

Drilling for Function

MARCH 16, 2012 BY [ADMIN](#) 5 COMMENTS

Editor's note: Today's post is from Aaron Fields of Seattle Fire Department and [The Nozzle Forward](#). His training program has trained thousands of firefighters. Aaron breaks line use down into three phases (rig to door, door to seat, and fire-room operations). This is a quick and efficient methodology for skill acquisition and an understanding. Today he shares with the Fire Service Warrior community how his instructional techniques have been so successful.

Drilling for Function By: Aaron Fields



In the following article I am going to address learning and instruction for performance based occupations, which operate in an acutely stressful environment. I am drawing from a variety of sources, both academic and practical. My goal is to increase the effectiveness of skill and experience transmission within our industry. I am not a learning specialist, nor am I an academic. My scope is not for the professional educator; instead it is for the line firefighter, or training officer. I will use verbiage that is simple and, like myself, blue collar.

In addition, much has been written on this subject. What I hope to achieve is a simple summary that outlines the overall process.

Before we begin we must realize that the burden of good drilling falls upon the drill instructors. It requires effort and research. Training must be relevant (i.e. reflect what works in the field,) build skills, and eventually let crews "play" out full evolutions.

(On a side note, it is incredibly worthwhile to have non-structured drills, which simply allow crews and individuals to direct their own drilling. Give them a sandbox and a few hours. That being said, this article is focused on organized drills.)

Drilling must begin with a clear goal. Drilling to simply "check boxes" benefits no one, our public or our members. The bulk of our training should revolve around practical application of realistic tasks. The focus of drill should be "bread and butter" basics.

The drill-ground is not punitive; it is in fact the place to make mistakes, correct mistakes, and most of all to sweat. There is no substitute for repetitions.

We must know our limits as instructors. If the skill set in question is not our strongest, find someone who is fantastic at the particular skill set and let them lead. We can still be involved in the drill, without being the lead. This doesn't take away from your credibility, it adds to it.

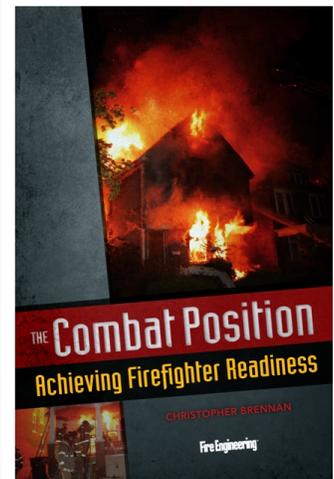
Our industry is notorious for teaching a skill setting and then set off into full company evolutions. For the sake of this essay, think of it as "scrimmage." As an industry the phase we skip is the "skill integration" phase of skill acquisition.

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HOW WE DRILL:

There are many learning models. Others may split hairs over minute deviations. I prefer the *Fitts and Posner* model. More or less learning performance skills can be broken down into three phases:

Cognitive phase – Identification and development of the component parts of the skill – involves formation of a mental picture of the skill

Associative phase – Linking the component parts into a smooth action – involves practicing the skill and using [feedback](#) to perfect the skill

Autonomous phase – Developing the learned skill so that it becomes automatic – involves little or no conscious thought or attention whilst performing the skill – not all performers reach this stage

“The learning of physical skills requires the relevant movements to be assembled, component by component, using feedback to shape and polish them into a smooth action. Rehearsal of the skill must be done regularly and correctly.”

I begin the drills which teach the transitions between one skill and another during the late cognitive phase and associative phase. My focus during the associative phase is the inclusion “whys,” in other words “why one over the other.” Late stage associative development should include simulations that prompt decisions from the participants.

Our industry often falls down because we go from the cognitive stage to the autonomous phase of learning without adequate time in the associative phase. More often than not, this leads to disgruntled participants and a disconnect between training evolutions and field operations. When members come away from training saying, “I would never do that,” the validity of training is undermined and there is a decrease in the willingness of crews to drill.

The cognitive phase is where skill acquisition occurs. This starts with learning the specific skill without context. (i.e., it is handling hose, tying a knot, etc.) Skills should be coached in isolation.

After mastery, the skill should be put into combination with other individual skills in a logical format, creating skill sets. Once we have learned to move between skills within the skill set, we begin transitioning between the skills-sets themselves. Once this is seamless we are ready to move on.

I think of the cognitive phase as the “mechanical” phase. Learn the individual skills and work towards linking them together.

An example would be starting with handling the lines. This would be followed by movement skills for the handlines. By the end, participants would be making short approaches using different styles of confinement attacks followed by stream targeting once they have made the room. Folks behind the nozzle team are working on the moving of the lines.

The associative phase should be thought of as the “skill integration” or the “transition phase.” It is refining how to move between skills within context. This phase includes drills which allow the participant to accomplish pre-designated tasks using the specific skills. This phase is the most neglected. It is also the most difficult, as the instructors need to be involved and have given thought to what is being taught and the best way to prompt successful choices.

The associative phase will build into fairly complex integration drills, with less and less of the steps pre-designated. This is a critical phase which must include realistic impetus for the transition between skills. This is where we learn the “whys” of our skills. In short, this phase is putting the skills into a simulation of what we will encounter.

We add drills that have preset agendas which begin to teach the “whys” to choosing one skill over the other. This is most often achieved through micro-evolutions that reinforce the various skills, putting those skills within a simulated context that reflects actual events. (Make no mistake, live fire is still a simulation, that does not reflect the conditions we often encounter.) During this “context” phase, drills should have decreasing limits and increasing skill sets, allowing for more variability. Finally, we have hit the point where we can “scrimmage.”

