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Online Tutorials: Tips from the Literature

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Online tutorials are an important addition to traditional teaching. Time and distance may make them the best option for graduate students. It is important to consider the design carefully, since students will not be able to ask questions. The tutorial must be clearly written and incorporate as many different techniques as possible in order to accommodate differing learning styles. This paper assembles fourteen best practices for constructing online tutorials.

Information Literacy is a skill that college students must acquire, and it can be argued that it is even more important for graduate students. The California State system has worked extensively on an Information Competence curriculum. Among the graduate schools, the doctoral program in education at San Diego and the Educational Psychology Department at Northridge have developed Information Competence standards (Curzon, 2002). The Information Competence program at Northridge can be accessed at www.csun.edu/edpsy/ACES/index.html. In 2001, Kelly, Orr and Houck wrote about their experience designing an online information literacy course at the University of Maryland. The Graduate School of Management and Technology was enrolling more distance education students and the school requested the library create an online resources course that would be required.

Online tutorials can be an effective means of education for graduate students. According to Prestamo (1998), experience has shown that faculty and graduate students often do not ask others for help. She also notes in her study of an online database that the help screens that come with the product are too extensive and technical to be very helpful. An online tutorial solves both these issues. Furthermore, many graduate students are distance-education students. They may hold jobs during the day and study at night. They need information during times when the library is not open, and they may not be able to travel to get it.

An online tutorial is different from a series of help screens. It is not just a collection of words, it is the computer equivalent of teacher, who explains things in an understandable way, has a goal for what the student will learn in that time-frame, provides examples, and tests the student for understanding. This is why design issues are important. Nancy Dewald (1999) addressed best practices in the design and content in online tutorials. Her criteria were:

1. Relate the tutorial to a specific course
2. Incorporate active learning
3. Incorporate collaboration with others
4. Use media for learning through both auditory and visual channels
5. State the educational objectives
6. Teach concepts (like Boolean operators), not just mechanics
7. Offer a librarian's help.

In the ACRL "best practices" document, one of the guidelines is that the teaching should respond to "multiple learning styles." Learning styles have been studied extensively in the general and college-age population. For example, people have been categorized into Visual Learners, Auditory/Verbal Learners, and Tactile/Kinesthetic Learners (Reese, 2002). Visual learners learn by textual reading or pictures, videos or charts. Tactile/Kinesthetic learners learn by doing, i.e. "active learning". Tactile learners learn through touch. Kinesthetic learners must move around.

There have been a few studies addressing graduate students' use of computers and how their learning styles affect the outcomes. In 2000 Ford & Chen found that field dependence/independence did not affect Internet learning outcomes, but experience in using the Internet did. Field independence was, however, associated with greater computer experience. Therefore, it can be argued that, ultimately, the field-independent learner has an

advantage over the field-dependent learner in using computers. Such a learner will be more comfortable with the logical and more independent style that computer learning offers.

Differing learning styles must be accounted for in program design. In 1998, Onwuegbuzie and Jiao did a study of how learning styles affect library anxiety in graduate students. Library anxiety was considered important because it adversely affected the students' ability to do research. They found that the most library anxiety was found in the students with these characteristics: high in motivation and low in persistence, those who preferred structured approach to learning, those who preferred working with peers to working alone, those who preferred visual learning over tactile or kinesthetic learning styles, those who require mobility in learning environments, and those who preferred not to undertake difficult tasks in the afternoon. Online tutorials are naturally high in structure, high in visual presentation, allow students to choose the time of day, and so address some of these issues well. People who like to move around while learning or are not persistent will be served well if the tutorial is not linear, so that one can stop and come back later. A person lacking in persistence will also be served if the tutorial does not begin with lessons that are too hard.

The issue of peer interaction is probably the most difficult for online tutorials. It has been suggested by several writers, (Ross, 1998; Holmes, 2003; Terrell and Dringus, as cited by Holmes), that the Accommodator learning style (as defined by Kolb) is the one that is least served by tutorials. This is because the accommodators learn through active experimentation, intuition, and interaction with people. Accordingly, tutorials should try to include some interactivity, such as quizzes with feedback, simulations, ability to have contact a real librarian, photos of staff, or some other human touch, (Holmes).

The fourteen tips were ideas taken from the following sources:

Dewald (1999), for tips 1-2, Smith (2001), for tips 3-10, Ross (1998) for tips 4 & 11, Holmes (2001) for tip 13, and filtered through my experience with using tutorials. The fourteen tips are:

1. Have objectives clearly stated.

Either have the objectives stated explicitly, or have a table of contents or Index so the student can have an idea what will be covered. A good idea for any course.

