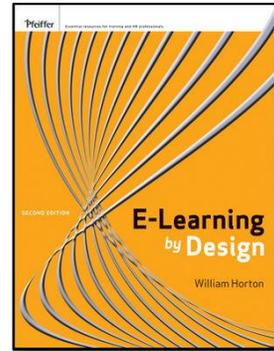


15 Navigation



Online chapter for
E-learning by Design
(2nd edition)

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Navigation

Accessing the components of your e-learning

To create successful e-learning, you must design and deliver two things: content and access to that content. The content consists of the lessons, topics, media components, activities, and tests that learners experience. Access is the ability to get to that content at the right time. Providing access requires designing appropriate navigation mechanisms into your e-learning.

HOW SHOULD LEARNERS NAVIGATE?

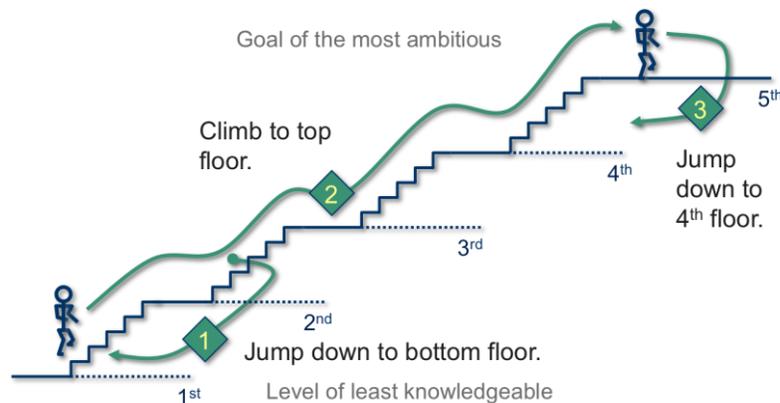
Early in your project, you need to decide the degree of navigation you will provide to learners. This is a policy decision that will guide subsequent decisions, such as the:

- ▶ Tools to create the navigation mechanisms such as learning management systems (LMS), learning content management systems (LCMS), and authoring tools.
- ▶ Modularity of topics so they make sense no matter how learners navigate to them.
- ▶ Templates, models, buttons, and icons to enable the navigation you envision.

Decisions about navigation affect what tools you will need. The navigation you design may be implemented automatically by a learning management system or learning content management system, added by the tool used to author your e-learning content, or hand coded by the developer (p. 41). Before you commit your project to a management system or authoring tool, make sure those tools can provide the navigation you require.

Overcome the one-path-for-all syndrome

One of the relics of classroom learning haunts the design of e-learning. It is the one-path-for-all syndrome. Let me explain it in architectural terms. Imagine that you are in a building of five floors. You are on the second floor and want to go to the fourth floor.



To go from the second floor to the fourth floor, you have to first jump down to the bottom floor. Then you have to climb the stairs all the way up to the top floor, bypassing your goal of the fourth floor. Once you reach the top floor, you must then jump down to your destination, the fourth floor. How would you rate the architect of such a building?

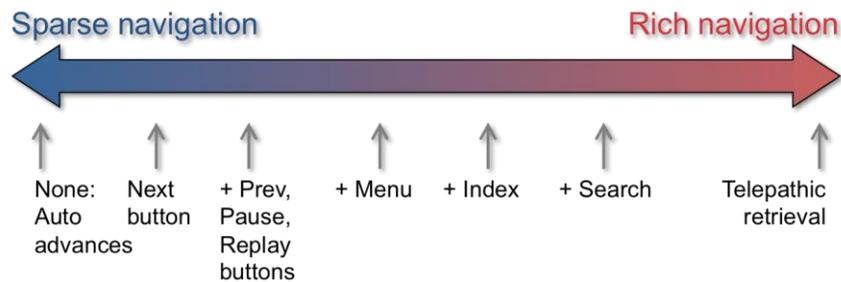
Now consider the building as a metaphor for course design, where the first floor represents the level of the least knowledgeable learner being educated. And the top floor represents the goal of the most ambitious learner.

It is common for classroom courses to adopt such a design, requiring all learners to span the entire distance from lowest common denominator to highest aspiration. But in e-learning, at least that which is taken individually rather than as part of a class, there seems to be little excuse for forcing all learners to start and end at the same point.

In e-learning all learners can have a direct path from their current levels of knowledge and skill to their desired levels. Provided we designers supply the necessary navigation mechanisms.

Sparse or rich navigation?

Do you want to guide learners through your e-learning along a specific path, or do you want to let them blaze their own trails? That is, do you want to implement sparse navigation or rich navigation?



Options range from almost no control to complete control. We might conduct a live presentation or play a recorded presentation without letting learners affect the playback. That would give learners no control other than to quit. Or we might give learners a **Next** button to click to advance to the next segment. For a bit more control, we might give learners standard playback buttons, such as **Previous** to go to the preceding segment, **Pause** to temporarily stop the display, or **Replay** to begin the presentation again from the start. For even more control, we might include a menu or table of contents from which learners could pick individual topics. We might go further to include an alphabetical index or a search facility so learners could find topics regardless of where they occur in the organization of the course. Now learners are really in control. Who knows what lies beyond? Perhaps we will have read-my-mind interfaces that will locate topics a few milliseconds after learners think of them. So how much control do we give learners?

Sparse navigation	Rich navigation
Best for simple tutorials taken by novices.	Best for just-in-time learning by Google-addicted Web-surfers.
Protects learners.	Empowers learners.
Makes the experience more predictable.	Makes e-learning more flexible.
Simplifies the user-interface. Learners have fewer buttons to click and display areas to watch.	Enriches the experience by providing learners with access to more resources and learning experiences.
Can restrict access to particular parts of the course, for example, requiring learners to complete the core of the course before attempting the final exam.	Can accommodate more groups of learners trying to accomplish different purposes under different circumstances.

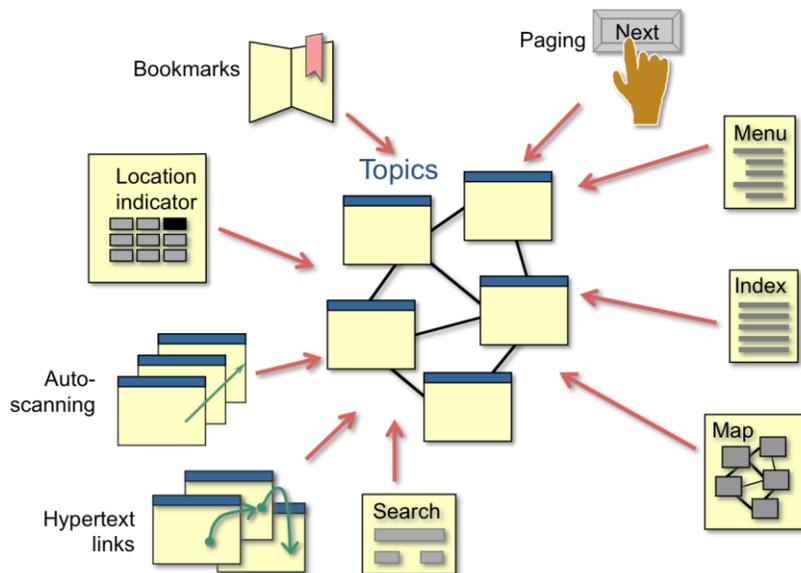
In the *Using Gantt Charts* course, I chose a moderately rich navigation scheme. Why? Learners were generally experienced computer users. They would be using the Web to access the course and would expect the same degree of navigation offered by Amazon.com, CNN.com, horton.com, and other popular Web sites.

I knew that these learners were impatient. They were mid-level managers and accustomed to making their own decisions to get things done quickly. They wanted to learn what they wanted to learn when they wanted to learn it.

The course would be taken as a refresher for many and would continue to serve as a reference for others. They needed to look up things without having to plod all the way from the beginning.

NAVIGATION MECHANISMS

Learners today are used to the freedom and “searchability” of the Web. “Don’t fence me in!” they shout. The trend today is to include more and more ways to move through a body of online material. This graphic summarizes all the common methods. You will seldom need all of these, but you may need several.



Some of these mechanisms are common within courses. Others are more often found in other forms of e-learning, such as knowledge bases and repositories of learning objects.

Your course or document or Web site consists of a large number of linked topics or pages. How can learners find the one they want?

The simplest method, **paging** (p. 7), merely requires learners to repeatedly press or click a **Next** button as if following a guided tour.

Another class of access mechanisms lets learners consult some kind of a directory to find the location of needed information. The most familiar kind of directory is a table of contents or **menu** (p. 9) to let users find topics by subject category. Another directory of locations is an **index** (p. 21), that is, an alphabetical list of topics. A **map** (p. 22) can show the organization of the topics as well as serve as a visual menu.

Most large Web sites include a **search** (p. 26) facility whereby visitors can specify the characteristics of the knowledge they seek and be transported to the topic containing that knowledge. Large courses are adding search as a navigation option.

For local navigation or references to external material, you may include **hypertext links** (p. 28), like those common on Web pages.

Some sites, for example virtual museums, include a grazing or **autoscanning** (p. 32) mode that automatically advances through the material at a rapid pace until the learner presses a **Stop** button.

To aid navigation, learners may consult a you-are-here sign to learn where they are. Such a **location indicator** (p. 33) in e-learning can also let learners navigate to related topics.

Bookmarks (p. 35) let users construct private lists of topics to which they will want to return later. A history mechanism may list topics visited recently.

Let's consider each of these navigation mechanisms in turn.

