PROVING THE ROI OF TRAINING

Moving from Expense to Necessity

DEMONSTRATING RETURN ON INVESTMENT

While world-class manufacturers know an investment in human capital is critical for achieving and sustaining a competitive advantage, less savvy companies relegate training and development to a minor expense line in the annual budget.

That means capital investments such as equipment and technology are readily funded, while training initiatives are often left out of final budgets.

A big challenge is that while human resources teams, plant managers and supervisors recognize that substandard training can lead to productivity, quality and safety concerns, many don't know how to communicate the value of investing in human capital to higher-level decision-makers.

This can and must change for the benefit of the industry, and our nation, which relies on a strong manufacturing sector for prosperity.

By ensuring that training programs are an integral part of a strategic plan from the beginning and are attached to overall fiscal goals, training departments can demonstrate the value and necessity of focusing on people to ensure the overall success of an organization.

This white paper will demonstrate how companies can tie their learning and development program to the bottom line. Tooling U-SME provides industry formulas for calculating return on investment (ROI) for metrics such as accelerating onboarding, reducing downtime and increasing productivity. In addition, the white paper will include best practices for implementing a training program that increases ROI for manufacturers.

MISSED OPPORTUNITY

Consider this real-life scenario: A mid-sized, high-precision machine shop was dropped by a long-time client because the shop didn't have enough skilled workers to produce the parts needed for a large order.

It was time for a change. The CEO decided to invest in the company's workforce by bringing training in-house. The resulting ROI was significant. With a new learning and development program that had measurement in place, the company quickly increased productivity by 10 percent, reduced scrap and rework, improved morale and innovation and nurtured an ongoing pipeline of workers.

In retrospect, with such a strong ROI, the decision to focus on learning seems obvious. However, trends in the industry show that companies are not recognizing the value of human capital to create a competitive advantage.

According to Tooling U-SME's Readiness Assessment Insights Report,[1] fewer than one-quarter (24 percent) of respondents agree that the training their companies provide its manufacturing employees is adequate to meet the needs of the organization going forward.

The survey also found that one-third of companies (33 percent) say their job-related training options are minimal, with only a quarter of respondents saying their company offers a structured training program on manufacturing skills.

Clearly, there is room for improvement. But how do training departments justify the expense of a formal training program?

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[1] "Readiness Assessment Insights Report," Tooling U-SME.

HIGH-IMPACT LEARNING ORGANIZATIONS OUTPERFORM PEERS

HELP WANTED: IMPROVED WORKFORCE DEVELOPMENT PROGRAMS[2]

4% say their company does an excellent job in consistently delivering the right training and development programs throughout the organization.

33% say their job-related training options are minimal.

75% say their company doesn't offer a structured training program on manufacturing skills.

76% say that the training their company provides its manufacturing employees is not adequate to meet the needs of the organization going forward.

According to a study by Bersin & Associates titled "High-Impact Learning Culture: The 40 Best Practices for Creating an Empowered Enterprise,"[3] high-impact learning organizations (HILOs) that have a strong learning foundation in place tend to significantly outperform their peers in several areas:

◆ 32 percent more likely to be first to market

◆ 37 percent greater employee productivity

◆ 34 percent better response to customer needs

◆ 26 percent greater ability to deliver quality products

◆ 58 percent more likely to have skills to meet future demand

◆ 17 percent more likely to be market share leaders

These companies understand that successful learning programs are continual.

Some HILOs offer onboarding programs that start as early as the talent acquisition phase and continue through all talent management processes.

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[2] "Readiness Assessment Insights Report," Tooling U-SME.

[3] "*High-Impact Learning Culture*: The 40 Best Practices for Creating an Empowered Enterprise," Bersin & Associates, June 10, 2010.

EVALUATING A TRAINING PROGRAM

HILOs are proficient at running strong training programs, and they are disciplined about tracking and measuring results. Many manufacturers rely on the well-established **New World Kirkpatrick Model**[4] (see chart), which provides companies with a structured four-level approach to training evaluation:

Level	Example
Level 1: Reaction The degree to which participants find the training favorable, engaging and relevant to their jobs	"Awesome instructor!" "Class moved too slowly."
Level 2: Learning The degree to which participants acquire the intended knowledge, skills, attitude, confidence and commitment based on their participation in the training	"I learned about taper turning on an engine lathe and demonstrated how to perform it in a lab environment."
Level 3: Behavior The degree to which participants apply what they learned during training when they are back on the job	"I correctly used a taper attachment on my assigned engine lathe on the shop floor."
Level 4: Results The degree to which targeted program outcomes occur and contribute to the organization's highest-level result	Overall improved competency of lathe setup and understanding tool wear has reduced scrap by 3 percent.

