Web-based Training Design for Human Resources Topics: A Case Study

By Patricia Yee Hsieh

"In spite of what the authoring tool advertisements say, it is not easy to develop web-based training."

Human resources (HR) departments are often responsible for providing employee and supervisory training in soft skill areas — such as performance management — and in compliance with HR-related laws, such as the Family and Medical Leave Act. Traditionally, this training has occurred in classrooms. In recent years, however, HR departments have made greater use of technology to provide or supplement training. This article describes how instructional technology theories have been applied in developing web-based training to enable a large state system of higher education, The Texas A&M University System, to meet its HR training needs more efficiently.

**Background**

The Texas A&M University System consists of nine universities (including the flagship campus, Texas A&M University), eight state agencies and a health science center, and employs more than 23,000 faculty and staff in locations throughout Texas. It is one of the largest and most complex systems of higher education in the United States.

The HR offices at the component universities and agencies (referred to as "components") are responsible for training their employees, but with small HR budgets and offices located in counties throughout the state, it is sometimes difficult for them to meet all their training needs. To support the component HR offices, the System HR office recently began developing web-based courses. Our design team consists of 1) one full-time instructional designer, who designs and writes the courses, locates clip art and develops course pages using HTML, JavaScript and Flash, 2) a programmer, who designs and develops the learning management backbone of the system and takes care of networking issues as needed and 3) a 25% time student assistant. Various subject matter experts (SMEs), including HR staff, line supervisors, university researchers and lawyers provide advice and review developed materials as needed.

Courses are developed in response to the needs of our customers, the component HR offices. For example, our two most frequently accessed courses (Ethics and Creating a Discrimination-Free Workplace) were developed to help the components administer mandatory training requirements for all employees. Other courses, such as Conducting Effective Interviews and Managing Employee Performance, were developed to help managers to perform these responsibilities effectively and legally.

Over the past two years, six courses have been developed and approximately 12,000 employees have taken one or more courses. The courses are accessible via an employee information portal called HRConncet, which allows A&M System
employees to view payroll and benefits information, as well as access online training. The design of the courses follows a simple tutorial format. To provide the opportunity for active learning, about one-third of the pages are practice questions. A bookmark feature allows employees to stop and resume their place in a course at any time.

So far this web-based training has enabled our office to support System components by training more employees at less cost (relative to our previous approach, which involved arranging for a training specialist to travel to the components upon request). In addition, the courses have been generally well received by the component HR offices and their employees. This response has been gratifying considering that, due to constraints that will be described in the following sections, our courses do not incorporate a lot of multimedia bells and whistles. However, we have made every effort to offset the liabilities of our no-frills, text-based format by providing clear explanations, frequent and realistic practice and useful information, and by making the most of our limited technological options.

**Challenges**

Although web-based training (WBT) has become more commonplace in recent years, there is still no standard approach to WBT development and implementation. In addition, the implementation of any new technology presents a number of challenges to any organization. Our challenges have included the following:

- **Our training development resources are extremely limited.** Our development team consists of one full-time instructional designer, one 25% time student assistant, and assistance as available from a programmer not directly assigned to training. Likewise, our hardware and software budget is measured in hundreds of dollars. In spite of these limitations, we need to get things done in a timely manner, i.e., four to five courses per year if possible. This means that some design and development steps (such formal, full-scale evaluations) do not happen as frequently as would be ideal. Instead we use “guerilla-style” formative evaluations to informally assess the effectiveness of our training whenever possible (this use of the term “guerilla” is borrowed from Nielsen, 1994).

- **HR subject areas tend to be either extremely dry (e.g., laws and policies) or extremely soft (e.g., leadership).** In either case, development of memorable instruction can be a challenge. In the case of soft skills, another challenge is to create training materials that are practical and easy to apply — rather than collections of platitudes and rules-of-thumb.

- **Subject matter experts are busy with their own jobs.** Our SMEs often do not have time for more than a couple of rounds of reviews, much less to educate an ignorant instructional designer on the intricacies of the subject matter. As a result, the most effective approach, in lieu of mind-reading, has been to rely on SMEs primarily for 1) providing specific or critical information such as anecdotes, common mistakes and key points; and 2) review of developed materials. Other information, such as general background information, must be derived from sources such as HR journals, books and other training materials. This requires a high degree of independent learning and ability to anticipate what the SMEs will accept.