Paging

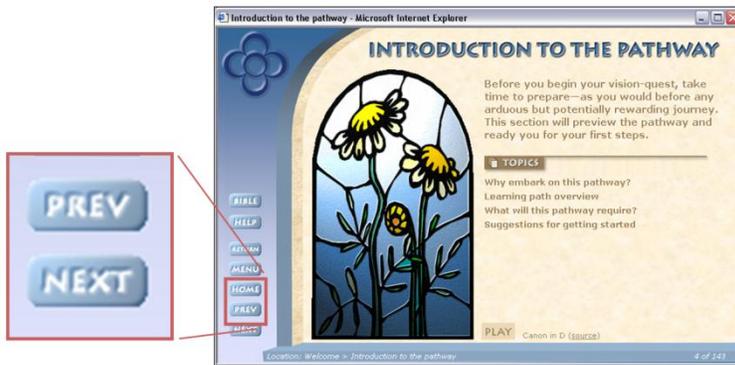
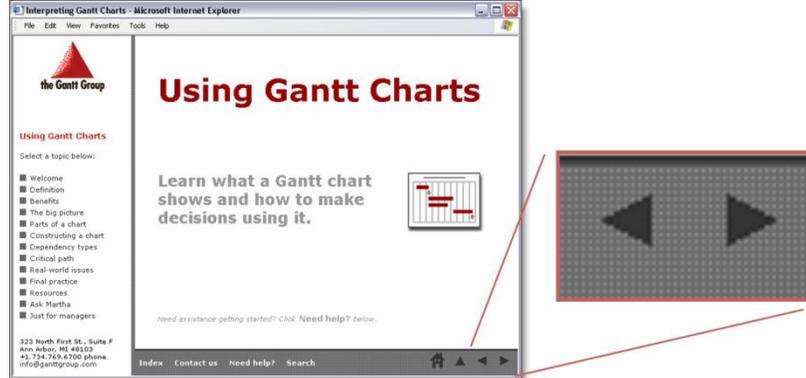
Paging provides a logical path through the e-learning. It lets learners flip through content just as they have with books for five centuries. It is the simplest access mechanism for learners. Typically a button takes the learner through topics in the order they are listed in the menu or table-of-contents, from top-to-bottom.

Include next and previous buttons

Next and **Previous** buttons take learners to the subsequent and preceding topic in a logical sequence.

For example, the *Using Gantt Charts* course included arrow buttons at the lower right.

Built using Adobe Dreamweaver, custom JavaScript, and Adobe Flash. View example at horton.com/eld/.



The *Vision and the Church* course contained word buttons at the lower left.

Built using Adobe Dreamweaver, Active Server Pages, custom JavaScript, and Adobe Flash.

I have found no compelling evidence that icons are better than words or vice versa, provided they are understandable by learners. For example, word buttons in a different language than that of the course would be a bit risky. Nor have I found that location is crucial, provided the buttons are clearly visible and appear in the same location on all displays.

Consider special browse trails

Define browsing trails, that is, special paths that traverse the content in meaningful ways. Use paging to let learners walk these paths.

- ▶ Let novices navigate without requiring them to make complex decisions.
- ▶ Let learners quickly survey many related items.
- ▶ Provide a simple linear path through complex organizations.
- ▶ Let learners methodically visit every topic in a lesson.
- ▶ Provide subsets of knowledge for learners with special needs or interests.

Should you use paging?

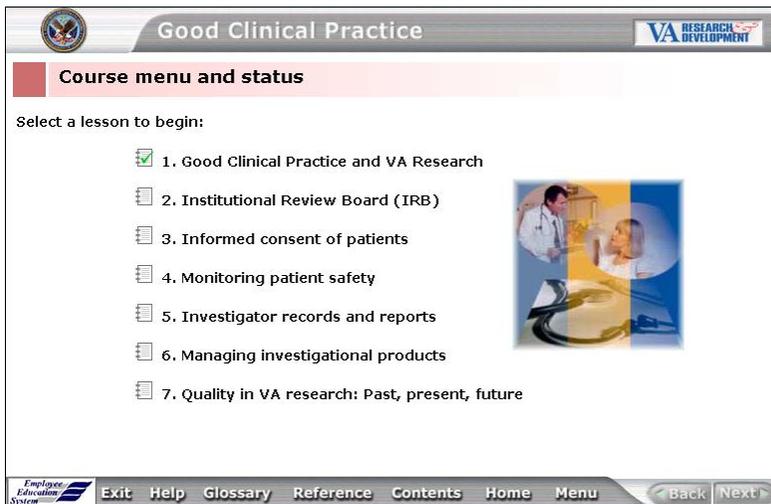
Should you use paging buttons for navigation in your e-learning project? In general, yes. Even when paging is not practical as a primary method due to the size of a course, paging may still be useful for navigating through a local area in the course. Paging is also useful when learners lack the computer skills or subject-matter knowledge necessary to use other mechanisms reliably.

Use paging when you want to restrict navigation to a specific path. For example, I worked on one project for which the sponsors needed to legally certify that every learner had experienced every part of the course. Paging buttons made that possible.

Paging does require that learning experiences be arranged in a logical sequence. Otherwise paging can prove more confusing than enlightening.

Menus

Menus list lessons and topics for learners to pick from. They are sometimes formatted as a table of contents and may be called such.



Here is the top-level of the main menu for the *Good Clinical Practice* course.

The checkmark indicates that the lesson has been completed.

Built using Adobe Dreamweaver.

Learners are familiar with using a table of contents from books. It lets learners drill down to specific topics through a series of simple decisions. The table of contents can also serve as a map, revealing how the e-learning is organized.

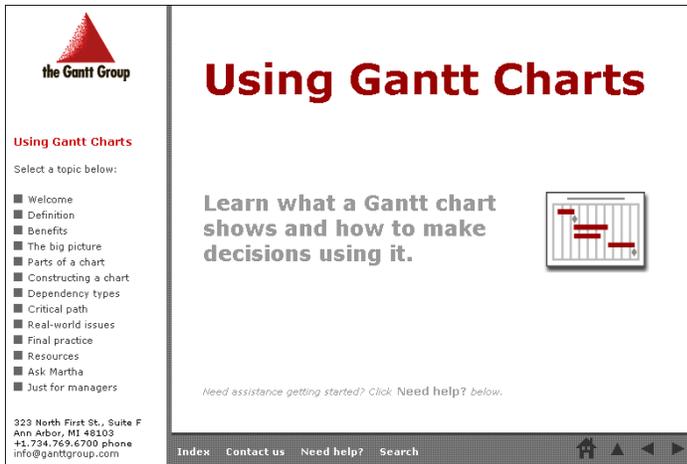
Designing menus requires some important decisions about how the menu is displayed and formatted and how your e-learning is organized.

Constantly displayed menu vs. menu-on-demand

Are menus always visible on the screen or do they appear only when summoned by the pressing of a **Menu** button?

Constantly displayed menu

A constantly displayed menu is a permanent part of the display. It is never hidden and remains immediately available.



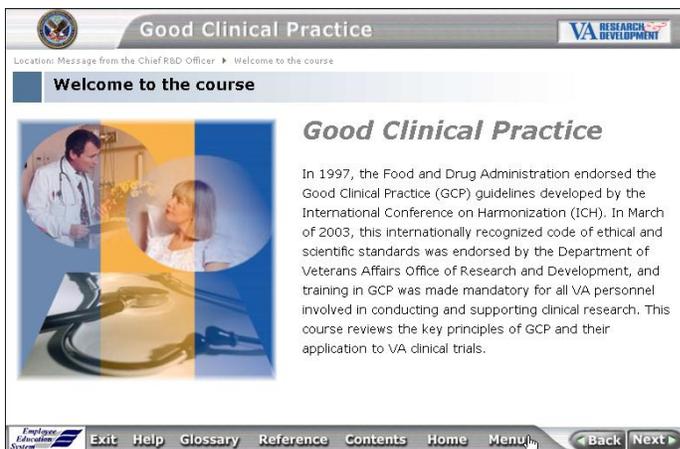
The *Using Gantt Charts* course included a menu panel at the left of its window.

Built using Adobe Dreamweaver, custom JavaScript, and Adobe Flash. View example at horton.com/eld/.

A constantly displayed menu is always available. It invites navigation and reminds learners of how the course is organized. It does take up space and can distract learners from the current topic. For a constantly displayed menu, entries must be short. Sometimes it is hard to write meaningful entries in the space available.

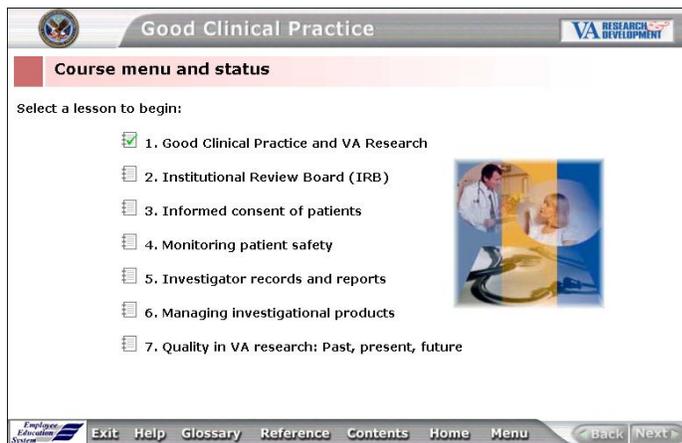
Menu-on-demand

With a menu-on-demand, learners must click a button to make the menu appear.



In the *Good Clinical Practice* course, I included a **Menu** button.

Built using Adobe Dreamweaver.



Clicking the **Menu** button replaced the current display with the course menu.

A menu-on-demand conserves space. It is usually the best choice for mobile learning that must be experienced on the small screen of a mobile device. When the menu does appear, it has adequate space. Thus, titles can be complete and easier to understand. However, learners may find it distracting to have the menu replace the current display.

With a menu-on-demand, you will have to provide a way for learners to get back to where they were before they summoned the menu. Notice that the *Vision and the Church* course has a **Return** button that restores the previously displayed page. Experienced Web browsers may know that the browser's **Back** button will take them back where they were, but not all e-learners are that knowledgeable.

Multi-level vs. expanding menu

If the entire menu will not fit in the available space, you may want to divide the menu into multiple levels or else employ a menu that expands in place to reveal lower-level components of selected entries.

