Developing Human Potential and a Learning Culture in Manufacturing

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Abstract

Training employees is essential for developing their human potential. The SEAM competency grid triggered the process of reevaluation of how to be most effective and strategic in training workers in the production environment at a factory in Minnesota. The learning curve of operations was discovered and analyzed. The management team used the learnings to design a current training system based on the difficulty of operations and availability of learning leaders. This case study provides details of the analysis of training workers in operations and redesign of a factory's training system.

Key words: SEAM, competency grid, training on production floor, learning curve of operations, learning leaders, human potential.

I have been involved in a training project at my organization over the last year and I would like to share my thoughts about the strategic management of the competency grid and the creation of a flexible work force. Let me provide a little bit of a background. After I graduated with my doctorate, I did not go to work in an academic environment and I did not go off to a consulting firm. Instead, I decided that I would go back to the factory. On any given evening, I am responsible for seven supervisors and anywhere between 125 and 150 employees. I manage a production floor in a factory. I actually make widgets. I took an evening job, second shift, and the reason I made that choice was that the production floor is a great place to work on projects. On the night shift, things are a little slower. So there is more freedom to try new things or programs. So there are some advantages.

I remember once somebody made the comment that a little SEAM is better than no SEAM. Along those lines, I am very interested in blending SEAM and lean concepts. Of course, because I work in manufacturing, I also work in a lean environment. The production lines are designed to run very lean. It is important to note that having lean production lines does not necessarily mean that the environment is a thriving robust culture of continuous improvement. Cultural change and sustainability are the most difficult aspects of lean concepts and tools.

Training, whether with lean or not, is always problematic. It has been my experience, that on the production floor, training is problematic and at the same time strategic. Training problems have to do with the population. How does one effectively train people for the production environment? There is a lot diversity. There are all the different languages. There are people

who are kinesthetic learners or hands-on learners. This is not the same as the front end of the business where everybody went to college. I have found many professionals who are not sure how to approach training of the production floor population effectively or efficiently. They assume that it is merely a matter of learning a series of lessons. In reality, production floor training plans should mirror production strategies and help answer the questions, "How do you ramp up to meet demand, or how do you manage a temporary spike in orders?"

In the SEAM literature, the competency grid is closely linked with the creation of human potential. In creating potential, there are two factors. There is strategic factor and there is the factor of preventing dysfunctions. Creating potential in the SEAM world is deemed to be very profitable. According to the socio-economic theory, the creation of potential has more economic value than even technological improvements. But the question is how to create potential that is not only valuable but the most meaningful for an organization in getting the job done?

Designing training to develop human potential

When I discussed with HR in my organization the differences between training programs for the front end of a business and the production floor, HR told me that if I needed more training, I could do more. I was told that I could design my own training system. So I decided to take them up on the offer.

Over the last year, I have been working with my supervisor team and we have come up with a new training approach. I would like to share our approach because it is a strategic and unique take on the competency grid. It is based upon what is behind the grid when one starts digging into operations. Yes, one must train, but what is the strategy for training? Filling in all the blanks on a competency grid is not a strategy. It is not practical to think that everyone will be trained in everything. That is an unrealistic goal. It is more realistic to strategize and ask how to train in order to easily ramp up operations and handle production spikes and surges? It more practical to ask, "How do I use my training resources to train and at the same time create the necessary flexibility in my work force to increase efficiency?" If in the process of implementing the chosen strategy, all the boxes are checked on a competency grid, then it is good, but it should not be the goal.

When confronted with developing a training system, because of my SEAM training, I understood the idea of creating potential through training and minimizing dysfunction. However, my other task, as assigned by my boss, was that I had to create through appropriate training plans and strategies a flexible workforce. I was required to develop 25% of my workforce, so that they could not only do different operations within their assigned department, but also be able to work in other departments. Strategically, I am required to create a trained workforce, which includes surge capacity. For those, who do not know what that is, I will explain that it is where all of a

sudden orders increase. In our organization, we have developed the capacity within the workforce to quickly ramp up the factory and get the orders out.

Factories are like battleships – it takes five miles to make the turn; and factory floors are no different. So the idea of creating a flexible workforce that could "surge" when necessary was, and is, a challenging task. As my team and I discussed possible strategies, we realized that training capacity is the one capacity that we never have enough. It is always scarce and it always is a limiting factor or bottleneck. This has been true throughout my career. I have entertained the idea that the scarcity is related to training being such a human activity. It is easy to add another machine to increase capacity but in order for humans to teach other humans, there should be a development process. Training takes time and is a delicate process. The capacity available for training is most effectively utilized strategically. So the challenge was: How can we utilize our training capacity more effectively? How can we do it better? What is the best plan?

