DROP YOUR TOOLS: ON RECONFIGURING MANAGEMENT EDUCATION

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This article is based on a keynote address delivered at the 33rd annual Organizational Behavior Teaching Conference in Rochester, New York, on June 15, 2006. The audience for this address included faculty, executive educators from the profit and nonprofit sectors, and doctoral students in the organizational and management sciences who had gathered to explore the content and processes for high-quality management education.

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The theme of this conference is "realizing human potential" through teaching excellence. The question is, how can we think about reconfiguring management education, when the dynamics of managing keep shifting? What, in other words, do students need to acquire to meet this challenge?

I want to suggest that the heart of that challenge lies in the words *acquire* and *drop*. I take my lead from an important text from Lao Tzu:

> In pursuit of knowledge, every day something is acquired;
> In pursuit of wisdom, every day something is dropped.
> —(Lao Tzu, cited in Muller, 1999, p. 134)

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Learning to drop one's tools to gain lightness, agility, and wisdom tends to be forgotten in an era where leaders and followers alike are preoccupied with knowledge management, acquisitions, and acquisitiveness. Nevertheless, human potential is realized as much by what we drop, as what we acquire. That theme is what I want to explore as a crucial component of teaching excellence.

I want to ground the idea of dropping one's tools in investigations of wildland fire fatalities. I am going to explore some of the reasons why firefighters refused to drop their tools when ordered to do so, were overrun by fire, and died with their tools beside them within sight of safety zones. As I do so, I want you to be thinking about analogous situations where students and professors hold onto concepts, checklists, and assumptions that similarly weigh them down, reduce their agility, and blind them to what is happening right here and now and how they can cope with it.

Wildland Firefighters Refuse to Drop Tools

At least 23 wildland firefighters have died in four separate incidents[1] since 1990 with their tools beside them. In every case, they died within sight of safety zones that could have been reached if they had been lighter and moved faster. For example, at the South Canyon disaster outside Glenwood Springs, Colorado, 14 firefighters were killed on July 6, 1994, when they failed to outrun a fire that exploded through a stand of oak trees just below them. One firefighter, whose body was found a mere 250 ft from safety at the top of the ridge, was still wearing a backpack and still had a chain saw in his hand.

To broaden the pattern, the reluctance to drop tools is not something that happens only in wildland firefighting. Fighter pilots whose planes become disabled lose their lives when they hold onto what they call "the cocoon of the cockpit" rather than face the harsh conditions of an ejection from the aircraft. National Aeronautics and Space Administration (NASA) engineers on the Challenger project failed to drop their launch routines in the face of increasingly severe burn marks on O-rings and approved the launch that killed seven astronauts. Naval personnel told to remove their steel-toed shoes before abandoning a sinking ship often refuse to do so and die when they jump off the ship and sink to the bottom or punch holes in life rafts when they board them. The investment firm Long-Term Capital (Lowenstein, 2001) almost triggered a bank meltdown when it kept its same old financial model in the face of dramatic market changes. The final report of the Columbia shuttle disaster investigation (Gehman, 2003) notes, on page 203, that NASA "management was not able to recognize that in unprecedented conditions, when lives are on the line, flexibility and democratic process should take priority over bureaucratic response." NASA could not drop its bureaucracy, a conclusion that is footnoted (footnote #47, p. 204) with the statement that people need to learn how to drop their tools.

Perhaps the strangest examples of reluctance to drop one's tools occurred in San Francisco as a blimp landed prematurely with a dead battery. The passenger and the pilot climbed out to hold the blimp by the ground-handling rail. The passenger tripped as he got out and rolled down the hill. By the time he got back on his feet, the blimp was rising past 20 feet with the pilot holding on to the railing. The pilot fell at about 200 feet.[2]

Reasons Why Wildland Firefighters Don't Drop Tools

Why didn't people in these incidents drop their tools? Why is it so hard for the rest of us to drop our tools when they weigh us down? Careful analysis of firefighter interviews, witness depositions, field observations, accident investigations, and computer simulations suggests some answers. These can be illustrated using the South Canyon fire.

