Is Your Learner Interface Smart?

BY MICHAEL ALLEN

*Part 1 of a series on the importance of good design*

Learner interface design determines what learners see and hear. It determines what input movements or gestures the computer will recognize. It determines precisely what those gestures mean and therefore how they can be used to convey thoughts or commands. Ultimately, the learner interface determines the possible effectiveness of the environment.

**The learner interface design:**
- Defines the range of actions learners can take
- Influences the learners’ expectations of what they should do
- Creates the mood for learning sessions, such as fun and playful or solemn and intolerant
- Identifies what’s important, and what isn’t
- Affects the speed and effort of learning
- Influences emotion, attitude, and performance energy
- Affects learning outcomes in a big way

Clearly, learner interface design has a major impact on the learners’ experience. Good interface designs strengthen and enhance learning; poor interface designs severely inhibit learning outcomes.

To help you with learner interface design, in this series I’ll first paint an overview of the need for good learner interface design and the challenges of creating it. In the second installment, I’ll enumerate some terrible things that are often done. Third, I’ll offer some helpful rules specific to learning application design. Then, we’ll look at how to use multimedia to communicate effectively with learners, and wrap up with the Continued on next page

Design is a major determinant of the learners’ experience. A good interface design will strengthen learning, while a poor one will severely inhibit learning outcomes. This is the first of a five-part series designed to help you with design. Read this issue to obtain an overview of the need for good design and to better understand the challenges of creating it.
gestures learners need to use to communicate with the learning application. You will find some user interface basics here, but we will look most closely at interface elements of particular concern to learning interactions. This is an area where unfortunate errors are especially prevalent, and where good design work really pays off.

The need for good learner interface design

I don’t know about you, but good learner interface designs fascinate me. They energize me and make me feel a bit more powerful because with them I can do more with less effort. Sometimes designs, although no more efficient than others, are just amusing or creative enough to justify their break with conventions. I like that, too. Sometimes interface designs tell me what I need to know before I realize I needed to know it. Excellent!

Good user interface designs reaffirm that computers are able to assume a proper and desirable role in our culture. They take the raw power of computers and networks and turn it into services we can use and appreciate. They can elevate our quality of life by helping us make good use of precious time, be more productive and creative, find and access useful information, and communicate more effectively and expressively with each other.

Unfortunately, good interface design is difficult. I’m keenly aware of the challenges. But according to Nathaniel Borenstein, writing in Programming As If People Mattered, poor user interface design thwarts efforts to do valuable things with computers. It wastes our time, energy, and enthusiasm. Poor designs upset me — and often infuriate. More than just being inconvenient, it seems insulting to have poor interfaces inflicted upon us — especially considering how many people a poor design can impact.

We’ve all seen them, and we’ve all had to work around them. Poor designs abound. A confusing cellular phone, a car heater you can’t control, a document that won’t stay formatted the way you like. And how about those digital watches? (See Figure 1 below.)

The world over, we pay the price of poor interface designs. But in e-Learning, good interface design is essential. learner interface design can determine success or failure of both individuals and entire training programs.

Interfacing with learners

In e-Learning, poor interfaces suggest that the provider cares little about wasting the learner’s time, maximizing their productivity, or quality in general. Learners receive these messages and take them personally.

Extensive research concludes that we tend to think of our computers as if they were people, as Byron Reeves and Clifford Nass explained in The Media Equation: How People Treat Computers, Television, and New Media Like Real People and Places. Although we may think otherwise (and the research says we do), we indeed disclaim our penchant for thinking of computers as people). scientific studies have shown that people express emotions and react to their computers very much as if they were persons. When people act disrespectfully toward us, we tend to dislike them and try not to keep company with them. And when our computers act disrespectfully toward us, we tire of their use, avoid them, and begin to dislike them and the activities we use them for.

Skilled instructional designers create a partnership with learners, or more precisely, a partnership between learners and the software that can help them learn. Learn-
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Designers develop either positive or negative feelings about learning technology largely from the interfaces designers devise, so it’s important to get the interface design right and to express our supportive intentions well.

More than efficiency

Wonderful interface designs contrast with poor designs not just by being more efficient and less offensive, they create environments that are appealing and so obviously beneficial that learners want to learn by using them. Good designs not only diminish the sense of burdensome work, but also accentuate awareness of personal gains. They help make every interactive minute valuable. They elicit a full measure of the learner’s attention, enthusiasm, and participation.

