

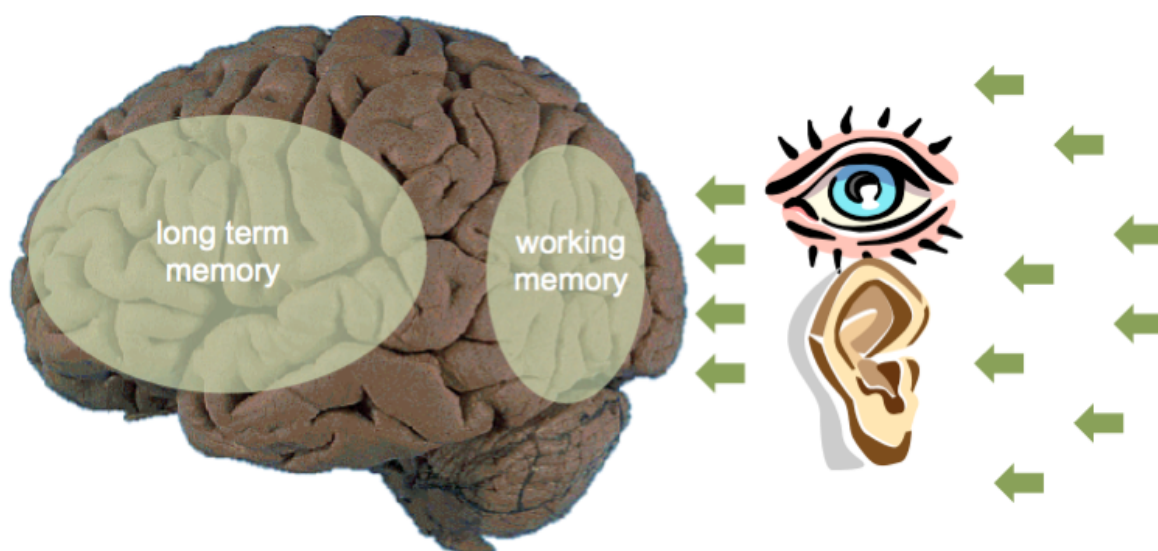
A practical guide to creating reference information

Strictly speaking, reference information isn't learning content at all, because its purpose is on-demand performance support, not learning. In a performance support context, there is no requirement for the information that is being referenced to be learned, i.e. to be stored in long-term memory. The information is required only to answer a current question or solve a current problem and, as such, it will be processed only in working memory.

Because working memory is so limited (current thinking is that humans can hold only 3-5 items of information in their conscious working memory at any one time), it is vital that reference information is extremely clear, simple and concise, minimising the risk of cognitive overload.

Reference information is playing an ever bigger part in our lives. There's so much we could know and it's changing so regularly that it really is pointless trying to remember it all – we couldn't do it if we tried. True, it is still as important as ever that we understand the key concepts, principles and rules that underpin our work, as well as the skills to apply these on a day-to-day basis, but the rest we can draw down as and when it's needed.

As a learning designer you may be wondering what reference information has to do with you, but you can play a key role. When you design a learning solution, you have to decide what's course and what's resource, and in many cases you will share materials between the two. And, as an expert in communication, you are better placed than many to do a good job of putting together reference materials that are clear, concise and usable.



Reference information need go no further than working memory

Media elements

Reference information can utilise any media element, but tends to centre on text. There are good reasons for this. Text is fast to load, it can be quickly skimmed, it can be easily cross-referenced with links and can be copied and pasted with ease. The key with reference information is to get users in, get them to what they want and get them out again as quickly as possible. Text – supported where appropriate by photos, illustrations, charts and diagrams – performs these functions really well.