The strategy of training

There is some strategy of completing a competency grid, but in the SEAM model, training holds a deeper meaning and function. In the SEAM model, training leads to increased competency, which in turn leads to increased levels of responsibility. Consequently, increased levels of responsibility within the workforce help to minimize and prevent dysfunction within the organization. Training also impacts the value creation process within organizations. The more people, who are trained in more operations, the better informed the overall population on the production floor. Ultimately, this makes the workforce more capable of replacing non-valued added activities with value added activities. That is part of the value creation process in organizations and in SEAM. Although it is a subtheme in the SEAM material, I think it is a very critical one.

So what did we do in our organization? How did we connect the strategy of training and the value creation process? I spent a lot of time thinking about it and finally realized that the connection was to analyze the learning curves of all the operations within a production area. I realized that if we could get a handle on the learning curve of each operation in each production area, then we would know two things. First, we would know how difficult or complex it was and second, we would know how much time it took to learn the operation. This is key information to crafting effective strategies and in making sure the work force was better informed and prepared.

I knew that when we started looking at how long it took to learn an operation, we would be dealing with a touchy subject because right away someone would say, "Oh, so you're creating standards. You're going to force Bob to learn it in three days when it's actually going to take him five." Let me be clear that this information is not a standard, but rather a scheduling tool.

Understanding the learning curve of each operation is more of a scheduling and analysis tool. It is more of a tool to help choose strategies and decide how to operate on the manufacturing floor.

The importance of the learning curves

The reader might wonder why we would analyze the learning curve. We realized that the learning curve of each operation, once understood, was the building block to quickly ramp up and ramp down operations. Knowing the learning curves of operations was the key to successful surging and surge capacity. We realized that if we knew that we had an operation with a learning curve that only took one day, we could take somebody, put them in that spot and in a day, the new guy could learn that operation and we could free up the guy, who had a higher skill level and knew everything. Then the guy, who knew everything, could run the line and do all sorts of higher level tasks. So understanding the learning curves of operations became a strategic tool. We also realized that we could increase our speed and speed was for us a critical factor. Speed in an organization, or how fast an organization learns, is key to replacing non-value added activities with value added activities. This is the essence of the value creation process in an organization. Speed is important to success. Unfortunately, the top down organizational design from the last century is not fast enough in the new digital age. In the new digital age, product life cycles or iteration of new products coming to markets are becoming shorter and shorter. Organizations must have fast processes, as well as be able to train strategically and efficiently.

So, when we started analyzing the learning curves in a production area, we did a pilot. During the analysis, we found two general patterns, at least in this particular case. The first was that when we had an operation with less employees than required, it most often was an operation with a more complicated learning curve that took more time to learn. The converse also appeared true. The easier it was to learn an operation and the less time it took to learn, the more people were trained in that operation. We had more people trained in the easier operations than we strategically needed. In this case, we found these two rules to be true across the production floor.

This analysis helped to explain why it was so hard to ramp up and ramp down the production floor. To ramp up, we generally needed people trained in the very complicated operations and we did not have them. After doing some investigating, I realized that training systems are really a subsystem, a subsystem of what was being produced on the production floor. We were able to understand how resources were allocated through time.

Reducing waste in the training process

We realized that there were a lot of false starts in training, and that was a waste. Very often we would have somebody trained in an operation, but the training would never be completed. While training hours were spent, the employee could not do the job. To complicate

matters, “false starts” were never documented. When I talked to the employees, they would tell me, “Well, you know I started that a year ago and I spent a couple weeks learning the job. I worked on it but I just never finished. I was assigned someplace else.” So there was this discovery of the glaring waste of a scarce resource. In spite of expended time, resources, and utilized training capacity, the employee still could not do the job.

An important lesson was that the incomplete training happened most often for the most complicated operations and learning curves. The people, who enjoyed learning the more complicated operations, were our learning leaders. They were capable individuals and they liked to learn. Consequently, they knew more operations. When employees were needed for the more complicated operations, the learning leaders were most often pulled away from their training activities to run the operation. Their training time was cut short. Most often their persistence helped them to excell.

So how did we collect and use the information about learning curves? The team and I decided to call everybody from a production area into a room. We asked them, to rank the difficulty of the operations that they were trained in and knew. We asked them to rank the difficulty of the operations on a scale of 1 through 5 with 5 being the most difficult. Next, we asked them to tell us, based upon their experience, how much time they believed it took them to learn those operations. Although the information we received was not exact, as it was all relative within the group, we could still use the information to prioritize and strategize.

With the help of the employees, we were able to put together a list of how long it took to learn an operation and how difficult an operation was in comparison to the other operations in that area. That is where we began to understand that the most difficult operations were the operations, in which we did not have enough people trained, in order to ramp up and surge when required.

I want to emphasize that we did not create standards for learning. We designed a scheduling tool. So, in our current competency grid, at the top we have the difficulty and the days to learn. For all the areas on the production floor, we have calculated this information. In the following couple weeks, we put the training schedules out there for all the areas. It is a very simple process.

