

Thirteen Rules of Success: A Message for Students

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Recently a student I care about flunked out of graduate school. It is a relatively rare thing, especially in our program which bends over backwards to prevent that outcome. But it has made me think again about just what it is that distinguishes highly successful students from others. We all recognize that some students and some young professionals will "make it" while others who are equally bright will not. Why is this? What are they doing differently?

Let me admit before I start that success is a relative term, and a multidimensional one at that. Too many of us are workaholics and tend to define success too narrowly, downplaying success as a friend, success in enjoying life, success in personal growth, and the like. I secretly hope and suspect that the student who flunked out is in part responding to muses that will lead to success in other areas. The purpose of this short paper, however, is limited to the work habits and general approaches to tasks that characterize successful students in scientific training.

I've tried to distill my opinions down into thirteen "rules of success." None are absolute—I personally violate one or more of these rules almost every day—but I have noticed that when I keep them things work much better than when I don't. I've also noticed that students who keep more of them tend to be much more successful.

Rule 1. Care About the Process, Not Just the Outcome

Few of us will be projected into success suddenly. More probably we will nibble away, and pieces will fall together one by one. The small things can end up being crucial, as skills and knowledge combine in unexpected ways. We simply cannot always predict which of our actions at any given moment will advance our career.

This creates a problem. If success as an outcome is too important, we are likely to cut ourselves off from the processes that might produce

it. For example, suppose a professor raises an interesting issue about an intellectual area outside your current interest. If the outcome pay-off is too dominant as a reason to behave there is a temptation to close down intellectually, and the opportunity to learn something that might later be important is missed.

Successful students have a richness about them that comes from an openness to such moments, and a consistency in quality that reveals a general tendency to care. The most successful professionals care about a wide variety of things in the field and emphasize the intrinsic value of the tasks. They are working toward outcomes all the time, but they don't forget the value of the process.

I have a preferred word for this: Play. I don't use this word to trivialize the tasks involved. I use it to point to the source of the consequences that maintain behavior and keep it high quality. The best reason to go to a journal discussion group, or attend a convention, or to do research is to play professionally. It is the "best" reason because playful engagement in a quality process is always immediately available. The concrete outcomes of these activities (e.g., jobs, money, reputation, praise), when and if they arrive, may be subtle and long-delayed. If you rely on such consequences to maintain the activities, they will almost surely drop away.

Stephen Jay Gould provides an example of what happens if you take intellectual play seriously. Yes, he is a paleontologist. But he also has written beautifully about psychology, baseball, architecture, and the human meaning of the millennium. It is obvious that he is entertained by his own scholarly play. Like any playful game, he follows the rules: he knows his evidence. The best students I have ever worked with are those who do things like staying up until 3 a.m. perfecting a presentation to a local group just because the task itself seems important, even though in some larger view of reality it is not. Importantly, they will show the

same care when they are writing a funny poem, or arguing an arcane point in philosophy of science. I suspect that Stephen Jay Gould was like that as a student.

Rule 2. Talk and Write – A Lot

Science is a largely verbal enterprise. Successful scientists must speak, write, persuade, and debate. The only way to become skilled at professional verbal behavior is to engage in it. Talk in class. Talk at conventions. Talk in the halls. Listen and respond. Propose and consider. Argue. Share thoughts. If you think you have something to say, say it. If you wonder if you have sometime to say, and worry that it is not worthwhile, say it anyway. Chronic fearful silence is a young scientist's worst enemy, and it is shockingly common. At least half of the wonderfully bright students we recruit into our department rarely talk in class, and in my experience, that is a terrible predictor if it continues.

Now, it is true that occasional thoughtful silence is a good thing. You have to learn to discriminate when to talk and when to listen. But frankly it is much easier to quiet a loud mouth than to jump start a mute, so the discrimination is more easily learned from that end of the continuum.

The same thing applies to writing. Writing with ease comes with practice, but most students seem to think that this "practice" should consist of reading, thinking, outlining, or planning. Those are important, but to get facile with professional writing you also have to write. You have to put words on paper and put them in front of an audience. If you write a paper for a class, write it as if you would publish it. Then try to do just that.