- **Knowledge about soft skills is difficult to evaluate.** In an ideal world, it would always be possible to write a test that could evaluate a learner’s mastery of subject in a valid and reliable way. However, it is difficult to write such tests for soft skills. In addition, computer-based evaluation presents even more limitations, such as 1) how do you make sure the person taking the course does not cheat by, say, having someone else take the test; and 2) how do you
test the learner’s ability to solve problems for which the set of acceptable answers is not closed (such as how to coach an employee whose job performance is below standards)? These issues may not be unsolvable, but a completely satisfactory solution is simply not within the scope of our resources at this time.

Design and development

We have tried to follow a systematic approach to designing and developing web-based training, based on ideas from the instructional design and instructional systems design literature (e.g., Dick & Carey, 1985; Smith & Ragan, 1999). Within this general approach, our selection of instructional strategies has been heavily influenced by cognitive psychology theories, such as John Anderson’s theories of information processing (Anderson, 1985), and by the concepts of situated cognition and authentic instruction (Brown, Collins, & Duguid, 1989). The sections below describe the steps we have followed.

Laying the groundwork

The initial 2-3 months of our WBT development effort were spent laying the groundwork for future development.

Identify minimum target platform characteristics. The goal of this task was to determine the minimum hardware and software requirements for taking our courses. We did not want to set the requirements too high, because we did not want leave out users with older systems. At the same time, we did not want to set requirements too low, because that would restrict our instructional design options. To accomplish this task, we met with users in our target population and reviewed surveys about penetration of various types of browsers and plug-ins. In the end, we assumed that most of our users would have access to machines with Netscape Navigator or Microsoft Internet Explorer (IE) version 3 and higher (this assumption has since been raised to version 4 and higher). This has proved to be a safe estimate; at the time of this writing, about 89% of our users use some version of IE 5 or higher (mostly version 6, 80%); and the remaining 11% are using Netscape 4 or higher (mostly version 4, 60%). These statistics are continuously collected and updated using an application called WebTrends.

Identify learner characteristics. This focus of this task was on determining minimum characteristics of our learners, in terms of reading grade level and computer literacy. With regard to reading grade level, the component HR offices have informed us that most of our learners have had at least some high school. We decided to try to write at an 8th-10th-grade level. With regard to computer literacy, we were told that a large number of learners are not very computer literate, and most had never taken a computer-based course. We decided to develop and stick to a simple interface, with the same navigational controls in every course (Figure 1.). We also use a book-like organizational structure, so that learners can easily find their way around our courses and assess how many pages they have left. Finally, all links open in a separate, smaller window, so that learners don’t lose their place in the course.

Select development tools. The goal of this task was to identify tools for instructional development and multimedia production. Our concern was that our training should run on a wide variety of target platforms and browsers, with minimal download times and minimal need for plug-in installation, and that any required plug-ins would be easy to install. At the same time, we wanted to be able to create visually appealing, interactive instruction. We decided to use HTML to create the course pages because all web browsers can display HTML to some extent and because HTML files can be very small. We also restricted ourselves to using older
HTML tags, because newer HTML capabilities, such as cascading style sheets, are not consistently implemented across all browsers (this was more common when we first started in 2000, but remains an issue even now because our customers still include many Netscape 4 users).

Our HTML pages contain Microsoft's Active Server Page (ASP) and JavaScript code. The ASP code interacts with learning management programs on our server to allow tracking of users' progress through the course. Since ASP code is interpreted by the server, users' browsers do not have to deal with it. Using JavaScript allows us to make the pages interactive and provides greater control over page appearance. All the targeted web browsers can interpret JavaScript, as long as the capability is enabled (generally the default setting).

In some courses, we include audio clips from interviews with experts, such as veteran managers or university researchers (Figure 1). We use a minidisc recorder to record the interviews, and then edit the audio using a sound editing tool (Sound Forge XP). We use Macromedia Flash both to create animations and as a player for the audio files. We chose Flash because of its versatility and because users are likely to already have the Flash player on their machines (it has shipped with Netscape since version 6 was released; and with Internet Explorer since version 4 was released).

![Figure 1. Course page showing navigation buttons and link to audio.]

Our courses also include resources and job aids such as forms, lists of sample questions, tables and course summaries. These documents are posted as Acrobat PDF files, which can be viewed only by using Adobe's Acrobat Reader software. The software can be downloaded for free, however, and many A&M System administrative sites (as well as many federal and state government sites) also use it for their documents, so users are likely to already have the software installed.

Since our team lacks a graphic artist, we needed to identify sources of clip art. We looked for inexpensive collections with a large number of usable images.
Our development team consists of one full-time instructional designer, one 25% time student assistant, and assistance as available from a programmer...

We decided to use a combination of licensed images from a subscription service (ClipArt.com) and Microsoft clip art images. We edit these images as needed using an image editing tool (Macromedia Fireworks). With educational discounts, the cost of our development tools comes to about $1000.

