

**A Review of Literature Related to
Measuring the Effectiveness of
Training in General and Food Handler
Training in Particular**

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Introduction

In 2023, the Conference for Food Protection (CFP) convened a focus group to identify techniques and tools used when training food handlers about food safety and sanitation and how this training can be used to facilitate behavioral change in the workplace.

Training, including food safety training for food handlers, produces many benefits for both the learner and their employer. Some benefits that training offers for learners include:

- helping them improve their competence and performance,
- acquiring new knowledge and skills, and
- applying their knowledge and skills in their workplace.

Some benefits that food handler training offers for employers include helping them:

- meet customer expectations,
- score higher on regulatory inspections,
- have better worker morale, and
- create an enhanced food safety culture.

When employees are trained and they learn effectively, the results usually show up in how they perform on the job. According to Asha Pandey, there's a plethora of research-based evidence that links effective training to exceptional performance. (1)

Measuring Training Effectiveness

Training effectiveness refers to the degree to which a training program or initiative achieves its intended goals and produces the desired outcomes. Measuring training effectiveness involves evaluating the transfer of learning from the training environment to the workplace and assessing the tangible and intangible benefits that result from the training program. (2) By measuring training effectiveness, it is possible to assess the impact and value of training on a trainee's knowledge, skills, performance, and the sponsor's return on investment (ROI) for the training it offers.

The goals and objectives of a training program should be determined before the training occurs. This will allow the goals and objectives to be clearly and accurately measured. Evaluating training effectiveness is critical to ensure training programs support the objectives of the organization and to assure that training doesn't become redundant. In addition to setting goals and objectives for training, an organization must answer some basic questions related to why, what, when, and how to evaluate the effectiveness of its training program.

Why Evaluate the Effectiveness of Training Programs

Some common reasons why training effectiveness is measured include:

- *Determine if the training benefits employees.*

Arguably the most important reason for measuring the effectiveness of training is to see if it enhances a trainee's knowledge, skills, and performance. Measuring the effectiveness of training can also help a trainer or employer communicate to trainees what they have achieved and any deficiencies they will need to work on.

- *Determine the effect on business performance and determine the training's ROI.*

The goal of training programs is to boost performance. Providing the right type of training is critical. Measuring the effectiveness of training will enable the company to see if it is getting the desired return on its investment of human and fiscal resources.

- *Identify problems with training and address them.*

Organizations must determine if their training programs are working or not. Measuring training effectiveness will help an organization determine if its training program is on the right track or if it needs to make any adjustments.

- *Measure The Impact Of Training Programs*

By evaluating the impact of training programs decisionmakers can get objective metrics on how well those programs work to support business objectives. When a compelling case can be built for the benefits of training and the return on investment for funds spent on training, the more likely those funds will continue to be available.

- *Improve The Impact Of Training Programs*

An in-depth training evaluation is the only way that Learning and Development (L&D) managers can identify important Key Performance Indicators to make training more relevant. By measuring the results of a training program, L&D managers can evaluate those results against predetermined KPIs and enhance or improve training plans based on that assessment. (1,2)

What to Evaluate when Measuring the Effectiveness of Training Programs

Measuring the effectiveness of training should focus on both learning and how learners apply what they have learned in their workplace. The evaluation should be designed to measure what knowledge and skills the learner has acquired during the training that can be applied in the workplace. Measuring the effectiveness of training also involves measuring how successfully the learner met the goals and objectives of the training.

When measuring the effectiveness of training, the evaluator should look at the combined results for all learners. This will help them identify gaps in learning and trends that might show a need to improve course content or instruction.

When to Evaluate Training Effectiveness

The effectiveness of training can be evaluated at different points throughout the training process. According to the Centers for Disease Prevention and Control (CDC), training can be conducted before and after training, during training, and as a follow-up to the training.