Multi-level menu

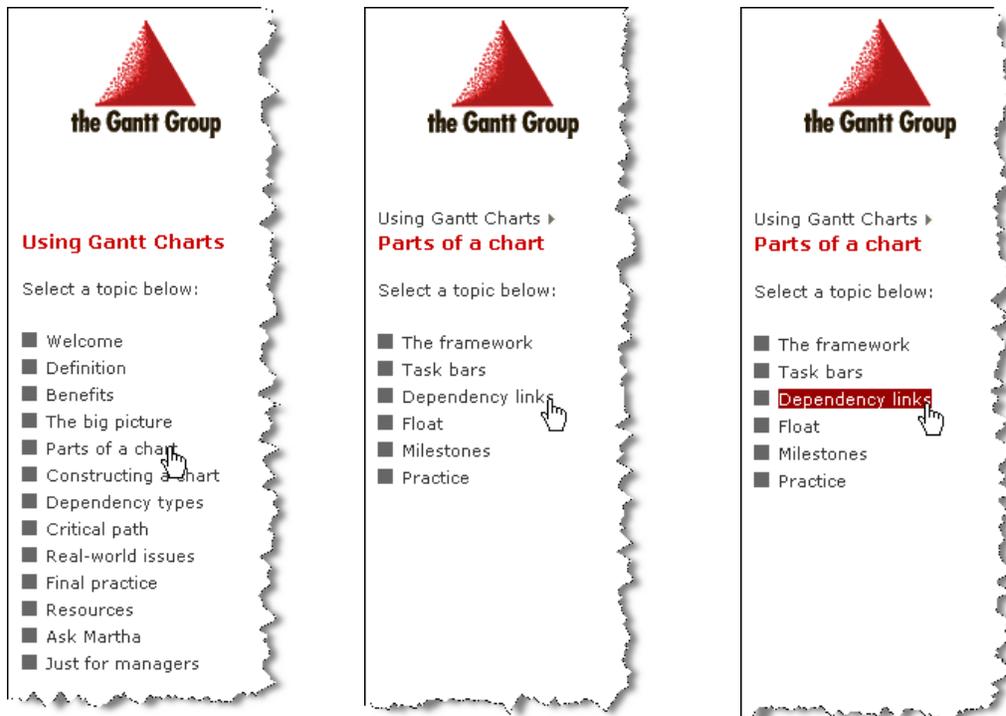
In a multi-level menu, selecting an entry replaces the current list of choices with a list of choices for the entry chosen. Each menu display contains only sibling entries.

Selecting items in the menu for the *Using Gantt Charts* course revealed lower-level menus.

Selecting **Parts of a chart** here, ...

reveals the sub-menu for Parts of a chart.
Selecting **Dependency links** here, ...

reveals that topic and highlights the item in the menu.



Multi-level menus reduce clutter because learners have to examine only one set of choices at a time. However, multi-level menus can cause tunnel vision as learners are looking at only a small area of the whole menu system at a time.

Expanding menu

An expanding menu displays sub-entries in place, indented below the main entry. For example, in the *GALENA Slope Stability Analysis* course menu entries expand as selected.

Selecting **GALENA basics** here, ...

reveals the sub-menu for GALENA Basics. Selecting **Material properties** here, ...

reveals that topic and highlights the item in the menu.



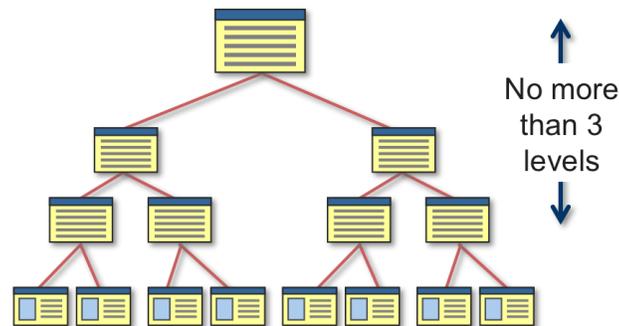
An expanding menu like this shows context of entries. Learners can always trace the path from the top of the menu down to an individual topic. Expanding menus can, however, result in a somewhat cluttered display that takes more time to search.

Depth versus breadth tradeoff

Menus can be deep or broad. *Depth* refers to the number of choices required to descend the menu from the top to a specific topic. *Breadth* refers to the number of choices on each level of the menu. This is not just a choice of how menus are organized but how your e-learning is structured into lessons (online Chapter 12).

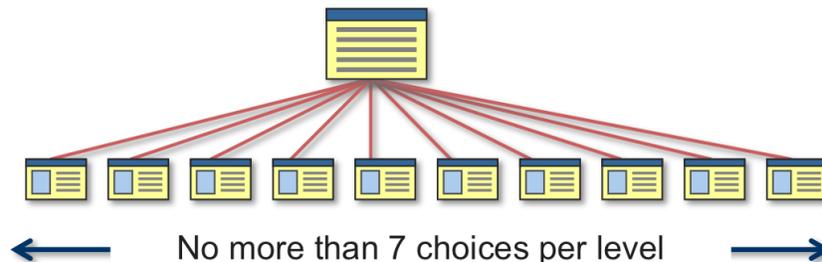
Deep menus

Deeper menus simplify the choices at each level but require more decisions. As a general rule, require no more than 3 decisions to get to a menu choice.



Broad menus

Broader menus reduce the number of choices learners must make to get to a topic. However, the individual choices are harder, as there are more items to pick from at each level. In general, try to limit the number of choices to no more than 7 per level of the menu.



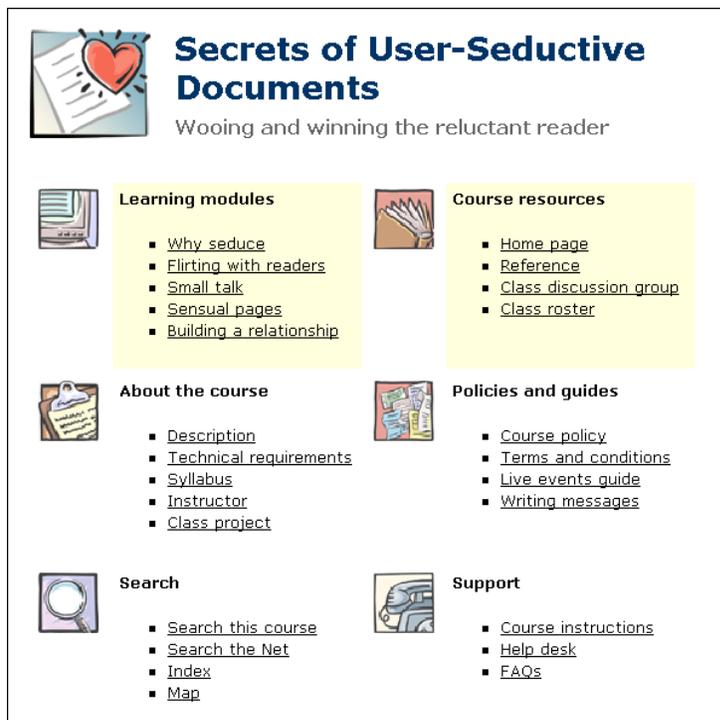
Better broad than deep

Sticking with our guidelines of only 3 levels and only 7 choices at each level, we could ideally accommodate a course with 343 topics ($7 \times 7 \times 7 = 343$). That should be enough for most simple courses. Courses are not so regular in real life, and compromises are necessary.

Research on computer menus suggests that wide menus are better than deep ones. It is easier to re-read a long menu than to have to click back and forth between levels of a menu system. Also, it is easier to find entries by moving the eyes than by moving the mouse.

Compromise by organizing menus

One solution to the depth-breadth tradeoff is to present lots of choices in one display, but to group them into a few categories.



Notice how this menu organizes 25 choices into 6 groups of 3 to 5 choices each.

Built using Adobe Dreamweaver. View example at horton.com/eld/.

Exception: Content for children

Children may be easily distracted or overwhelmed by menus with too many choices but sufficiently motivated by curiosity to pursue their interests through several menu levels. For children, keep individual menu displays short and simple. Use graphics, animation, and other techniques to keep children interested and to give them a sense of progress as they select through a series of menus. Make selecting from the menus like playing a game.

Designing better menus

Create menus that show the organization of the course and guide learners to the specific topics they need.

Avoid dump-truck menus

Avoid the “dump-truck” menu, which occurs when all topics appear at the same level in the menu without regard for how they are related.



No

- Taking pictures with a digital camera
- Setting exposure mode - digital
- Setting speed - digital
- Composing the shot - digital
- Focusing - digital
- Uploading from a digital camera
- Connecting the digital camera
- Completing the upload
- Scanning film pictures
- Starting the film scanner
- Importing scanned pictures
- Editing pictures in the computer
- Adjusting brightness
- Adjusting contrast
- Adjusting saturation
- Cropping the picture
- Rotating the picture
- Adjusting hue
- Printing your photographs
- Calibrating the monitor
- Calibrating the printer
- Printing photographs



Yes

- Taking pictures with a digital camera
 - Setting exposure mode
 - Setting speed
 - Composing the shot
 - Focusing
- Uploading from a digital camera
 - Connecting the digital camera
 - Completing the upload
- Scanning film pictures
 - Starting the scanner
 - Importing the pictures
- Editing pictures in the computer
 - Adjusting brightness
 - Adjusting contrast
 - Adjusting saturation
 - Adjusting hue
 - Cropping the picture
 - Rotating the picture
- Printing your photographs
 - Calibrating the monitor
 - Calibrating the printer
 - Printing photographs

Front-load menu entries

Make sure the most important words in the menu entry appear at the beginning of the entry. Impatient learners may not scan past the first few words. If the menu must appear in a narrow panel, only the first few words may be visible.



No

- Lesson 1: How to take pictures with a digital camera
- Lesson 2: How to take pictures with a film camera
- Lesson 3: How to upload from a digital camera
- Lesson 4: How to scan film pictures
- Lesson 5: How to edit pictures in the computer
- Lesson 6: How to print your photographs



Yes

- Taking pictures with a digital camera
- Taking pictures with a film camera
- Uploading from a digital camera
- Scanning film pictures
- Editing pictures in the computer
- Printing your photographs

Speak the language of learners

In menu entries, use terms learners will understand and value. Replace esoteric terminology that learners can appreciate only after completing your e-learning with simple, everyday language they will already recognize.



No

MERCHECK Program
 CHARGNET Network
 FraudAlert page
 OverLim page
 Reissue DB
 FastHold program
 RePortal Site



Yes

Reduce merchant fraud
 Verify card charges
 Spot fraud
 Check credit limits
 Accept reissued cards
 Hold dubious charges
 Get up-to-date info

Stick with one or two menu styles

As a consultant, I once encountered a suite of courses that included 6 distinct styles of menus: textual and graphical; items arranged in one column, two columns, a grid, and a diagram; menu on the left, center, and right of the page; and sub-menus on subsequent displays and sub-menus in pop-up areas. In some cases to get to a single topic, the learner had to select from four different styles of menus. Please, pick 1 or 2 styles of menus and stick with them.

Use the home page as a starting menu

You can use your course home page as a special menu to some of the high-priority topics. What's the difference between a menu and a home page? A good home page:

- ▶ Welcomes learners.
- ▶ Orients learners.
- ▶ Reveals top-level organization.
- ▶ Supplies one-click access to featured items.

