

## **Finding the Science Skills in the Frills: Lessons from the High School Dance Scene** **By Patricia MacQueen**

I want all women to know that you don't have to be a stereotypical nerd to succeed in science, and you don't have to grow up building circuit boards on the weekend to have the necessary skills to go on to a higher degree. Be proud of what you've done – whether it be building robots, dancing ballet, fixing cars, climbing trees, or stamp collecting – because those skills are *your* skills, and they will help you, in odd ways you might never expect. When I look back, the foundations of my success in science came from probably one of the *least* science-y activities – organizing groups of friends to attend my high school's dances. So if you ever secretly thought you were too “feminine” or “frilly” to be successful as a scientist, this essay is for you.

In addition to being a lover of ball gowns and sparkly necklaces, during high school I was also a self-described loud and proud nerd – not exactly your first pick for social queen bee. But adopting the mindset of the scientist I would one day become, I saw a problem, and tried to solve it.

I should take a moment explain my high school's school dance culture first, or none of the rest of my story will make much sense. At my high school, dances were always attended in groups, and much of the excitement around the dances focused on these dance groups and the parties that went with them. These groups were typically comprised exclusively of couples, and the party surrounding the dance usually involved a formal dinner before, traveling as a group to make an appearance at the dance, and then some sort of activity or party after the dance. Now, the way things often worked at my rich suburban high school meant that it was *normal* to rent a limo, purchase custom-printed group hoodies at \$45 each, and buy a \$1,000 dress to go with it all. That sort of ridiculousness was out of reach for my family, and, anyway, my friends instinctively balked at such over-the-top glitz. And we completely rejected the idea that you couldn't attend a dance without a date. The status quo seemed quite silly to me, so, without fully realizing what I was getting into, I made it my goal to make sure that my nerdy friends and I could have a fun school dance experience regardless of whether we had a date or our parents made a six-figure salary.

After a few rather awkward dance experiences as a freshman (which I imagine is rather obligatory, anyway), for my sophomore Homecoming dance I planned my own dance party. I didn't really intend to create an institution; I just wanted to go to the dance with my friends – so I did. We were not, to put it mildly, the stereotypical group for my high school. Instead of Abercrombie-bedecked elites, most of my horde was fellow marching band nerds. There may have been only one couple among the whole group. Tweaking the often expensive “custom group t-shirt” tradition, everyone in my group chipped in \$10 each to make a ridiculous, zany t-shirt we all signed with sharpie. And while our stylish classmates arrived in expensive limos, we rode to the Homecoming dance in a fleet of “un-stretched golden limos” (gold minivans driven by some of our mothers) – and we had a *great* time. No limos or dates required: nerds welcome! And so began what would become a huge part of my high school experience and, ultimately, a lesson in mastering chaos that taught me the skills I needed to thrive in my master's degree program.

Two vital science skills that often get overlooked are effective writing and communication. The professors at my university often bemoan the miserable writing skills of their students. The importance of effective written and oral communication has become increasingly apparent in today's debates and discussion over evolution, climate change, geologic hazards, and basic science knowledge. I got my first lessons in effective communication through creating the information-dense itineraries I distributed to the guests of my dance parties. I learned the hard way to be careful about using jargon when I suddenly had several “translation” requests from my friends after they tried, and failed, to interpret a Pixar *Cars*-themed itinerary I had written (hilariously, I thought) in “Southern,” with such baffling expressions as “ah-dee” (ID) and “horse-doovers” (hors d' oeuvres). This early experience made it much easier to understand why non-scientists, or even scientists in other fields, get slightly frustrated with me if I persist in talking about “pyroclastic flows” rather than “deadly flows of hot ash, rocks, and gas from a volcano” or “pahoehoe” rather than “that smooth ropy lava you always see in videos about Hawaii” without at least defining the terms *once*. Scientific terms, like jokes, are no good if only the speaker understands them!

