The project flow for e-Learning is typically quite straightforward: Design, Develop, and Deploy. Of all the sub-steps within that flow, two stand out as essential to ensuring the quality and usefulness of the course. Unfortunately, despite their importance, these two steps are often rushed through, performed incorrectly, or even skipped entirely. These critical but neglected elements are the alpha and beta tests.

**Why is testing important?**

The combined process of alpha and beta testing is the main quality control for an e-learning course. These tests ensure the following:

- Accuracy of content
- Ease of use
- Instructional integrity
- Technological soundness
- User satisfaction

The importance of the above items is obvious. For example, if the content is not accurate, at best the students will come away with incorrect information. At worst they could jeopardize their own safety or that of others if the course covers a critical topic, such as safety procedures or handling hazardous materials.

Even if the material is correct, the course must be instructionally sound or students will not learn or retain what is taught. The course must have clear objectives, and there must be a way to measure how well those objectives are being achieved.

But even though a course might contain valuable information, and even though it is presented in an engaging and interactive manner, students will not use it if the interface is not simple to use. Almost every Internet user has visited a website that they were hoping to explore in depth, only to give up after a few minutes when confronted with confusing navigation or an unwieldy interface. If your...
course is not easy to use, your students may feel that same frustration.

This problem is compounded if there are technological problems, such as a bad link, a JavaScript error, or excessive download times. Even if the problem can be caused only by using an obscure key combination, rest assured that someone will find that key combination within days, if not hours, of the application’s public release.

Problems in any of the above areas alienate users and cause rework for you. They also cast doubt on the credibility of your entire program. Fortunately, a thorough testing program can root out the majority of these issues and ensure that you release a quality, error-free product.

The testing process for e-Learning programs is divided into two phases: the alpha test and the beta test. Each is a separate, distinct event that occurs at a different point in the development cycle. Each has its own specific objectives and guidelines for the pool of testers. (See Figure 1.)

Although it can be tempting to combine the two tests by conducting them simultaneously with only one set of testers, do not fall victim to this common mistake! By combining the tests, you invalidate the results, and you can end up worse off than if you skipped the process entirely.

The alpha test

The alpha test occurs in the development phase of the project. It should be held when the first working draft of the course is complete. The alpha test is conducted to determine the technical accuracy of the content. Although broken links, spelling errors, and coding issues may be uncovered during the alpha test, the primary purpose is factual verification.

This rough draft is often referred to as an “alpha version.” It contains the material provided by the subject matter experts (SMEs) and most of the elements that will be contained in the final version. However, there may be some incomplete elements, such as placeholders for graphics that are not yet ready. An alpha version is not ready to be seen by anyone beyond the project team.

You may think that you know your audience, and that you can predict what they will like, but don’t be surprised if your instincts are proven inaccurate. The beta test can turn up some real surprises.

The beta test

The beta test is conducted when the first complete course is available. The beta test is conducted to determine the content’s usability and effectiveness. Although the beta test may uncover some errors, the primary purpose is user satisfaction.

The beta test can turn up some surprising results. You may think that you know your audience, and that you can predict what they will like, but don’t be surprised if your instincts are proven inaccurate. The beta test can turn up some real surprises.

The alpha test

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The primary testers should be the subject matter experts from your project team who provided the initial input. If appropriate, you may wish to include other experts with extensive knowledge of the topic. For example, if you are developing a course on your company’s fiber optic product line, your subject matter experts may be product managers. You may also wish to solicit input from engineers who were involved in the development of the product line. In addition, it can be valuable to include members of the field sales force who know which features and benefits are of the most importance to customers. Often your initial SMEs can recommend additional qualified testers.

The alpha test may be conducted in a variety of ways, depending on your location, time constraints, and other factors. The two most common approaches are:

Remote testing: The testers review the course on their own PCs and send their feedback to you via email, comments written on screen prints, a typed document, or in some other convenient manner. This arrangement works best when testers are in several locations or when it is difficult to get the whole group together at one time in a central place. It can also be used when there are only one or two subject matter experts, with little likelihood of disagreement on content issues.