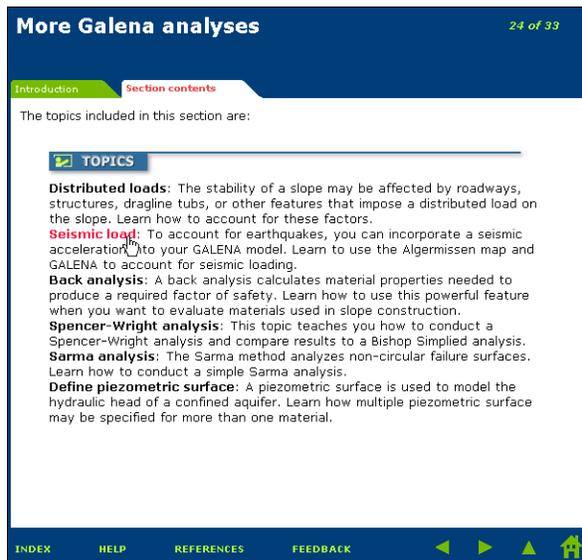
A home page prepares learners to navigate to high-priority topics. It may not be complete, but it is informative and convenient.

Reveal the full title

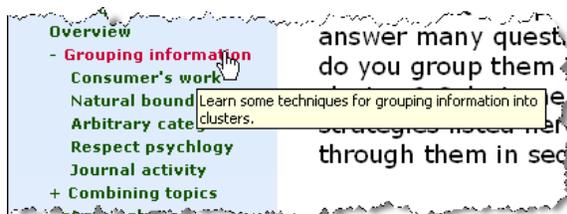
Often menu displays that appear in a narrow panel do not have room for a complete title. Here are some ways to work around this limitation:



In *Virtual and Rapid Prototyping*, when the learner points to a menu item, the menu item expands to reveal the complete title.



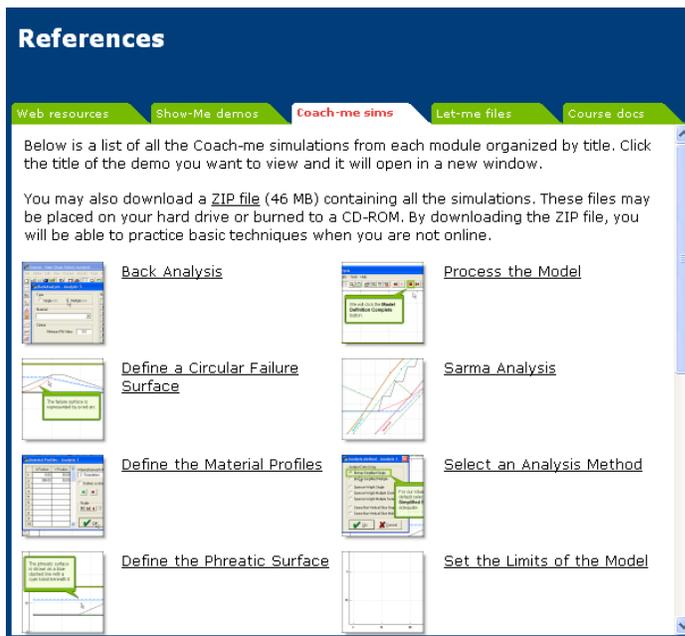
In the *GALENA Slope Stability Analysis* course, there is a lesson-overview page for each top-level selection in the menu. This page gives more details about the topics within that part of the menu.



In *Designing Knowledge Products*, when the learner points to a menu item, an explanation of it appears in a tool tip.

Visual menus

Visual menus indicate choices with visual images rather than just word labels. They work well when learners know what something looks like but may not be able to recognize its name.



Here is an example of a menu of simulations for learners to select from as part of the *GALENA Slope Stability Analysis* course.

Built using Adobe Dreamweaver and custom JavaScript.



And here is an example from the *Mineral Museum* project.

Miniature images preview the appearance of the topic or its subject.

Built using Adobe Dreamweaver, Active Server Pages, and custom JavaScript. View example at horton.com/eld/.

Visual menus are also provided automatically in some tools. Adobe Acrobat includes thumbnails of pages, and Articulate Presenter and Adobe Presenter include small images of slides converted from PowerPoint to Flash.

A visual menu may be useful in subjects for which visual appearances are important, for example, architecture, astronomy, art, archaeology, geology, and biology.

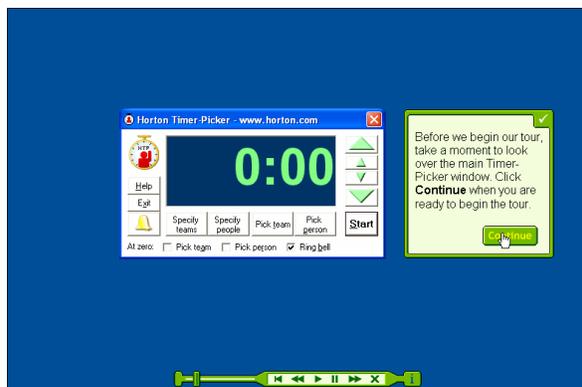
If you are considering a visual menu, think about maps (p. 22), which extend the idea of a visual menu by organizing the items into a composite visual display.

Help menu

Computer programs often let users access tutorials, simulations, and demonstrations from the same menu used to access Help topics. Such access provides shortcuts for people impatient to learn the product.



For example, in the *Horton Timer-Picker*, clicking on the **Help** menu reveals not only conventional help, but also a list of tutorials. For example, selecting **Help** → **Touring the interface** ...



... reveals a short tutorial on how to use the most common features of the program.

Built with Adobe Captivate. View example at horton.com/eld/.

Should you use a menu?

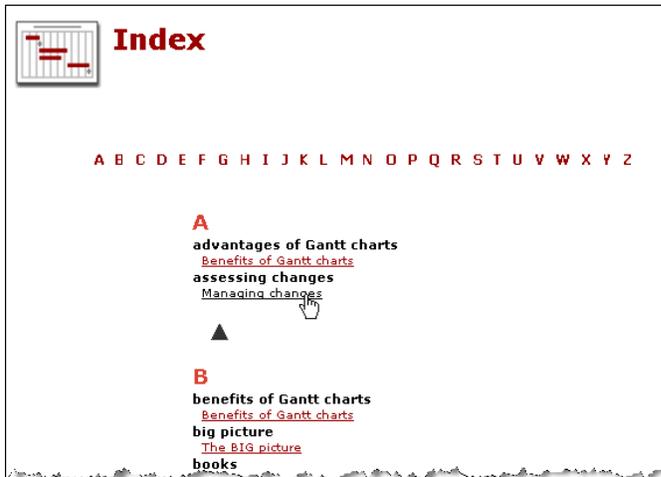
Should you include a menu in your e-learning project? With few exceptions, yes. A good menu is essential if learners need to zero in on specific subjects, for example, when taking e-learning as a refresher or using it as a reference.

The few exceptions for which a menu is not warranted include these:

- ▶ You do not want to let learners skip ahead.
- ▶ No hierarchical organization of the subject is meaningful.

Indexes

The index for the course, like an index for a traditional book, presents an alphabetical list of topics for learners to pick from.



The index for the *Using Gantt Charts* course let learners select a letter button to zip to the entries beginning with that letter. Learners could then select an entry and see its topic displayed.

Built using Adobe Dreamweaver, custom JavaScript, and Adobe Flash. View example at horton.com/eld/.

Should you use an index?

An index is usually a good idea that takes lots of work to create. The index has an advantage over menus or a table of contents. The index can include synonyms that anticipate what words learners may use to describe a concept. An index may be especially useful in helping learners find a specific concept, whose name may not appear in the title of any topic. An index is doubly important if e-learning does not include a search facility.

But creating an index is time-consuming and difficult. It requires a good understanding of both the subject and learners' vocabulary.

An index may not be appropriate if it encourages learners to experience topics out of context and out of sequence. If you include an index, make sure that your topics are not confusing or misleading when accessed in almost random order.

Design better indexes

Several years ago, I purchased the Cinemania CD-ROM because it contained reviews, biographies, photographs, sound and video clips, and other information about movies. One day I wanted to find a picture of the director Alfred Hitchcock, so I began looking in the media index under the letter H.

I could not find Hitchcock, but I did notice a few other entries that seemed to be listed by first name. So I looked under the A's. No Alfred Hitchcock. Can you guess where I had to look? To find Alfred Hitchcock, I had to look in the S's for Sir Alfred

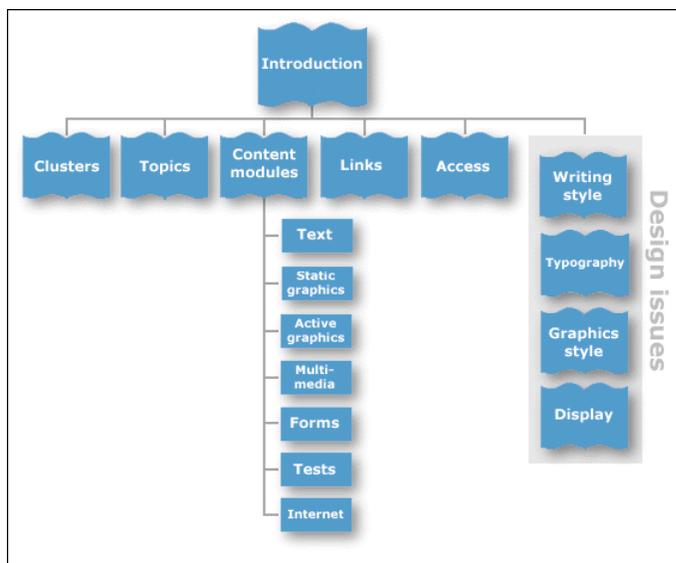
Hitchcock. A convenient way for the computer to sort items, but hardly the way human beings do it. I do not think Sir Alfred would have been amused.

So index by the way people call things—even those ignorant souls who have not learned the correct names by completing your course.

In compiling your index, use terms your learners already know and understand. Use terms they would use to describe what they want to learn. For some guidelines on indexing topics, see page 309 in Chapter 6 on Topics.

Maps

A map is a visual menu that shows how e-learning or its subject is organized. A map displays the logical or navigational organization of e-learning. A map provides shortcuts to the main topics and helps learners form a mental model of the course so they can navigate more reliably on their own.