- *Before and After Evaluation* - The CDC considers before and after training as the best way to evaluate changes in learning that result from training. This method of evaluation uses a pre-test and post-test approach to measure learning. This method can also employ demonstrations to assess skills in addition to knowledge. When conducting a pre- and post- training evaluation isn't possible, a retrospective pre/post assessment can be used. This method asks learners to self-assess their knowledge before and after the course as part of a post-course evaluation.

- *During Training* – This form of evaluation is commonly used during e-learning. It employs a variety of measurement options such as knowledge checks, quizzes, or observations. For in-person training, the trainer can pose questions to assess the learners' level of knowledge and skills. The approach provides real-time feedback that can help the instructor know when topics need to be reinforced or if a change in course content is needed.
- *Immediately After Training* – In addition, or in lieu of a post test, it is possible to gather information from learners at the end of a training course. According to the CDC, this option measures learner satisfaction but is not effective for objectively assessing learning or learning transfer. (3)

How to Measure Training Effectiveness

Organizations that provide training, whether in-house or through outside vendors, should link the training to behavioral change in the workplace. This requires proper metrics to measure training and its contribution to positive business outcomes. Training effectiveness can be measured using Performance Metrics and Key Performance Indicators (KPI)

Performance Metrics

Performance metrics are measurable data that can be used to track progress and performance in areas that are deemed critical to the success of a business. Some examples of performance metrics include revenue, customer data, employee data, etc. Performance metrics can also be used to track processes within a business using activities, employee behavior, and productivity as key metrics. The main difference between measurement and metric is, measurement gives you a vague number, but metrics give you specific numbers.

Performance data is collected and compared against an established objective (like employee productivity or sales objectives). Generally, a group of metrics will typically be used to build a dashboard that management or analysts review on a regular basis to maintain performance assessments, opinions, and business strategies. By analyzing metrics, businesses can make informed decisions, identify areas for improvement, and gauge their overall success in achieving organizational objectives. (5) (6)

Some examples of the metrics used to measure the effectiveness of training include:

- **Pass or fail rate**, which applies to tests and quizzes and their successful completion.
- **Scoring**, which helps you estimate learners' performance and adjust the difficulty level of a quiz or test if needed.
- **Training experience satisfaction**, which identifies how learners perceive training and what requires improvement.
- **Training completion rate**, which shows the number of learners who finished a course.
- **Learning dropout rate**, which shows the number of people who didn't complete a course or decided to leave it. This can indicate problems with the content or browser compatibility.
- **Post-training performance**, which shows the effectiveness of training and how employee performance has improved (an increase in work efficiency, the number of calls, client contacts, sales, etc.) (4)

Key Performance Indicators (KPIs)

Key performance indicators can also be used by organizations to measure the effectiveness of training. A key performance indicator is a quantifiable value that an organization can use to track progress against individual, team, or company goals. Key performance indicators are commonly used to help an organization determine if it is achieving the desired results. These indicators play a crucial role in performance management and decision-making, helping organizations focus on what matters most for their success. Key performance indicators aren't static, and they must be updated as the organization's needs evolve. (7) (8)

These following performance indicators are linked specifically to the training program itself. They measure how well you're running the program and whether people are engaging with it.

1. *Training Attendance Rate* is a simple KPI that can be determined by data such as number of signups for training; attendees in each training course; attendees in each training session; and attendance of courses and sessions for each participant. If attendance in a

course drops off over time, it might be time to change the content, format, schedule, or other element that might impact attendance.

