

Improving Institutional Corrections Training Academy: Pre- and Post-test Design for Outcomes-based Training Evaluation

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The purpose of this resource is to provide free, publicly available information on pre- and post-testing related to the topics discussed in the Outcomes-based Training Evaluation webinar series. This handout also includes examples and pre- and post-test assessments using the Bureau of Justice Administration's (BJA) First-line Supervisor training developed by The Moss Group.¹ This document is a supplement to the material covered in the webinar series and does not serve as standalone training. Please see the series linked [here](#) for more information.

Training curriculums are designed to improve the competency of existing knowledge and skills, enhance performance, and teach new information and skills. Developing and implementing effective curricula through outcomes-based training models is paramount; however, this is just the beginning. Evaluation is a necessary component of the process to realize training objectives fully. Organizations and trainers have a variety of options for evaluating your curriculum. One of the most appropriate research methods for evaluating outcomes-based training programs is the pre- and post-test design.

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Overview: what is the pre- and post-test design, and how is it used?

Simply put, this method involves two assessments, one provided before (or at the beginning) of training (the pre-test) and one after (usually immediately following the training) (the post-test). This research design is useful because the pretest establishes a baseline knowledge on a topic from your target population – in this case, the trainees

¹ The First Line Supervisor training is linked [here](#).

expected to participate in the training. By including a post-training assessment among the target population (in this case, the trainees who completed the training), trainers can assess whether the participants obtained the desired knowledge and skills through the curriculum.

By comparing the pre-test and the post-test results, trainers can assess the change in knowledge and skills based on the training curriculum. Ultimately, this allows trainers to assess whether the material presented achieves what it was designed to accomplish.

What is a pre-test?

A pre-test is an assessment used to determine the participant's knowledge or skills relative to the topic before completing the curriculum. Pre-test assessments should incorporate questions that focus on the intended outcomes of the training and may include the following types of assessments:

- Surveys and questionnaires
- Practical evaluations testing hands-on knowledge or skills
- Performance evaluations when training relates to items measured during a regular performance evaluation process
- Trainee expectations

PRE-TEST TIP

Pilot your assessment tools by deploying pre-tests prior to curriculum finalization. Ask those not involved in the curriculum development to review the training and complete the assessments. Look for indicators that the test or training needs improvement (e.g., are there questions that are frequently skipped, or are there questions participants frequently respond to inaccurately?). You can use data gathered as part of your needs assessment and to inform the final curriculum development.

POST-TEST TIP

Post-tests should be administered at the conclusion of your training or as soon as possible thereafter. Additionally, you can deploy follow-up post-tests at iterative time points (e.g., six months, 12 months, and so on), and those later time points can inform trainers about knowledge retention (i.e., how much trainees accurately recall from the curriculum over time).

What is a post-test?

A post-test is a follow-up assessment tool designed to capture current knowledge on a topic.

The goal of a post-test is to determine the participant's knowledge or skills relative to the topic after completing the curriculum from your target population – in this case, the trainees who completed the training. The post-test may include the following types of assessments specifically focused on the topics covered during the training program:

- Surveys and questionnaires
- Practical evaluations
- Performance evaluations
- Trainee satisfaction

Key Assumption

The assumption is that the only factor that changed between the pre-test and post-test is the training. Though there are exceptions, generally, when evaluating the effectiveness of outcomes-based training, assessments should be immediately before training and immediately after training.

Types of Assessment Questions

Based on “The Basics” learning module² from the Bureau of Justice Assistance First-line Supervisor training developed by The Moss Group, an assessment may include the following types of questions:

- **True or False:** A mission statement tells employees what to do and how to do it.
- **Multiple Choice:** Which are not characteristics of a healthy team: trust, conflict, mascot, or defined roles?
- **Likert Scale:** On a scale of strongly agree to strongly disagree, I feel prepared to be a supervisor.
- **Select All that Apply:** Provide a variety of mutually exclusive options: What are the best days to attend training: Monday, Tuesday, Wednesday, and Thursday?