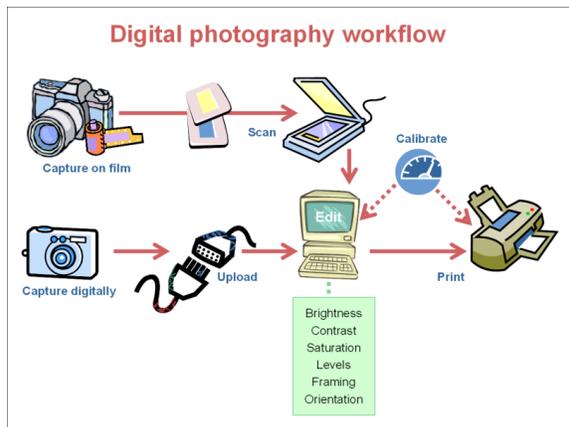
The course *Designing Effective Electronic Courses* features a map showing how content is organized and indicating important relationships within the subject. Clicking on an item in the map displays that topic or lesson.

Built using HTML and custom JavaScript. View example at horton.com/eld/.

If the course contains a separate menu, the map need not be complete. In fact, a single course can contain multiple maps, each emphasizing a different aspect of the subject.

Logical maps

A logical map shows the logical relationships among the lessons and topics of the course.



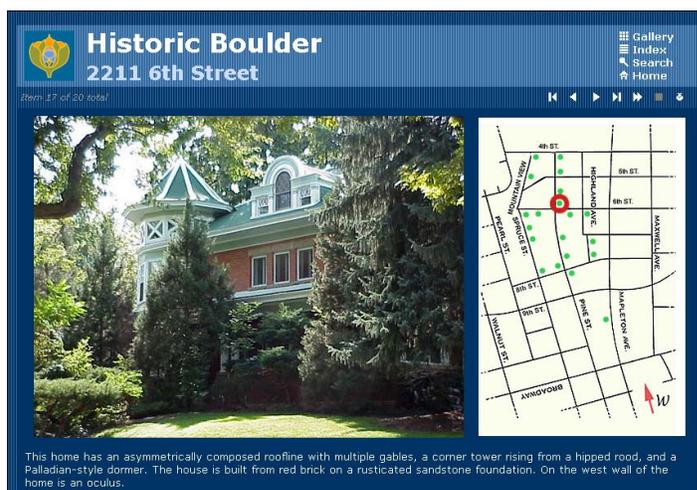
For example, this map shows the processes involved in digital photography. It shows logical dependencies among tasks, alternative paths through the process, and optional steps—all in a way that provides a conceptual overview and lets learners select the part of the process they want to learn about.

The logical map is good for complex procedures, processes, and concepts for which the learner needs to learn just one part. They are good ways to communicate these kinds of relationships:

- ▶ One thing is part of another.
- ▶ One item causes another.
- ▶ Two items or paths are alternatives.
- ▶ One item requires or depends on another.

Geographic maps

A geographic map relates topics to locations in the real world.



In the *Historic Boulder* virtual field trip, a map shows the location of an historic home and other homes the learner can visit. Clicking one of the locations displays the home at that location.

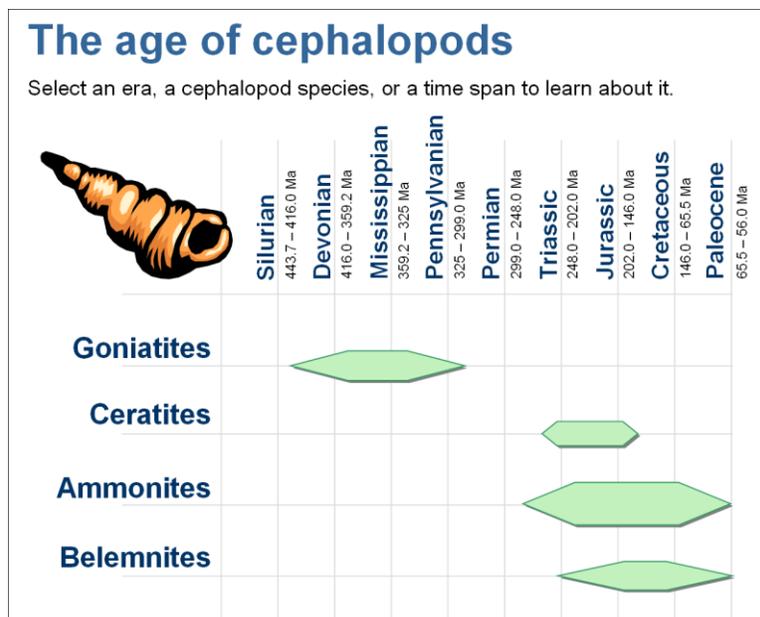
Built using Adobe Dreamweaver and Active Server Pages.

A geographic map can be used whenever the location of a subject is important. For example:

- ▶ Geology by region or by layer in a road cut.
- ▶ Geography by continent, country, province, or region.
- ▶ History by where it occurred.
- ▶ Laws by jurisdiction.
- ▶ Weather by layer of the atmosphere.
- ▶ Urban architecture by neighborhood.
- ▶ Famous battles by location of skirmish.
- ▶ Oceanography on a world map.

Timeline maps

Some subjects are best organized chronologically. Whenever you are talking about a process, procedure, or history, consider a timeline map.



This timeline relates different extinct species to the times when they lived. Learners can access topics by clicking on a time period along the top, a species along the side, or a span during which the species lived.

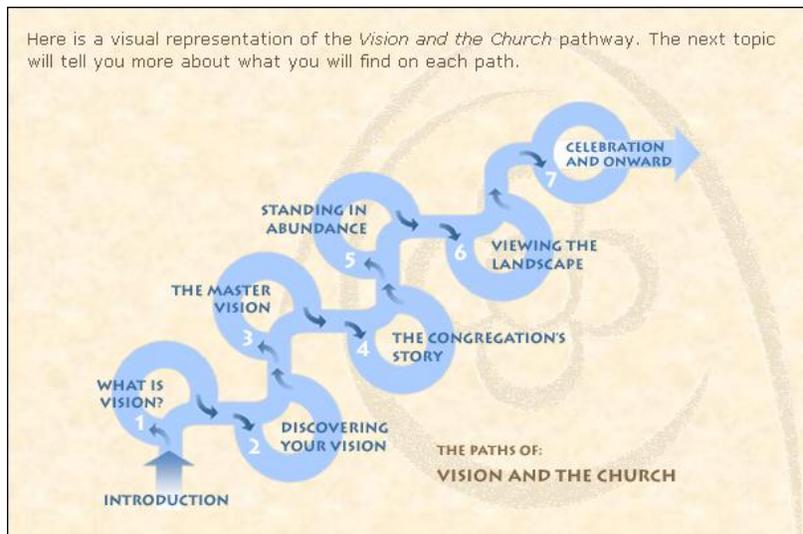
Created in Microsoft PowerPoint.

If you use a timeline map, remember to include the time scale. And make sure that the items and scale are familiar to learners.

Timeline maps can be especially useful when the subject involves events that take place over a span of time, such as manufacturing processes, business processes, military campaigns, developments in science or religion, artistic and literary movements, and evolution of natural and artificial systems.

Schematic maps

A schematic map invites learners on a figurative journey. It recommends sequences of topics and offers side excursions.



The pathway map from *Vision and the Church* shows the sequence of lessons in the course but indicates that each represents an exploration along the way to the ultimate goal.

Built using Adobe Dreamweaver, Active Server Pages, custom JavaScript, and Adobe Flash.

Use a schematic map when none of the other types of map captures the relationships you want to communicate. It is especially appropriate when you want to suggest relationships to learners, even though the relationships do not exist in a physical sense.

Should you use a map?

Should you include a map in your e-learning projects? A map is seldom an absolute requirement, but it is a valuable addition for visual subjects and for visual learners. If you are teaching art history to architects, a map will be appreciated and understood.

A map is also a good idea when you need to teach how the subject and the course are organized. If the organization is a simple linear sequence or a regular hierarchy, a map may not be so critical because learners can pick up the organization from the menu. A map may not be necessary when it would just duplicate the menu. If the menu captures the organization of the subject and the course, save the space and forego the map. However, if the organization is complex or critical relationships exist among units of content, include a map to make those relationships clear.

Search facilities

A search page might seem an odd idea for a course. Yet many learners, whose models of online information and knowledge are shaped more by Internet search engines than by books, may expect or even demand a search facility.

Several years ago I confused and enraged a group of instructional designers by suggesting they include search mechanisms in their courses. Half had no idea what I was talking about and the others thought it was the worst idea since junk mail. Today, most designers have used Google, Yahoo, Bing or some other search service and recognize the value of being able to search for learning. If they do not see the value, their younger learners will be glad to explain it to them.

How search works

In e-learning, we let learners search for courses or within courses.

Search this course

Simple search

Search for:
critical path

For example, in the *Using Gantt Charts*, course, clicking the **Search** button brings up a simple search screen.

Built using Adobe Dreamweaver, Active Server Pages, and custom JavaScript.

Search results

[New search](#)

Num.	Rank	Title	Description
1	74 %	Critical path	Learn what is a critical path and how it can change throughout the project.
2	7 %	Main menu	
3	7 %	Spotting opportunities	Gantt charts help managers complete projects in less time by letting them spot opportunities to improve the project schedule.
4	4 %	Managing changes	No complex project proceeds exactly according to plan. A good plan accommodates changes and makes it easy for managers to foresee the consequences of slippages and early completions.
5	3 %	Parts of a Gantt chart	This topic provides an overview of the parts of a Gantt chart.

The learner enters a search term and clicks the **Submit** button. The system then displays a list of topics that match the search term. Matches are listed by rank, that is, by how closely the topic matched the search terms. Clicking on the name of one of the topics displays that topic.

Search the site

Advanced search

Search for:

Any of the words Exact phrase

Search in:

Text
 Title
 Keywords

Sort results by:

Ranking Title

A more advanced search mechanism might let learners search for words or phrases, specify where the match must be found, and how the resulting matches are displayed.

Built using Adobe Dreamweaver, Active Server Pages, and custom JavaScript.

Index Search Query More Hints

Search

Keyword

Type

Book on paper
 Computer program
 Live event
 Media
 Online course
 Online discussion
 Online event
 Online resource
 Online search
 Organization
 Other paper document
 Periodical
 Person
 Physical object

Length hours

Cost

Include resources with a cost
 Include free resources
 Include resources of unknown cost

Note: If you deselect all the checkboxes, you will not get any resources.

Language

File Format

Product Number

An even more advanced search mechanism may let learners search for learning resources on a particular subject, in a particular medium (book, course, presentation, person), of a specified length, in a certain language, or of a particular file format.