Rule 3. Say "Yes" Easily and Mean It

Early in your career you should expose yourself to different things. You need to broaden your repertoire. When someone talks about a good project, say "let's do it." If someone asks for help with a project, say "yes." Then deliver. Do *more* than is expected. If your part of the project is to design a computer program, have it done tomorrow instead of next week and add some bells and

whistles to it. If you have agreed to organize the lab, do it elegantly.

Rule 4. Work with Others and Share Easily

You can learn a lot from others. They help you push you and they teach you new things. So collaborate. Form teams. Network. Give more than you ask to receive.

The thing that usually prevents collaboration is fear that someone else will get more than you. That is possible, but if you try too hard to prevent that, you kill the collaboration. Worry about order of authorship when the time comes and even then do so with ease. In the larger scheme of things whether you end up third author versus second doesn't matter much. Similarly, if someone else gets some credit for "your ideas," well there should be plenty more where that one came from if you take advantage of all that others have to teach you.

Rule 5. Keep Your Commitments

This is the most important rule of all. This one rule separates the successful from the unsuccessful student more than any other, but its value cannot be known until you do it. So figure out a way. Set up a program, make it life or death, ransom your grandmother. Do it. Of course, no one always does it. OK, so when you slip, go back and do it 100%. Then when you slip, go back and do it 100%. I violate this one nearly every day. Yet I continue to fight like a tiger to keep it.

Rule 6. Even Dogs Never Urinate in Their Own Beds

In one sense, the outcome of success is dominantly social: people think well of you and your work. But we are all afraid we will fail. Students have the extra burden of dependency combined with some degree of powerlessness. A horribly seductive way to deal with this fear and this burden is through cynicism, criticism, paranoia, gossip, and the like. For example, students can complain to one another about their program, or this or that instructor—but not openly where something might be done. You begin to gather together a group (e.g., fellow students) who will all agree that things are terrible, no one could achieve these

standards, the instructors are dolts anyway, and so on. The effect is that a) you get a thin version of the social benefits of success (a supportive verbal community) but without achievement, b) control by the larger scientific verbal community and that of the program you are in diminishes, and c) you can feel righteously bad about where you are. You create a social community in which each person is supported in doing what does not work. It feels good but it goes nowhere.

I have seen this process destroy the training of many students. Sometimes they catch themselves after a year or so and pull out of it. Sometimes they leave the program. The most tragic are those who do their training in a half-hearted (but secretly righteously angry) way, and years later they realize that they wasted their opportunity. The solution is simply to refuse to do it, to walk away when others try to draw you in, and to take responsibility for your career. After all, even dogs never urinate in their own beds.

Rule 7. Acknowledge Your Own Power and Behave Accordingly

Let me tell you something incredible: you can make a huge difference in your discipline. We are not talking about fields that require a gazillion dollar superconducting supercollider to do good work. We are talking about fields that are young and accessible, in which even one person can make a big difference. The unsuccessful students will withdraw in fear from that statement (see Rule 6), or will mistake dreams for action. The successful student will acknowledge their own power, and will push on vigorously to make it manifest.

Here is a quote from Nelson Mandela's inauguration speech that I particularly like on this general point:

Our deepest fear is not that we are inadequate. Our deepest fear is that we are powerful beyond measure. It is our light, not our darkness, that most frightens us. We ask ourselves, "who am I to be brilliant, gorgeous, talented, fabulous?" Actually, who are you NOT to be? You are a child of God. Your playing small does not serve the

world. There is nothing enlightened about shrinking so that other people won't feel insecure around you. We are born to make manifest the glory of God that is within us. It is not just in some of us, it is in every one. And as we let our light shine, we give others permission to do the same. As we are liberated from our fears our presence liberates others.

Rule 8. Acknowledge Your Own Finitude and Behave Accordingly

You do not know how long you have on this planet. Regardless of how many years, the time is certainly short. I tell my students to be mindful of this in the area of research and to try to do work that is both entertaining and important. For example, sometimes weak students come up with research ideas that are minor variations of what someone else has done in the literature. It is as if they think that is all they can aspire to (see Rule 7) or as if they think they have all the time in the world. My question to students in this circumstance is this: suppose unknown to you, you only have two or three research studies allotted to you before you die. Do you want to spend one on *that*? Successful students aspire to make a difference in the time they have.