Conversion Values	
<p>Length</p> <ul style="list-style-type: none"> 1 Mile (Statute) = 5,280 Feet 1 Mile (Nautical) = 6080 Feet 1 Mile = 1.61 Kilometer 1 Meter = 3.28 Feet 1 City Block = 528 Feet 1 Fathom = 6 Feet 1 Hair's Breadth = .0039 Inch 1 League = 3 Miles 1 Leap = 6.75 Feet 1 Marathon = 26.22 Miles 1 Mark Twain = 12 Feet 1 Mile (Nautical) = 1.15 Mile (Statute) 1 Military Pace = 2.5 Feet 1 Pole = 16.5 Feet 1 Rod = 16.5 Feet 1 Stick = 10 Feet 1 Story = 10.827 Feet <p>Temperature</p> <ul style="list-style-type: none"> 1 Degree C = 33.8 Degrees F <p>Speed</p> <ul style="list-style-type: none"> 1 Knot = 1.15 Mile/Hour Speed of Sound = 781.21 Mile/Hour Speed of Light = 670,415,504 Mile/Hour <p>Volume</p> <ul style="list-style-type: none"> 1 Barrel = 31.5 Gallons 1 Barrel Oil = 42 Gallons 1 Bucket = 5 Gallons 1 Bushel = 8 Gallons 1 Cord = 128 Cubic Foot 1 Cubic Yard = 27 Cubic Foot 1 Cup = 8 Ounces 1 Fifth = 25.6 Shots 1 Fifth = 17 Jiggers 1 Pint = 2 Cups 1 Gallon = 8 Pints 1 Gallon = 4 Quarts 1 Gallon = 128 Pony 1 Gallon = 3.785 Liters 1 Hogshead = 63 Gallons 1 Ounce = 6 Teaspoon 1 Ounce = 1 Tablespoon 	<p>Weight</p> <ul style="list-style-type: none"> 1 Bale = 480 Pounds 1 Bag (Portland Cement) = 94 Pounds 1 Grain = .00228 Ounces 1 Gram = .03527 Ounces 1 Kilogram = 2.205 Pounds 1 Last = 4000 Pounds 1 Pound = 16 Ounces 1 Quarter = 25 Pounds 1 Stone = 14 Pounds 1 Ton = 2000 Pounds 1 Gallon Water = 8.33 Pounds 1 Gallon Diesel = 7.38 Pounds 1 Gallon LPG = 4.24 Pounds 1 Cubic Foot Concrete = 145 Pounds 1 Cubic Foot Copper = 550 Pounds 1 Cubic Foot Aluminum = 165 Pounds 1 Cubic Foot Steel = 490 Pounds <p>Area</p> <ul style="list-style-type: none"> 1 Acre = 43,560 Square Foot 1 Square Mile = 27,878,400 Square Foot 1 Square Yard = 9 Square Foot 1 Township = 36 Square Miles <p>Electrical</p> <ul style="list-style-type: none"> 1 Horsepower = 746 Watts 1 Kilowatt = 1000 Watts 1 Megawatt = 1,000,000 Watts 1 Milliwatt = .001 Watts 1 Microwatt = .000001 Watts <p>Miscellaneous</p> <p>Diesel Fuel Consumption = .070 x KW = GPH</p> <p>If you weigh 150 pounds on earth, you will weigh:</p> <ul style="list-style-type: none"> 56.7 on Mercury 138.05 on Venus 24.9 on The Moon 56.55 on Mars 354.6 on Jupiter 137.4 on Saturn 133.35 on Uranus 168.75 on Neptune 10.05 on Pluto 4060.8 on The Sun

Assuming it is formatted properly for reference use, text does an excellent job of getting the user to the information they require

There are exceptions of course. Some tasks are best explained visually, using video or screencasts with accompanying narration. As long as these are kept short and sweet, they can do the job. As we have dealt with both of these formats in previous guides, we won't be covering them here.

Interactive capability

Because the purpose of reference materials is just-in-time support and not learning, interactions which encourage users to explore ideas or which assess learning are not relevant. Apart from anything else, they would drastically slow up the user in getting in and getting to the required information. On the other hand, as we shall see in part 3 of this guide, navigational interactivity is critical to good reference materials, whether that's through search, indexes, tables of contents or cross-references. Some more advanced performance support materials may also allow users to configure the information they want to receive (think of something like a weather or stock price app on a mobile device) or will ask users a series of questions to help them trouble-shoot a problem or narrow down a decision.

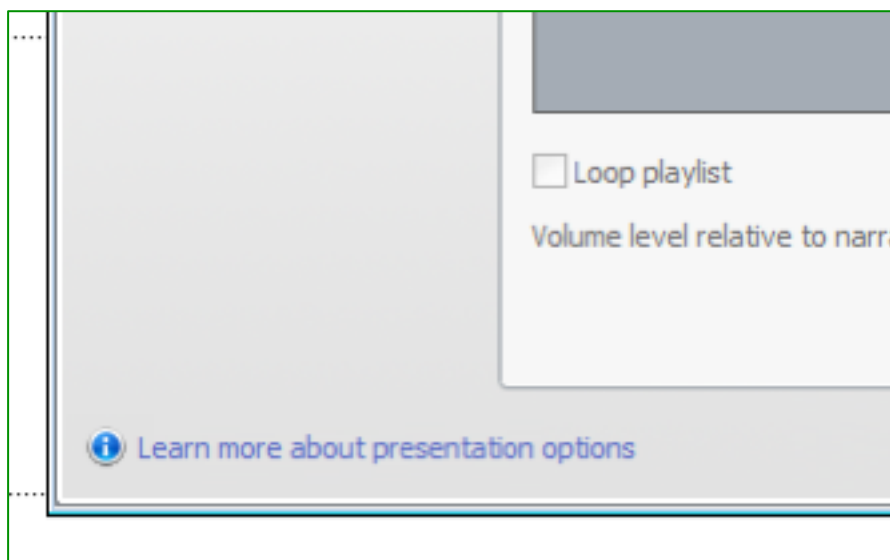
Applications

Reference materials fit classically within the exploration learning strategy. As such they are designed not to be 'pushed' at the user but 'pulled' as required. In the context of a blended learning solution, they supplement courses with easily accessible resources. Whereas historically some 80% of a learning designer's effort might have been put into the courses and only 20% into providing on-demand resources, we can expect that ratio to reverse in coming years. People no longer expect to have to store loads of information in their heads; they do expect to be able to access it online.

Formats

Reference information can be presented in a number of formats:

Embedded in a software application: One of the most common requirements for on-demand help is to explain how to use a particular software application, or how to enter appropriate data into that application. An advantage of embedding the help within the application itself is that the information presented can be context-sensitive, i.e. directly relevant to the activity that the user is currently undertaking.