Some of the answers are obvious. The exploding fire was so loud that the crew may not have heard the order to drop their tools. The people who ordered the firefighters to drop their tools were not familiar, so the retreating crew may not have trusted the order even if they heard it.[3] They may have kept their tools to clear a safe area. The firefighters were tired, hungry, dehydrated, and had ingested considerable carbon monoxide, all of which made it more difficult for them to think clearly, no matter what they heard. And the firefighters had little experience converting a reduction in the weight of their equipment into a gain in speed. Post hoc calculations suggest that if people at South Canyon had covered 6 to 9 more inches per second when they started to retreat, they would have made it to safety. However, people in the crew had no way of knowing this. And when you face escalating events it surely must feel unlikely that changes this small can make a big enough difference to matter. Thus, people may refuse to drop their tools because of problems with hearing, trust, control, physical well-being, and calculation.

However, there are additional reasons that are a little less obvious. First, firefighters may keep their tools because dropping them and using an alternative tool such as a fire shelter seems even riskier. The perceived risk is high largely because they have little familiarity with the alternative. Second, to drop one's tools is to admit failure; to keep one's tools is to show that one is still in it, that the danger may pass, and that everything will work out. A third possibility is that people may hold onto their tools because of social dynamics. If one person keeps his or her tools, then others may conclude that the first person is not scared. Having concluded that there is no cause for worry or that it would be too embarrassing to go back to camp as the only person without tools, others keep their tools. Each person individually may be fearful but mistakenly concludes that everyone else is calm. The situation appears to be safe except that no one actually believes that it is. Thus, to the earlier obvious reasons why people don't drop their tools, we can now add the less obvious

reasons of fear of unfamiliar technology, reluctance to admit failure in a can-do culture, and perception that fear is not widespread.

There is a third and final set of reasons that are even less obvious. These are the very ones we need to linger over. There is evidence that some people at South Canyon didn't know how to drop their tools. Quentin Rhoades, who survived, described running but being slowed because he was trying to find a place to put down his saw so it wouldn't be burned. The same thing happened at Mann Gulch back in 1949. In his testimony during the Mann Gulch accident investigation, Walter Rumsey mentioned that even though he was running for his life, he saw that Eldon Dietterт was carrying a shovel. Rumsey grabbed it but then searched for a tree so that he could carefully lean the shovel against it. At the Dude fire, a crew chief told a crewmember to drop a chain saw, which he did. However, then the crew chief mindlessly picked it up and almost got overrun by the fire as he carried it out. People who have been trained to value and carry out whatever equipment they carry into a fire might be at a disadvantage when, without any prior experience of what it feels like or how to do it, they are told to drop their tools.

It may seem odd to think that people keep their tools because they don't know how to drop them. However, it is perhaps oddest of all to imagine that the firefighters didn't drop their tools because they didn't think of their tools as separate from themselves. But that's what I think happened. Fire suppression, like almost any kind of work, calls for capabilities involving tools. Firefighting tools such as the Pulaski are named after famous firefighters. These tools are designed solely for firefighting, and their skillful use is the mark of a seasoned firefighter and central to that person's identity. The fusion of tools with identities means that, under conditions of threat, it makes no more sense to drop one's tools than it does to drop one's pride or one's sense of self. Tools and identities form a unity without seams or separable elements.

Listen to Norman Maclean's (1992) reflections on firefighter identity at Mann Gulch: "When a firefighter is told to drop his firefighting tools, he is told to forget he is a firefighter and run for his life" (p. 273); "When fire fighters are told to throw away their tools, they don't know who they are anymore, not even what gender" (p. 226).

When I first posed the question, why don't firefighters drop their tools, I assumed a separation between firefighters and tools that may not be their circumstance at all. Instead, their circumstance may be one of equipment and action in a context where there is no separation between subject and object.

Pediatricians Don't Drop Diagnostic Tools

When tools are closely tied to identity, those tools can preclude ways of acting. In addition, if you preclude ways of acting then you preclude ways of seeing. The sometimes-tragic consequences of this relationship are on vivid

display in the example of the medical profession's difficulty coming to terms with the diagnosis of child abuse.