Built using HTML, Active Server Pages, and custom JavaScript

Mineral Museum Search

Gallery
Index
Search
Home

On this page you can look for minerals by specifying various criteria such as color, hardness, location where found, and keyword(s). You can view the results of your search in two ways: as a visual gallery or text list.

Color

Hardness to
on the Mohs scale

Where found
Country (Russia), region (Siberia), or state (Arizona)

Keywords
Words or phrases describing the mineral

Display matches as Gallery List

Still another kind of search lets learners locate topics by subject characteristics. For example, the *Mineral Museum* lets learners search for minerals by color, hardness, source locations, and other characteristics.

Built using Adobe Dreamweaver and Active Server Pages. View example at horton.com/eld/.

The advantage of a search facility is that it allows learners to describe in precise terms the knowledge they seek and then zip right to the topic that best provides just that knowledge. With an effective search facility, the size and organizational complexity of the course are no barrier to finding the needed knowledge.

Should you use search?

Should you allow search in your e-learning projects? If impatient learners will use the course for reference or a refresher, include a search mechanism—especially if learners are accustomed to using Google, Yahoo, and other Internet search services. A search mechanism is also good if you cannot include an index.

Realize though that a search mechanism can subvert your course organization by making it easy for learners to jump directly into the middle of your course. If you include a search mechanism, make sure your topics are self-contained enough to be understood out of context.

How to improve search

What can you do to make search work better for your learners. Here are some suggestions:

- ▶ Explain how to conduct complex searches. Provide instructions on how to search for individual words, combinations of words, and specific phrases.
- ▶ Edit the text throughout your e-learning so it uses terms that searchers use. Write your content in the vocabulary that learners use. Doing so makes your content easy to search and easy to understand.
- ▶ Include keywords in metadata to provide synonyms for words used in text.

Hypertext links

Hypertext links, or hyperlinks for short, let learners select information to display. Clicking on an icon or area of text on the screen jumps to a new location in the document or course and displays the content found there.

What are hyperlinks?

Hyperlinks invite learners to stop reading in one place and continue elsewhere. They also express relationships between topics. Links are nothing new. They have existed in books for centuries as cross-references, tables of contents, index entries, footnotes, bibliographies, figure citations, and thumb tabs.

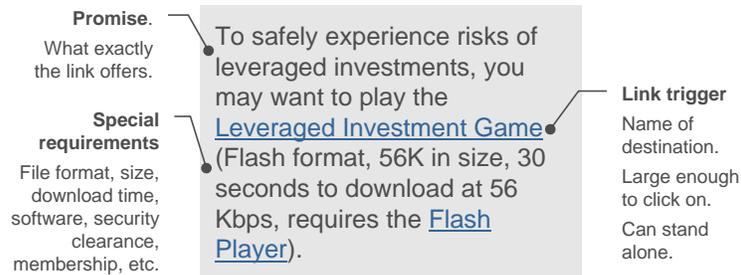
In e-learning, a hyperlink is a sacred contract with the learner that says, “If you take the trouble to click this link, you will experience something of value.”

Label hyperlinks clearly

Ensure that learners can predict the destination of every link they encounter.

Anatomy of a hyperlink trigger

A well labeled hyperlink communicates three vital pieces of information: the promise, the trigger, and requirements.



Make a clear promise

Tell learners what they will experience after clicking on the link. A single, precise phrase is usually sufficient.



No

Click here for miscellaneous other information.

Some really cool stuff



Yes

See a more detailed explanation.

Pictures, games, and music.

Show where to click

Visually indicate where learners should click. Do not require learners to mouse all over the screen looking for the cursor to change indicating something to click on.



No

Would you like to continue the course or return to the simulation?



Yes

Would you like to continue the course or return to the simulation?



Leave text legible

Links should not degrade the legibility of text. Choose link colors and styles that leave text legible. Make link triggers large enough to click, but do not turn whole paragraphs into links.

 No

You may want to see a detailed drawing showing the overall plan for the project and the main phases of work it requires.

 Yes

You may want to see a detailed drawing showing the overall plan for the project and the main phases of work it requires.

Integrate hyperlink triggers into text

Do not disrupt continuous reading. Place link triggers at the end of sentences and paragraphs.

 No

Try the advanced procedure only after you have mastered the simple procedure.

The most valuable form of the mineral beryl is the gemstone emerald. Click here, to learn more about emeralds.

 Yes

If you have mastered the simple procedure, try the advanced procedure.

The most valuable form of the mineral beryl is the gemstone emerald.

Display new content appropriately

You often have a choice of where the destination content should appear. Should it replace the content you clicked on or appear in an entirely new window? Or somewhere else? Let's review your choices and their pros and cons.

Where content appears	Advantages	Disadvantages
Replaces the current window's content.	No separate windows to manage. Learners have only one thing to view at a time.	Learners cannot refer to the original display. A novice may not know how to get back.

Where content appears	Advantages	Disadvantages
In an additional window.	Learners can compare the new display to the one containing the link. The new display is self-contained and clearly separate.	The new display may cover up other windows and clutter the screen.
In another frame or area in the same window.	The display remains stable. The context of the new information is clear.	The new content still replaces the previous content of the target area. Can make text more difficult for screen readers for the blind.
In line with the text of the link.	Information appears where the learner is looking. The surrounding information provides context. Good for definitions of terms, for example.	Limited to small amounts of new information, not for navigation between topics.

Keep in mind that operating systems and browsers for mobile devices may limit the number and display of windows.

Pick persistent Web links

Links to external Web content can create a problem if the content is removed or relocated. Some solutions include:

- ▶ **Link to providers not likely to go out of business.** The university-based Web site created by a student is likely to change once the student graduates.
- ▶ **Link to stable sites.** Prefer sources that do not reorganize their Web sites every few months. Trendy subjects rarely occasion stable sites.
- ▶ **Link to highly cited resources.** The provider may feel a community duty to keep the material available.
- ▶ **Provide multiple links for each type of information** you want to make available. At any moment, some of them will be available.

- ▶ **Check your links frequently** to identify problems. Find replacements for dead links.
- ▶ **Give search terms** instead of links to find resources. For example, “Search the Web for: **gastroenterology seminar.**”

Autoscanning

Autoscanning lets learners flip through topics rapidly until they spot the one they want. Why, you ask, would anyone ever want to access e-learning that way? Well, did you ever flip through the pages of a new book just to see what was there? Later, did you ever return to the book to find something you read by flipping, looking for the page where you remember the information was located? Do you, or perhaps someone in your family, ever flip through TV channels looking for something to watch?

How autoscanning works

Autoscanning automatically advances through pages, screens, or topics of e-learning at a fixed rate of so many displays per minute until the learner signals it to stop.



The *Mineral Museum* includes an autoscanning mechanism.

Built using Adobe Dreamweaver and Active Server Pages. View example at horton.com/eld/.



Clicking the pocket watch icon in the upper right displays the **Set display time** window, where the learner can specify how long to display each page.



Then, if the learner clicks the **fast forward** icon (double right-pointing triangles) on the main display, the virtual tour begins, showing mineral specimens at the rate specified.



Upon spotting a mineral of interest, the learner clicks the **stop** icon.

Should you use autoscanning?

Should you use autoscanning in your e-learning project? Autoscanning is a special-purpose tool. Do **not** use it for general access to learning but for specific occasions, such as:

- ▶ Previews and introductions.
- ▶ Unattended demonstrations.
- ▶ Teaching basic navigation skills.
- ▶ Getting learners' full attention.
- ▶ Controlling the pace.

Autoscanning is a good addition for visual subjects such as art and architecture. It also helps when learners can recognize something but cannot recall its name, such as a distinctive photograph, drawing, diagram, or chart. Or when learners can search for a particular title, banner, heading, bullet list, table, or other visually distinct topic component.

Autoscanning is not effective, however, when objects all look the same or when slow-speed connections make updating the display erratic.

Location indicators

In large, complex courses, it is easy for learners to get lost. Or be unable to find a topic they visited earlier. One way to alleviate this confusion is to include signposts and "you-are-here" maps. Dictionaries tell you where you are by putting the range of words defined at the top of the page in a page header. This book does a similar thing with its page headers. In an amusement park or sports stadium, it is common to find "You are here" signs that include a map with an arrow showing your location.

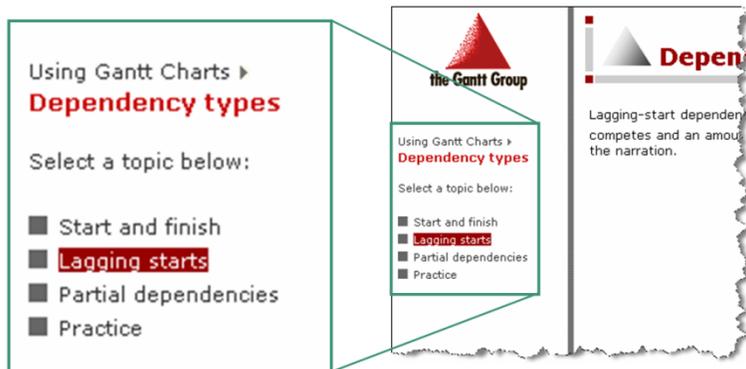
How location indicators work

In e-learning, location indicators visually show how the current topic is related to other topics. They may show its place in the organizational scheme. Location indicators help learners develop a mental model of how the course is organized.

One common approach in hierarchically organized courses is to show the path from the home page or main menu down to the current page. *Basic Training in Protecting Human Subjects* displays such a “breadcrumb trail.” Clicking on one of the items on the path, displays that item.



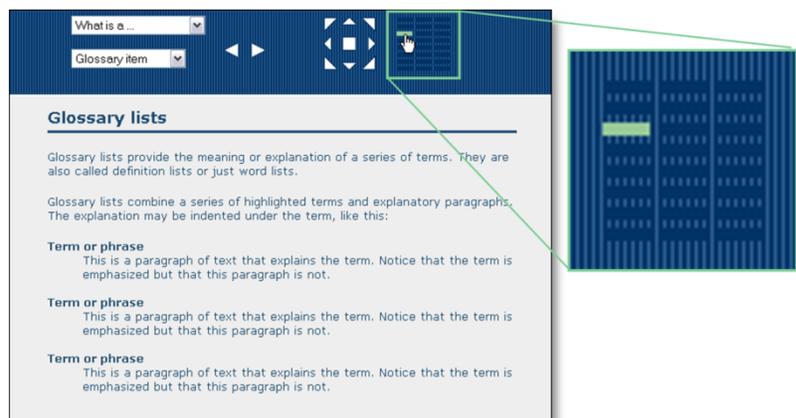
Another form embeds the location indicator at the top of the menu.