Jack J. Phillips, Ph.D., a measurement and evaluation expert, added a fifth level:[5] ROI, which uses a data-driven approach for comparing monetary benefits of a training program with the costs.

Description	Example
Level 5: ROI Measures return on investment using data-driven approach	Overall program yields 126 percent return on investment.

The levels help evaluate if a training program is working and can provide the data needed for management to make important business decisions.

As this model demonstrates, training programs can and should be designed to address specific business pain points to meet an organization's overall goals. For success, ROI needs to be measured and aligned back to the initial planning and business.

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4   *"The New World Kirkpatrick Model,"* Kirkpatrick Partners (Kirkpatrickpartners.com).

5   ROI Methodology, ROI Institute (roiinstitute.net).

HOW IS ROI CALCULATED?

Training and development needs to be treated like other investments presented to top management, with value substantiated. The following formulas can help put financial measurements in place to back up a proposed investment.

Standard ROI Formula:

To calculate ROI, you must calculate training costs, including:

♦ Design and development of program

♦ Program materials

♦ Facilitator

♦ Training facilities

♦ Travel/meals

♦ Salaries and benefits of those participating in training

♦ Administration/overhead

A standard ROI formula[6] looks like this:

$$\text{ROI} = \frac{\text{Net Program Benefits}}{\text{Training Program Costs}} \times 100$$

For the biggest impact, however, it is helpful to tease out metrics around specific business priorities.

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[6] "The Benefits of Using the ROI Methodology," ROI Institute, 2013.
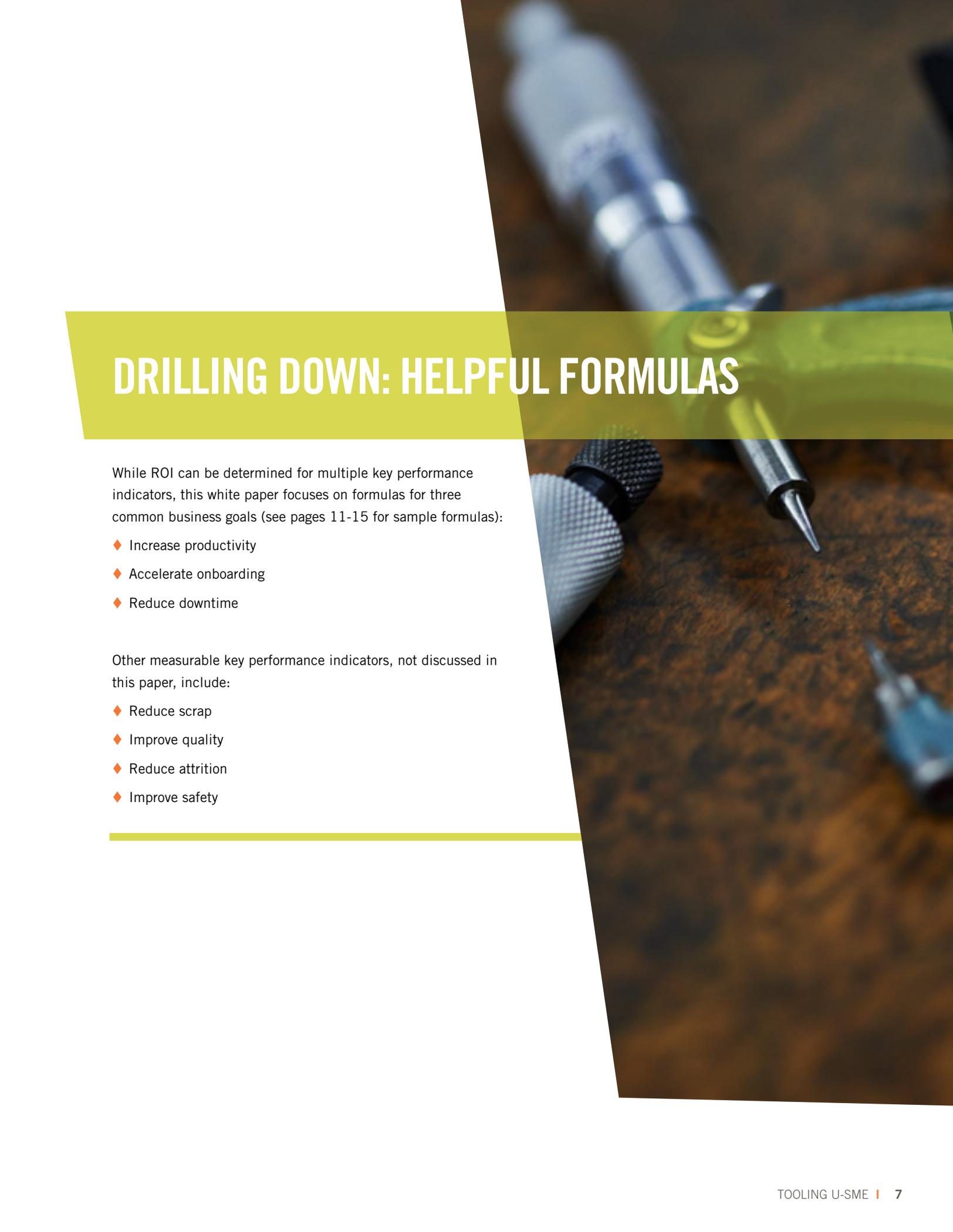
DRILLING DOWN: HELPFUL FORMULAS