**Course design and development**

*Conduct background research.* In designing our courses, we conduct extensive library and web-based research with the goal of learning more about 1) the subject matter and 2) how the subject has been and should be taught. We also work with local SMEs such as HR staff, line supervisors, university researchers and legal counsel. This research allows us to identify important teaching points, appropriate instructional strategies and useful instructional resources. Whenever possible, we try to develop fresh instructional approaches with the potential for improving upon current training practice, on the assumption that if there is a persistent training problem in an area and there is a training approach that is commonly used when teaching about that area, then that approach may have a shortcoming of some sort. For example, because it is so easy to find articles and booklets with tips about how to conduct interviews, it is probably safe to conclude that most managers have seen this type of material before. Yet there continues to be a high demand for courses on conducting interviews, and HR personnel continue to complain that managers need training in this area. This suggests that the “tips” approach may be inadequate and leads to an analysis of why it may be inadequate and what might be more adequate, given the needs and characteristics of busy managers.

![Compensatory Time](image)

*Figure 2. Practice question requiring application of rules about use of comp time.*

**Determine entry behaviors and learner characteristics.** On the individual course level, we try to determine exactly what it is that our target audience needs to know, including mistakes they often make in dealing with the subject matter. For example, in developing a course on managing employee performance, we were told that supervisors often fail to provide honest assessments of employee performance on performance appraisals out of a desire to avoid conflict. Therefore we designed our training to emphasize that 1) honest performance appraisals are important and why and 2) it is easier to be honest during performance appraisals if you have been honestly providing feedback about performance throughout the year.
Identify course goals. After reviewing related materials and meeting with SMEs, we develop course goals. For our purposes, a course goal is a general description of the scope of the course and the knowledge/skills learners should acquire. For our course on conducting effective interviews, for example, the course goals were stated as follows: "This course is intended to help you develop the skills needed to conduct an effective interview. You will learn steps to follow in preparing for, conducting, and following up on an interview, and reasons for doing so. You will also review some of the legal issues related to interviewing."

Conduct instructional analysis. After identifying course goals, we try to identify what learners need to be able to know or to do to achieve the goals. In the case of human resources training, where most learners already know something about the subject being taught, this analysis involves identifying not only what learners need to be able to do, but also what makes doing the right thing difficult.

In the case of interviewing, for example, most supervisors are already aware that they need to identify the most qualified candidate and that it is inappropriate to ask candidates about certain things. Many may have read interviewing tips and laundry lists of questions to ask or avoid. However, based on our initial background research, it appeared that available training materials typically do not provide interactive practice on evaluating the appropriateness of questions. This analysis suggests that training on interviewing should include detailed information about what makes a question appropriate (or inappropriate) and why. It should also provide opportunities to practice discerning between appropriate and inappropriate questions, using questions supervisors might ask.

For example: Flo is interviewing candidates to help with her research on Hispanic families. As the position requires frequent interactions with Spanish-speaking study participants, she routinely asks candidates, "What languages do you speak?" Is this question appropriate? (Answer: No. Asking candidates what languages they speak could be construed as an attempt to find out their national origin. Instead, Flo should state that the job requires someone who can speak Spanish fluently, and ask about (or test for) that capability.)
"At the end of the day, careful instructional analysis and good writing are at the heart of any useful course."

The outcome of this task is a list of instructional objectives and a description of instructional activities that can help learners attain the objectives. We also make a decision about course completion criteria at this point, such as whether or not the course will have a final test, what the passing score should be if there is a test and whether there should be other criteria (such as requiring the employee to view all or certain pages of the course). In general, the decision about whether learners should be required to pass a test depends primarily on whether the content lends itself to testing (it is generally easier to develop tests for courses with substantial policy or legal content) and whether the importance of the content warrants subjecting employees to a test. Our tests are not onerous: the answers are provided at the end, and employees may retake a test until they achieve a passing score. In addition, for all courses developed so far, whether there is a test or not, we have required employees to view all pages of a course in order to complete it. Table 1. provides information about courses developed so far.

We realize that this approach may seem inelegant to some, since a commonly cited benefit of computer-based training technology is that it can save learners time by allowing them to test out of some or all portions of a course. However, because of the soft nature of HR topics and the limited evaluation capabilities of computer technology at this time, it is difficult to devise a test that can accurately discern what learners know. Thus the main point of our testing and other course completion criteria is to maximize the likelihood that someone who completes one of our courses has had sufficient opportunity to learn the subject matter.

