

2003 Excellence in Practice Citation

Workplace Learning and Development



Printpack, Inc.

Greensburg, Indiana

Machine Operator Training

SUMMARY

Changing production demands, negotiated labor agreements, and reallocation of the existing workforce resulted in a need for standardized knowledge and skills training for approximately 120 experienced and inexperienced machine operators.

Development and production time for the training content was limited to six weeks. Classroom training for groups of employees was not feasible. Due to limited availability of experienced trainers, only groups of four to six employees per shift could participate in the training at a given time.

Subject matter experts in the affected department were consulted, and it was determined that the required content could be effectively delivered through a six-week training course.

Training would utilize a combination of standardized computer-based presentation, structured hands-on practice, and demonstration-based knowledge and skills assessments.

The computer-based portion of the training used existing software and an information distribution system previously established within the facility.

For each hour of computer training, three hours of supervised hands-on practice of the knowledge or skills were required in order to facilitate the transfer of training into behavior.

Knowledge and skills assessments were required at the conclusion of each computer-based training module, at the end of each of the six weeks of training, and at the conclusion of the program.

The effectiveness of the training program has been demonstrated over the past twelve months. Employees who have successfully completed the program have consistently demonstrated an average 15% increase in production compared to production results prior to the training.

BACKGROUND

In the summer of 2002, production demands and labor contract negotiations resulted in the creation of a new Machine Operator job classification in a manufacturing facility of approximately 360 employees. This particular manufacturing facility is one of nineteen owned by the parent corporation, with a total employee population of approximately 4,000. The creation of this new position directly affected approximately 120 employees, who would be responsible for performing or supervising the job duties described in the classification. This group of employees consisted of both experienced Operators from within the department and inexperienced employees who were transferred from other departments within the facility.

Training for similar positions in the past had consisted of informal 'buddy system' programs, administered with little consistency and minimal documentation, resulting in unreliable and unpredictable performance. Even the population of experienced Operators within the group of affected employees displayed a wide range of skill levels and a lack of understanding of existing policies, procedures, and machine operations. It was determined through analysis of the general skill level of the affected employees that standardized training in the knowledge and skills required for the new position should be developed and implemented. The goal of the new training program was to provide complete, consistent, standardized information combined with structured, supervised practice for skills reinforcement, and thorough documentation of performance through a series of assessments. To create the new standard of performance, it was determined that all employees in the new classification, regardless of their level of experience, would be required to complete the entire training program.

Schedules dictated by the negotiated labor agreement and the production demands of the business resulted in an extremely short timeframe available for the development, production, and implementation of the training program. Development and production of the training material was limited to six weeks. The costs incurred for the training were to be limited to the man-hours of those employees involved in the development and production of the material, and the man-hours of the individual trainees. After consultation with relevant subject matter experts within the facility, it was determined that the content of the training program itself would require six weeks for each trainee to complete.

Production demands and a 24-hour, three-shift schedule made classroom training of groups of employees unfeasible. Subject matter experts were available to provide technical expertise, but they did not possess group facilitation skills and were not available to assist in the initial training effort. These conditions, combined with the need to address a variety of educational levels and learning styles, resulted in the development of a three-part training program.

The first part of the training program consisted of seventeen computer-based training modules. The computer-based training was developed and produced entirely 'in-house', using an existing software program and facility-wide delivery system previously implemented in the facility. The computer-based training modules contained standardized instruction in machine and procedural knowledge and skills based on information provided by five subject matter experts within the facility. Due to the wide range of computer skills within the employee population, the training was designed to be used with the 'mouse' only – no login, password, or use of the keyboard was required. Each training module contained interactive reviews after every eight to ten screens of information to reinforce the content that had been previously viewed. Approximately three hundred screens of information were produced in less than three weeks.

Upon completion of each module, the employee completed a paper-based knowledge assessment covering the information in the module. Paper-based assessments were used to provide physical documentation through the employee's signature that the knowledge had been retained and that training had been completed.