The breakthrough in diagnosing and treating child abuse occurred in the late 1950s when Henry Kempe formed interdisciplinary treatment teams in a Denver, Colorado, children's hospital. These teams brought together radiology, pediatrics, and social work. The big change was the addition of social workers. When social workers joined the team, there was no need for the other members to feel helpless in the face of clear signs of child abuse because now there was a way to deal with it. Physicians didn't know what to do with abusing parents; however, social workers did. They were familiar with protective services and how to separate abusing parents from the children that pediatricians kept handing back to them. With the addition of social workers, "Physicians now became more willing to *see* child abuse, to talk about it, and to prevent it. . . . Child abuse could thus be better seen when there was an explicit social organization to deal with it" (Westrum, 1993, p. 338).

The important message in this example is that "A system's willingness to become aware of problems is associated with its ability to act on them" (Westrum, 1993, p. 340). When you develop the capacity to act on something, then you can afford to see it.

The discovery of child abuse is as much a story of dropping one's diagnostic tools as it is a story about acquiring tools of social work. Think about what the pediatricians dropped. They dropped their idea that child abuse was unthinkable. They dropped their bizarre diagnoses of X-rays showing injuries at different stages of healing that parents could not remember. They diagnosed these inexplicable patterns as brittle bones, multiple unsuspected trauma syndrome, bruises easily, subject to spontaneous brain bleeding, subdural hematoma, and nonspecific bleeding disorders. They dropped the tepid label under which they grouped these cases, "multiple unsuspected trauma syndrome," and replaced it with the much more vivid label, "battered child syndrome." They stopped arguing that child abuse was very rare and occurred only among the insane (Westrum, 1993, p. 333). And toughest of all, they stopped trusting parents who remained silent about relevant history when X-rays of their children revealed signs of trauma that parents didn't remember.

It's also instructive here to review why the pediatricians didn't drop their tools sooner because those reasons closely resemble the reasons why firefighters didn't drop their tools. Physicians refused to drop their face-saving diagnoses because, if they did, they would have to admit a terrible reality. In the words of one pediatrician, "if I believed the parent could abuse the child, I would leave pediatrics immediately" (Westrum, 1993, p. 335). That's no different than a firefighter keeping his chain saw while trying to outrun a fire. To drop that saw is to admit the terrible reality that he may be trapped. Pediatricians also refused to drop their diagnoses because they were told to do so by radiologists who were relative "strangers." Pediatricians also didn't

know how to drop their face-saving diagnoses (e.g., what do I do and what do I say when I suspect that abuse is the problem?). However, most of all, pediatricians kept their tools because none of the other pediatricians were dropping theirs.

Implications for Teaching Excellence

So, what does the phenomenon of "dropping one's tools" have to do with teaching excellence? Let me suggest six extensions of the idea that might stimulate your own thoughts about the role that dropping tools might play in the development of excellent teaching that furthers the development of human potential.

1. DROP YOUR CONFUSED COMPLEXITY

William Schutz (1979) argued that the act of understanding progresses through three stages: superficial simplicity, confused complexity, and profound simplicity. In my own work, I have argued that, if you want to preserve your ability to adapt to change, you need to "complicate yourself" (Weick, 1979, p. 261). This counsel derives from the idea of requisite variety and from my interpretation that it takes complex thinking and perception to register and adapt in a complex world.

However, my counsel, considered in the context of Schutz (1979), may stop too soon. I treat complication as the endpoint of understanding, under the assumption that when your thinking is as complex as the environment, that's all you need. That is wrong because there are no endpoints. Instead, there is life beyond confused complexity. We may call it *profound simplicity*, or we may call it *wisdom*, or we may call it *small wins* enacted with full attention to the here and now. If we map Schutz onto the distinction between knowledge and wisdom that I started with, then to move from superficial simplicity to confused complexity is to "acquire" many, sometimes-conflicting perspectives. However, to continue moving and to move from confused complexity to profound simplicity is to cut through the confusion and "drop" those perspectives that are redundant, useless, secondary, and contradictory. I take my lead on this from the firefighting community, which has found that their 56 firefighting rules boil down to 4. Those four, summarized in the acronym *LCES*, advise firefighters that they should not put themselves into a high risk situation unless they first have lookouts, assured communication, escape routes (2), and safety zones.