In the *Using Gantt Charts* course, the location of the current menu is indicated at the top of the menu. The current topic is highlighted within that menu.

In courses with a more complex organization, additional organizational clues may be required.

In a grid organization it may be necessary to show the position in the grid as well as the names of the current row and column.



Built using Adobe Dreamweaver and custom JavaScript. View example at horton.com/eld/.

Should you use location indicators?

Should you use location indicators in your e-learning projects? I have found them valuable when the course is more than two levels deep. It also helps when learners frequently need to backtrack and start down a new path, as in simulations and exploratory learning.

Location indicators are especially important when learners must follow long paths, for instance, in simulations or troubleshooting procedures. Location indicators simplify reversing direction or undoing recent choices and starting down another path.



The top of each page in this troubleshooting procedure shows the diagnostic trail taken to get to this page.

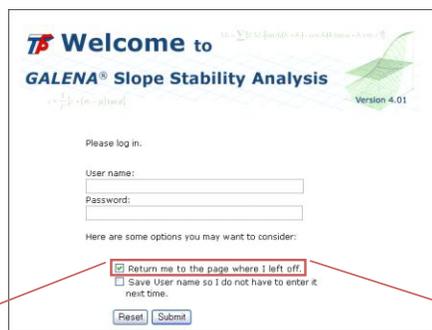
A location indicator may not be of much benefit if the course is not organized in a regular structure, such as a linear sequence, a hierarchy, or a grid. And a location indicator may require valuable space better used for other purposes.

Bookmarks

Bookmarks flag the location where we left off so we can easily return there. When reading a book, we may dog-ear a page or insert a slip of paper to mark our location. In e-learning, we do the same with electronic bookmarks.

How bookmarks work

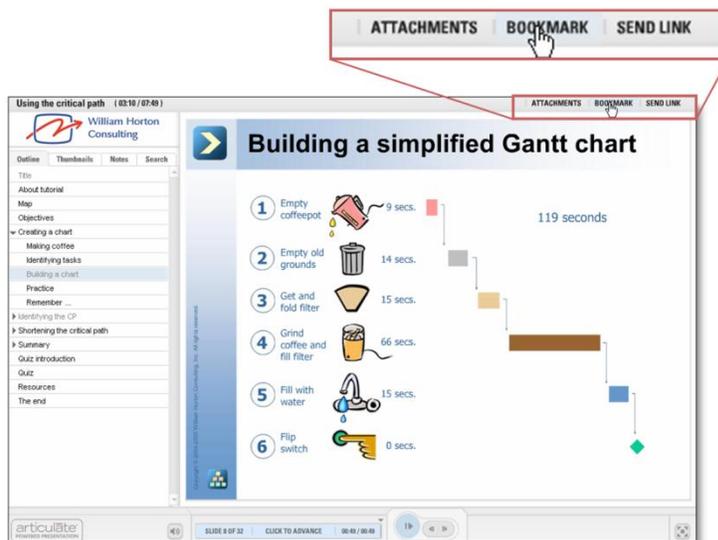
In e-learning, bookmarks serve the same function as in paper books, but they work differently. In e-learning, a bookmark may record where the learner was when exiting and offer to return the learner to that location the next time the learner begins the e-learning.



Return me to the page where I left off.

When learners log into *GALENA Slope Stability Analysis*, they can choose to resume learning where they left off last time.

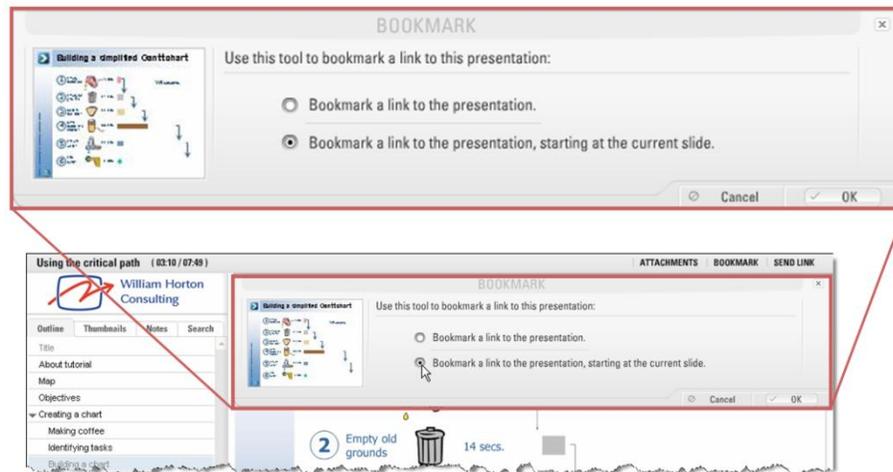
Or the learner can manually define a bookmark.



In courses converted from PowerPoint with Articulate Presenter, the learner can click a Bookmark button.

Created in Microsoft PowerPoint and converted for Web delivery using Articulate Presenter. View example at horton.com/eld/.

The learner can then create a bookmark to the module or to the current location within the module.



For courses that play in a Web browser, the learner can use the **Bookmark** or **Favorites** feature to define a shortcut to the current page.

Page Title	Last Visited	Course
Communications: Chat/Whiteboard	19-January-2006 7:26 PM	
Courses	19-January-2006 7:26 PM	
Courses	19-January-2006 7:24 PM	
Courses	17-January-2006 6:30 PM	
Communications: Chat/Whiteboard	16-January-2006 4:58 PM	Digital Photography
Discussion Topic: Critiquing photos - Welcome	16-January-2006 4:44 PM	Digital Photography
Communications: Discussion	16-January-2006 4:44 PM	Digital Photography
Courses: Map	16-January-2006 4:43 PM	Digital Photography
Courses	16-January-2006 4:43 PM	
Discussion Topic: Photos to critique - Welcome	16-January-2006 4:42 PM	Digital Photography
Communications: Discussion	16-January-2006 4:42 PM	Digital Photography
Courses: Map	16-January-2006 4:42 PM	Digital Photography
Courses	16-January-2006 4:42 PM	
Course Information: Digital-Photography	16-January-2006 4:41 PM	

And some learning management systems, such as The Learning Manager, can display a history of recently displayed topics.

Should you use bookmarking?

Should you use bookmarking as a navigation aid in your e-learning project?

Bookmarking is valuable if segments of the course are longer than learners can take at one time or if learners are frequently interrupted. They have less value for short courses. They can be difficult to create unless your tools automate the process.

BALANCE NAVIGATION MECHANISMS

By adding navigation mechanisms to your e-learning, you turn them into efficient reference works as well. If learners can quickly find an individual explanation, fact, or sequence, they can look up knowledge when they need it—without having to take the entire course. If learners can quickly find the part of the course on a single subject, they can use it for just-in-time learning, right when they need specific skills or knowledge.

Spotting opportunities

Gantt charts help managers complete projects in less time by letting them spot opportunities to improve the project schedule.

Tasks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
A	█																								
B						█																			
C												█													
D																									
E	█																								
F				█																					
G																									
H																									
I																									
J																									

Navigation: Restart Previous Stop Play

Index Contact us Need help? Search

Several navigation mechanisms are built into the *Using Gantt Charts* course. First there is a constantly displayed **menu** to the left. As part of the menu is a **location indicator**. At the lower-right are buttons for **paging** through the course one topic at a time.

Index

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A
 advantages of Gantt charts
[Benefits of Gantt charts](#)
 assessing changes
[Managing changes](#)

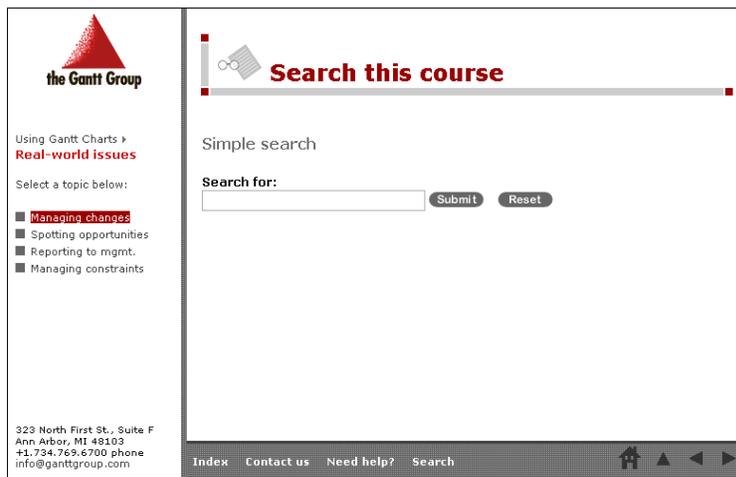
▲

B
 benefits of Gantt charts
[Benefits of Gantt charts](#)
 big picture
[The BIG picture](#)
 books
[Books](#)
[Resources](#)

▲

Index Contact us Need help? Search

The course also includes an alphabetical **index** so that learners, unfamiliar with the structure of the course, can find the individual topics or modules they want.



Built using Adobe Dreamweaver, Active Server Pages, custom JavaScript, and Adobe Flash.
View example at horton.com/eld/.

The course does contain a couple of other navigation aids: a **Home** button to return to the starting topic of the course and an **Up** button to move up one level in the menus.

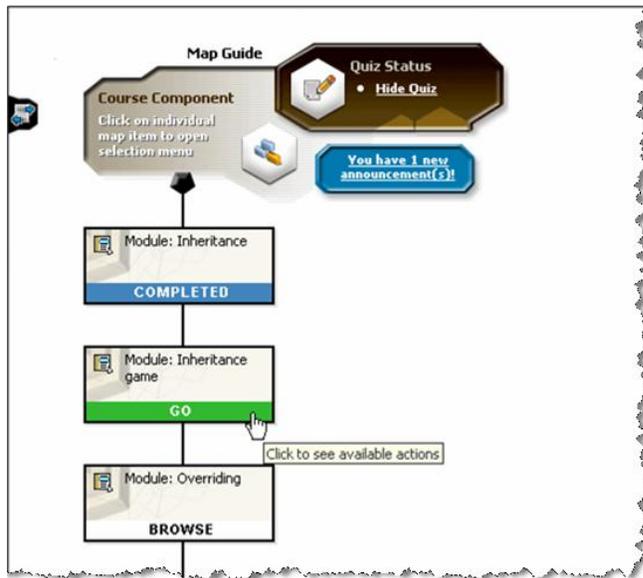
IMPLEMENT NAVIGATION MECHANISMS

There are three ways to provide the access mechanisms mentioned in this chapter:

- ▶ Run the course in a learning management system (LMS) or learning content management system (LCMS) that provides access mechanisms.
- ▶ Build the course in authoring tools that automatically create access mechanisms.
- ▶ Manually construct the mechanisms using custom programming or scripting and custom-created buttons.

