

Building Quality

into Online Training

Apply Quality Assurance in Four Steps

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You've made your case to design and produce online training. Your company has agreed that this is needed. You've developed a production process and are ready to begin. Then your manager asks you how you'll determine that the online training is successful.

What do you do? Anyone involved in the design and production of online training encounters the problem of measuring quality. Particularly in the context of online training, with its numerous elements and inputs, this can be difficult.

What is quality? Is it instructional integrity, marked by matching content to learning objectives? Does it imply that the product is based upon sound instructional strategies? That the courseware is well designed and pleasing to the eye? That the training has few defects or functional problems? Is quality determined by how well the instructional product satisfies the user's requirements? By whether the users like it and the buyer is satisfied? This article clarifies quality assurance (QA) and how it can be applied to the production of online training.

Take a look at Figure 1, a screen capture from an online training course for United States Air Force civilian employees. Note the interface, navigation, colors, text, titles, and control buttons. How would you determine quality in this case?

Would you look at the attractiveness of the screen, the content, colors in the interface, the navigational elements, the control buttons—or everything?

In fact, this particular online project required our QA personnel to look primarily at functionality—how the training course works. The interface, including colors and titles, was approved well before development actually began. In this case, the developer and customer focused almost exclusively on the functionality of the program because the intended audience had not previously participated in online training. Colors and aesthetic design took a backseat to what the training program could actually *do* for the user.

QA is driven by the purpose of the online training and the specific needs of its intended audience. While in this example functionality was foremost, in other cases, QA may require looking at every element of the training or focusing

on a certain set of criteria. Because the purpose and audience change with every project, good QA activities should be spelled out clearly within development processes. To make QA as easy to implement as possible, this article provides four QA steps to be implemented during the production of online training.

Step One: Create a QA Plan

Before doing any development, create a QA plan specific to online training. In this step, you are creating documentation to support the development process, not necessarily performing QA reviews (those come later in the process). This is a global plan that governs QA from the beginning of the development process until the final delivery of the product.

The foundation of such a plan, which has four parts, is driven by both instructional needs and customer expectations. Since these sometimes conflict with each other, relying on a written QA plan is a must to correctly implement quality during both design and production. Here are the steps to create a good QA plan:

1. Establish *requirements* for instructional quality based on content, customer expectations, the advice of subject matter experts (SMEs), and practitioner design knowledge.
2. Develop a clear *instructional design process* for the project.
3. Establish clear *production processes* to be followed by all personnel involved.
4. Create a *documentation plan* that clearly specifies customer expectations, guides the development of a design document, and creates a process for developing both defect reports and a revision plan.

The following documents can be included in a documentation plan:

- *Requirements specification*—based on customer expectations
- *Style guide*—lists and explains key design features and controls the design process
- *Design description or blueprint*—details the design plan
- *Review and audit schedule*—covers the life of the design project
- *Defect reports and revision requests*—report defects to designers
- *Revision verification and validation plan*—validates that revisions have been made

Without such a plan or the documents that make it real, projects can suffer *scope creep*, meaning that the size of the project grows as it nears completion, often moving beyond boundaries that both the customer and practitioner have already defined. When this happens, QA activities must sometimes stretch beyond practical limits to cover longer development processes. A strong QA plan can help rein in unwieldy projects.

These four QA recommendations and their corresponding documentation are essential to the first step of developing a QA plan. The design process is easier when the QA plan is established from the beginning.

Step Two: Focus on Sound Instructional Design

Early in my industry experience, I learned that a QA plan for online training development must be based upon the underlying instructional design. Proper instructional design is like scaffolding. With it, the content has internal structure and conformity, and there is a

framework for understanding. Without it, content can seem loosely structured and perhaps irrelevant to the objectives. An examination of the course objectives, content structure, instructional strategies, practice and assessment, and conclusions typically helps determine whether a course is instructionally valid.

To be certain that the instructional design of your interactive training is sound, ask yourself the following questions:

- How well does the instructional design of the training material match the learning needs of the users?
- Are the objectives measurable?
- How well does the design document list the instructional objectives, describe the content, and plan the program's structure?
- How clear is the assessment, and is it linked to the instructional objectives?
- How appropriate are the instructional strategies used to design the instruction? Do they match the needs of the primary audience?
- How closely are the course sections aligned with the instructional objectives and the assessment?
- If necessary, are expectations for synchronous versus asynchronous activities clearly identified?
- Is the navigation intuitive?
- How useable is the interface, and does it match the content?
- Is there a metaphor used for the training, and if so, how effective is it?

Good instructional design will engage users and help them learn. If the instructional design is sound, the online training product will have the instructional integrity needed to help learners meet the instructional objectives.