Using the example of what keeps firefighters from dropping their tools, one can discuss the advantages and difficulties of dropping. There is the small advantage that is amplified when you drop early, the need to avoid the inference that dropping equates to failure, the importance of maintaining

self-respect in face of others who may be acting differently and keeping their tools, and finally, the understanding to accept that impermanence is normal and that clinging produces vulnerability.

2. DROP YOUR FIXATIONS

The phenomenon of lock-in or a fixation error fits in the context of discussions of dropping one's tools. For example, experiments in medical schools have examined fixation errors in programs to train students in anesthesiology. After injecting the anesthesia into an "incredibly lifelike dummy," a problem develops. The students immediately diagnose it as a bronchospasm, when in reality it is a problem involving a phlegm plug. Although they treat the brochospasm and continue to do so for as long as 25 mins, nothing improves. They have made the wrong diagnosis; however, they do not go back to reconsider it. The students suffer from fixation error and find it very difficult to move beyond their initial diagnosis.

Attempts by researcher Jenny Rudolph (2005) to help students avoid this problem have important implications for training of people in general. She found that if people do three things, they are able to break a fixation error and drop the diagnosis on which they are stuck.

First, voice aloud an expanded symptom review. Second, voice an expanded list of what diagnoses might fit those symptoms. Third, voice a plan to eliminate diagnoses one by one. The striking finding is that when people start to vocalize this review, they stop fixating on just one possibility. In many cases, trainees come up with the correct answer in as little as 90 secs.

Computer programmers have also learned how to work around fixation error. When writing computer code, a programmer who has a problem will ask for help. In the course of describing the problem, the programmer usually comes up with the answer himself or herself.

A closely related point suggested by Lance Sandelands (private communication, May 2005) is that tools preclude ways of acting. If you preclude ways of acting, then you preclude ways of seeing. If you drop tools, then ideas have more free play. Just think of the maxim that when you have a hammer, the entire world turns into things that need to be nailed. Take that one step further. If you drop your hammer, then the world is no longer a world of mere nails.

3. DROP YOUR UNDIFFERENTIATED CATEGORIES

One path to excellence lies in helping people to drop simple undifferentiated categories. NASA's lumping of novel symptoms of trouble together as being something that was almost within their experience base (almost-in-family) was a contributing factor in the Columbia shuttle disaster. The idea about dropping that is implied here is captured in one of Robert Irwin's favorite maxims: "to see is to forget the name of the thing one sees"

(Weschler, 1982, p. 203). In Irwin's view, sense making starts with perception of undifferentiated sensations that gradually take on conventional meaning when they are named, systematized, and formalized. Essentially, when people engage in sense making, they impose abstractions and categories that mean they move farther and farther away from their initial impressions.

This transformation is necessary to share and coordinate perceptions; however, we pay a price for it. As social complexity increases, people shift from perceptually based knowing to categorically based knowing in the interest of coordination (Baron & Misovich, 1999). Concepts become simpler and more general in the interest of transmission. The cost is greater intellectual and emotional distance from the phenomena picked up by direct perception.

As a simple exercise to bring home the point about dropping your abstractions, have your students write essays in which they have to drop the verb form *to be*. Writing in this manner is called e-prime (Kellogg, 1987). When you drop *to be*, you can't say "'he is drunk." Instead you have to write your way around that crutch and be more specific: "he talks in a slurred manner," "he staggers when he walks," "he has a strange odor," "he makes strange requests." What e-prime does is raise unforeseen possibilities anchored in data. A person described with details may be drunk; however, that pattern also fits diabetic shock, onset of a stroke, and carbon monoxide poisoning. As we know from studies of commitment (e.g., Salancik, 1977), people justify and become tied to the public, irrevocable choices they make. These choices are uncommonly tough to drop unless people reexamine the basis of their choices and weaken the hold that these three variables have on dysfunctional persistence.