Embedded help can be context-sensitive, taking you directly to the information relating to your current task

In a native document format: Much reference information is stored in a native document format such as Microsoft Word. While tools like Word have very sophisticated editing capabilities, they are not best suited to online use. Native files are slow to open and depend on the user having a copy of the application that was used to create them. More importantly, it becomes clumsy to link from document to document and it is all too easy for different versions of the document to be available at the same time.

As a PDF file: PDF is versatile in that a wide range of applications can save in this format. It also overcomes the need for users to have copies of Word, PowerPoint or whatever other applications were used to create the materials. PDFs are particularly suitable when users need to be able to access information without an online connection or when they want to print materials out. In all other circumstances, HTML wins out.

In HTML: HTML is the format of the web and, as such, is standard across all computing devices. Web pages are ideal for displaying reference information because they download quickly, can be accessed from any device, and can be kept up-to-date centrally. They can also be easily cross-referenced using hyperlinks.

As a mobile app: As any smart phone or tablet user can attest, apps are the quickest and easiest way possible to access information. They are particularly suited to situations in which a body of content or an up-to-date information source needs to be accessed very regularly.

They score over mobile web browsers which access simple HTML pages online because the way the information is displayed can be designed specifically for the mobile device in question. The application itself is stored locally which speeds up access, and less volatile information can be stored on the device itself, making the information accessible even when there is no internet connection.

So how do I get started?

Assuming you have researched fully what information is needed by whom and in what circumstances, your next job is to choose the format in which the information will be presented. This format will dictate the tools you'll need:

Embedded information: Here your best route is to liaise with the developers to see what's possible and what help creation tools are available.

Native document format: This is simple enough – just use Word, PowerPoint or whatever to create your materials and then publish in the version most widely available to your users.

PDF: It used to be you had to purchase special Adobe Acrobat software to create PDFs, but now you'll find that many of the applications you're already using can save directly to PDF format.

HTML: The tools you use here will depend on the infrastructure your organisation already has in place for distributing information. You probably already have a content management system for your intranet and that's a good place to start looking. If not, and you're focusing particularly on providing information to support software users, you may want to purchase a system that's specially designed for creating online help materials.

Whatever the case, you do not want to be hand crafting HTML pages. Those days are long over. Creating web pages should be no more complicated than filling in a form.

Mobile app: Although some easy-to-use tools are coming available, developing an app is still a specialised and highly technical process. For now, it is probably best to liaise with your own IT team or engage an external contractor.

vi		Changing Text	
Replace The Current Character	r[char]	>	
Replace Current Chracter With Text	R[text][escape]	>	
Substitute For Current Character	s[text][escape]	>	
Substitute For Current Line	S or cc[text][escape]	>	
Change Current Word To Text	cw[text][escape]	>	
Change Rest Of Current Line To Text	C[text][escape]	>	
Change To End Of File	cG[escape]	>	

Reference apps for mobile devices are ideal for information you need to access regularly

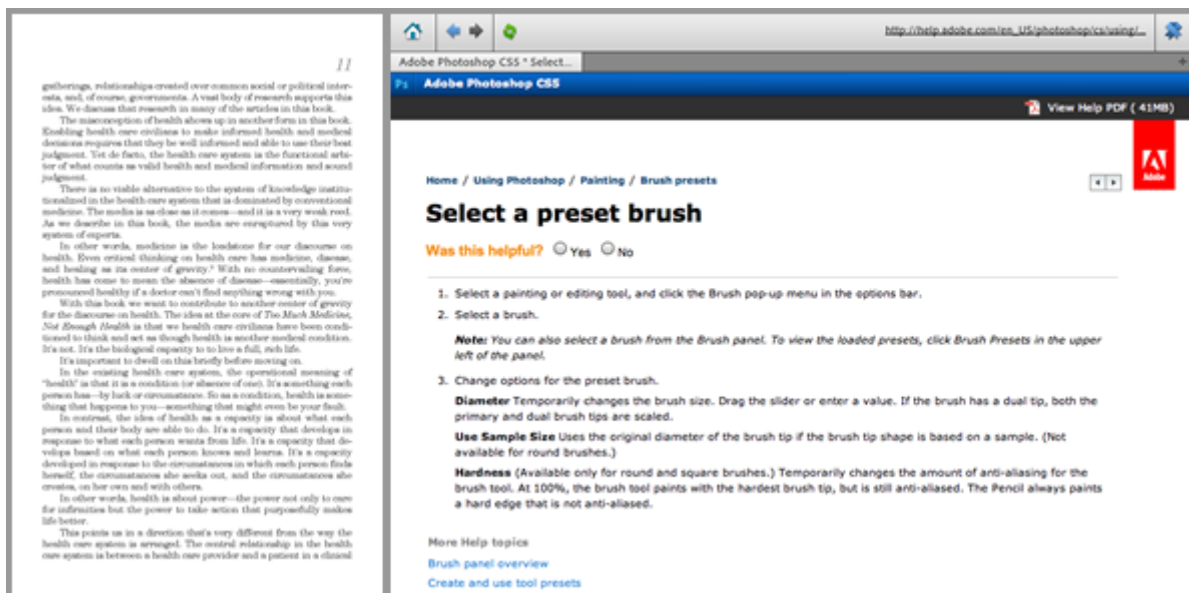
Let's move on to how best to design your reference information ...

