Multidisciplinary Approach to Needs Assessment and Evaluation in Web-Based Training Design

Christina Curnow
Managing Associate
Caliber Associates

Claudette Archambault
Senior Associate
Caliber Associates

Just as traditional classroom training cannot be moved into a web-based environment without significant reworking, traditional models of training needs assessment and evaluation also need to be viewed from a new perspective for application to web-based training. Web-based environments are more complex to assess and evaluate than traditional classroom environments because of the different types of technologies that can be used. Therefore, we developed a new model that blends perspectives from psychology, education, and technology to capture the complexities inherent in web-based training. Combining the three perspectives allows for us to conduct a more thorough analysis for designing and developing web-based training and creates a holistic picture of training needs and evaluation outcomes. Enhanced needs assessment can lead to more realistic planning and budgeting as well as more informed expectations of course outcomes, while enhanced evaluation can provide more accurate feedback about the content, execution and impact of a web-based training.

The Blended Model

Three perspectives influence the blended model: educational, psychological and technological. The blended model combines the ADDIE model from the educational literature, Kirkpatrick’s (1984) four levels of training outcomes from the psychological literature, and the Software Development Lifecycle (SDLC) from the technological perspective.

ADDIE

ADDIE includes both needs assessment and evaluation of the content as part of the basic model, but does not include an assessment or evaluation of the technology supporting the learning. Most versions of the ADDIE model suggest a process where in the analysis phase, the needs for creating the training (from learner, supervisor, and organizational perspective) are assessed, training content is designed (e.g., determining the cognitive level of learning, modules for the content) and developed (e.g., creation of content) and evaluated iteratively as “chunks” of training content are created.

Kirkpatrick

The focus of Kirkpatrick’s model is only on the evaluation of the training, including content and other factors affiliated with face-to-face training, but does not consider the impact of the technology used for online training. Kirkpatrick’s four levels of training evaluation criteria are: reactions, learning, performance, and results. The first level, reactions, refers to what a learner thought of their training experience. Kirkpatrick’s second level, learning, refers to the measurement of knowledge, skills, and attitudes that were specified as training objectives. The third level, performance, refers to behavioral changes as a result of training. Finally, results, refers to the impact of the training on organizational objectives.
SDLC

The software development life cycle (SDLC) includes both needs assessment (called analysis) and evaluation (called testing) of the technology that supports the learning, and does not focus on the content. SDLC contains six basic steps to build and assess a system including analysis (identifying organizational, instructor and learner needs for the software), design (layout of the pages and the architecture of the back-end systems that support it), code generation, testing, release (or implementation of a Web-based system) and support. These phases support the gathering of requirements for a Web-based training system, including database(s), interface(s), and design needed to support the online training.

The relationship between each perspective is shown in Table 1.

Table 1. Three Perspectives on Needs Assessment and Evaluation

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Analysis and Requirements Gathering</th>
<th>Planning and Design</th>
<th>Development and Formative Evaluation</th>
<th>Release and Implementation</th>
<th>Terminal Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education (ADDIE)</td>
<td>Analysis</td>
<td>Design</td>
<td>Development and Formative Evaluation</td>
<td>Implementation</td>
<td>Evaluation</td>
</tr>
<tr>
<td>Psychology (Kirkpatrick)</td>
<td>Software Requirements Analysis</td>
<td>Design</td>
<td>Code Generation</td>
<td>Testing</td>
<td></td>
</tr>
<tr>
<td>Technology (SDLC)</td>
<td></td>
<td></td>
<td></td>
<td>Release</td>
<td>Support</td>
</tr>
</tbody>
</table>

The blended model (Figure 1) combines all three perspectives to achieve a more comprehensive model for needs assessment and evaluation of web-based training. The analysis and requirements gathering phase of the blended model is based on the educational and technological literature. The summative and formative evaluation phases contain components from all three perspectives. Needs assessment and evaluation are the first and last phases of the blended model. However, they are not ends, but rather a part of a continuous loop whereby evaluation feeds further analysis and requirements gathering throughout the process, which in turn creates new standards against which to measure training success.
Application of the Model

By combining these models, web-based training programs can be assessed and evaluated from multiple aspects including system and interface design, and content and learning objectives. Below we present examples of how the blended model can be used to conduct needs assessment and evaluation in a more comprehensive manner than using one model alone.

System and Interface Design

Based on the blended model there are several aspects to conducting needs assessment and evaluation related to system and interface design that can be considered.

**Needs assessment.** Needs assessment of system interface and design involves identifying functional requirements (e.g., platforms, applications) and interface requirements (e.g., features needed, organization and grouping of content) for the web-based training. In addition, this can involve assessing the technical competency of the target audience to design an appropriate interface that is easily usable for the end-users. A final issue for considerations is whether appropriate technology is available in the organization/agency hosting the web-based training and to the clients (meaning computers that learners will use to access the training).

**Evaluation.** During the evaluation phase, the impact that these requirements have on the instructional strategies (e.g., peer-to-peer discussions, whiteboards) able to be employed by the system can be assessed. In addition, the impact of the interface design on the learning experienced can be assessed.

Content and Learning Objectives

Based on the blended model there are several aspects to conducting needs assessment and evaluation related to content and learning objectives that can be applied.

**Needs assessment.** Needs assessment involves defining the knowledge and skill/task areas needed to effectively perform on the job and identifying key content for training. During this phase, one would describe measures performance and instructional strategies needed for the appropriate cognitive level of learning – knowledge, comprehension, application, analysis, synthesis, evaluation.

**Evaluation.** To assess the content and learning objectives, one would measure student learning through the use of written tests or hands-on testing. Job performance could also be measured to determine if the training had an impact on the performance of specific tasks or the job overall. In addition, instructional strategies and their effectiveness can be evaluated.

Conclusion

Using the blended model for conducting needs assessments and evaluations has several advantages. Information gathered helps organizations determine if their training goals and organizational goals are aligned with one another, which ultimately saves time and money if problems or inconsistencies are identified early. In addition, assessment from multiple perspectives produces more insightful feedback. For example, if only usability (SDLS perspective) is assessed, one may believe the training to be sound because the trainees can easily navigate through the material; however usability does not guarantee learning (ADDIE and Kirkpatrick perspective). Assessing both usability and learning can lead to a greater understanding of how well a web-based training is functioning, and ensure appropriate use of organizational dollars to improve performance.
References


Biographical Sketches

Christina Curnow is a managing associate with Caliber Associates in Fairfax, VA. She holds a Ph.D. in industrial and organizational psychology from the George Washington University. Her research, presentation and publication efforts focus on improving workplace learning and evaluations of distance learning environments.

Address: 10530 Rosehaven St., Suite 400
    Fairfax, VA 22030-2840
E-mail: ccurnow@caliber.com
URL: www.caliber.com
Phone: 703.279.6213
Fax: 703.219.3777

Claudette Archambault is a senior associate with Caliber Associates in Fairfax, VA. She has an M.Ed. in instructional technology from George Mason University. Her work focuses on the usability of information technologies; applications of communities of practice; and design, development and evaluation of online learning.

Address: 10530 Rosehaven St., Suite 400
    Fairfax, VA 22030-2840
E-mail: carchambault@caliber.com
URL: www.caliber.com
Phone: 703.219.4408
Fax: 703.385.3206