Another interesting thing was that new information allowed us to put together what my leadership team calls “training tracks.” We were able, based upon this information, to put together scenarios for learning that made sense in terms of sequence and skill but also made sense through time. We were getting a better utilization of our training capacity and we were able to train people faster. The creation of human potential was happening. No employee was overlooked or left out.

So how do we schedule training? We used a simple Gantt chart. One can do it on the fly. I will stuff hard copy of the schedule in my pocket as I am running out to the floor to make changes and run back to change it in the computer. Also this Gantt chart is easy for employees to understand. I use a few scheduling rules to stay on track. One of our scheduling rules is to track time in terms of planned vs. actual training. If I say Bob is going to take seven days and he takes eight, that is not a problem, but I need to mark that on the schedule. So I track the plan vs. actual time on the employee's Gantt chart schedule. I have found that planning and close tracking of training also minimizes the politics of training.

The politics of training

I do not think that people are aware of the politics of training in organizations. In the world in which I work, it is a big deal. Somebody decides that somebody is not smart enough to learn something and so they do not put them on the list. Or somebody cannot learn something because there is overtime and the people that know the operation do not want to share the overtime hours. So the politics of training, at least on the production floor, are very real and they impact people economically. So the schedule minimizes politics of training and also supports a learning culture. Another scheduling rule is that the published schedule must include the current training assignment and the next training assignment. The reason for that is not only to have the effective utilization of training capacity but also to support the learning culture. One of the things I hear often is, "Well, I don't have to learn it." Having published learning plans and schedules helps develop and support a learning culture.

Many organizations use a certification process. Here are a few certification rules I would suggest: avoid written tests when possible, use demonstrations of understanding, have employees perform the task, avoid lumbering training bureaucracies attached to a training system. These are costly. It is also good to let employees help in managing their training records. Another tip is to form triads for certifying employees rather than using dyads. Usually a trainer grants a certification when the trainer watches an employee perform the task. Instead I suggest using a group of 3 people. Leverage the certification opportunity. Use 3 people and reinforce the training culture. Ask an already certified employee to work with a trainer to certify the employee. It actually becomes a refresher for them and a way to keep current. Building training refreshers into a training system helps to make all processes common knowledge. The basic components of a training system, the schedule, the competency grid, training records, and the learning curves should be written and formalized. This also includes metrics. It is important to know how many certifications are being completed and the average training capacity available. If all the components of a training system are formalized, they become more meaningful and can be strategically leveraged.

Learning leaders

What we have learned through our analysis is that we will always have learning leaders. Amazingly enough, they always emerge. I consider about 25% of my working population to be learning leaders. These are people who love to learn, they love to flex to other areas and, so I put together some opportunities for them but it is not enough. My dream would be to put together an enrichment type program for learning leaders. Possibly it could be an online custom certificate program with a local technical college. This program could be connected to some sort of pay incentive. I think the learning leaders are high potentials, the ones who most likely will support the next round of innovation. In the digital age of fast moving new products, the continued development of learning leaders, I believe, is an important key to success. However, it is just not about one group. It is also about the culture that would focus on their development. The organization would gain from this.

In contrast, about 75% of the workforce does not especially care about learning new stuff. They will learn but it is not a high priority for them. I have discovered that this is not a problem, because we need them just as much as we need the learning leaders. They are effective and efficient at what they do. I used to think that everybody had to be flexible. I now understand that there is a self-selection process that goes on and will always go on. Part of a good training strategy is understanding this and designing a system that would accommodate both segments of the population. Ultimately the goal is to create a learning culture on the production floor where everyone thrives.

Conclusion

The focus of a training system should improve levels of interaction with the workforce and support adult learners. Workers have the published schedule and managers are interacting constantly with the employees about learning based on the schedule. Because the focus is on the learning curve, an opportunity for continuous improvement is created. Now it is easy to analyze the most difficult operations and the operations that require the most time to learn. Perhaps there is a need to write some sort of booklet to make it simpler to understand the most difficult operations, or maybe something has to change in how these operations are being taught. In short, there is an opportunity to improve and conserve scarce training capacity. It becomes simpler to make changes because all people are involved in training and are part of the learning culture.

Another important element of this new training system is that it is very cost effective. It is just a way of organizing information about the operations out on the production floor. That is all it is. I am not a strong advocate of computer based training as an initial training system. So often computer based training is expensive, does not include the level of detail necessary and gets out of date quickly. I do believe that computer based training has an important role if the information

is organized in a strategic and meaningful way. Yet, the designers of such training program often do not know what most difficult task on the production floor is. They do not know what tasks take the most time to learn. The approach to training described in this paper is very effective and easy to expand. It is foundational and could be a game changer for manufacturing organizations.

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