TIP

You can look at an individual student’s performance from pre-to-post-test to understand changes to their performance, and you can also look at a cohort or class’s aggregate scores from pre-to-post-test to understand changes to group performance. The latter can provide valuable information about how your curriculum may or may not successfully meet the standards of your intended learning outcomes (i.e., a single student’s low post-test score alone does not signal a curriculum issue, but an entire cohort’s performance may suggest this).

Assessing Effectiveness: Comparing Pre- to Post-testing Scores

When compared, pre- and post-tests can help you understand how trainees understood the material and whether intended learning outcomes were met at the conclusion of a training. For example, you will be able to answer the following questions from your pre/post-test assessments:

² Note: Pre- and post-test assessments can be created for a single webinar (e.g., module 1 of a series), a webinar series in totality (e.g., all modules), or any other training delivery format. Just be sure that the content of the questions focuses on material that is covered before the delivery of the post-test assessment.

- How many trainees increase their scores at the conclusion of the training? How many did not?
- On which questions or topics did trainees' scores not improve? What does this tell you about the curriculum or instruction design?
- Overall, did the training result in higher post-test scores?

Analyzing Your Data

Data can be evaluated with simple descriptive statistics such as total scores, averages, minimum and maximums, and more. Data can also be analyzed with paired sample t-tests. More information on running paired sample t-tests can be found below:

- <https://www.youtube.com/watch?v=VekJxtk4BYM>
- <https://www.youtube.com/watch?v=7IW2PUqe64>
- https://www.youtube.com/watch?v=zTBn_lbCueI

Percent Change: An Example

A simple calculation to assess the difference between two quantities is percent change. This calculation requires two sets of data, such as pre- and post-test scores. For example, the aforementioned First-line Supervisor training, “The Basics,” begins with a pre-test to assess the pre-training competency of 30 staff members. Following the training, the trainer issues the same assessment (post-test). Comparing each participant’s pre-test results to the corresponding post-test results allows the trainer to determine if there was any change in each participant’s competency relative to The Basic’s curriculum of mission creation, leadership, boundaries, and communication. Taking it a step further, trainers can compare the average pre-test scores for the group of 30 participants to the average post-test scores for the same group to determine if, collectively, the training increased the group’s competency overall. Assume the average pre-test score for the group was 50 and, after completing the training, the group’s average post-test score is 85. The differences (between 50 and 85) show the training had a positive impact. To reflect the depth of that change, the percent change can be calculated. In this case, the percent change would be 70 percent.

Consider: What is the change in values?

TIP

Triangulation is the process of interpreting and understanding the results of the pre- and post-test assessments within the context of your data. For example, you may see that post-test scores increased for all students, yet all students missed Question 9 on their post-test assessments. This will be when you, as the instructor, need to triangulate what happened with Question 9. Is this a poorly written question? Is this piece of information insufficiently covered in the curriculum? Something else? Analyzing the data in a variety of ways, reviewing your curriculum, talking to trainees, etc., are all potential sources to help you understand these types of data anomalies.

Scores: Average pre-test score = 50
Average post-test score = 85

The Math: $((\text{Time2} - \text{Time1})/\text{Time 1}) * 100$
 $((\text{Post-test score} - \text{Pre-test score})/\text{Pre-test score}) * 100$

Percent Change: $((85-50)/50) * 100 = 70\%$
Competency increased by 70 percent.

Resources for Designing and Implementing Pre- and Post-test Evaluations

- *Developing a survey instrument.* Developing a Survey Instrument (Rutgers NJAES). (n.d.). <https://njaes.rutgers.edu/evaluation/resources/survey-instrument.php>.
 - This includes a compilation of evaluation resources for developing survey instruments. Resources include assistance in designing questions, guidance on increasing responses and reliability, and examples of pre- and post-test evaluations.
- *Evaluate Training: Measuring Effectiveness.* Centers For Disease Control. (2024, April 3). <https://www.cdc.gov/training-development/php/about/evaluate-training-measuring-effectiveness.html>.
 - This includes a brief overview of how to design evaluations to measure training effectiveness as well as example questions.
- *Guidance for pre- and post-test design.* Empower - The Emerging Markets Foundation. (n.d.). https://empowerweb.org/assets/uploads/tools-resources/461/5_guidance_for_pre_and_post_test_design.pdf.
 - This guide provides design review, tips for analysis and reporting of results, and additional resources for evaluating outcomes related to pre- and post-testing.
- Szczesny, M. (2023, April 27). *A guide to evaluating training success with pre- and post-training assessments.* Training Industry. <https://trainingindustry.com/articles/measurement-and-analytics/a-guide-to-evaluating-training-success-with-pre-and-post-training-assessments/>
 - This guide article provides a snapshot of pre- and post-training assessments, including tips for effectively and efficiently conducting assessments.