General design guidelines

Reference information is different from other learning content because its purpose is to meet a short term need, not to have some long-term effect on the user. It does not need to engage the user, because you can assume that anyone who has made the decision to consult reference material is already engaged. It does not seek to stimulate thought or discussion. It does not need to assess the degree to which learning has taken place, because learning is not its purpose. You should have one simple aim in designing your materials: getting the user to the information they need as quickly and simply as possible and then presenting that information in such a way that it can be used immediately.

Here are some general tips that you can apply to any type of online reference material:

Provide structured information, not prose: What works in a book, a report or a magazine does not work for reference. Very few people will read your material from beginning to end, if they read it at all. They will jump around and skim at lightening speed until they find what they are looking for. Long paragraphs of text are very hard to skim, so focus instead on using tables, lists and diagrams. If you must use prose, keep paragraphs and sentences short and focus on one point at a time. Use plenty of clear, descriptive headings. Leave out the anecdotes and witticisms.



Unstructured prose is fine if you're relaxing reading a novel but is no good if you're hunting down information. Contrast the extract on the right from Adobe Community Help.

Be consistent: It is much easier to navigate information that is presented consistently. Choose a format for each type of information and use this every time. Adopt a typographical standard and apply this universally. Never vary your means for navigation. What should stand out should be important information such as rules and warnings. The only way you will achieve this is against a uniform backdrop.

Ditch the numbering system: It is debatable whether elaborate numbering systems ever helped anyone to navigate a print document, but they are completely unnecessary and unhelpful online. Online information is accessed using search boxes and links. Numbers only get in the way.

Presenting factual information

Factual information, such as names, dates, email addresses, spellings and codes, is best structured into databases or tables, and sequenced alphabetically, numerically or chronologically.

As software becomes more intelligent, we will have less need for these tables; we should expect frequently-used data to be suggested to us automatically, based on our historical usage pattern and the particular context. But there will always be exceptions and we do not only need factual information when we using a software application.

What you want to do	What you press
Bold	[Ctrl][B]
Change case	[Shift][F3]
Center Align	[Ctrl][E]
Copy	[Ctrl][C]
Cut	[Ctrl][X]
Delete a word	[Ctrl][Backspace]
Find and replace	[Ctrl][F]
Go to page, section, line, etc.	[Ctrl][G]
Go to the beginning of the document	[Ctrl][Home]
Go to the end of the document	[Ctrl][End]
Insert a hyperlink	[Ctrl][K]
Italicize	[Ctrl][I]
Left Align	[Ctrl][L]
New Document	[Ctrl][N]
Open	[Ctrl][O]
Open the thesaurus	[Shift][F7]
Paste	[Ctrl][V]
Print	[Ctrl][P]
Repeat your last action	[F4] or [Ctrl][Y]
Save	[Ctrl][S]
Select all	[Ctrl][A]
Select to the beginning of the document	[Ctrl][Shift][Home]
Select to the end of the document	[Ctrl][Shift][End]
Spell check	[F7]
Undo	[Ctrl][Z]

This alphabetical table of keyboard shortcuts from Techicious makes it easy to reference factual information