Centralized testing: A meeting is set up for a group review of the course. It often helps to allow the testers to preview the course, either “live” or via screen prints. This allows them to jot down comments and suggestions that can later be discussed in the group setting. The meeting is held in an area with access to a computer and projection system so everyone can review the program together. This allows group discussion of any proposed changes so that a consensus can be reached. This arrangement works best if the team is in a central location or if divergent opinions are likely.
The beta test

The beta test occurs after the alpha changes have been made and the program has been polished into something closely resembling the final version. At this point, the e-Learning application should be fully functional, with a finalized interface design, accurate material, working screens, and all placeholders removed and replaced with the correct content. Because the beta test is the last step before the course is released to the public, it is critically important as the final quality control measure.

The beta test serves multiple purposes. First, it should uncover any typographical errors, misspellings, broken links, and programming errors such as non-functioning Java, JavaScript, or Visual Basic. Second, by tracking the performance of the testers on the exercises and final exam, you can determine whether the course is instructionally sound. Third, through the use of a post-course questionnaire, you can gather feedback on the usability of the course, its interface design, and the testers’ impressions of the training.

The beta testers should always represent a cross-section of the people who will actually use the program. Never use subject matter experts as beta testers. Using SMEs as beta testers is one of the most common errors in the testing process because the results from such a beta test are virtually useless. Testers who know the content as well as they know their own names will not be able to view the course objectively. They will also tend to zip through the course, missing typos and other minor errors. SMEs are also useless for validating the criterion test (final exam) and the overall instructional integrity of the course.

The beta test should be conducted in the same environment in which the course will actually be used. If it is a web-based course and students will be dialing up with a 56K modem, don’t use testers connected by a digital subscriber line (DSL) or broadband cable access. Otherwise, there could be issues with download time that won’t show up until you release the course and are bombarded by angry phone calls.

If you are testing a course that will be deployed on CD-ROM, with a minimum hardware requirement of Windows 2000 or ME and 800 x 600 screen resolution with 16 million colors, be sure that it is tested on the minimum platform and on several other hardware and operating system combinations. Will the program be run in Internet Explorer, Netscape, Mozilla, Opera, or possibly in all of them? What about AOL and Web TV users? Is the program also Mac compatible? While it is impossible to test every imaginable configuration, be sure that your beta test encompasses as many as possible.

You must also consider the computer literacy of your students. Will some be new PC users who may be unfamiliar with a browser or how to download and install plug-ins? If you instruct them to change their screen resolution, will they know how to do so (or will they even know what that means)? Many people, especially those who work with computers every day, assume that the rest of the population is just as comfortable with PCs, but this is not always true. For example, if you are developing training for a manufacturing company with a primary workforce of older adults, it is possible that they may have a limited knowledge of PCs and may even be reluctant to use e-Learning programs.

If inexperienced users will be among your student population, be sure to include some beginners in your testing.

A good beta test questionnaire is carefully designed to be complete.
Getting that beginner's input is critical to solving problems, and they may skip right over what they are missing the same question, it must be revisited before the course is released. The question itself may be confusing, or the related material in the course may not be clear. Fine-tune the material or reword the question and administer the course to additional testers to ensure that the problem is resolved.

After the criterion test, the beta testers should also be asked to fill out a questionnaire. (See Figure 2 on previous page.) A good beta test questionnaire should gather demographic information and contain items on the student’s perception of the course material, ease of use, interface design, clearness of objectives, and accomplishment of those objectives.

The items should be ranked on a Likert scale (i.e. 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, 1 = strongly disagree). Statistical analysis requires at least five options to obtain valid results. This will allow comparison to determine whether there is a relationship between particular items.

For example, is there a correlation between how well students liked the interface and their level of PC knowledge? The results may show that those with a higher level of PC experience strongly agreed with the statement “The interface was simple to use,” while those with less knowledge disagreed. This means that the interface could be too complex and should be reworked.