Let your LMS/LCMS provide a framework

Learning management systems launch and track completion of courses. Learning content management systems consolidate the modules or objects of a course and provide navigation among them. As such, these tools can provide some of the navigation mechanisms you need.



For example, here is a course map generated for a course managed by an LMS called The Learning Manager.

Management systems vary in the mechanisms they implement. Some pure LMSs merely launch the course. Those that combine some features of LCMSs automatically generate menus, maps, paging buttons, bookmarks, location indicators, search facility, and other navigation aids. Check the technical documentation of the LMS or LCMS before you depend on it for your navigation.

The advantage of using a management system to provide navigation is that the navigation is automatic and is consistent among all the courses managed by the system. With some systems all you need to do is to create the individual learning objects, import them into the system, and define a menu. The designer selects the desired navigation tools from a dialog box and the system takes care of the details.

A disadvantage of relying on the management system is that your course is totally dependent on the management system. If you need to move your course to another LMS, it may not have the same navigation mechanisms. If your course needs to run outside a management system, you are out of luck.

Use your authoring tool for standard features

Some authoring tools for e-learning can automatically create navigation aids, or at least simplify the process for the author. For example, let's consider the navigation provided by Articulate Presenter. It is a tool for converting PowerPoint presentations into e-learning. Articulate provides several navigation mechanisms. In a panel to the left of the content, Articulate creates an **Outline** tab which displays a multi-level menu of slides and assessments. A **Thumbnails** tab offers a visual menu where

learners can select from miniature images of slides. A **Search** tab provides a simple search facility.



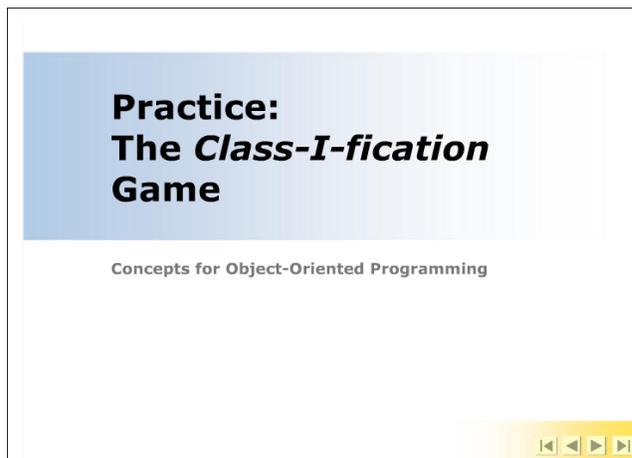
Created in Microsoft PowerPoint and converted for Web delivery using Articulate Presenter. View example at horton.com/eld/.

Articulate also includes buttons to page through the course and to create bookmarks. It also creates links to related documents and can display text notes or a transcript of narration.

If your authoring tool can create navigation mechanisms, by all means consider using them. They will save you a lot of time over creating the navigation manually. However, do not let the authoring tool dictate the navigation. If an authoring tool does not provide adequate navigation or does so in an awkward way, consider hand-building custom navigation.

Hand-build custom navigation

Sometimes, you just have to manually build navigation into content. Perhaps you cannot depend on the presence of a management system and your authoring tool cannot provide the specific type navigation you need.



For the *Class-I-fication game*, I needed to construct navigation buttons keyed to this particular unit of content. Those are the buttons at the bottom right.

Created in Microsoft PowerPoint and converted for Web delivery using Articulate Presenter. View example at horton.com/eld/.

When is it worth the effort to break out the manuals, roll up your sleeves, and custom-code a navigation scheme? Here are some cases for which lazy (that is, time-efficient) developers resort to manual means:

- ▶ You need a custom pathway through the course or you need to customize navigation to local areas of your course.
- ▶ You need navigation that is specific to the subject matter. A management system would thwart subject-specific navigation, such as in highly-branching simulations.
- ▶ Your course needs to run independent of any management system.
- ▶ Your course does not have a simple organization.

BEST PRACTICES FOR NAVIGATION

Make navigation predictable

Learners should navigate your course confidently and surely. Buttons should take them where they expect. The course should behave the way learners expect it to behave. Enlist learners in making your navigation predictable. Sit down with a learner and a prototype. Point to a button and ask, “Where does that button take you?” Then make sure the button does what learners expect.

Provide intra-topic navigation

Once learners get down to an individual topic, they may still need to move around in the topic.

I've closed the North Loop Trail because the #29 bridge has collapsed due to rot. We're coming up on the fall hunting season and we need the trail open. What's the "minimum" action in this case?

Trail supervisor

Instructions

This micro-scenario presents a situation you must resolve by making a decision. Consider the facts of the situation and necessary concepts and principles before you decide.

Use the **Background**, **Policy**, and **Resources** tabs to research the scenario and decide what decision you should make.

Click the **Decide** tab when you are ready to resolve the scenario.

Tip: Look at the question and option on the **Decide** tab before you complete your research and analysis.

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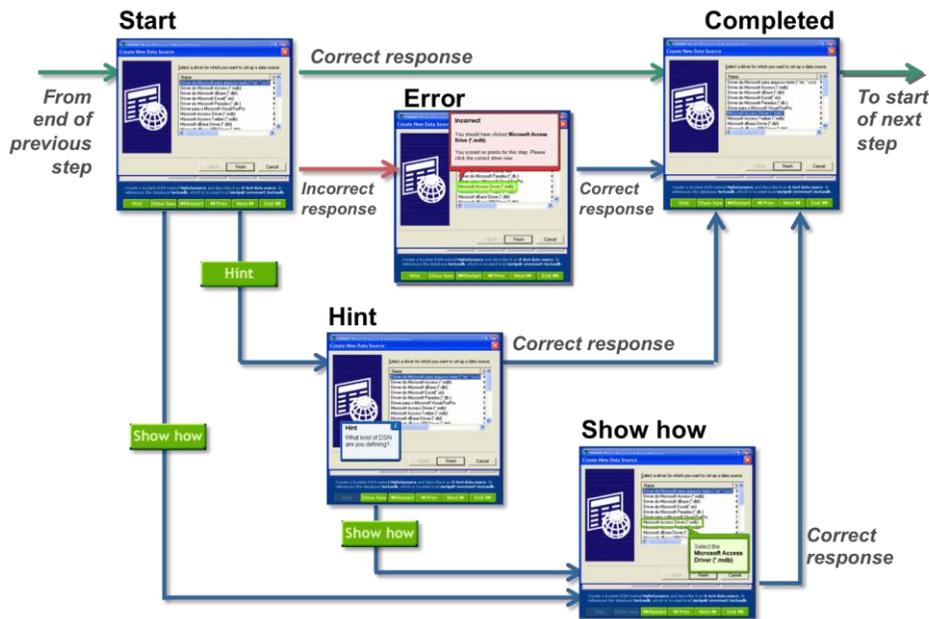
In this example, learners navigate within the topic by selecting tabs.

Created in Microsoft PowerPoint and converted for Web delivery using Adobe Breeze Presenter. View example at horton.com/eld/.

Make navigation simple and direct at all levels of e-learning.

Design pathways for efficient learning

Chart out the paths learners will navigate through your course. Construct bypasses and shortcuts for impatient learners and slow roads for those who need to take in the scenery.



This diagram shows navigation through each step of a simulation teaching a computer procedure. From the start learners can complete the step by making the correct response. If they make an error, they get instructions on how to proceed. Learners can also request a hint or explicit instructions.

Charting out your pathways helps you refine them so they seem simple and natural for learners.

Shorten pathways

When learners want to learn, they want to learn. They do not want to rummage around in your e-learning hoping to find something useful. As a standard, I suggest this rule:

Require no more than 3 to 5 decisions to get to any component of the course or to answer any question.

Anything more than that and learners will give up before they get to the component they need.

IN CLOSING ...

Unless learners can find the content they need, e-learning is for naught. Navigation mechanisms ensure that learners can move through e-learning in ways that help them accomplish learning objectives—their own and those of the provider of e-learning.

Summary

E-learning benefits from an appropriate mixture of navigation mechanisms, selected with the needs of learners in mind. Some of these mechanisms are familiar from their use in paper books while others are creations of the electronic era. Pick wisely from this list:

Navigation mechanism	Description	When to use it
Paging	The learner repeatedly clicks a Next button to move through the content in a logical sequence.	Almost always, especially for novices who lack skills required by more sophisticated navigation mechanisms. Also when you want to restrict access to a single path.

Navigation mechanism	Description	When to use it
Menu	Learners pick lessons and topics from a hierarchical list organized by logical categories.	To allow learners to drill down to a specific topic. To reinforce the organization of the course.
Index	Learners pick from an alphabetical list of topics.	To enable just-in-time learning by letting learners directly access specific topics, regardless of where they occur in the course.
Map	Learners pick lessons or topics from a visual representation of the organization of the course.	To communicate a complex organization of a visual subject to visual learners.
Search	Learners search for words and phrases in the course.	Learners familiar with Web search engines need to go directly to individual topics.
Hypertext links	Learners click highlighted words or phrases to jump to related content.	Not everything fits in the formal organization or learners need access to auxiliary materials.
Location indicators	Learners see visual indications of their current locations in the course.	When learners need to learn how the course is organized so they can navigate more reliably.
Auto-scanning	Learners watch as displays appear in sequence. Learners signal when they want to stop and examine a display.	Learners recognize what something looks like but do not know its name.

Navigation mechanism	Description	When to use it
Bookmarks	Learners return to topics they visited earlier.	Learners need to return to topics they visited earlier or just to resume where they left off.

For more ...

The navigation needed for a course depends on how the course is organized. Online Chapter 12 suggests ways to organize topics into lessons. Navigation mechanisms typically require buttons, text items, and other gadgets that must be displayed. Online Chapter 14 suggests how to design the visual display.

Implementing navigation mechanisms will require tools. Of first importance are tools for authoring e-learning. Also important are *learning management systems* and *learning content management systems*. Web searches using these terms will guide you to specific tools.