2. Teach concepts, not just mechanics

Because the Internet world changes rapidly, students should learn the concepts behind what they are doing, not just which button to push. The examples Dewald gives include providing an explanation of Boolean operators and keyword vs. subject searching.

3. Initial technology check.

Check with the user to see which browser they are using, processor speed, RAM, high speed vs. modem. Some features will be too slow or will not work with older models/editions.

The ideal would be for the tutorial to state what the program requires and then check the user's computer to see which browser is being used. More technologically advanced online tutorials perform a test or warn the user, while the simpler ones do not. It could be hypothesized that this is because such tests are not necessary for simple programs; that is, that they are more robust.

4. Don't let the user get lost.

If you want to show examples by taking the user to an external site, either open a second browser window or a pop-up.

5. Use clear navigation that is easy to use, gives feedback, offers alternatives and has clear labels.

The user should be able to go wherever they choose, including backing up a screen to review the last page. The navigation should be clearly marked. Using the Table of Contents instead of arrows works well if the program is small enough.

6. Most people read more slowly on the web than in print, and people like to scan web pages, rather than reading them. So make your pages short and scannable.

Don't make users scroll to get the information: one idea per paragraph, one topic per page. Use a table of contents or site map, and use bulleted lists to draw the eye to the important information.

7. Use white space and color to make pages readable

Use of white space allows the page to be easier on the eyes. It also allows the page to be more organized by making things stand out. Color can be used to emphasize certain words, and has an emotional effect.

8. Use linear navigation only if you allow students to get up and come back to the place they left off.

Linear navigation means that you must view the pages in sequence. The user cannot skip pages or choose where to go. This may be less effective for kinesthetic users who have to move around during their study. If the user wants to quit in the middle of the tutorial and come back later, the tutorial should remember where the user left off.

9. Updated links and crash free.

Make the tutorial hardy, so it doesn't crash or do unexpected things. Also, links that lead nowhere are frustrating to users and some content/examples will be missed.

10. Accessibility.

Provide equivalent alternatives to auditory/visual content, make sure it can be transformed to text easily, and use www.cast.org/bobby to test your site against Web Content Accessibility Guidelines (Smith, 2001).

This free program tests web pages for accessibility. It will analyze your page and display it with a London Bobby's hat symbol next to all the possible problem areas. It is not intuitive and the designer must make interpretations. For example, one of the standards is that every image should have alternative text to explain it. The program, of course, will not be able to ignore all the non-essential images and graphics and will cite each one, whether or not it is important. None of the tutorials examined here passed the Bobby test.

11. Make sure it loads quickly.

Some people have older computers with slow dial up connections. Make sure that the page loads quickly or have an alternate version. To increase load speed times, use web-safe colors, optimize JPEG files or use GIF compression images. Ross (1998) also suggests using streamed audio-visual instead of downloading. He defines unreasonable load time to be two minutes or more!

In a test of three tutorials, I included a test on a 1998 computer with Windows 98, a Pentium II Processor, 128 MB RAM, AOL Browser at a modem speed of 52K. This is an example of a slow computer environment which some may still have.

12. Include tactile/kinesthetic learning styles by using simulations.

Tactile/kinesthetic learners cannot learn best by reading about something: they have to actually do it. This is why simulations are important. If you are talking about the library catalog, then give the user live access or at least screen shots.

13. Provide interactivity

According to Holmes (2002), some students need interactivity to learn. This could include social interaction with real people through a bulletin board, quizzes with feedback, photos of staff, and "Contact a librarian" buttons.

14. Effective use of screen shots

Screen shots are very helpful in showing what the text discusses; however, many tutorials do not edit their screen shots, so they are extremely small and contain too much information. It is possible to only include the relevant portion of the screen and make it larger.

There is more work to be done on online learning in graduate students. They are a population that is not always reachable by traditional instruction. The web is an ideal place for them to get instruction on library use. They also have more of a need than undergraduates for understanding how to use the library, and how to evaluate the quality of the information that will be used in doing original research projects. Most of the existing studies focus on undergraduates. There is also more work to be done on tutorial design. There are no official standards or best practices for them. The ACRL guidelines of 2003 are for instruction in general. These fourteen tips are an attempt to extend and make specific some best practices for online tutorials.

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