Learners are too smart for poor interface design

When we choose to use computers to support learning, we assume that computers are easy enough to use for this purpose — not just easy enough for engineers and programmers — but easy enough for our learners. The evolution of computing speed and memory has indeed made it possible to devote a considerable amount of the computing power to the task of working with us humans. We can provide powerful, easy-to-use interface facilities without reducing the computer’s ability to simultaneously present text, graphics, and media, process data, and perform communication functions.

We humans need responsiveness and consistency, because otherwise, our attention wanders or we become frustrated. We’re very complex, capable organisms with a highly developed selective perception. We constantly look for patterns and consistencies to confirm our understanding and make communication faster and easier. Paradoxically, all this intellectual activity makes us easily confused or annoyed. In other words, we are so smart that we are also easily misled. When we see underlined text, for example, and learn that we can click it to access related information, we quickly come to see all underlined text as also clickable. We assume consistency, especially with machines.

Less intelligent beings are slower to recognize patterns. They wouldn’t be easily upset, as we are, if they found clicking some underlined text didn’t do anything. But in our case, inconsistencies set us to wondering if we misunderstood, if we overlooked an important differentiating clue, if the computer had frozen up, or if the Internet connection were down. But no. It’s usually none of these. We mistakenly assume there is consistency within the learner interface design when there often is a mixture of consistency and unexpected variation. We react negatively. Ah, the penalties for being so smart!

Computers can now display information quickly enough that our minds won’t wander. Computers can display crisp text made of smooth, anti-aliased lines. They can also

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display spectacular color graphics, photographs, video segments, and smooth animation. They can zoom in for detail and out for an overall perspective. They can emulate a camera flying through re-creations of ancient ruins or through the illustrated molecular structures of blood cells.

Computers can make confirming sounds instantaneously upon our clicking the screen image of a button or upon our construction of a good solution to a posed problem. They can provide a variety of responsive controls displayed in 3-D graphics that we instantly recognize as counterparts to physical controls. They can allow us to interrupt a complex process to scribe in a personal notebook, send email, or check a glossary, then return to the previous process exactly where we left it.

They can do all this, and yet good simple interface designs for learners are all too rare. Where do we go wrong?

**Pretty does not equal good**

It’s easy to be deceived by appealing design. From book covers to automobile fenders, designers work endlessly to attract our attention, provide an appeal, paint a fantasy. Designers hope to create an enthusiasm and a desire to buy, regardless of other factors that should be taken into account. They are often successful in distracting us from practicalities, quality, and expense. We blithely buy promoted dreams and, more importantly, we buy.

An attractive interface doesn’t necessarily equal a good interface, however. An attractive book cover can adorn a dud as easily as a masterpiece. We know that, but even so, we sometimes forget to be analytical until we find ourselves saying, “Gee. I bought that? Why?”

The same forces misdirecting our attention and affecting our objectivity are at work in much of today’s e-Learning. There actually may be very little correlation between visual attractiveness and ease of use or instructional effectiveness. I’ve seen plenty of visually stunning e-Learning applications that were hopelessly devoid of potency. I’ve also seen some really ugly stuff that was brilliant in its ability to stimulate learning.

In e-Learning, poor interfaces suggest that the provider cares little about wasting the learner’s time, maximizing their productivity, or quality in general. Learners receive these messages and take them personally.

**Beautiful e-Learning**

Good visual design can contribute considerably to effective learning experiences, so one should not suspect a cover-up when an appealing design is present. It is true, however, that many organizations work for graphic appeal especially when they don’t know how to create truly beneficial interactions of deeper beauty. And it is true that many of those who invest in e-Learning solutions are blinded by pretty screens and don’t easily see the ugly ineffectiveness that lies beneath. Learners see it, however. And the results are often evident in the high numbers of e-Learning dropouts.

Beauty in e-Learning has many characteristics, all of which involve good learner interface design, such as:

- Motivating, meaningful context
- Intuitive, easy-to-use interface and navigation
- Ability to adapt to learner needs and abilities
- High levels of learner control, with browsing and review
- Engaging, productive, authentic interactivity
- Progress and position indicators
- Confidential self-evaluation capabilities
- Excellent information presentation
- Helpful tools, such as glossaries, galleries, or a personal notebook

**Blending aesthetics and functionality**

Good screen design helps learners see what is on the screen, understand the purpose and meaning of elements, and note changes when they occur. It reminds them of the options available and makes it clear how to use them. It allows learners to focus comfortably.