Develop practice questions and test items. We view practice with feedback as an essential part of the learning experience. Practice questions typically make up about 1/3 of our courses. In developing questions, we try to evoke the kinds of thought processes that learners would need to use on the job. We also make a special effort to include questions about knowledge that is important and/or confusing.

For example, in Texas, state employees who are eligible for comp time may earn three types of comp time, depending on a variety of factors. Figure 2. shows an example of a question that requires the learner to determine if a particular type of comp time is applicable, given the information available on a standard bi-weekly timesheet. This question simulates a realistic situation in that 1) the timesheet has the same layout as an actual timesheet and 2) the learner is not limited to selecting one answer (or any answers). The figure shows the feedback if the employee checks all the possible responses.

Similarly, in teaching about appropriate uses of sick leave, we do not ask learners about the rules, because this is an unnatural way for most people to use this type of information. Instead, we ask them to evaluate whether sick leave can be used in various situations. We also present realistic situations that force learners to reflect on the rules, and provide feedback that emphasizes the appropriate information from the rules. See Figure 3. for an example of a question and feedback.

Develop instructional strategies and instructional materials. Based on the instructional analysis, we develop instructional strategies and materials to help learners achieve the type of performance we desire. For the most part, we use a book-like tutorial style, with modules and practice questions at the end of each module. Advantages of this format are 1) it is a teaching style that learners are familiar with, 2) it facilitates later use of the course as a reference tool, 3) it is easy to program and 4) it is easy to navigate. The main disadvantage of this format is that it can lead to mindless page-turning. We have tried to counter this by 1) providing many opportunities for interaction, 2) presenting information in a way that is clear, concise and interesting, 3) using humorous graphics and, most importantly, 4) by providing useful information.
For example, Figure 4. shows a screen that employs a simple animation to illustrate the procedure for comp time calculation. Federal law mandates that a non-exempt employee must receive comp time (or pay) of 1.5 hours per extra hour worked anytime he or she works over 40 hours in a workweek. These hours must be actual hours worked; paid leave, such as holidays or sick leave, does not count toward the total. In Texas, however, state employees may also earn state comp time (of one hour per hour worked) whenever their hours worked plus their hours of paid leave exceed 40 hours. The screen in Figure 4. shows a description of a case, a timesheet and an animation. The animation shows the different types of hours represented as graphical units along a number line. The units are added end-to-end; then the hours over 40 are trimmed off and moved to the appropriate category below the graph. The numbers of extra hours and hours earned for each type of comp time are also indicated numerically.

![Screen showing comp time calculation](image)

*Figure 4. Animation illustrating how comp time is calculated.*

Learners may always click the Resources button to access forms, links and other relevant resources. In our course on interviewing, for example, we provide sample position descriptions, sample questions, a table that compares different types of interview formats, sample forms for reference checks, a sample job application form, a sample letter for unselected applicants and a list of key points from the course. All this information is tailored for A&M System employees.

**Conduct formative evaluation.** Subject matter experts periodically review instructional materials as they are being developed. Each component of the
completed courses are reviewed by subject matter experts, legal counsel and human resources administrators before being posted for employee use. Employees may also submit anonymous comments about the courses using an online form.

**Future directions**

Our future plans include the following goals:

- Developing new courses on sexual harassment prevention, positive discipline, customer service excellence, preventing violence in the workplace, effective leadership and A&M System policies;
- Adding a “Listen” button to course pages so that learners who are not strong readers can listen to an audio narration. (We already do this on a limited basis when incorporating quotes from experts; but providing audio for every page of our courses would pose too great a burden on our server. We are exploring the possibility of using a synthesized speech plug-in);
- Translating our most frequently-taken courses into Spanish;
- Assessing the long-term impact of the training on job performance;
- Developing advice for other budget-conscious WBT developers.

Following are a few words of advice for readers with shoestring budgets who are considering developing web-based training in-house.

- In spite of what the authoring tool advertisements say, it is not easy to develop web-based training. If you don’t already have personnel with the necessary technical and instructional design skills, it may be more efficient to hire them than to attempt to develop the capability from scratch.
- Keep programming simple. One good way to do this is to take the time upfront to develop a few good-looking, bug-free, coding templates, and then keep using them.
- Analyze your subject before beginning to develop instructional materials. For soft skill subjects, think about what makes the desired skill so hard to perform.
- Technological bells and whistles (such as streaming video) may make your courses more attractive, but their use does not guarantee instructional effectiveness. In addition, they may make your courseware less accessible to users with slow Internet connections and/or multimedia-challenged machines. At the end of the day, careful instructional analysis and good writing are at the heart of any useful course.
- Include as many practical examples and tools as possible.
- Ask questions that allow learners to practice the same types of thought processes that they will use on the job.

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**References**