Following the completion of each computer-based module and assessment, the employee was provided a series of hands-on practice exercises. This hands-on practice was a structured series of exercises on the actual equipment the employee would be using, supervised by a manager or subject matter expert who was already familiar with the content of the training course. For each hour of computer-based training, three hours of structured practice was provided on the same skills to ensure the transfer of skills training into reproducible behavior.

At the end of each week of the training program, a demonstration-based skills assessment was administered to each employee. The employee was observed demonstrating, to a level of acceptable performance, a series of predetermined job skills that were contained in that week's training material. At the conclusion of the entire training program, a comprehensive assessment was administered that covered all aspects of the training, and included both knowledge- and skills-based demonstrations of predetermined job activities.

From the outset, the measure of success of the training was to be determined by the increase in output of quality production. In the first twelve months that the Machine Operator training program was in place, there was an average increase of 15% in quality production per employee compared to production results immediately prior to the training. The training material is reviewed on a regular basis, and only minimal modifications have been made to the training reflecting additional manufacturing procedures that have been introduced since the training was initiated.

The success of the model that was used to develop, produce, and implement the training was such that a similar model was used in the facility for another job

classification, and additional training in the same format is under development in other facilities within the corporation. By producing all training material 'in-house', by addressing the learning styles of all participants, and by tying the success of the program to actual production performance measurements, the training program has proven to be efficient and consistently effective.

DOCUMENTATION

Needs Identification

- 1. Describe the problem or need for which this practice is designed and implemented. How was this problem identified, and how was it determined that this practice is an appropriate response?*

Increased production demands and labor contract negotiations resulted in the creation of a new Machine Operator job classification in a manufacturing facility. The creation of this new position directly affected approximately 120 employees, who would be responsible for performing or supervising the job duties described in the classification. This group of employees consisted of both experienced Operators from within the department and inexperienced employees who were transferred from other departments within the facility.

The job functions and responsibilities of the new position consisted of existing tasks currently performed by experienced Operators, and new policies and work instructions intended to standardize procedures, terminology, workflow, and efficiency.

Training for similar positions in the past had consisted of informal 'buddy system' programs, administered with little consistency and minimal documentation, resulting in unreliable and unpredictable performance. Even the population of experienced Operators within the group of affected employees displayed a wide range of skill levels and a lack of understanding of existing policies, procedures, and machine operations. It was determined through analysis of the general skill level of the affected employees that standardized training in the knowledge and skills required for the new position should be developed and implemented.

The goal of the new training program was to provide complete, consistent, standardized information combined with structured, supervised practice for skills reinforcement, and thorough documentation of performance through a series of assessments. To create the new standard of performance, it was determined that all employees in the new classification, regardless of their level of experience, would be required to complete the entire training program.

Production demands and a 24-hour, three-shift schedule made classroom training of groups of employees unfeasible. Subject matter experts were

available to provide technical expertise, but they did not possess group facilitation skills and were not available to assist in the initial training effort. The basic content of the training material had to be available in the manufacturing environment on an 'on-demand' basis for trainees' reference. These conditions, combined with the need to address a variety of educational levels and learning styles, resulted in the development of a three-part integrated training program that included computer-based modules with knowledge-based assessments, structured hands-on practice, and comprehensive knowledge- and skills-based demonstration assessments.

Design Values

- 2. Please describe how this practice takes into account the best interests of both the organization and the employees targeted.*

The manufacturing facility produces products for an extremely competitive and price-conscious market. The ability of the facility to produce products of high quality in large volume is essential for its continued economic viability. The lack of consistent, standardized training in the past had resulted in product quality issues, unreliable production forecasts and scheduling due to the inconsistent knowledge and application of standardized policies and procedures, and production delays due to the lack of availability of qualified Operators.

For continued profitability and job security, it was in the best interest of the company and the individual employees to increase the level of quality production in the facility. To accomplish this, it would be necessary to increase and standardize the skill levels of the affected employees, and to ensure that the increased skill level was consistent in practice with the expectations of the company's customers.