Figure 2 details a section overview offered along with the learning objectives. For an instructionally sound training program, make sure that your instructional objectives match the content, along with the assessment. This will determine if the instructional thread is unbroken throughout the online training product. QA's role, if properly prepared, can include a review of the underlying instructional design to help ensure that the online training will accomplish its claims.

Figure 1. In evaluating this online training course, offered to United States Air Force civilian employees, QA personnel focused primarily on functionality.

The screenshot shows a web-based training interface. At the top, there is a red header with the text 'Section 4 - Asset Losses General Information' and the MERC logo (Mercer Engineering Research Center, An Operating Unit of Mercer University). Below the header is a navigation bar with 'CONTENTS | RESOURCES | GLOSSARY | EXIT'. The main content area is titled 'Sources of Asset Losses Data' and contains the text: 'The data displayed in this section comes from one of two sources:' followed by a bulleted list:

- IMS/MM File Maintenance
- Mechanical interfaces from the D035A-Item Manager Wholesale Requisition Process System

 Below this list is a table with two columns: 'ASSET LOSSES DATA ELEMENTS' and 'SOURCE OF ASSET LOSSES DATA'. The table contains the following rows:

ASSET LOSSES DATA ELEMENTS	SOURCE OF ASSET LOSSES DATA
Condemnations	D035A System Interface
Installations	D035A System Interface
On Loan	IMS/MM File Maintenance
Shipments to FMS	D035A System Interface
Shipments to NRA	D035A System Interface
Special Projects	IMS/MM File Maintenance
Modification	IMS/MM File Maintenance
Minus IAV	IMS/MM File Maintenance
Transfer to DRMO	D035A System Interface
Other	IMS/MM File Maintenance

 At the bottom of the interface, there is a red bar with a 'Turn Audio On' button on the left and a 'PAGE 6 of 14' indicator on the right.

The functions of this screen are (1) to provide the user with a preview of upcoming content and (2) to specify the instructional objectives, which tell the user what content there is to learn.

Step Three: Apply Specific Criteria to Measure Quality

QA is built around ensuring that projects meet basic requirements—often by exhibiting previously agreed-upon criteria. Brandon Hall, a noted e-learning researcher and consultant, hosts annual online training awards and has created very relevant criteria for evaluating online training. His criteria are used to determine the best new online training products in the marketplace. His Web site at www.brandon-hall.com is an excellent place to learn about quality in online training. From Hall's criteria, we can ask some basic questions.

First, is the content okay—does the course include what it is supposed to include per the customer or original intent of the project? What about the course's design—is the instructional design sound? Will users learn from the way in which the course is sequenced? Is the program engaging and motivating, and does the user have a mechanism for input? What about the navigation—

are all normal navigational features in place, such as a course or site map and exit buttons?

In addition to these criteria, the use of media in online training can also be a quality point. The training should appropriately play media elements such as video, audio, animation, and sound, and all these elements should be packaged together so that the program can be used as a single unit, rather than narration from one source and video from another, for example. Media can greatly affect users' enjoyment and motivation, so they should be closely paired to the interests and demographics of the audience.

Finally, aesthetics and tone are also important factors in online training quality. Each screen should be attractive and appealing to the user, with colors and graphics chosen to carefully match the audience's expectations. The tone should also be congruent with the audience, avoiding any hint of condescension or trite language.

On his Web site, Hall includes quality measurement criteria that span different categories, such as instructional design, functionality (navigation, media, and so on), and services provided by the training program (record keeping, motivation, and evaluation). Content is

primary; Hall wants to make sure that training programs are reliable, covering what they are supposed to cover. His criteria make an excellent quality checklist for online training designers and developers.

Lynette Gillis, who wrote *Quality Standards for Evaluating Multimedia and Online Training*, presents another set of standards in a four-stage QA process: Stage 1. Match courses to organizational needs. Stage 2. Conduct a content review. Stage 3. Conduct a usability review. Stage 4. Conduct an instructional design review.

In stage 1, matching courses to organizational needs, Gillis reviews the quality of the content, the objectives, and the audience (the learners). She also evaluates course management tools and examines both the technology used to design the product and the technology needed by the learners to use it.

In stage 2, conducting a content review, Gillis examines the content along with the clarity of the multimedia presentation. She also considers whether the learning requirements match those of the user to ensure “fitness for use”—basically, an instructional design tactic. In other words, as good technical communicators do, she is analyzing the intended audience. Finally, she looks at the appropriateness of cultural, gender, and racial items.

In stage 3, conducting a usability review, Gillis looks at the technological concerns of the training, including how easy it is to install, the speed of the courseware, the design of the interface, and the functionality of the navigation and menus.