4. DROP YOUR FOCUS ON DECISION MAKING

Learning to hold one's tools lightly shifts the focus from decision making to sense making. In the words of the late Paul Gleason (personal conversation, 1996), one of the most revered wildland firefighters in the world,

> If I make a decision it is a possession, I take pride in it, I tend to defend it and not listen to those who question it. If I make sense, then this is more dynamic and I listen, and I can change it. A decision is something you polish. Sensemaking is a direction for the next period.

Gleason's commitment to wise sense making is striking. When crews fight fires, they post a lookout whose job is to monitor the relationship between the oncoming fire and the crew and to warn if the distance between the two gets too small. On some of Gleason's especially hazardous fires, where there was danger of rolling rocks or windblown spot fires, he assigned as many as 16 people to be lookouts, leaving only 4 people to actually fight the fire. He fights the fire as if he knows and doesn't know what he is facing. In the Dude fire near Payson, Arizona, which was an active, dangerous fire, Gleason

worked part of the time without gloves so he could get a fuller sense of the weather conditions. He clothed himself as if he didn't know for sure what his surroundings were and needed to learn more about them. It paid off. The first day of fighting this fire, around 1:45 in the afternoon, he felt a few drops of rain on the back of his hands. He knew there were no thunderstorms in the area, inferred that he must be feeling "virga" from a huge column of smoke that had iced over on top and was about to collapse, and he moved firefighters into a safety zone just before the column collapsed. When it collapsed, it pushed fire in all directions and six people, who were located some distance from his safety zone, were killed.

5. DROP YOUR TACTICS THAT MUDDY LEARNING ABOUT DROPPING

There are at least three tactics that seem relevant if one wishes to convey the wisdom of dropping one's tools. These three include comparison, awareness, and refinement. To sensitize people to the consequences of dropping, compare performance with and without the tool. Learn how much of a difference it makes. In the case of firefighters, during their training they compare how fast they can move with their packs and without their packs. When firefighters drop their packs, this makes a big difference in speed if they are small people, but a smaller difference if they are big people. The fascinating question is, what's the equivalent dimension for big and small size when we're talking about people who benefit more and less from dropping their overused ideas?

The tactic of comparison is especially relevant because this is how the idea of drop your tools was first discovered by Ted Putnam. In the 1970s, Putnam was a wildland firefighter; however, he was also a competitive runner who ran 50- and 100-mile races. He also designed his own packs to carry snacks and water on his long runs. Putnam reports that routinely, about 3 miles from finish, he would throw off his pack and be astonished at his feelings of "exhilaration" and increased speed when he did so. Later, when Putnam began investigating wildland fire fatalities, he started to measure how far people who died would have gotten if they had dropped their packs and heavy tools. He found that, in most cases, they would have made it to safety.

A second tactic is implicit in the fact that you can't drop what you don't consciously possess.

> The range of what we think and do is limited by what we fail to notice. And because we fail to notice *that* we fail to notice there is little we can do to change until we notice how failing to notice shapes our thoughts and deeds. (Mangham & Pye, 1991, p. 31)

Part of the process associated with dropping one's tools in an audit of what tools you do have. It helps to date when tools were first acquired because older tools

tend to be overlearned. These are the tools that people regress to when under pressure, and they are the tools that are harder to drop. Notice that, if dropping one's tools is a relatively new skill and not overlearned, stress will dissolve that skill and force regression back to much earlier, much more resistant skills.

A third tactic closely tied to the other two is to spend time refining judgments of precisely which tools need to be dropped. The Forest Service's experience is instructive. Initially, they trained people to drop their packs but then discovered that chances of survival were better if they dropped their packs but kept their water and their radios. Initially, they also told people to drop all their tools to pick up speed; however, this was refined to the directive that they drop their heavy tools like chain saws, 5-gal water containers, and sigg packs containing gasoline but keep light tools that might help them clear debris and create a spot that wouldn't burn. The question of what to keep and drop, and why, lies at the heart of adaptive excellence.