Alignment

- 3. How is this practice in alignment with the performance identified, as described in your answer to question 1?*

In order for the Machine Operators to produce consistent quality materials in the required amounts, across shifts on a number of similar machines, it was necessary to determine the best practices currently in use, and compare those to the business goals and objectives of the company, to the requirements and specifications of the customers' products, and to the designed capabilities of the machines. Once the best possible procedures were established, those procedures had to be communicated to the entire population of affected employees in a manner that would allow them to both learn and practice those skills until their application became consistent behavior for each individual.

The practice adopted for communicating and reinforcing the required performance behavior meets the requisite standardization and skills practice/demonstration criteria.

- 4. Please describe how this practice integrates other training, learning, and performance improvement practices, and aligns itself with organizational goals to achieve the desired outcomes.*

Even with the use of relatively sophisticated computer-based training materials, the simple 'Tell, Show', Do' formula used in the combination of computer-based training, hands-on practice, and demonstration assessments responds to the needs of Visual, Auditory, and Kinesthetic learners. The three-part technique ensures that all learners are provided with the opportunity to establish the skills and behaviors that are required to allow them to perform at the expected level.

To communicate the initial information to the affected employees, a computer-based training system that had been previously established in the facility was utilized. The plant-wide computer-based system had been used to train site-specific and company-specific policies related to safety and environmental topics, human resources issues, information technology training, and training topics required for regulatory compliance. The system had already established a familiar and consistent graphic and presentation format for the employee population, so when the new Machine Operator training was introduced using the established format, the affected employees were not required to overcome an additional 'learning curve' for the use of the computer-based material.

The hands-on practice portion of the training was specifically designed to provide a 3:1 ratio of practice to learning. For each hour of computer-based training, three hours of structured, supervised practice on the information or skills covered in the computer-based material was provided. These practice sessions were supervised by management personnel or by subject matter experts who had been previously trained on the material, and who were thoroughly familiar with its content. In many cases, the subject matter experts who supervised the practice sessions also provided expertise in the original development of the training material. Great care was taken to ensure that information provided to trainees during the practice sessions did not contradict the information contained in the computer-based training materials.

The assessment portion of the training was designed to measure the level of performance of the affected employees and to provide documentation of successful completion of each piece of knowledge or skill content. The skills demonstration assessments were specifically designed to require each employee not only to demonstrate a learned skill, but also to apply that skill in a realistic job-related context.

The primary organizational goals for the training program were to produce consistent and reproducible sets of skills in the affected employees, and to provide those employees with a base of knowledge that could be expanded upon for the introduction of new products, machines, or procedures. The standardized method of content presentation and reinforcement, combined with the flexibility and ease of revision and addition inherent in the methods used to communicate the required information, resulted in a training intervention that exceeded the expectations of the organization.

5. *What evidence is there of partnerships within and outside the organization (e.g. with senior management, frontline supervisors, unions, external training suppliers, consortia)?*

The Machine Operator training program was to include requirements established by Plant Management, Department Management, frontline supervisory personnel, negotiated labor contracts, and product and machine specifications. Each of these areas of concern were addressed by including representatives of the respective groups in the initial development of the training method and content, and by conferring with these sources on a consistent basis throughout the development, production, and implementation process.

Frontline supervisory personnel, union representatives, and subject matter experts were asked to be in the initial group of trainees so that any issues pertaining to content or delivery method could be addressed prior to the dissemination of the material to the affected employee population.

Evaluation Strategy

6. *How is this practice evaluated? What factors are included in your calculations (e.g. time, costs, staff count, lost phone calls, customer satisfaction)? Are the financial costs of this practice calculated? If so, how? How often is this practice evaluated?*

From the outset, Plant Management had required that the success of the Machine Operator training program be determined by quality production measurements already in use. These measures included quantity of material produced per machine, quantity of scrap produced, quantity of rejected material returned by the customer, and effective use of machine production time. The use of the existing metrics provided an accurate measurement of the ultimate goal of the training, which was increased quality production, and also provided an 'apples-to-apples' comparison of performance both before and after the training for each affected employee. There has been a consistent and significant increase in the performance measurements of every employee who has participated in the training program.