While ROI can be determined for multiple key performance indicators, this white paper focuses on formulas for three common business goals (see pages 11-15 for sample formulas):

♦ Increase productivity

♦ Accelerate onboarding

♦ Reduce downtime

Other measurable key performance indicators, not discussed in this paper, include:

♦ Reduce scrap

♦ Improve quality

♦ Reduce attrition

♦ Improve safety

GOLD-STANDARD KIRKPATRICK MODEL

Donald L. Kirkpatrick, Ph.D., developed the four levels (Reaction, Learning, Behavior, Results) of his Kirkpatrick Model as the subject of his Ph.D. dissertation in 1954. Today, the model, with a few enhancements, is one of the most widely used training and evaluation models in the world. Through the years, Kirkpatrick's son and daughter-in-law — Jim Kirkpatrick, Ph.D., and Wendy Kirkpatrick — have expanded and clarified the original model, introducing the New World Kirkpatrick Model.

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
REACTION	LEARNING	BEHAVIOR	RESULTS

The model emphasizes the **Kirkpatrick Foundational Principles** that promote a strong training program value:

1. **The end is the beginning.** Effective training evaluation begins before the program even starts by creating clearly defined results.

2. **Return on expectations (ROE) is the ultimate indicator of value.** Training goals must attach to, and satisfy, stakeholder expectations related to a company's business goals.

3. **Business partnership is necessary to bring about positive ROE.** A cooperative learning and development effort, including supervisors and managers, is needed for a sustained training initiative (before, during and after formal training) to meet expected results.

4. **Value must be created before it can be demonstrated.** Most positive behavior change comes from pre-training as well as follow-up activities, through reinforcement and coaching, after formal training.

5. **A compelling chain of evidence demonstrates your bottom-line value.** Quantitative and qualitative data that sequentially connect the four levels is needed to show the business value of the entire business partnership.

For more information, please visit: **kirkpatrickpartners.com**

CASE STUDY: CUSTOMIZED TRAINING PROGRAM LEADS TO QUALITY IMPROVEMENT

Challenge

A large electronics manufacturer was besieged by operator errors and bad product being assembled.

Good Pieces	= Total Pieces – Rejected Pieces
	= 146,000 – 88,000
	= 58,000 good quality pieces

Scrap Cost	= $500 per piece x 88,000 rejected = $44,000,000/yr.

Solution

Tooling U-SME performed a comprehensive job analysis to define knowledge and skills required to achieve full performance levels of production workers in all functional areas. A customized on-demand, hard-skills training program was created with measurement tools in place. The new format, using online training, allowed the program to be delivered in the same way across all cells, locations and trainers. Online training, available in the company's new dedicated learning lab, reduced the amount of training on production machines, resulting in lower risk of injury and operator error. In addition, operator error and quality issues were eliminated through skills validation testing on the assembly line. The company not only improved its operator qualification, it also created a hands-on onboarding program for new employees and offered a flexible, on-demand training schedule for all production staff. The cost of the training program including salaries and fringe benefits of participants and implementation was $3,000,000.

