

Employee Training Often Misses the Mark

What happened to employee training? I mean *real* training and qualification to do specific tasks right the first time, every time. Imagine the results: new state-of-the-art equipment, employees who have never seen anything like it before with “training” limited to several short “show-and-tell” sessions with a manufacturer’s rep. No training documentation, no in-house trainer, and only a few individuals who were sharp enough to figure things out on their own. And the equipment takes a beating. Why does this happen? A company invests millions in new equipment but little if anything on employee training to operate it, set it up, maintain it, or repair it just doesn’t make sound business sense at all. But it happens over and over again all over America.

Maybe my perspective is a bit dated. I began developing operations and maintenance training back in the early 1970s and continue to this day. Training for apprentices, training for new employees, training to optimize old equipment, and training on one-of-a-kind high-tech equipment. As we moved into the 1980s, automation was at new levels with microprocessor controls, PLCs, and robotics. Machines “talked” to each other and became an integrated process. Mechanical and electrical components were blended into hybrid devices. Learning ability and mechanical aptitude became critical hiring, or job assignment, criteria. Equipment purchases often included specific requirements for structured employee training. This made sense.

Employee training today often misses the mark. I believe there is no excuse for assigning an untrained employee to do task, especially on state-of-the-art equipment, without job-specific and procedure-based training and qualification processes. Without formal and specific training and qualification, equipment is treated like all the other older equipment in the area, and it is often improperly operated and maintained and damaged by default. When employees are trained and qualified to do their jobs right the first time the equipment performs as designed and is very reliable.

The National Association of Manufacturers (NAM) and the Manufacturing Skills Standards Council (MSSC) have been defining and attempting to address the critical skills shortage for more than ten years. While they have made strides in increasing the awareness of the shortages and the needs for specific career education, the general public and school systems have been slow to respond.

What needs to be done? Individual companies must attract, train, and retain the most appropriately skilled and knowledgeable people if they wish to remain competitive. Employees’ skills and knowledge must be developed to master the unique requirements for operations and maintenance of new equipment as advanced manufacturing technologies are added to the business. Without the appropriate skills and knowledge deployment in the workplace, the new equipment will not perform as designed during its planned life cycle.

Most workplace training misses the mark. There are numerous ways to improve employees’ skills and knowledge. The often used, but **least effective** is the learning process based on our own schooling and education: classes, teachers, manuals and books, or online courses. While these may be formal and structured, they tend to be long, drawn out, and theoretical in nature with minimal hands-on applied learning. Another common approach is vendor-supplied training that accompanies new equipment. Unless there is a detailed “training specification” unique to your plant and employee needs, vendor-supplied training often misses the mark. It is mostly informal, unstructured “show and tell” with limited print materials (documentation) and almost never a “qualification” component where employees demonstrate their skills and knowledge.

The most effective workplace training is very focused, fast, and sustainable. The United States discovered this during World War Two with the deployment of a very structured process called Training Within Industry (TWI). From 1940 through 1945, this was the predominant method for training service men and women as well as training housewives to work in factories and build our war machinery, weapons, and munitions. Training for job-task “mastery” was essential. Douglas MacArthur and Edwards Deming used this TWI method to help rebuild the Japanese industry from 1946 to 1952. Oddly enough, these proven TWI methods that contributed significantly to the end of WWII stopped being used in the United States and to this day continue being used in progressive Japanese industries worldwide – including the U.S.-based operations of Toyota, Honda, and Nissan.

Numerous variations of TWI have been developed since the 1960s and '70s and used in our military and manufacturing operations. Generally, these continue to follow an instructional systems design model to specifically address business’ and employees’ learning and training needs. However, over the past 20 years, many companies that had strong training and development programs discontinued them as part of cost-cutting initiatives and reductions of “non-value adding” activities. Unfortunately, we are feeling the results of those cutbacks today in many U.S. businesses. At the same time, most emerging industrial nations (Mexico, India, China, Turkey, etc.) have recognized the value of both advanced manufacturing technologies and formal employee training.