The primary concerns related to the cost of producing and implementing the training program were those related to the man-hours of the participants. In the time that the training has been in effect, the increases in quality production have more than offset any costs associated with the initial developmental costs and subsequent costs of administering the program. Due to an extremely low attrition rate in the affected department and the lack of a need to train additional new hires, the financial benefits of the training are realized on an on-going basis when compared to the initial cost of employee participation in the program.

The training material is reviewed on a regular basis, and only minimal modifications have been made to the training reflecting additional manufacturing procedures that have been introduced since the training was initiated.

Results

- 7. What specific participant behaviors are observed as a result of this practice, and how do these behaviors contribute to the goals of the practice? Are the impacts of these behaviors short-term or long-term? How do these behaviors differ from the results of previous practices?*

The statistical measurements used to track employee skills and performance are, as previously stated, existing metrics used for quality production. If employee behavior can be measured by the effective application of skills related to job performance, then the performance measurements over a twelve-month period show an average 15% increase in quality production compared to performance before training for each employee who has completed the program. Since the stated requirement of Plant Management was to use quality production measurements as the method to determine the effectiveness of the training program, then the goals of Plant Management to increase quality production through the acquisition and application of a standard skill set by the Machine Operators have been met and exceeded.

In addition to statistical evidence, there is anecdotal evidence based on employee statements that reflects an increased amount of job satisfaction in the group of affected employees. Employees have stated that, through the acquisition of the new skill set required for their job, they feel an increased amount of control over their work environment and an increased ability to make informed decisions regarding the application of their skills.

The Machine Operator training program has been in effect for more than twelve months. In that time period, the increases in employee performance have been consistent and continuous. The effects of the training continue to be monitored through the specified metrics.

This approach to knowledge- and skills-based training was a new application for this facility. As previously stated, past practice had consisted mainly of informal

'buddy system' training that was difficult to monitor and assess, and did not produce consistent skills sets in the trainees. By standardizing the training material and the method of dissemination, by including structured practice of the required skills to reinforce behavior, and by assessing and documenting the application of the required knowledge and skills in realistic scenarios, the training program has resulted in increased employee job satisfaction and in more than the desired quality production outcomes.

8. What was the impact of the practice on your organization? Are the impacts of these behaviors short-term or long-term? Wherever possible please include actual figures related to the practice.

The impact of the introduction of this training program is reflected in both the 15% average gains in quality production in the affected department as previously stated, and in the approach used in training for additional Job Descriptions in other departments of the facility. Based on the demonstrated success of the Machine Operator training, a similar approach was used with equal success for employee training in the Warehouse department of the plant. It is expected that this method will become the standard for all knowledge-and skills-based training for this facility in the future.

Additionally, the Machine Operator training was presented as a Best Demonstrated Practice to a conference of Plant Managers from throughout the corporate division. Training programs utilizing this template are either under development or are being studied for application corporate-wide.

Shared Learning

9. What have been some of the specific lessons learned from designing and implementing this practice for the purposes of continuous internal improvement? Please discuss whether and how this practice might be transferred and replicated both internally and external to your organization.

One of the most important realizations that occurred as a result of the development and implementation of the Machine Operator training program was the importance of initial involvement by representatives of all 'stake holders' in the implementation and outcome of the training. Not only was this involvement essential for the acquisition of technical information and expertise, it was also necessary for obtaining 'buy-in' from Plant and Department Management for the dedication of resources and the continuing support of the program. The success of the development and implementation model, and the accompanying increases in employee performance, were demonstrated again on a smaller scale when the identical method was used for training Warehouse employees.

The three-part training model of computer-based information, structured practice for skills reinforcement, and demonstration-based assessments for documentation is not limited in its application to manufacturing or 'hands-on'

skills. Training that may be essentially knowledge-based in its content may still benefit from the use of this model by presenting opportunities for participants to apply, in realistic practice scenarios and demonstration assessments, the knowledge obtained through the training.

Based on the level of involvement by the departments and individuals that had a vested interest in the outcome of the training program, and based on the demonstrated success of the program, this process has been readily adopted plant-wide as the standard for developing and implementing employee training.

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