In addition, the questionnaire should include questions that require the student to write out a response, such as, “What did you like best?” and “What did you like least?” Always provide a space for additional comments. While multiple choice questions work well for statistical analysis, they constrain the testers and don’t allow them to add an explanation.

Multiple choice questions may let testers indicate that the exercises did not help them to prepare for the final exam or that the interface was difficult to use, without allowing them to tell you why and to give suggestions for fixing the issue.

An interface may be perceived as difficult for many reasons. For example, in the student’s opinion, the navigation buttons may not be labeled clearly, or perhaps they are at the bottom of the screen when they should be at the top. Without this additional information, you will know that a problem exists, but you will not be sure of its exact nature or how to fix it.

If the changes necessitated by the beta test are simple, they will not require a retest. However, for something more complicated, such as an interface design or a complete rewriting of several lesson screens, you will need to conduct a second beta test. Always use a new pool of testers, as you will not get valid results if you use students who have already gone through the material.

**Some personal experience**

You may think that you know your audience, and that you can predict what they will like, but don’t be surprised if your instincts are proven inaccurate. The beta test can turn up some real surprises.

This point was forcefully driven home when I decided to incorporate a new type of exercise into one of my web-based training programs. I had read that students enjoy a challenge when they are completing exercises and that adding a timer is a good way to give a sense of urgency and foster a sense of competition. I was working on a course covering
the features and benefits of a specific product line. I confidently added a timer to several multiple-choice exercises. (See Figure 3 on previous page.)

I was sure that my beta testers would give them glowing reviews. They hated those exercises! I was overwhelmed with complaints and ended up removing the timed component.

Conversely, in another program I used some simple true/false and multiple-choice exercises, but added a target graphic that changes based on the student’s answer. (See Figure 4.)

The target grays out for a wrong response and turns into a bull’s-eye when the answer is correct. It was simple to design, simple to program... and the students loved it! I never would have expected to receive positive comments on something as simple as visual reinforcement, but to this day it is still frequently cited as a favorite element in our programs. I have leveraged this simple but effective element by using other graphics (for example, a box that is filled in with a checkmark or X) with the same underlying programming.

In addition, on one exercise where the objective is to match a product name with the correct description, I added a “hint” link that the student could use to see a photo of the product. (See Figure 5.) I doubted that anyone would notice, but again there was a resounding positive response. This feature has become a mainstay in courses with similar exercises and objectives covering our other product lines.

If I had skipped over the beta test, I would never have realized that students were most likely experiencing frustration with an exercise that I thought was great. I could have alienated users (many of whom, in our case, are customers or distributors of our products). Also, I might not have realized how much bang for the buck I could obtain from the visual reinforcement and the simple inclusion of photographic hints. My beta tests add a week to the project cycle, but that time is negligible when compared to the potential rework and the negative impressions and user frustration it has prevented.

**Make the effort, reap the rewards**

Conducting a thorough testing process, including both the alpha and beta phases and any necessary re-tests, is a time-consuming process. It’s not surprising that this is such a frequently neglected area.

The temptation to rush things along can be great, particularly toward the end of the cycle when the course seems so close to being ready for release.

But just as you wouldn’t release any other new product without strict quality control measures, you should never release a program without running it through a stringent “road test.” It may look done on the surface, but hidden problems may be lurking just below. Take the time to do it right and you’ll eliminate the complaints, the support calls, and the rework. Testing is an effort, but it’s well worth the reward of knowing that your program is truly complete and that you’ve once again proven your skill and credibility as a professional developer.
DEVELOPMENT Strategies

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Barb Lesniak has worked for Panduit Corp., a manufacturer of electrical/electronic components, since 1989. She started out in corporate communications and stand-up training, but Barb’s knack for computers led her to be chosen to spearhead Panduit’s initial e-Learning program in 1996. Barb is a one-person team, designing, developing, and testing all of Panduit’s courses. Her primary tools are Dreamweaver, JavaScript, and ASP/VBScript. Barb has a Masters degree in Psychology from Lewis University in Romeoville, IL. You can contact her by email at bnl@panduit.com.

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