2. *Course Completion Rate* is a KPI that measures the number of employees who finish the training they sign up for. Low completion rates may indicate that learners aren't getting what they expected from the course, or it isn't clear to them how the course content will provide knowledge and skills they can use on the job.
3. *Average Time to Completion* is a training efficiency KPI that measures how long it takes the average learner to go from signing up for a course to completing it. This only applies to self-paced learning via an online course or a training program with multiple options for attendance dates. If it takes learners a long time to complete learning tracks, it may be because they're not getting a lot of value from the training, they have competing priorities, or they may feel pressured by their managers not to take time away from their jobs for training.
4. *Post-training Assessment Results* are an important KPI for training coordinators. If learners are scoring well on their assessments, it can be assumed they're learning from the training. If the failure rate is higher than expected, the most appropriate fix is to improve the quality of the training.
5. *Learner Satisfaction Rate* is a measure of how much trainees enjoy the training program. Trainees are more likely to show up and pay attention to training that they're satisfied with. This is where learner satisfaction rate comes in.

The KPIs above are designed to provide information about how effectively a training program imparts knowledge. The KPIs below will measure the impact the training is having on business and business outcomes.

6. *Learner Retention Rate* is a measure of the knowledge gained by a participant in a training program. A related KPI is learner competency that measures the ability of the learner to put knowledge to use and solve problems. Learner competency is more difficult to measure but it makes a great training effectiveness KPI. Competent employees are of great value to companies.

7. *Job Performance Impact* measures if training is having a real impact on job performance. If the training does not have a real impact on job performance, then the training isn't having its desired effect.
8. *Training ROI* is the ultimate metric of success in business. It is a measure of training effectiveness that compares the financial value of the learning outcomes against the investment made by an organization to achieve those results through training. ROI is most commonly used at the end of the evaluation process. (10)

Key performance indicators should meet the following criteria:

- **Specific** - a detailed, simple, and clear description of what exactly you want to achieve.
- **Relevant** - directly related to the organization's objectives.
- **Measurable** - quantifiable so the organization can measure them properly and establish a definition of success.
- **Achievable** - ambitious yet realistic.
- **Time-bound** - attainable within a given timeframe whether it's daily, weekly, monthly, or annually.
- **Clarity** - easily understood by all stakeholders so everyone has a common understanding of performance expectations. (7)(8)

Difference between KPIs and Performance Metrics

It's important to understand the difference between performance metrics and key performance indicators. Some significant differences include:

- KPIs are tied to specific goals, while metrics are data points.
- KPIs are directly tied to strategic goals, and they're used for measuring performance against set objectives. Metrics are much broader and include various data points used for analysis – but may not directly align with key objectives.
- KPIs tend to be goal-oriented while metrics are the numbers that inform these goals but are not directly linked to the goals themselves.
- KPIs can have multiple metrics tied to them. (7)

Training Evaluation Models

Before an organization decides what to measure or how to measure it, it must choose an evaluation technique that's best suited to meet its needs. There are many training evaluation techniques to choose from, but the following are considered to be among the most trusted by organizations today. (2)

Kirkpatrick Model

The Kirkpatrick model is a widely used tool for evaluating training effectiveness. It consists of four levels:

1. **Reaction** – Evaluate learners' reactions to the training. This feedback is captured through surveys, questionnaires, or interviews.
2. **Learning** – Measure what was learned during the training. Use assessments to measure how much knowledge and skills have changed from before to after the training. This could be measured by test scores or changes to employee performance metrics.
3. **Behavior** – Assess whether or not (and how much) behavior has changed as a result of training. The best way to measure behavior change is through workplace observations and comparing pre- and post-training performance.
4. **Results** – Evaluate the impact of training on business results. Tracking the tangible outcomes of the training. It's common to measure results like reduced costs, improved quality of work, greater productivity, or employee retention.

The Phillips ROI Methodology

This model is the same as Kirkpatrick's model, but with an extra step. The fifth step of the Phillips ROI model is to evaluate the program's return on investment (ROI). While Kirkpatrick measures training results against Return on Expectations (ROE), Phillips applies cost-benefit analysis to determine if L&D investments generate value. To measure ROI the organization will measure the difference between your training cost and training results. When the results of training exceed the cost, then a positive training ROI is attained. When the cost of training is larger than the results, something needs to change. A benefit of using the Phillips ROI model is that it's easy to spot the areas that need improvement. In addition,

ROI can be a very persuasive tool when requesting more training resources from company leaders.