6. DROP YOUR PREOCCUPATION WITH EFFICIENCY

People in traditional organizations tend to focus on their successes, simplify their assumptions, refine their strategies, pour resources into planning and anticipation, and defer to authorities at higher levels in the organizational hierarchy. These ways of acting are thought to produce good decisions; however, they also often allow unexpected events to accumulate unnoticed until those events become so complex that they are tough to deal with and have widespread unintended effects.

High reliability organizations (HROs) have a different set of priorities (Weick & Sutcliffe, 2001). They drop the traditional ways of acting and pay more attention to failures than success, avoid simplicity rather than cultivate it, are just as sensitive to operations as they are to strategy, organize for resilience rather than anticipation, and allow decisions to migrate to experts wherever they are located. These may sound like odd ways to make good decisions, and that may be true. However, decision making is not what HROs are worried about. Instead, they are more worried about making sense of the unexpected. In that context, their attention to failure, simplification, operations, resilience, and migrating expertise makes perfectly good sense.

So, the question of what to drop and what to acquire can be embedded in discussions of effectiveness. When people fail to drop their tools and get entrapped, they often (a) fail to spot early warning signals that danger is building, (b) oversimplify the task, (c) lose sensitivity to operations and the here and now, (d) lack resilience, and (e) ignore expertise on the frontline.

Stated positively, to drop your tools you need to:

1. see where your model didn't work. You need to spot indicators that signal the unexpected (failure).

2. need to strip away labels that conceal differences among details (simplification).
3. focus on what is happening here and now (operations).
4. see new uses for old resources through improvisation and making do (resilience).
5. discover people who understand a situation better than you do and defer to them (expertise).

Conclusion

It may seem that with all this talk of dropping one's tools, there is nothing left. That is decidedly not true. Consider the tools of traditional logic and rationality. Those tools presume that the world is stable, knowable, and predictable. To set aside those tools is not to give up on finding a workable way to keep moving. It is only to give up one means of direction finding that is ill-suited to the unstable, the unknowable, and the unpredictable. To drop the tools of rationality is to gain access to lightness in the form of intuitions, feelings, stories, improvisation, experience, imagination, active listening, awareness in the moment, novel words, and empathy. All of these nonlogical activities enable people to solve problems and enact their potential.

Knowledge involves acquiring. Wisdom involves dropping. Sensitivity to that difference is part of what I think it means to reconfigure management education.

Let me end with an example of the kind of wisdom and excellence I think we are shooting for. An old cautionary tale narrated by Kirkpatrick Sale (1980) has it that

> there once was a kingdom in which all of the grain crop one exceptional year somehow became poisoned, causing anyone who ate its products to go insane. That posed a terrible dilemma for the king and his advisors because the store of grain from previous years was very modest, and not nearly enough to feed the entire population of the land. And there was no way to get food from outside the kingdom. The kingdom would face either widespread famine and starvation if the harvest were destroyed, or widespread madness and chaos. After much deliberation, the king reluctantly decided to have the people go ahead and eat the grain, hoping its effects would be temporary, and that at the very least human lives would be preserved. "But," he added, "We must keep a few people apart and feed them on an unpoisoned diet of grain from previous years. That way there will at least be a few among us who will remember that the rest of us are insane."

Your students are likely to remain among the sane if they learn to drop their tools, and you maintain your own lightness as you teach excellence.

Notes

1. Six died at the Dude fire, 14 at South Canyon, two at the California fire, and one at the Buchanan fire.

2. The blimp continued to rise and disappeared into the overcast. With the help of a fixed-wing aircraft, the unmanned airship was tracked as it ascended to an altitude of about 10,000 ft and drifted slowly northeast over the eastern San Francisco Bay area. After several hours, the blimp gradually descended when helicopters hovered over it and forced the blimp to the ground in Orinda, California (NTSB File LAX95LA121).

3. Hotshots are trained to wait for orders from their own leaders. Six of the hotshots who died still had their fireshelters in their cases, presumably because no order had been given to deploy them.

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