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Column

On the other side of failure

Growing up, I dreamed of becoming a professional soccer player. Unfortunately, injuries got the better of me. When I look back at my soccer training, a critical principle stands out: *train to failure, and then push some more*. Do your push-ups and pull-ups till your arms buckle, and then push some more. Do your endurance training till your body buckles, and then push some more, and so on. The idea was to take the body to its limit, and then find the strength – physical and mental – to stretch it just that little bit more. Good things happened on the other side of failure. It was on the other side of failure that physical and mental strength developed to the maximum. It was on the other side that mind and the body could work together for optimal growth and performance. It is on the other side of failure that tough matches are often won or lost.

As it is in sport, so it is in learning. When learning something new, it is much too easy to take the path of least resistance. Why not simply ask someone who knows to show you exactly what to do and how to do it? However, it turns out that *making learning easy does not always ease learning*. In fact, research on *Productive Failure* suggests that making initial learning more challenging, and allowing the learner to struggle and even fail to solve a problem or perform a task can be beneficial for learning from an expert (typically a teacher) subsequently.

Why should that be? Well, good things happen on the other side of failure. It is failure that creates what I call the 4A conditions for deep learning: Activation, Awareness, Affect, and Assembly. When designed well, failure *activates* the prior knowledge necessary for acquiring new knowledge. Failure makes us *aware* of the limits of our knowledge. With the right mindset, failure can build a positive *affect* orientation – for example, the motivation to bridge the gap between what we know and need to know. Finally, failure gives the teacher essential information on how to help the learner *assemble* and integrate new knowledge with prior knowledge.

Therefore, the next time you are trying to learn something new, try not to take the easy way out. Try to figure it out yourself first, play with ideas, tinker a little, solve the problem on your own first, and in as many ways as you possibly can. Focus not on the struggle, or any failure in not getting it right, but on how such an experience prepares you to learn from an expert later on. And that is what Productive Failure is all about: the art and science of intentionally designing for and bootstrapping failure for deep learning.



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