When it became possible to do so, many designers began applying graphic effects and textures such as marbled surfaces to their buttons and panels. (See Figure 2 below.) They capriciously decked out their screens with effects that had been far too expensive previously. There was often no functional justification, just the fun of doing what was newly possible. The rationale included making screens more attractive and professional-looking.

In the process, however, many made their screens less functional. Graphic elements vied for attention, making the learner interface design more confusing and distracting to learning tasks. Whether they actually were prettier in any way was a subjective matter. They might have been, but it is important to keep priorities straight. Budgets rarely allow as much to be spent on fundamental learning activities as would be beneficial. Reducing available funds further just to glamorize can be a serious mistake.

It makes no sense to require learners to spend a large portion of their learning energy on learning to use the applications that are supposed to help them learn. As obvious as it sounds, it seems necessary to say that an important value for good e-Learning is to make sure all resources, including both visual and logical, contribute positively to the learner’s experience. It is unacceptable, for example, to have an attractive navigation panel that no one can use without trial and error investigation.

The temptation to gild learner interfaces is evidently quite strong. As you have probably also seen, quite a few beautiful but unintelligible and cumbersome ones are about.

"Intuitive and simple" is not intuitive and simple to do

It can be quite difficult to design simple and intuitive interfaces. Making them gorgeous without sacrificing their most important attributes further heightens the design challenge, often beyond the novice’s abilities. Too often designs succeed only in their visual beauty or uniqueness. Again,
it isn’t easy to build functional interfaces that are simple and intuitive in software or any medium, but clearly aesthetics shouldn’t be the foremost concern. I offer a case in point in the Sidebar at the right.

In his classic, Don’t Make Me Think, Steve Krug sums up the primary responsibility of good interface design: “I should be able to ‘get it’ — what it is and how to use it — without expending any effort thinking about it.” Of course, if it were evident just how to do this, he wouldn’t have had to write his book, nor would all the many other authors who have expounded on the topic of interface design. Good design requires talent, knowledge, and practice. It requires clear priorities.

In e-Learning, we want people to think, but we want them to concentrate their thinking energy on learning useful skills, not on doing combat with the interface of our e-Learning applications.

Learning from mistakes is often a good way to learn, but beneficial mistakes don’t come from learner interface induced errors. Beneficial mistakes are those that provide teachable moments after learners discover they have erred. Making it tricky to enter correct responses does not provide beneficial learning risks or in any way improve instructional interactivity.

Oh, by the way, the stereo unit described in the sidebar is one I actually purchased. If you should buy one, here’s critical tip: To turn it off, you press and hold the Source/Power button for two seconds. But of course you knew that. Intuitive. Simple. Sigh.

It’s somewhere in the user’s manual.

My wife, for whom I (now apologetically) bought this sleek and quite attractive but pricey unit, has little patience for gadgets that are more of a puzzle than a convenience. She has kindly withheld saying many of the things I know she is thinking, but what she’s thinking is right. Who, in their right mind, thought this was good design? Good design achieves both aesthetic excellence and intuitive functionality.

**Feature-rich e-Learning creates design challenges**

Page-turning applications are the simplest kinds of applications. They do what a book does — provide convenient access to pages of information. However, computer applications tend to do it less well.

A page-turner interface would seem to be quite simple indeed. All that appears to be needed is a **NEXT PAGE** button and a **PREVIOUS PAGE** button. But this design becomes annoyingly restrictive if there are more than a few pages. Books make it easy to browse through pages very rapidly. We can jump to the end, back to the front, and so on.

So, for a page-turning interface, it might be helpful to also have a **NEXT CHAPTER** button and a **PREVIOUS CHAPTER** button. Of course, you’ll probably want a **QUIT** button. What about a **BOOKMARK PAGE** button? Sounds good, but that might also require a “go to bookmark” button, which should probably be two buttons: **GO TO PREVIOUS BOOKMARK** and **GO TO NEXT BOOKMARK**. What about a way to remove a bookmark? **ERASE BOOKMARK**!