Anderson's Model of Learning Evaluation

This is one of the training managers' favorite evaluation techniques for training, because it helps them keep their business strategy a priority.

The three stages of Anderson's Model:

Stage 1: Evaluate your current training programs against the business' strategic priorities.

Stage 2: Measure the contribution of training to strategic results.

Stage 3: Find the most relevant approaches for your company. Here's where you decide whether the ROI is worthwhile. This final step will depend on your company's approach.

If the ROI measured in stage 3 is not adequate, then it's time to make some improvements to your training programs.

Summative and Formative Evaluation

It's important to know how to assess a training program both while it's being developed (formative evaluation), and after it's been delivered (summative evaluation). Formative techniques of training evaluation aim to catch problems (and fix them) early on before they negatively impact learning. Summative techniques are applied after training is completed.

Kirkpatrick's four levels of training evaluation and Anderson's Model of Learning

Evaluation tools can be used to provide this type of evaluation

Challenges Encountered When Evaluating Training Effectiveness

Implementing a program to measure the effectiveness of training can be met with some challenges. Information gleaned from the literature indicate the following are examples of challenges that may be encountered when evaluating training effectiveness:

- **Inability To Link Training To Talent Development, Performance, And Outcomes**

Organizations that lack employee performance metrics are unable to say with any degree of certainty whether training helps or hinders employee performance. For instance, how do you determine if training is helping to develop your in-house talent pools or if employees are successfully applying newly acquired skills (learned through training) as performance aids on the job?

- **Lack Of The Right Framework And Methodology**

Most L&D managers use a training outcomes measurement approach to evaluate training. This approach doesn't work because it doesn't consider what happened prior to or after training. Better results can be achieved if the process begins with a Training Needs Analysis (TNA) and culminates with a determination of whether training meets all KPIs and delivers a justifiable Return On Investment (ROI). (2)

During the Training Needs Analysis, L&D managers must integrate Learner Needs Analysis to identify specific learning objectives and map them to business objectives.

During the Learning Needs Analysis phase, managers must:

- Understand and document learner needs, tasks, and preferences.
- Analyze the data collected.
- Integrate the conclusions from that analysis into the designs of future training initiatives. (1)

- **Lack Of The Right Tools And Technology To Collect Data**

Training technology, such as Learning Management Systems (LMSs) and Learning Content Management Systems (LCMSs), has embedded tools that provide a lot of analytic data for evaluating training effectiveness. Unfortunately, many organizations either lack the right tools and technologies to collect such data or are incapable of using available tools to collect and objectively analyze that data.(8)

Conclusions

Food handler training is an essential component of a retail food establishment's food safety management system. Effective training will equip food handlers with the knowledge, skills, and attitudes required to handle food safely and prevent foodborne illnesses. (11)

There are a variety of techniques and criteria that can be used to measure the impact of food handler training on food quality and safety. Some of these criteria will measure the transfer of knowledge and skills through testing, observation, and feedback. Other criteria will focus on the benefits that training provides for the business. These criteria will include things such as job performance, customer complaints and satisfaction, worker retention, food quality and safety, and return on investment.

Organizations that invest significant resources in employee learning and development, without a system to measure training effectiveness, may find themselves unsure of whether their investments are yielding the desired results. Measuring the impact of training and development is a worthwhile endeavor. However, it won't produce the desired benefits unless the organization uses what it has learned to improve the training, find a better provider, or decide to discontinue the program.

The impact of food handler training should be used as a basis for continuous improvement and review of the food safety management system. This means that the results and findings of the measurement methods should be used to identify strengths and weaknesses, opportunities and threats, best practices and lessons learned, and action plans and recommendations for improvement. Evaluating training programs is essential to determine their impact on individual performance and overall organizational success.

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