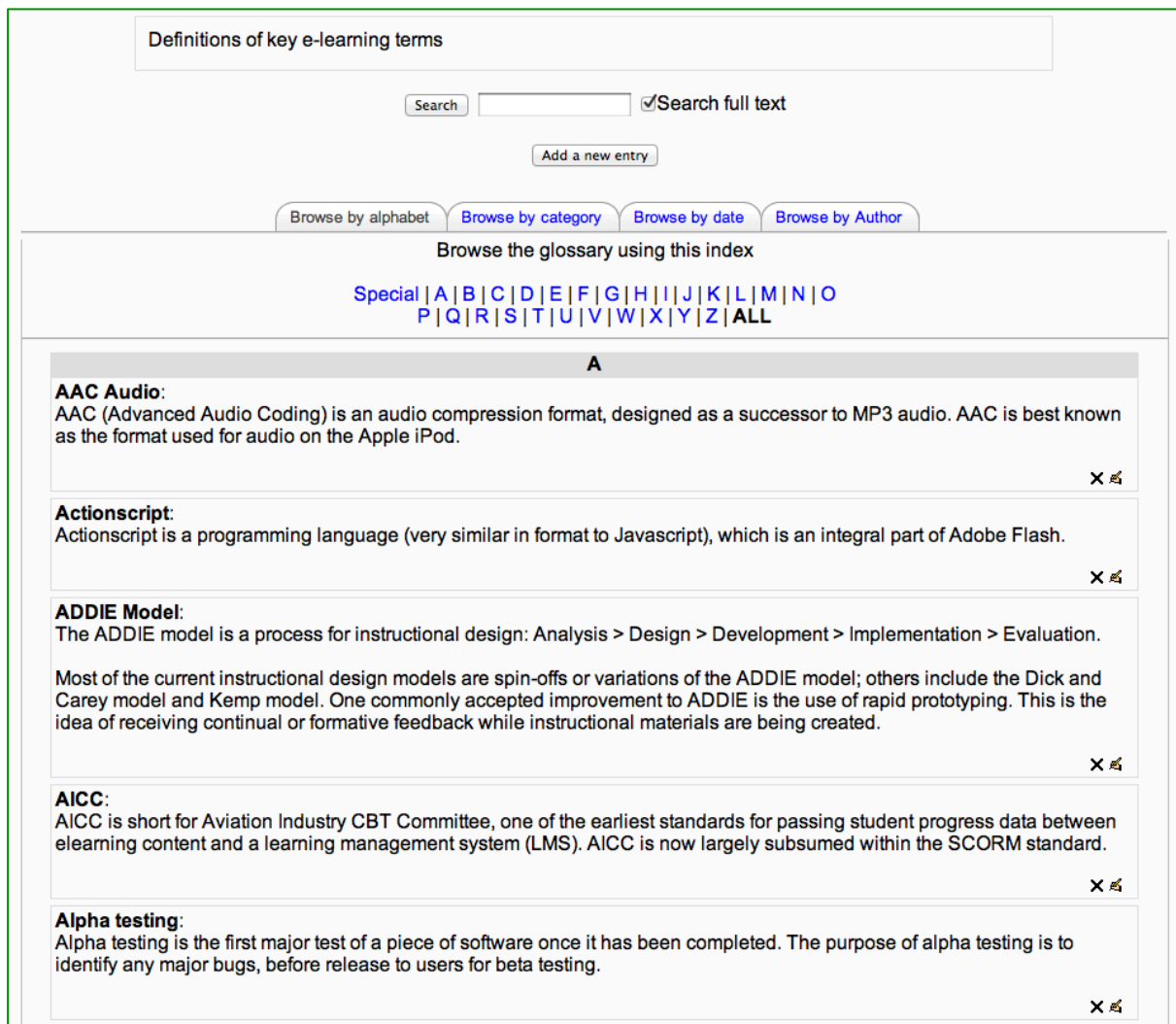
Presenting concepts

According to Ruth Clark, a concept is a category of objects or ideas that is usually designated by a single word. Essentially when we refer to concepts, we are talking about the terminology which helps us to find our way around a particular knowledge domain. Without a common understanding of this terminology, we cannot communicate with our peers.

An example of a concept is the hashtag used by Twitter. To understand this term we need a definition, one that makes clear what a hash tag is and what relevance it has. We could do with some examples and some non-examples; for example, #devlearn is a hashtag to be used when referring to the DevLearn conference, but @devlearn is a Twitter username.

Some concepts are less abstract and benefit from a non-verbal approach. So don't just list the characteristics of different species of bird; show what they look like and what they sound like.

Sometimes we need to explain a concept in conjunction with a procedure, because the procedure only makes sense when the concept is clear. More typically, when we have many concepts to explain we are better off building a dictionary or glossary.



The screenshot shows a Moodle glossary interface titled "Definitions of key e-learning terms". It includes a search bar with a "Search" button and a checked "Search full text" option, along with an "Add a new entry" button. Below the search bar are navigation tabs: "Browse by alphabet", "Browse by category", "Browse by date", and "Browse by Author". The main content area is titled "Browse the glossary using this index" and features a navigation bar with links for "Special", "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", and "ALL". The "A" tab is selected, displaying a list of terms with their definitions and edit/delete icons:

- AAC Audio:** AAC (Advanced Audio Coding) is an audio compression format, designed as a successor to MP3 audio. AAC is best known as the format used for audio on the Apple iPod.
- Actionscript:** Actionsript is a programming language (very similar in format to Javascript), which is an integral part of Adobe Flash.
- ADDIE Model:** The ADDIE model is a process for instructional design: Analysis > Design > Development > Implementation > Evaluation. Most of the current instructional design models are spin-offs or variations of the ADDIE model; others include the Dick and Carey model and Kemp model. One commonly accepted improvement to ADDIE is the use of rapid prototyping. This is the idea of receiving continual or formative feedback while instructional materials are being created.
- AICC:** AICC is short for Aviation Industry CBT Committee, one of the earliest standards for passing student progress data between elearning content and a learning management system (LMS). AICC is now largely subsumed within the SCORM standard.
- Alpha testing:** Alpha testing is the first major test of a piece of software once it has been completed. The purpose of alpha testing is to identify any major bugs, before release to users for beta testing.