Steps to Efficient and Effective Training

1. Focus on the “critical assets” as defined in corporate strategic Goals or are identified as constraints in a value stream map of the process flow, or are high maintenance cost or high unplanned downtime in a critical process. Focus on the critical few and make rapid and sustainable improvements.
2. Perform a duty-task analysis to codify the targeted equipment skills and knowledge requirements to operate, maintain, setup/changeover, supervise, training and coach. The duty-task analysis results in documents used for a) employee training needs analysis, b) OJT guides, and c) On-job performance qualification checklists. Consult the following sources:
 - Equipment documentation, manuals, schematics, drawings, etc.
 - Detailed procedures (operating, maintenance, calibration, repair, changeover, etc.)
 - Current highly skilled employees (hourly and salary) a.k.a. “job incumbents”
3. Compile the duty-task findings in a readily searchable data base. Include references to documentation, procedures, and highly qualified individuals (current or potential “equipment specialists”)
4. Verify the duty-task analysis findings with the highly-skilled job incumbents, supervision and management. Revise as needed.
5. Gather materials to be included in training and development processes for a training reference library. Reference these materials in the applicable duty-task lists
6. Develop new materials for training and development as needed, including:
 - Print materials to supplement equipment manufacturer’s materials
 - Detailed procedures (operating, maintenance, calibration, repair, changeover, etc.)
 - Audio-visual media: purchased or developed in-plant
 - Supervisory and on-job training coaching
 - Reference these materials in the applicable duty-task lists

7. Develop a company-specific training and qualification process guide and process flow map to show how the new training process should work.
8. Define equipment specialist roles and responsibilities. These may include:
 - Being involved in any and all activities pertaining to the targeted equipment
 - Serving as the coordinator of employee training on the targeted equipment
 - Conducting on-job training (coaching) of employees on the targeted equipment
9. Assign equipment specialist designation to the one person who is the most skilled and knowledgeable in the equipment and is willing to serve as an equipment specialist and training coach.
10. Perform a targeted employee training needs analysis (assessment) using the duty-task lists to determine the following skill & knowledge levels:
 - Currently skilled and knowledgeable
 - Needs training
 - Needs refresher training
 - Not needed
11. Develop specific targeted employee training plan for the specific equipment and related processes that includes:
 - Duty-task lists to be mastered
 - Training reference library materials needed
 - Assign equipment specialist as a resource person, training coordinator, coach
 - Schedule for self-study time, coaching, and OJT
12. Begin your training and qualification process based on priority needs of 1) the equipment, 2) the manufacturing process, and 3) the people on each shift or crew. Remember to remain focused on the business needs identified in Step #1 above.
13. Evaluate the effectiveness of the training and refine as needed to be sure that the business goals are achieved and that training for “qualification” to perform, or training for skill mastery, is achieved.

Investing in Training

Imagine if you gave your car keys to your teenage son or daughter, grandson or granddaughter, and said “You can figure it out. I have every confidence that you can learn to drive this car. Now go for it – and be careful: That’s a new car.”

In many cases, today’s equipment and process technology are more complex than the family car and as complex as a helicopter. Equipment costing millions of dollars with little or no employee training will fail prematurely and cost significantly more than planned just to keep it running. Training is not a cost; it is an investment. Operating and maintaining equipment without employee training is an uncontrollable cost. Why not invest in training?

Here’s a rule-of-thumb that I have used for years: Employee training for new equipment should be budgeted at 5 to 10 percent of the total installed cost (sometimes higher depending on the complexity and the sheer size of the project). On-going equipment- and job-specific training should be budgeted at two- to five-percent of payroll.

Training Specifications

Another message for equipment procurement: Include a “training specification” in the bid, quotation, and purchase specifics. Describe the prospective training audience (operators, maintainers, setup/changeover staff, engineers, programmers, et al). Specify the type and formats of training documentation to be provided. Specify the criteria by which the vendor-supplied training will be judged successful. Specify when various training will begin and end (i.e. pre-installation, pre-startup, startup and commissioning, running or steady state operation). Withhold a percent of the final payment until the specified training is completed. Treat employee training as another project deliverable. To do otherwise is gambling with the reliability and performance of the new equipment and gambling with your business competitiveness.

I believe in very specific employee training to assure that the equipment performs as designed throughout the equipment’s life cycle. I have seen this type of employee training work over and over again since the 1970s in many different companies and industries. It works every time! In my own career as a mechanic and as a tool and machine designer I have also seen the benefits of training, as well as the downside of no training.

Does your employee training miss the mark... or is it right on target.

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Robert M. Williamson
Strategic Work Systems, Inc.
PO Box 70
Columbus, NC 28722
RobertMW2@cs.com
www.swspitcrew.com