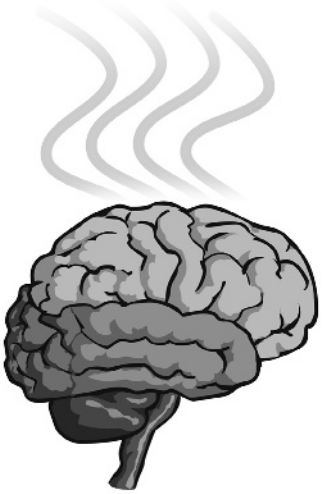
Yet another set of challenges exists for us as learning application designers: How do we make learning experiences meaningful, memorable, and motivational? This is where learner interface differs from general user interface issues. While generally all interface designers want to make things easier for users, they often don't care about making their transactions meaningful or memorable. They don't always work to make the user ponder the outcomes of alternative actions. They generally want to minimize mental involvement entirely and may even reward haphazard clicking.

In contrast, learning interface designers must get learners to engage their mental faculties in order to learn. Unlike many design principles appropriate for transactional Web sites, where the goal is challenge-free entry and retrieval of data, e-learning need to confront learners with challenges. Note the differences in the instructions (left) related to the same interaction (right):

Alternative Instructions	Interaction
User Interface Design Click c for information about the true statement. Click misconceptions a, b, and d for related information. **Learner Interface Design** Think carefully about Plexiglas, a synthetic "organic glass," and click the statement you think is correct.	**Plexiglas** a) is heavier than glass b) is toxic, being made from poisonous hydrocyanic acid c) coalesces with human tissues d) is less transparent than typical window glass

Design Goals

Our goals, as learner interface designers, are therefore two-fold: (1) overcoming some negative aspects of using computers for learning and (2) taking full advantage of the benefits and opportunities computer technology affords. The difference between user interface design (UID) and learner interface design (LID) needs to be clear.



1. The **user interface** designer's challenge: Minimize the attention and effort learners must sacrifice in operating the user interface

2. The l**earner interface** designer's challenge: Maximize the impact of the learning experience

1. Minimizing the Negative

Humans are adaptable, capable of continuous learning, and yet also resistant to change. Learning is work. It's a disruptive process. It's a change process. Perhaps the reason change is so difficult is literally our physiology. The brain tends to defend itself against assaults to the status quo and it literally heats up, especially when challenges are great. While we are wired to learn, we also have a constitution that prefers familiarity and consistency. This internal battle is escalated when it's clear that the targeted outcome of a learning experience is a change in behavior, where the discomfort of rearranging and augmenting what one knows is accompanied by the risks of actually doing things differently. Mistakes, embarrassment, humiliation, and who knows what are among the potential outcomes.

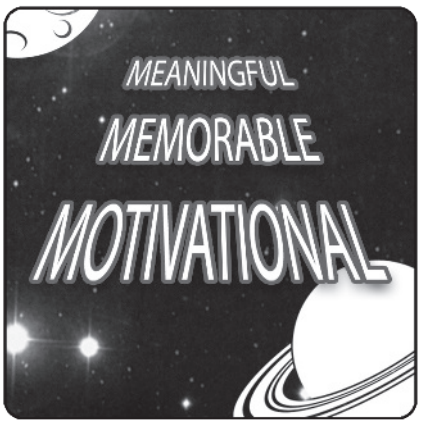
With all this stirring their minds, we must nevertheless help learners to focus their full energy and concentration to reach successful outcomes. We want them to set aside fears and self-doubts like, *I'm no good at math, I've never been able to sell anything,* and concentrate for the period of time necessary to learn and acquire

new skills. And, oh yes, we want them to be working with unfamiliar software under the direction of perhaps the least empathetic of all instructors—a computer.

With all these challenges, we obviously don't want learners inadvertently pressing wrong buttons, being confused about how to correct entries, concerned that getting help will "go on record," mistaking *NEXT* for *SUBMIT*, and so on. The negative aspects of learning via technology must be minimized as much as possible. And this is not a small challenge.

2. Maximizing the Positive

Did you see a *Star Wars* movie? How long ago was that? Like it or hate it, chances are you still remember a very large number of things about it. Costumes, spaceships, animal-like war machines, English-speaking alien creatures, lightsabers, a guy in a black full-face helmet whose breathing you could hear, *May the Force be with you.* Nodding? I could list plenty more.



You probably can even recall names. Does Princess Leia ring a bell? Luke Skywalker? Chewbacca? Han Solo? How about R2-D2 and C-3PO? I'll bet you could identify them all in a lineup.

Can you list a similar number of things you remember from your last training course? How about the instructor's name? And how long ago was that course?

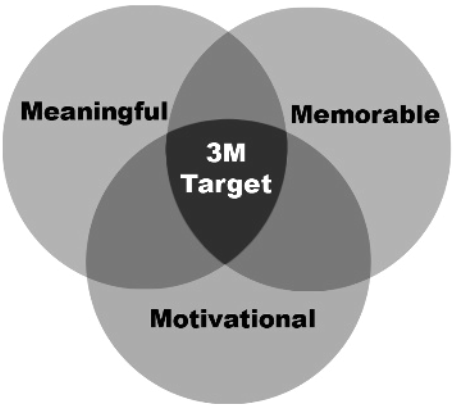
Now it's certainly possible that the *Star Wars* saga hasn't stuck with you (Who are you?) or that you do actually remember vividly your last instructor's name and what you learned, but I'm sure you get my point. If experiences have a certain dynamic to them, they stick with us much longer than those that are routine. Most training, including most e-learning, is routine at best and, just like a boring movie, it's quickly forgotten.

As stressed in the other books in this series, the operative criteria for e-learning or any learning experience are the three M's:

M1. Is it **meaningful**? If learners don't understand what they're being taught, it will not be helpful to them. It will not improve their performance nor add to their skill sets.

M2. Is it **memorable**? If learners can't remember what they learned, they might as well never have learned it. How can forgotten principles or procedures improve performance?

M3. Is it **motivational**? If learners are not motivated to apply their learning, to rehearse and keep it alive, it will fade. The learning might just as well not have happened.



The *Star Wars* series achieved one of the criteria (memorable) through ways we can understand and articulate to some degree, and that is a major achievement. Their stories include conflict, the drama of human relationships, and discussions of morality, losses, and triumphs. For some viewers, the stories, upstaged as they often were by the special effects, may have provided meaningful and motivational experiences as well. Unfortunately, in training, achieving only one of the three M's is a failure. We must achieve all three and on, I suspect, a somewhat smaller budget than George Lucas had.

Interfacing the Mind

When talking about learner interface design, you might think we were simply addressing the mechanics of interaction—almost as if we were talking only to the fingers. We do, indeed, want gestures to be so automatic that one doesn't have to be cognizant of translating decisions into hand and finger movements. But with learner interface design we're, more importantly, talking about ways to get the mind to exercise productive and useful thought

patterns—and then automatically translate them into recognizable gestures for our appraisal.

When thinking of interactions constructed to engage the mind, we turn to CCAF—the four interlocking pieces of the instructional inter-

activity puzzle—context, challenge, activity, and feedback. Of these, context is the foundation and critical to do right before building the others on it.

Throughout this book, we'll be stressing the importance of *context* as the key to orienting and focusing the mind. *Challenges* waken the mind and more fully energize it. *Activity* calls on all the general principles of good user interface design, but contributes effectively only if it relates fully to the context. And finally, as we shall see from examples, *feedback* achieves its greatest effectiveness if, as with the other components, it plays off the context.