Results

Through a customized training program and commitment to a learning culture, which ensures workers are prepared when they reach the shop floor, the company saw a dramatic improvement in operator error and quality issues in one year. Within a year, this data was recorded:

Improvement Good Pieces	= Total Pieces – Rejected Pieces
	= 146,000 – 32,000
	= 114,000 good quality pieces

Scrap Cost	= $500 per piece x 32,000 rejected = $16,000,000/yr.
Net Annual Program Benefit	= $44,000,000 – $16,000,000 = $28,000,000

ROI

Implementation of this training program yielded immediate return in the first year. Cost savings will continue beyond the first year through improved good piece count.

$$ROI = \frac{\text{Net Program Benefits}}{\text{Program Investment}} \times 100 \qquad ROI = \frac{\$28,000,000}{\$3,000,000} \times 100 = 933\%$$

IDENTIFYING ROI IN FOUR STEPS

Proving ROI doesn't have to be daunting. Simply think of it as a four-step process:

1 **Plan.**
As with anything, the earlier you start thinking through and finalizing business objectives for the program, the better. For instance, a goal could be "Improve productivity by 10 percent." From there, put plans in place for how you will evaluate and measure outcomes at the end of the project or year.

2 **Gather data.**
Remember to collect data before, during the program (i.e., participant satisfaction, knowledge/skills transfer success) and after implementation (i.e., application and on-the-job learning) so that you can calculate business impact.

3 **Analyze and measure.**
In this phase, you will calculate ROI based on your original business objectives to see if you reached or exceeded your goals. You will also measure intangibles such as employee satisfaction and lower stress levels.

4 **Report.**
Decision-makers need data to justify investments, whether in equipment or people. Make a business case about training by telling a story that demonstrates its value as an investment. Departments that are able to calculate a return on investment for training dollars are the ones building a strong workplace culture with better financial results.

THREE COMMON ERRORS IN WORKFORCE DEVELOPMENT

1. **Employee advancement is based exclusively on seniority, not merit.**

2. **Training is too dependent on tribal knowledge, not standardized instruction.**

3. **Training program lacks documented best practices and key performance indicators tied to competencies.**

Sample Formulas

Proving ROI can justify an investment in learning and development. Following are detailed formulas and examples for calculating three key performance indicators: Increase Productivity ROI, Accelerate Onboarding ROI and Reduce Downtime ROI.

INCREASE PRODUCTIVITY ROI FORMULA

From improving standardized work to enhancing workflow, productivity enhancements are at the top of every manufacturer's wish list. A standardized learning and development program can help achieve this.

Increase Productivity: [your labor cost] x [your estimated productivity improvement]

Example: A company employs 20 shop floor employees at a salary of $50,000 each per year ($1,000,000). The company expects a 7 percent productivity increase due to enhanced training. Training costs are estimated at $10,000.

$1 million labor cost x 7 percent productivity improvement = $70,000 productivity gain

$$\text{ROI} = \frac{\text{Net Program Benefits}}{\text{Training Program Costs}} \times 100$$

$$\text{ROI} = \frac{\$70,000}{\$10,000} = 7 \times 100 = 700\%$$

ACCELERATE ONBOARDING ROI FORMULA

Instituting a formal onboarding program demonstrates an organization's commitment to learning, helps the trainee develop critical competencies and personally guides the individual with clear objectives toward desired performance. The costs associated with hiring workers, conducting orientation and providing on-the-job training are high. The fear of not retaining those new hires in which the company is investing, keeps financial stakeholders up at night.

Providing a structured onboarding program that not only trains to aligned job competencies, but also trains the knowledge and skills in the most effective and efficient time period possible, is a key component to manufacturing workforce goals. The investment to develop an organized and direct onboarding and job development program will reduce the gap to performance, which will yield positive results when looking at its ROI.

For this example, a company hires 50 employees annually, and it currently takes six months for them to become fully productive in their role. The business goal is to reduce the time to proficiency for new hires to four months. First, it is important to identify the major labor costs that are attributed to the current onboarding of personnel. The next step is to illustrate how a reduction in these costs offsets the cost of creating an onboarding and job development program. These numbers show the ROI of an onboarding program.