Example Pre-test Assessment

1. True or false: Healthy conflict is a characteristic of a high-functioning team.
 - a. **True**
 - b. False

2. True or false: It is not important for organizations to have a mission statement.
 - a. True
 - b. **False**

Example Pre- and Post-test Assessment Using the First-line Supervisor Training Module 1

This section of the handout provides an example of pre- and post-test using the First-line Supervisor training: Module 1. The highlighted option is the correct answer.

Please note that the questions between the pre- and post-test are not identical to one another; however, all questions covered in the pre-test have a partner question in the post-test asking about the same piece of content in a slightly different way. This will allow you to ensure that the information is understood rather than strict memorization and recitation from the pre-test materials or the training materials.

3. Who defines the “what to do” of an organization and serves in the role of decisionmaker?
 - a. **Administration**
 - b. Supervisors
 - c. Both
 - d. Neither the administration nor the supervisor

4. What are the three types of organizational systems?
 - a. Ones you avoid, ones you influence, and ones you change
 - b. **Ones you experience, ones you influence, and ones you control**
 - c. Ones you experience, ones you influence, and ones you observe
 - d. Ones you influence, ones your experience, and ones you witness
 - e. None of the above

5. True or False: It is a best practice for supervisors to “silo” or work independently without collaborating with other colleagues.
 - a. True
 - b. **False**

6. Which of the following is an example of an internal factor that can impact the mission of a correctional organization?
- a. Media
 - b. Local policing initiatives
 - c. Advocates
 - d. **Administrators/Supervisors**
 - e. State legislature
 - f. Community stakeholders
 - g. None of the above
7. True or false: One of the primary duties of supervisors is to link line staff and upper management.
- a. **True**
 - b. False
8. True or false: It is not a critical role of supervisors to enforce policy and set a culture that is supportive of change.
- a. True
 - b. **False**
9. Which of the following is not a healthy team characteristic?
- a. Trust
 - b. Clear communication
 - c. **Authority**
 - d. Diversity
 - e. Conflict
 - f. None of the above
10. True or false: It is important for supervisors to demonstrate strong communication skills.
- a. **True**
 - b. False

Example Post-test Assessment

1. True or false: A sign of a high-functioning team is zero conflict.
 - a. True
 - b. **False**

2. True or false: It is vital for an organization to have a clear mission statement.
 - a. **True**
 - b. False

3. Who defines the “how it’s done” of an organization and serves in the role of operationalizing decisions?
 - a. Administration
 - b. **Supervisors**
 - c. Both
 - d. Neither the administration nor the supervisor

4. Which of the following is not one of the three types of organization systems?
 - a. Ones you avoid
 - b. Ones you influence
 - c. **Ones you change**
 - d. Ones you control
 - e. None of the above

5. True or false: The “silo effect” refers to when supervisors choose to work in isolation from one another, which can create duplicative work and frustrate staff.
 - a. **True**
 - b. False

6. Which of the following is not an external factor that can impact the mission of a correctional organization?
 - a. Media
 - b. Lack of community mental health resources
 - c. State legislature
 - d. Policing initiatives
 - e. Community stakeholders
 - f. **Administrators/Supervisors**
 - g. None of the above

7. True or false: It is not one of the primary duties of supervisors to link line staff and upper management.
 - a. True
 - b. **False**

8. True or false: It is a critical role of supervisors to enforce policy and set a culture that is supportive of change.
 - a. **True**
 - b. False

9. Which of the following is not a healthy team characteristic?
 - a. Trust
 - b. Clear communication
 - c. **Unavailable**
 - d. Diversity
 - e. Conflict
 - f. None of the above

10. True or false: Supervisors do not require strong communication skills.
 - a. True
 - b. **False**

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