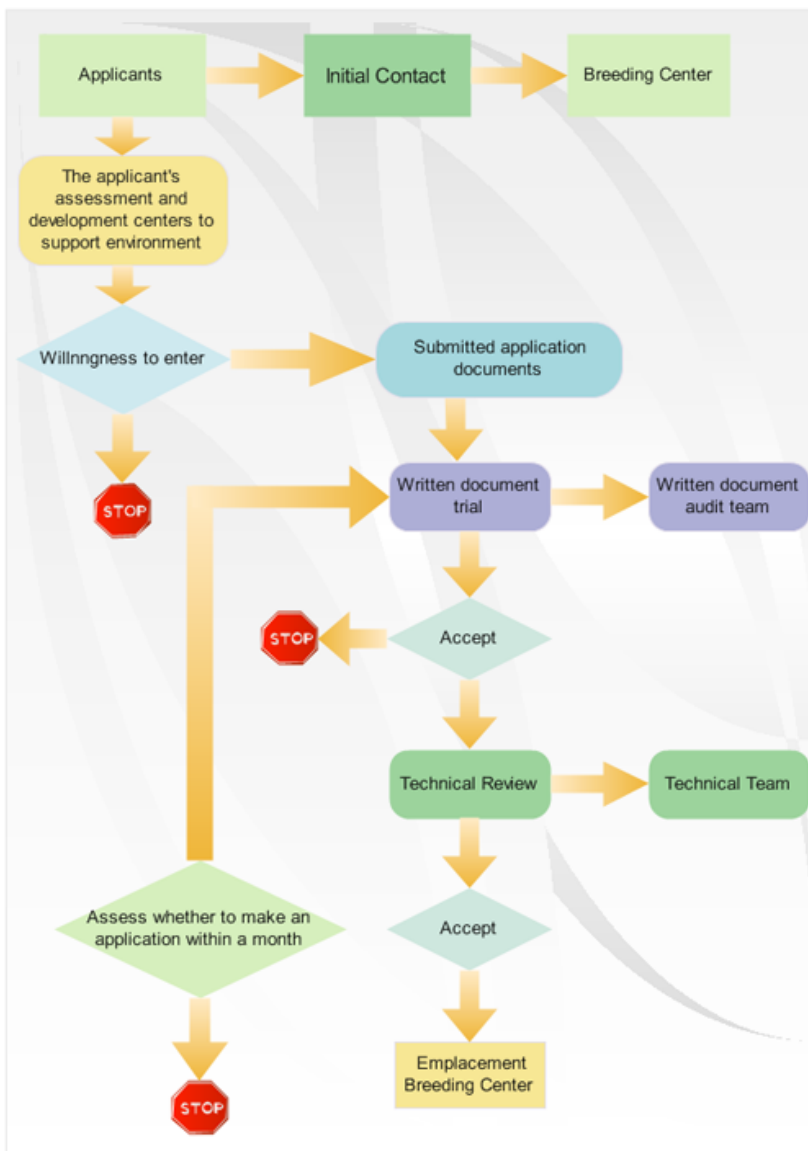
This Moodle glossary provides easy access to definitions of e-learning terms

Presenting procedures

A procedure is a series of rules for carrying out a routine task in a logical sequence. Some procedures are essentially linear: we carry out the same steps each time. Others are conditional: at each step we need to progress differently depending on the particular situation.

Linear procedures can be laid out in a simple tabular form, with tips and warnings at each step where appropriate. If you are presenting a software procedure, use screen shots at each step, but only if these are really needed to make the procedure clear. Remember that these will need revising regularly as the software is updated.

Conditional tasks can be hard to explain in tabular form, in which case you could use a flow chart. These too can become complex and unwieldy, in which case an interactive tool might be more appropriate, in which each step is presented in turn, with conditional links depending on the decision made at each point.



This flowchart from Edraw Soft provides an overview of how a business process works

Presenting processes

A process is a description of how something works. Processes typically involve a number of stages, with the output of one stage being the input to the next.

Some processes, such as the water cycle, are cyclical. Others, such as a disciplinary process, continue until some goal or end point is reached.

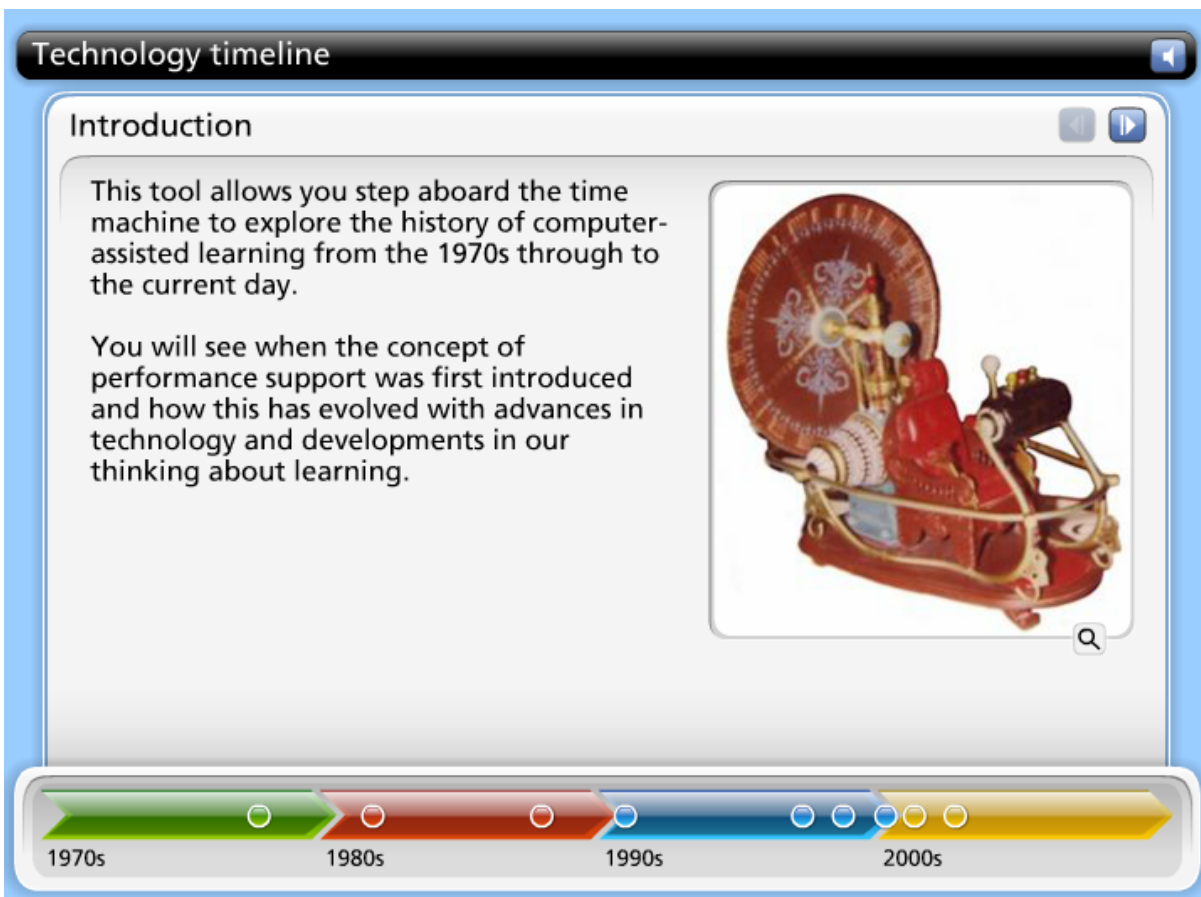
When users understand a process, they get the bigger picture; they understand how what they do impacts on others.