TYPE OF COST	CURRENT COST (50 employees per year unstructured over six months toward work productivity)	NEW COST (50 employees per year under accelerated onboarding – four months)
HR Labor Costs (New Hire Orientation, Forms) HR Generalist Salary = $45,000 ($45,000/2,000 hrs. per year = $22.50/hr.) HR Labor time to conduct orientation = 2 hrs. x 50 employees = 100 hrs. HR Labor cost to conduct orientation = 100 hrs. x $22.50/hr. = $2,250/year. **HR Labor cost per accelerated onboarding = 1.5 hrs. x 50 x $22.50 = $1,687.50**	$2,250.00	$1,687.50
On-the-Job Training Team Leader/Supervisor Salary = $65,000 ($65,000/2,000 hrs. per year = $32.50/hr.) Team Leader/Supervisor Labor time to conduct OJT = 80 hrs. x 50 employees = 4,000 hrs. Team Leader/Supervisor cost to conduct OJT = 4,000 x $32.50/hr. = $130,000 **Team Leader cost per accelerated onboarding = 40 hrs. x 50 x $32.50/hr. = $65,000**	$130,000.00	$65,000.00
New Hire Training Time New Hire Salary = $50,000 ($50,000/2,000 hrs. per year =$25/hr.) New Labor development time towards full performance = 1,000 hrs. x 50 employees = 50,000 hrs. New Labor cost during performance development = 50,000 x $25/hr. = $1,250,000 **New Labor cost during performance development per accelerated onboarding (4 month target) = 667 hrs. x 50 x $25/hr. = $833,750**	$1,250,000.00	$833,750.00
Total Yearly Labor for onboarding development program (based on 50 new hires)	$1,382,250.00	$900,437.50
YEARLY NET PROGRAM BENEFIT = $1,382,250.00 - $900,437.50 = $481,812.50	$481,812.50	
Accelerated Structured Onboarding INVESTMENT (standardized onboarding, employee qualification program, structure OJT)	$200,000	
$$ROI = \frac{\text{Net Program Benefits}}{\text{Program Investment}} \times 100$$ ROI = $481,812.50 / $200,000.00 = 2.41 x 100 = 241%	**241%**	

This example shows how a one-year investment in a structured onboarding and development program can yield a positive return. Future years will not require the $200,000 investment to start-up a program, but the company will still continue to gain the net benefit attributed to the onboarding acceleration, which shows a great yield after the first year. This program will also indirectly add positive contributions to other metrics, such as employee retention.

REDUCE DOWNTIME ROI FORMULA

Productivity losses due to unplanned shutdowns are detrimental to all manufacturers. Proper training is an essential way to decrease downtime caused by factors such as:

♦ Machine repair
♦ Poor operator setup
♦ Operator errors
♦ Lack of qualified operator
♦ Poor production planning

The manufacturing industry typically measures downtime by looking at overall equipment effectiveness (OEE)[7], based on equipment availability, equipment performance and output quality. From there, companies can use formulas to measure how improved downtime metrics can benefit the bottom line and how investing in a training program is a small spend for greater productivity.

Example: A manufacturer is looking to improve overall lost production time. The company employs 20 shop floor employees at a salary of $50,000 per year ($1,000,000 annual). It operates 8.5 hour days, with 30 minutes of scheduled breaks per day, and 260 working days per year. In a day, it needs to produce 600 good parts at an ideal cycle time of 1.5 minutes.

Through the OEE formula for calculating downtime (Lost Time[8] = Net Operating Time – Ideal Operating Time), it was calculated that the company averages 60 minutes of Lost Time per day.

The company has a desire to reduce the lost time by 60 percent.

Using the OEE Downtime Reduction formula ([your lost time] x [your estimated percentage of reduction in downtime]), the target reduction is 36 minutes of downtime per day.

[7] "OEE Short and Simple," Vergence Analytics (versalytics.org)

[8] Ibid.

The labor gain impact is calculated as:

Labor Cost per Hour x Annual Hours of Production Gained = Net Program Benefit by Improving Lost Time.

$240 x 156 = $37,440

To achieve this improvement in downtime, the company will train on quick changeover and total productive maintenance techniques that address the key causes of downtime and to both hold operators accountable of their responsibilities and to validate they can demonstrate techniques.

The cost of training is $10,000 per year to verify workers are continuing good practices in downtime prevention. A successful design, implementation and validation of the training program would yield the following ROI.

$$\text{ROI} = \frac{\text{Net Program Benefits}}{\text{Program Investment}} \times 100$$

$$\text{ROI} = \frac{\$37,440}{\$10,000} = 3.74 \times 100 = 374\%$$

These formulas are just a few examples of training program ROI. Other attributes that can lead to strong training program ROI include training cycle-time improvements, reduction of overtime costs and a reduction in scrap. Increasing the competence of workers will positively impact key performance indicators monitored on the job.

TIE TRAINING TO THE BOTTOM LINE

High-impact learning organizations (HILOs), with a strong learning foundation in place, significantly outperform their peers in productivity, customer satisfaction, quality and market share.

So why is training and development often seen as a pesky expense?

To change perceptions, training programs must validate their worth by demonstrating positive impact on the bottom line.

This can be achieved by calculating return on investment (ROI) through the use of industry formulas for key performance indicators such as:

♦ Increasing productivity

♦ Accelerating onboarding

♦ Reduce downtime

Proving training ROI will quickly move an investment in human capital from an expense to a necessity.

Contact

For more information on how to tie learning and development to the bottom line, please call Tooling U-SME at (866) 706-8665 or email info@toolingu.com.

About Tooling U-SME

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