Finally, in stage 4, conducting an instructional design review, Gillis examines the content modules, media (graphics, animation, video, audio), and the ability of the course to involve the user in higher-level thinking and interaction. Gillis also looks for evidence of instructional integrity, found when content modules match assessment, objectives, and appropriate instructional strategies.

Both Hall and Gillis have identified important criteria for measuring the

Figure 2. In this sample online training course, the screen provides both a preview of course content and the instructional objectives.

Section 4 – Overview and Objectives

CONTENTS | RESOURCES | GLOSSARY | EXIT

Overview
In Section 4, we look at the Asset Losses Section of the A-R Report. This section provides information about the different categories of losses reflected in the Asset Losses Section of the A-R Report.

Objectives
Upon completion of Section 4, you should be able to:

- Recognize the categories of losses contained in the Asset Losses Section.
- Understand the validation of losses and sources for validating data.
- Identify the source of data for Asset Losses.
- Recognize the different types of losses and what constitutes a valid loss for each type.

Turn Audio On

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quality of online training, and both sets of guidelines can be equally effective to use as checklists for good QA.

Step Four: Reduce Quality Costs and Eliminate Barriers

Barriers to effective QA exist even when a course is well designed and meets all the customer’s expectations. Two potential inhibitors of effective QA are its costs and the walls sometimes raised by people or organizations involved in the development process. The cost of QA is an opportunity cost: the actual expense of not doing it or taking an alternative route can exceed the cost of doing it and doing it well. In other words, if you don’t ensure quality, you may pay more in the end to redo a poorly developed product.

QA costs are typically measured by the actual cost of performing QA activities rather than the very real cost of *not doing QA*, which causes rework because of persistent errors and product defects. Schulmeyer and McManus, authors of *Handbook of Software Quality Assurance*, explain it this way:

If the quality assurance task costs one amount, but the result of performing that task saves another amount, the real cost

is the *difference* between the two, not the initial cost of the activity.

A good rule of thumb is that QA should represent about one-third—or 30 percent—of the total cost of design and production, while planning, design, and development constitute roughly 50 percent of the total cost. Production should account for 20 percent. QA efforts become more efficient when design and production personnel work together to reduce errors throughout the process and thus reduce the number of hours required to accomplish QA activities.

Follow these steps to estimate quality costs:

1. List all major QA activities.
2. For each development phase, list both tasks and deliverables.
3. For each development phase, determine customer and supplier requirements and project parameters.
4. For each development phase, analyze parameters, determine the level of effort required for QA activities, and estimate the cost of *this effort*.
5. Compare the cost of QA to that of design and production.

The importance of tracking costs in QA is clear, as is the relationship be-



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tween a QA function and sound online training. If QA consistently emerges as a major expenditure in development projects, management may step in and raise expectations during design and development, or may react negatively and cut back QA activities in order to lower costs. In either case, the project is likely to suffer. Keeping QA activities as efficient as possible can help protect its role in the design and development process.

Barriers to QA

As mentioned earlier, walls are sometimes raised by people or organizations involved in the development process. Sometimes this is necessary to streamline production time, or results from a turf battle over who “owns” different phases of the project and the product itself. As in many production processes, three potential barriers can derail the QA function:

1. *Organizational placement.* If QA is not an independent function that reports either outside or higher up in the production organization, it will

likely be ineffective. Design and development personnel may often take up matters with the project manager rather than working with QA personnel, who may require more product revisions. When QA is separate, it has more authority to guarantee that quality recommendations will be implemented.

2. *Resistance actions.* Development and production staff may resist QA activities, or the reverse may happen—QA staff may resist design and development procedures.
3. *Funding issues.* When funding is not held at the same level as other design and production phases, quality is compromised.

In all three cases, effective planning for QA at the beginning of a development project can forestall the creation of these barriers. To protect QA, its time must be estimated as part of the effort required for successful project completion. Project staff must be educated about the value and proper place of QA, and the organizational structure must

support the role of QA as an independent auditor of courseware.

Necessity, Not Luxury

Many good things happen in a well-designed online training production process. At the same time, production is often vulnerable to turf wars and the resentment development staff feel toward a QA team earnestly hunting for defects. Having a strong QA plan is a cost-effective means of forestalling these negative effects and turning out a good, almost defect-free product. Probably no product is completely defect free, but if you follow a good QA plan, you can eliminate most defects before the product is released. Each step in this article is meant to be a guide to developing efficient QA in the production of online training. Employing a robust QA process is not a luxury, but a necessity. **❶**

SUGGESTED READINGS

Gillis, L. 2000. *Quality Standards for Evaluating Multimedia and Online Training: Everything You Need to Know to Rate Online Courseware.* Toronto: McGraw-Hill Ryerson.

Schulmeyer, G. G., and McManus, I. (Eds.) 1987. *Handbook of Software Quality Assurance.* New York: Van Nostrand Reinhold.

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