Rule 9. Network With Your Betters

There is a tendency for students to think of experienced and highly successful professionals in two erroneous ways: as persons on a pedestal or as dinosaurs to be overthrown. Unsuccessful students gravitate toward the first error, somewhat more successful students toward the second. But the most useful reaction is to see them as people who have earned respect through their sweat and effort, from whom you can learn. With a few exceptions, well known professionals are likeable, hard-working, and smart. This is not surprising since they would not be well known if they were not. People try to make jerks fail, and dumb or lazy people rarely come up with ideas that withstand the test of time. Successful students want to know successful people—they want to talk with them, correspond with them, listen to them. They want a dialogue of

ideas. Unsuccessful students are too afraid or uninterested, or they want only to show off.

Get to know the leaders of the field. Listen to their talks. Talk to them at cocktail parties. Write to them. Send them copies of your work if it seems appropriate. Nice, bright, hardworking people are just good people to learn from.

This networking will help you create a forum for your ideas. Successful students tend to use their intellectual contacts to create opportunities to play. For example, even fairly junior students can organize a symposium and participate in it. If you can get well known people to play on your stage it will elevate your own talk. Then all you have to do is to give a darn good one, which in turn will allow you to network with others about your ideas.

Rule 10. Guard Your Integrity

Anonymous self-reports tell us that a larger percentage of students have at some time cheated in school. Perhaps it was to pass a test or get a better grade on a paper. Students in training know that science is supposed to be above that sort of thing, but we spend little time dealing with the human realities that lead to cheating, preferring instead to moralize. It is very rare that cheating in science is even talked about, and as a result most students do not realize how pervasive the temptation is to cheat in science.

People who want to be successful are especially susceptible to the kind of shaping that can lead to biased data, or outright dishonesty. To order to publish that paper or get that grant, it is tempting to throw out a few outliers or change an exclusionary criterion post hoc. You can often even justify it, but shades of gray compromises can lead to black and white cheating. I've seen highly successful careers tragically destroyed by this shaping process.

Prophylactically, it helps to focus on the process, not the outcome (Rule 1). Watch out for things that might let to internal pressure to cut corners, especially a needless outcome orientation. For example, never do a study "to show x" and if you catch yourself using such a phrase, self-edit it immediately. Do it "to see if x is so." Wanting to be

right is your enemy. Wanting a specific outcome is your enemy. Wanting to find out is your friend.

Focusing for the moment on the student scientists (and not the consumers of science—another important matter), the most tragic human cost of scientific cheating is not the careers that are destroyed—after all, most cheaters will “get away with it.” The cost is this: If you violate your integrity, even in little ways, to achieve a particular outcome you will find the activity itself to be less intrinsically reinforcing. It always works that way. The playfulness disappears. It's now a means to some other end. Science is no longer fun.

Rule 11. Follow Your Bliss

Successful students are confident. I don't mean they necessarily *feel* confident. I mean that they follow their bliss: They are true to themselves. This is confidence-the-action (*con*: with; *fidence*: fidelity). Be true to yourself. If you have an odd mixture of interests, well maybe that mixture will lead to new and exciting things even though someone will tell you that you have to focus on something safer. Take the risk. If it worries you, build a little safety net. Do not, however, violate what seems important to you. You will pay very dearly for the violation because it will take away your compass for scientific entertainment. You can get lost without a compass.

Rule 12. Say "No" Easily and Mean It

As your career progresses, you will naturally focus. It is the only way to maintain your quality. As you focus, learn to say "no." Set priorities. Stick to them. I'm still learning this rule (actually I do it more and more, but the distractions and requests go up too so it seems that I never have quite enough Rule 12 for Rule 5 to be 100%).

Rule 13. Open Your Mail, Return Your Phone Calls, and Keep Your Desk Clean

Oh well. Not every rule can be followed.