Processes can be presented in a tabular fashion, but they will often benefit from a process flow diagram of some sort.

Presenting structures

Some information is essentially structural in nature; it describes the 'parts of' things, like the bones in the body, the towns in a region, the elements in a software interface, the roles in an organisation chart, the events in a timeline.

Unsurprisingly, this information is best presented visually, with each part clearly labelled. You can also configure each element as a link to further information.



This interactive timeline, produced using Articulate's Engage tool, provides a way for users to explore the history of learning technology

Problem-solving and decision making

Sometimes it is not just information that a user needs, but help in troubleshooting a problem or making a decision.

One of the most common ways of addressing the former is with an FAQ, a list of frequently-asked questions, but for more complex problems, such as a network fault, an interactive troubleshooting tool is likely to be much more useful.

Decision aids could be structured as a simple comparison table, listing the pros and cons of each option, or more helpfully as an 'if ... then' list, which recommends a different option for each potential circumstance. A more interactive tool might ask a series of questions in order to narrow down a suggestion to a single alternative.

Let's move on look at the various ways you can provide access to your information:


Tables of contents

Tables of contents (TOCs) are usually associated with print publications but still have a valid role to play in digital media. Whereas searching can be a rather hit and miss affair, a TOC provides an organised and orderly gateway to a body of information. Every situation is different, but there are some general rules that will help you in preparing a TOC:


Organise the table in a way that makes sense to your user, not what is easiest for you. Think of all the situations in which a user might come to your information and how they would expect to drill down to find what they want. Should the information be organised in task order, by category, chronologically or alphabetically?

Keep menus to a reasonable length while keeping the loading of new menu pages to a minimum. This might sound an impossible compromise to make, but there are all sorts of ways of hiding and revealing lower-level menu items using the sorts of tree menus you find in your computers file managers.

Draw your user's attention to the most commonly sought after items of information. You could even have a top ten list.

 **What can we help you with?**


Example: "search box" or "clear history"

 **Learn more about using Google Chrome**

Get started	How to
Install Google Chrome	Bookmark your favorite pages
New to Google Chrome?	Manage your tabs and windows
Frequently asked questions	Search the web
Using the address bar (omnibox)	Manage your personal settings
Importing or exporting bookmarks	Manage language and display settings
More...	Chrome Web Store

Google provides access to its Chrome help library through a table of contents, but also – as you would expect – through a search box


Google Chrome > Help articles > Get started > Install Google Chrome > Downloading and installing Google Chrome

 How do browsers and the web actually work? Check out [20 Things I Learned about Browsers and the Web](#) [Hide](#)

Downloading and installing Google Chrome

Google Chrome is a free web browser that takes just minutes to install. It's available for Windows, Mac, and Linux computers ([see detailed system requirements](#)). In this article, we'll walk you through each step of the installation process.

- [+ Windows instructions](#)
- [+ Mac instructions](#)
- [+ Linux instructions](#)

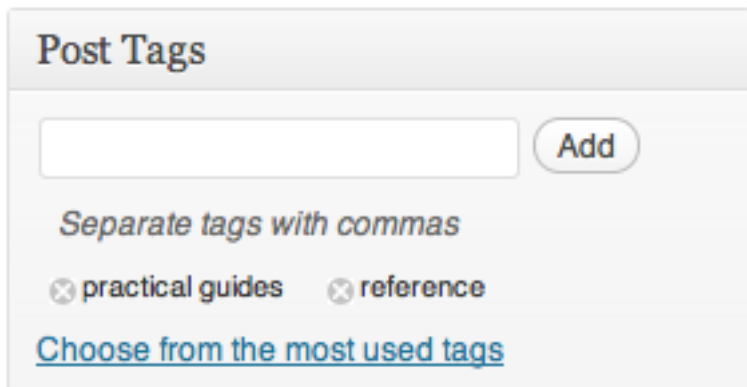


The length of this menu is kept to a minimum by the use of collapsible menus. The user chooses which menu is appropriate to their operating system. Notice how Google draw your attention to a popular favourite – '20 things I learned about browsers and the

Search

Search used to be considered a rather unfriendly way for users to access information, but search technologies and users skills in searching have come on in leaps and bounds. The advantage from a user's perspective of using search over a TOC is that it shortcuts all that drilling down through menus. A search facility is now expected and should definitely be provided if at all possible.

