Design Principle:

Closure and Web Navigation Design

Tim Boileau

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Content Structure and Navigation

A key component of Web-based training, or of well designed Web sites in general, is a navigation system that keeps the learner or user informed of where s/he is at, at all times. Navigation must be integral to the screen layout in order to be effective, without being obtrusive or distracting to the user (Van Every 2003).

An underlying design principle adopted for use in Web-based Instructional Systems Design (ISD) comes from the concept of closure. Simply stated, closure permits the instructional designer to break the learning content into chunks, allowing the learner to focus on content at the topic level, while maintaining a contextual reference to the lesson and module. (Huang 2003). Navigational elements are used to group the topics into a cohesive lesson, thus providing the learner with a gauge to track his/her progress, and a reference to provide a context of where s/he is at within a topic, lesson or module. The distinction here is in whether the learner is going through the training unit to accomplish a learning objective, or accessing the material for reference following the initial training.

Gestalt Principles of Perception

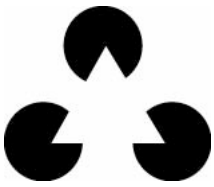
The Gestalt theories were developed in the late nineteenth century by a group of Germans including Max Wertheimer, Wolfgang Kohler, and Kurt Koffka. This work was largely in response to the predominant psychological theory of the time – atomism. Atomism looked at parts of things as being absolute and not dependent on context. Gestalt Theorists, on the other hand,

studied how the mind perceives the whole out of incomplete elements. "To the Gestaltists, things are affected by where they are and by what surrounds them…that is to say that things are described as "more than the sum of their parts."" (Behrens 1984; Mullet, Sano 1995).

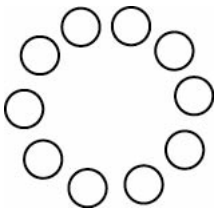
There are several principles that have been derived from the original work of the Gestalt Theorists including: similarity, proximity, symmetry, and closure. Whereas each of these principles has application to the science of instructional design, the focus for the remainder of this paper is on the principle of closure and its application to navigation and structure of content in Web-based training.

Gestalt Principle: Closure

The principle of closure is based on the innate tendency and need for humans to seek completeness in shapes and figures, even when part of the information is missing. There is speculation that this stems from a survival instinct, allowing humans to complete the form of a predator even when provided incomplete information. (Skaalid 1999). The principle of closure is illustrated in the examples below.



In this example, we perceive three black circles covered by a white triangle. Alternatively, we could see three incomplete circles that are joined together.



In this example, we perceive a larger circle outlined by the smaller circles, even though they are not joined together.

From an instructional design point of view, the concept of closure has been applied in each evolutionary stage including Computer-Aided Instruction (CAI), Computer-Based Instruction (CBI), Computer-Based Training (CBT), and eLearning Web-Based Training (WBT). (Huang 2003)

Applying the Principle of Closure to WBT Navigation

Transitioning from Print to On-line

When developing instructional content for the printed page, we are able to make certain assumptions regarding the way that users will navigate through the final product. Learners are well adept in using such navigational elements as pages, binding, covers, table of contents, page numbers, headers, footers, and indexes. In moving to on-line environment, few of the cues learned from using printed materials translate into this new domain of information presentation and delivery.

In effect, "We need to teach our users how to find what they are looking for and allow them to put that information to use." (Andrisani, Gaal, Gillette, Steward 2001). The use of navigational elements provides both a frame of reference, and a context for the instructional content. Consistency in placement of text, graphics, and navigational devices is key to gaining user confidence, resulting in credibility for a WBT program.

Example of Closure in WBT Navigation

The example given is based on a taxonomy consisting of four levels:

- Module
- Lesson
- Topic (Sub-Topic)
- Page

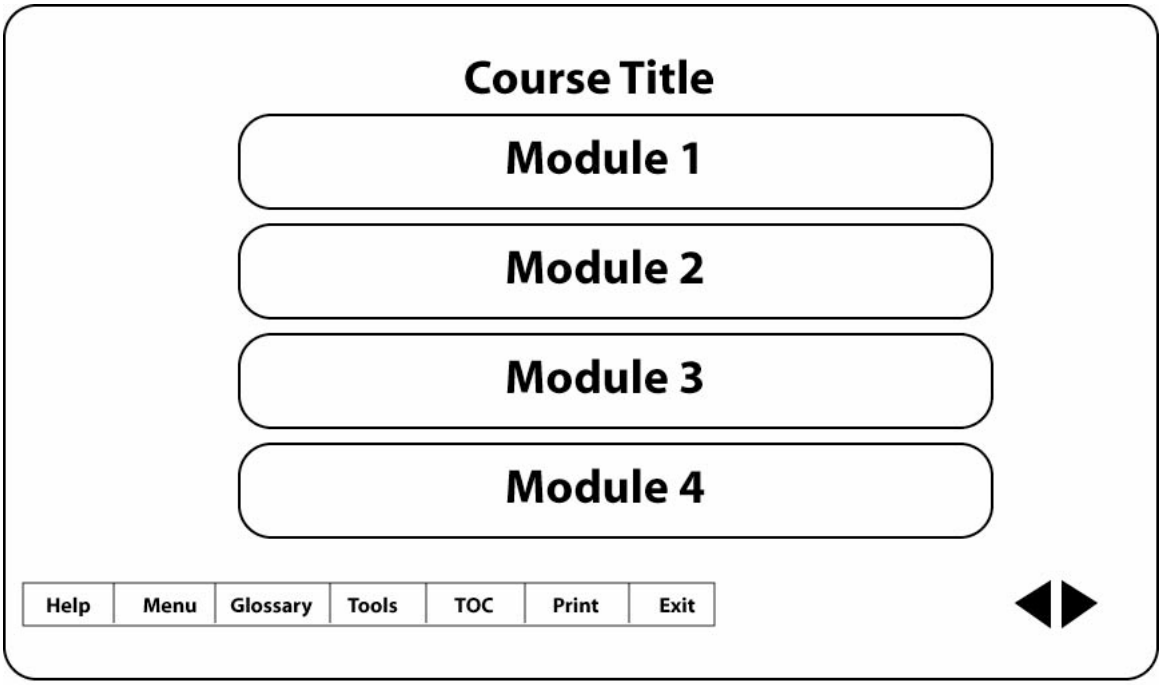


figure 1

Figure 1 shows an example of a main menu. The standard navigational elements provided are help, menu, glossary, tools, TOC (table of contents), print, exit, and next/back buttons. These elements appear on each page and serve the same purpose regardless of content displayed. When the learner clicks on one of the module selections, they see a screen such as in figure 2.

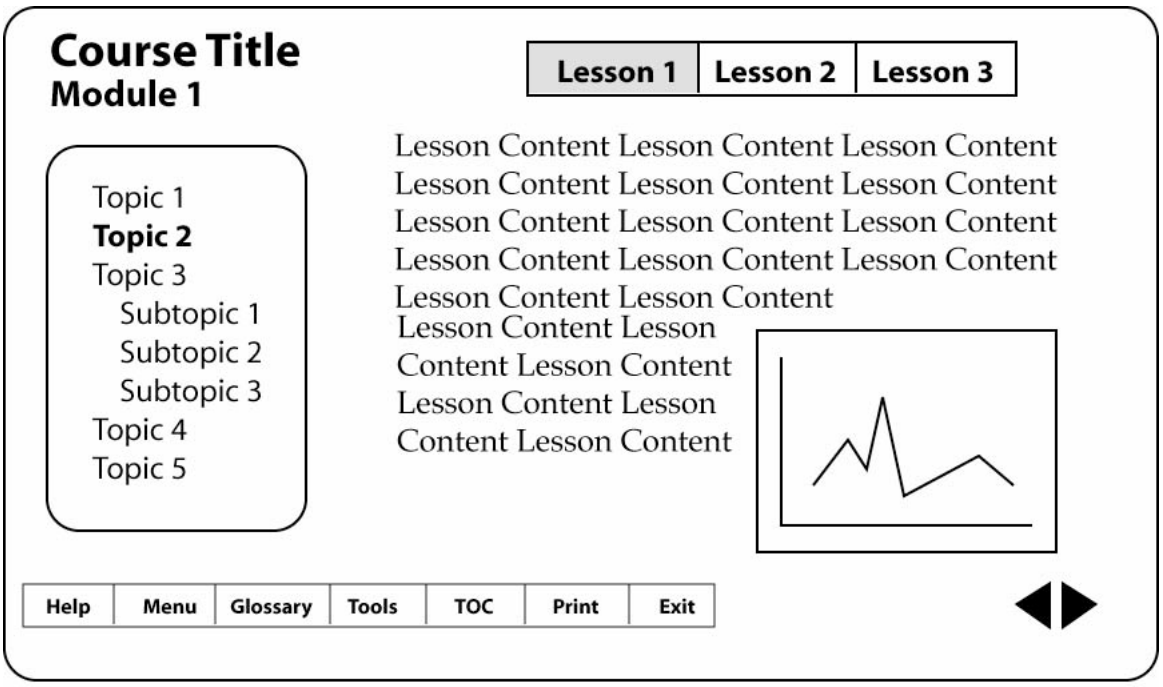


figure 2

In figure 2, navigation is provided at the course, module, lesson, and topic level, providing the learner with a snapshot of where s/he is at, thus allowing her/him to focus on the content. While this implies a linear progression through the content, learners can in fact jump to any other part of course. The buttons on the lower left part of the screen provide course-level navigation. Module-level navigation is provided by selecting one of the lessons in the upper right corner of the screen or by clicking the next/back buttons in the lower right corner. Topic-level navigation is provided via the topic-level submenu on the left side of the screen and with the next/back buttons in the lower right corner.

With the interface shown in figure 2, the use of additional pacing indicators such as a thermometer, sliding bar, or pagination (e.g., Page # of ##) would create a distraction to the learner. The exception to this could come in the situation where there is no topic level sub-menu. In this case the use of

pagination could provide the learner with a context for where s/he is at within the lesson.

Conclusion

The design principle of closure states that the whole of the navigation elements is greater than the sum of the parts, even when part of the information is missing. As applied to Web-based training, this principle allows the learner to focus on the instructional content without having to consciously keep track of what module, lesson, topic, and page s/he in on.

A well executed WBT interface, therefore, should allow the learner to navigate through all levels of available content, and provide a consistent, visual frame of reference as to where s/he is at within any given context.

References

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Huang, Zhouran, Ph.D., eLearning Manager, Carlson Marketing Group.

Van Every, Barbara, M.S., MBA, ISD Manager, Carlson Marketing Group.