Evaluating Web-based Training (WBT) based on a Systems Approach
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“Can you evaluate online courses without missing any elements? How do you know you identified all important elements to evaluate your online courses?”

With the interest in the use of Web-based Training (WBT) increasing, educators are asked to determine the effectiveness of these training programs. Evaluation of web-based training programs is a critical part of training design and yet, it is easily neglected. The cause of this neglect is due to a variety of reasons, not least of which is that the wide variation in WBT forms creates difficult and complicated WBT programs (Curtain 2002; Jung and Rha 2000; Rumble 2001; Trentin 2000; Whalen and Wright 1999). The evaluation of WBT is influenced by a number of factors, including the following: the IT infrastructure used; the number of learners; the flexibility of learning times; the frequency of course revision; the type and amount of media, learner support, and interaction; and the learners’ experience levels with technology and/or unexpected technical issues.

For example, when an organization provides different types of online courses that require different preparation times and levels of online interaction, it is difficult to evaluate the level of workload and extra time spent by administrative staff and instructors to support these online courses (Curtain 2002; Rumble 2001). In addition, efficient course delivery time for WBT is challenging to evaluate due to variations in the experience levels of learners with technology, the use of multimedia contents, and other situational variables such as technical problems (Whalen & Wright, 1999).

“How then can we identify and understand all important elements to evaluate WBT programs?”

Using a systems approach to the evaluation of WBT can alleviate the difficulty and yield data that reveals the level of effectiveness of training and areas in need of improvement.

In practice, Jacobs (2003) provides an interactive process of evaluation from the systems view for evaluating structured on-the-job training (SOJT). In his book, he suggests that the evaluation questions for SOJT be asked based on system inputs, processes, and outputs. These questions also need to be asked about the organizational context in which the training takes place.

First, the training input questions focus on the components required at the time of the training. For example, questions are asked about units of material to be learned, the nature of the training modules, the training locations in the work setting, as well as about the trainee and the trainer. Second, the training process questions focus on the behaviors of the trainer and trainee during the training. Questions are now asked about the amount of time required to complete the training, the availability of training resources, trainers’ behavior regarding the delivery of content and the quality of the learners’ work, and trainees’ behavior for quality of instruction.
Third, the training output questions focus on the various effects of training. Therefore, questions are asked about whether the training goals have been achieved, whether the training met the needs of trainees, and whether the training is more effective or efficient than other training approaches in terms of financial benefits. Lastly, the organizational context questions focus on the context that affects the training. Key questions are asked about the extent of management commitment to the use of the training and the interaction of the training with other systems in the organization.

Jacobs points out that this systems view of training evaluation enables educators to see all the relevant elements separately, allowing them to evaluate training programs, and how the elements bring together each component. In addition, this approach enables educators to examine the relationship among the four components within a system (i.e., a training program) and with other systems in an entire system (i.e., an organization), allowing them to determine the value/effectiveness of each component and of the entire system. This systems view of training evaluation also helps educators to understand the dynamic interactions among people who have different roles and responsibilities during an evaluation process.

Following the systems approach proposed by Jacobs (2003), we can evaluate a WBT program as shown in Figure 1.

**Input.** The input evaluation is important for measuring the appropriateness of three sets of characteristics—the individual, the training design, and organizational variables—that influence training performance, before conducting training (Baldwin & Ford, 1988). General input questions cover trainees, trainers, online experts, technicians, instructional designers, administrative staffs, the work functions and conditions to be performed, KSAs to be learned, instructional design and content, hardware, network services, e-learning management systems, and other resources such as location, budget, time, reward systems, and so on.

**Process.** The process evaluation questions focus on the behaviors of trainers and trainees as well as the technical maintenance support for instruction during the training. They ask how the trainer delivered the online course, how the trainees learned the content, and how the e-
Learning management system supported the instruction. The process evaluation is important to modify a program or redesign presentations, materials, or training content.

**Output.** The output evaluation questions focus on the various effects of having used WBT. To measure the unique effects of WBT, training output questions frequently measure the following:

- **Learning outcomes:** Learning outcomes should be measured to examine the extent of trainees’ changes in knowledge, skills, and attitudes (Kirkpatrick, 1998). Online computer-marked assessment tools such as quizzes and simulation exercises can be used to measure knowledge and skills. Further, sophisticated software tools can be used to grade complicated materials such as learners’ essays (Bradsford, Brown, and Cocking, 1999).
- **Transfer of training:** Behavioral changes in learners should be measured to see whether trainees have applied the behaviors learned in training to their jobs (Kriager, 2002). Learners’ behavioral changes may be measured by online self-reports, completion of checklists by supervisors or others who are in the best position to observe trainee behavior (e.g. customer), or by performance review records.
- **Result:** Performance effectiveness may be measured through 360-degree feedback systems, formal certification programs or assessment centers, or surveys asking trainees or their supervisors to estimate the percentage of improvement in job performance as a result of training (Kraiger, 2002).
- **Financial return:** The most common method to measure financial benefits of WBT is a cost-benefit analysis of training. Whalen & Wright (1999) point out that two common measures for WBT are the breakeven point, the point at which costs are recovered, and ROI, which quantifies the financial benefits of having undertaken a program.

**Organizational context.** The organizational context section of the evaluation instrument measures how WBT exists within an organizational context. The general questions about the organizational context address such issues as government support, organizational culture and structure consistent with WBT, availability of sufficient resources, willingness to manage and maintain WBT after implementation, the organization’s contractual obligations and agreements that promote/inhibit WBT, alignment with organizational goals and goals of related other systems in the organization, innovativeness of WBT, and so on.


**References**