Search can be improved by tagging, the process whereby descriptive labels are applied to content. The process of tagging can be managed on a top-down basis, by content authors, or bottom-up, when users supply their own labels.



Post Tags

Separate tags with commas

practical guides reference

[Choose from the most used tags](#)

This box is used to add tags to postings on the Onlignment blog

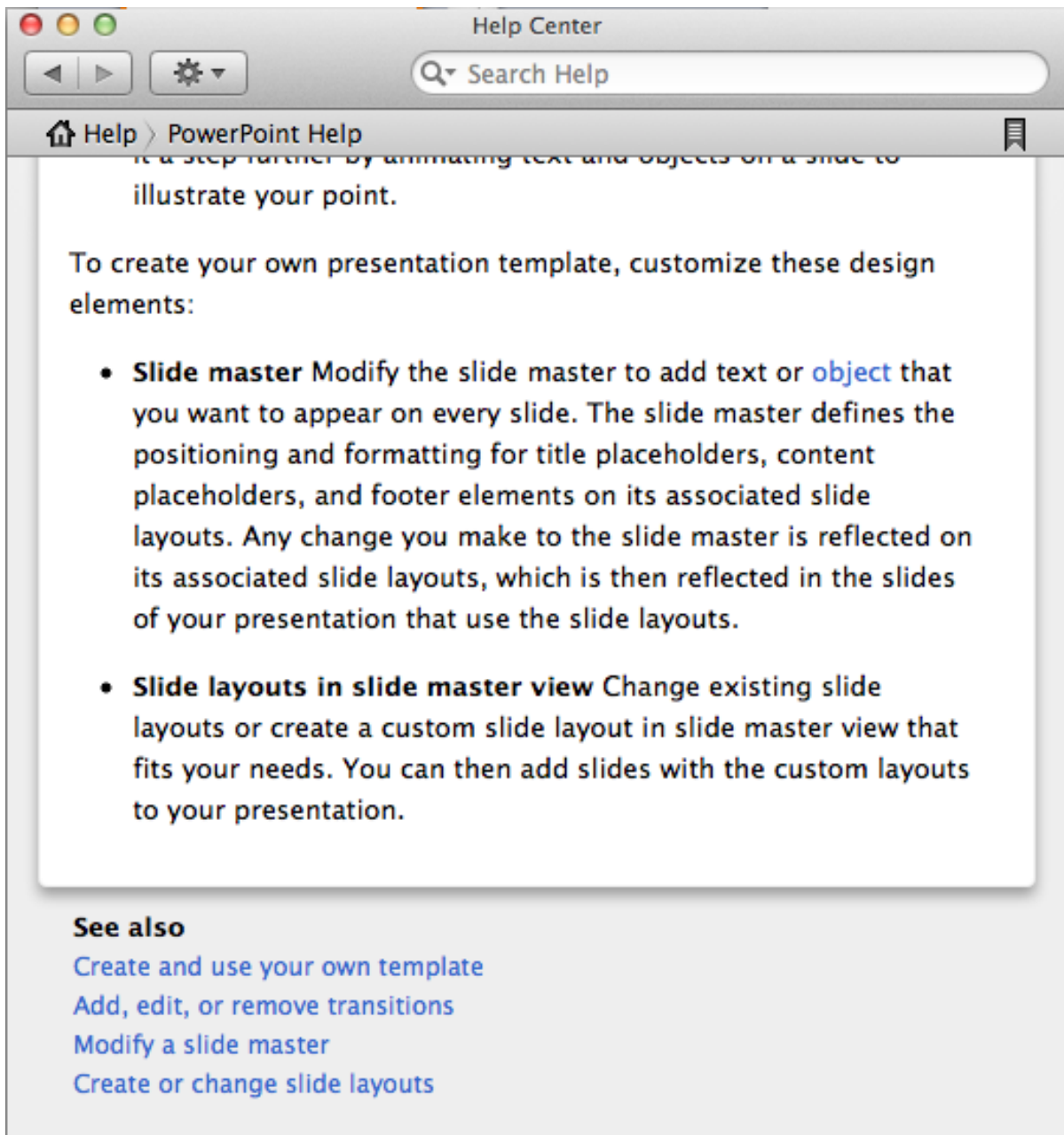
Making suggestions

Another way to get users to information that they could find useful is to provide them with intelligent suggestions. An easy and obvious way to do this is to provide 'Related items' links at the bottom of each piece of information.

You could go a little further by building up a profile of each user and then suggesting links that you know from their past usage history would be relevant to them – something like what Amazon do with their 'People who bought this title also bought ...' suggestions.

Peer recommendations are always the best, so you may also want to provide a facility to let users recommend items of content to their colleagues, perhaps by emailing them a web address or through some social networking tool.

Unless you have a great deal of programming expertise at your disposal, chances are you'll be limited in the way you can provide access to information by the tools already available to you. Where you do have choices, use them wisely. Listen to your users and let them tell you what they find useful and what's just dressing.



This entry in the PowerPoint help system is supplemented by links to related items. Notice also how the word 'object' is linked to a pop-up glossary entry