With a book, we also have quick access to the **TABLE OF CONTENTS**, the **INDEX**, possibly some **APPENDICES**, and information on the **FRONT AND BACK COVERS**. How about skipping through by looking for illustrations and tables? We often do that while inspecting books. More buttons for...
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our page-turner? We have already identified fifteen possible buttons! Figure 3 on page 5 only shows a few of the possible buttons on the interface.

The illustration is offered to underscore the point that learner interfaces are not easy to design, even when the operations they emulate are simple, such as reading a book. When the operations are numerous and sophisticated, as in feature-rich e-Learning applications, the challenges are very great indeed. They are often so insurmountable that highly beneficial features cannot even be provided because no one can figure out a reasonable way for the learner to readily understand and control them.

Fortunately, our experience in building powerful interfaces is growing rapidly, technologies are advancing to give us a greater variety of recognizable learner gestures, and learners are increasingly familiar with computer interface conventions. Things are getting better, but even the top software application designers still have difficulty designing interfaces that we all can use without frustration. And no matter how many one has created, almost everyone underestimate the effort required to come up with a good design.

As an e-Learning design takes shape, the simple learner interface design originally conceived can begin to sag under the weight of incremental features. (See Figure 4 above.) As we've seen, just a large count of options, each of which might be clear and easy enough to use, can make an interface onerous. I have attended plenty of design meetings where useful features were abandoned because the number of features had become overwhelming. Those were sad outcomes for learners, indeed. Abandoning a feature, of course, may be the correct decision. Many times, however, more interface design expertise can solve the problem.

**Procedural guidelines**

I'll share some helpful principles and techniques with you in follow-on articles in *The eLearning Developers' Journal*. Before we get into the nitty-gritty of design principles, however, here are some practical, procedural guidelines:

**1. Don't start from scratch**

There are two layers of navigation and interface features that are almost always required in e-Learning applications. The top layer includes features for topic selection, overview access, progress recall, quit and resume. Context- and content-specific features provide the second layer, including support for entering and editing responses, controlling simulations, and accessing related resource information and help. Experienced designers know how to handle these structures and rarely start completely from scratch. It is quite effective and
expeditious to adapt previous designs that have proven successful and flexible in the past.

2. Let others judge

There are, in fact, many solutions known to experienced design teams, but even experts do some pretty horrendous things in learner interface design. Interface designers rarely have much trouble using their own interfaces, so they often conclude too easily that their designs are intuitive and user-friendly. Thankfully, it doesn’t really take an expert to judge whether an interface is easy to use. It does, however, take some objective evaluation and some open-mindedness.

Theory and experience are helpful, but the acid test is how effective a design is in use. It is important to watch others use interface designs without comment or guidance. Don’t just ask them what they think. Through observation, you may find learners overlook simple ways to do things or avoid using options they really need to use. Follow-up questions based on actual performance can reveal helpful information about your design.

3. Plan for more

Experienced designers know that more controls and interface features than initially expected will eventually be desired. In their prototypes, they are careful to both reserve space and to delay refinement of global interface protocols until the desired learning experiences have taken clear shape.

An overall synthesis of the various learner options is essential to bring unity to the design, set learner expectations, fulfill those expectations, minimize the learning effort, promote use of valuable learning aids, and prevent frequent learner mistakes. Consistency in the application’s features and compliance with established protocols found in contemporary software are also crucial. Added features may require you to rethink the initial design, so don’t lock things in too soon. Again, leave space and also reserve some time to rework your design once your tests with some learners confirm that you have the right feature set identified.

While the bulk of the design work of e-Learning must naturally be given to devising meaningful and memorable learning experiences, it’s a mistake to spend all the design time on content, necessarily making

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short shrift of the interface. The interface design affects the quality and effectiveness of every interaction. It many ways, it determines the effectiveness of e-Learning applications. Getting it right is not just nice, it’s critical.

Next time

Next week we will look at nine common but terrible things to do in learner interface design. You’ll probably recognize all of these transgressions from applications you’ve seen. Why do designers do these things? Well, they seem like good ideas as projects evolve. Later on, it’s too expensive to correct them. So, being vigilant and ready to identify treacherous paths can help us all be better designers. See you then.

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. Previously, he was a principal tools architect and systems designer of Control Data’s famous PLATO computer-based education system used around the world. 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.”

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