The autonomous phase is where we see skill proficiency; it is the “scrimmage” phase. This is the phase where the members are presented with a problem and solve it using a wide variety of skills. This phase is really about decision making, rather than specific skill practice. Here is where we can drill home our agencies “best practices.” Participants in this phase must be competent enough to be focused on the event and not the skills. This phase is critical, but again keeping the situation open-ended, (i.e., not having one solution) is critical.

In addition, this phase requires coordination from those in charge of the drill. If the members make a choice that would in an actual event would adversely affect the crews’ efforts, the drill must be able to adjust and reflect the outcome of those

choices. On the flip side, accurate choice-making must positively impact the event. This phase must be realistic, must be able to adjust, and must be based in reality.

This is the point where we must base drills off what is happening on the fire ground. What we think is only relevant if it is backed up by the reality of the facts. Drills that firefighters deem as un-realistic undermine the pro-training environment.

Drill instructors need to have done their homework and present events that actually occur. We must be able to coach the "whys," not simply set up situations in which the expectation is mimicry.

HOW WE CHOOSE:

How we make choices is based on experience, this experience not only comes from actual application, but also from drill experience. If, when faced with an event, we don't have that specific experience, we base our choices on what seems closest to the situation at hand. We know that in an acutely stressful environment our brain blocks out the information and stimuli that it perceives as being "extra." We focus on what seems the biggest threat. Needless to say, the range of our focus is eclipsed by the actual context. In addition, what we are hoping is that we pay attention to the right information, or that our brain doesn't "block out" important stuff. When this brain feature is coupled with the fact that the environment which firefighters work in is already sensory depleting, we have a recipe for costly mistakes.

If we don't have the experience pool to draw upon, our brain looks for similarity and analogy upon which to hinge the choices. Simply put, our choices which we have not prepared for, are never as good as we recall them being. Often we get lucky.

Success via luck or non-quantified factors is dangerous and compounding, as our seeming "success" goes into our experience pool and becomes the basis for future choices. At this point, we have stepped onto a very slippery slope.

I tell folks in the classes that I teach, "if you are fighting fire hose, you are not fighting fire." This final stage of drill/learning is focused on creating a net of experience that gives our members the basis for successful decision making. It is impossible to drill for every possibility, but it is possible to break our environment down into common enough possibilities that we can prepare for the general type of situation we will be faced with. The natural laws at play on the fire-ground add limits to what we typically see.

STRESS FOR SUCCESS:

Stress is our reaction to our perceived environment. It degrades our ability to make decisions. As it narrows the range of our focus and reduces our physical skills. We must practice with stress in order to be able to work with stress.

Overcoming the effects of stress is simple; the answer is preparation. If we have made choices in drill that are based in the context of our work, we will be prepared to hinge our decision in the field on experience. Drill experience is not as valuable as fire-ground experience. Yet it is more valuable if the fire-ground experience is without comprehension of the "whys."

Our final stage of drilling should be prompting decision making, the skills should already be in place. During late stage *associative* and the *autonomous* phases we should be including a dose of stress to the drills. This can be accomplished in many ways; timed events, any aid to delete the senses, simulated broken equipment, changes to conditions in the middle of an evolution, etc.





WRAP UP AND WHAT THE...

The biggest difficulty in drilling is creating the impetus within the drills that force participants to make choices that mimic the fire-ground. Our industry has never been one of mimicry, without comprehension. We need to know the why's of what we are doing.

In order to make the choices that we are paid to make, **we must have an understanding of the environment in which we are working, the capabilities of our tools, and the priorities of the event at large.** If we fail to create context within the drill, all we are doing is mandating skill-sequence, in other words, a checklist.

All the talk is often made simpler by giving an example, so I will outline the model which I use regarding engine work.

Once the "academic" side of fire attack has been achieved, we start by defining the parameters of our different tools.

We begin on the drill ground by showing one of several stretches.

Participants stretch dry lines to a variety of targets until the stretch is smooth. We then move on to the other stretches and move through the same sequence. During this phase we explain the tactical considerations, etc. of stretching.

We then set up a series of stations that simulate actual stretches; porches, stairways, hallways, etc. The participants use the stretches in combination, solo, and as teams with water. We add in time and unexpected layout components, naturally increasing the stress level.

We then move on to hose handling and movement. We follow this with a series of drills that reinforce the individual skills.

Next is a series of drills that incorporate the stretching, advancing and employing the hose. Again, explaining tactical considerations for the skills is included.

After the basic skill sets are fluid, we have hit the point where participants are fluid in all phases of hose deployment; rig to door, door to seat of the fire, we begin with a series of drills that simulate a variety of interior fire conditions which prompt the nozzle team to transition between the variety of fire confinements and attacks.

At this point we are adding in fire room operations and creating the drills which will prompt decisions and fine tune the skills, via photos, narration of conditions, visually blacking out participants etc. Here we are taking the "whys" and adding them to the "how's."



This process continues throughout all the variables of engine work. Culminating in company level drills that are open scenarios. These drills are based around actual events, ranging from simple and common to less common more dynamic fires. Remember the success of the scenario ride upon the instructors' ability to adjust the event based around the actions taken by the crews.

Usually during the final two stages of learning we increase the levels of stress. This is easy to do using any number of sensory inhibitors, loud noises, simulation of any number of technical issues, etc. Stress must be included in our training regime, as it is who we always work with. I have found it is best to wait until the participants have good skill mastery, in other words the late cognitive stage. Special attention should be paid to ensuring that the stress inducers are not perceived as personal attacks.

When your crews come away from drills saying, "I have had that fire," or "that was good training" you have been successful.

Finally, knowledge is not fixed. The nice thing about coaching is that we as instructors get a fantastic chance to learn.

Knowledge is only power when it is shared freely. It is divisive if it is used to create hierarchy of who is in the know... and who is not.

Finally, we are all on the same team, the best way to instruct is to demonstrate, put your sweat where your mouth is.