When I first began my master's degree, the sheer chaos of actual scientific research, which had always seemed so orderly in the textbooks, was a bit of a shock to me. Precious samples got mislabeled; grad students graduated and left behind mysterious folders of files and

vital computer programs that only they knew how to use; data sheets disappeared; and scientific equipment was always elderly and always broken, and you were lucky to have any manual—let alone a manual with anything *useful* to say about how to fix this machine you needed crucial data from in two days. Looking back, it was a darn good thing my poor little A-type brain had already been exposed to chaos and uncertainty in the form of all the logistical and emotional turmoil surrounding a high school dance! In high school I had survived being told a month before the dance that I would be taking on 50 more people. Multiple last-minute but oh-so-vital revisions of our group's t-shirt design were put forth one week before the manufacturer needed the final designs. Five people walked out the week before when I had already made reservations and had t-shirts printed. Group members disappeared at the school's after-party for a good two hours or so. If I could survive that, then I could survive the sole gravity meter our lab owned going haywire on a calibration survey some five months before my field season! I mean, I had *five months* to figure something out. *No* sweat. Even better, equipment doesn't suffer from hormone-enhanced teenage drama....

While planning my dance parties, I could not have maintained even a semblance of sanity without the massive spreadsheets I created to keep track of all the rapidly changing variables involved in the enterprise. These spreadsheets were my first forays into the joys of data. They contained detailed information on all the attendees, their names, their parents' names, phone numbers, who had paid, which of the guys needed a boutonniere and which of the girls needed a corsage, any special dietary restrictions or curfews, who I had delegated tasks to, etc. From the beginning, I always felt more secure when I knew I had all the necessary information, and more importantly, that I knew *where* to find this information. When I was in the thick of planning dances, I was proud of that spreadsheet and carried it everywhere with me, updating and optimizing it obsessively.

This need to not only know my facts but know that I could access them at a moment's notice, plus this practical experience of data management, served me well in my master's degree. I had hundreds of papers to keep track of, gigabytes of data, Matlab programs, computer models, modeling programs, notes on those modeling programs, maps of my field areas and station locations, sketches of models and field areas, algorithms worked out once that I didn't want to work out again... Of course, the problem of keeping all this information in order for my research was much more complicated than for my dance parties, simply because I had never had my own

research project before. I began my master's research without much sense of what was important, how things should be divided, and what I would need to access quickly. But having faced this problem before, on a smaller scale, meant that I already knew that being organized was not a mild mental disorder. It was vital to be able to function at all.

It was through these dance parties that I also learned my first important lessons about seeking help. By nature I am the sort of person who would often rather amputate her own toe than ask someone for help extracting a splinter, because I'm smart/strong/resourceful enough to do it myself, dang it! I suspect many other grad students are much the same.

However, a seemingly trivial little episode at my senior prom opened my eyes to the idea that, yes, you *can* let people help you every now and then. One of my friends, "Jim," had a notorious habit of getting lost and disappearing. We were preparing to leave the after-party after our senior prom. I did a head count, and yep, sure enough... Now, earlier, I had fought tooth and nail, and lost, to keep another friend, "Al," from driving his own car, for "just in case," rather than riding in the "golden un-stretched limos." My view was that the fewer variables we had to deal with in getting from point A to point B the better. But he insisted and insisted that driving himself was necessary, and finally in the commotion of leaving my house for dinner he ended up driving anyway. It was a good thing he did, because while Al stayed behind looking for Jim, the rest of us could go off to the next event of the evening, without worrying about accidentally abandoning Jim. (Of course, it turned out Jim had been waiting with another part of the group the whole time).

It was a small, stupid incident, but the lesson from that dance stuck with me. I had been certain I wouldn't need help, and that accepting assistance would cause more problems. Then, however, when it turned out that I *did* need some support, the world did not end when I accepted that help. In fact, the world got *better*. Because of this experience with Al and Jim at the dance, when it came to my Master's I knew there was no shame in asking, *again*, how the gravity meter worked, if asking again now would mean avoiding breaking it later. And when I needed serious help with a mental health crisis in the second half of my master's degree, I knew—thanks in part to Jim getting lost, and Al insisting on helping—that it was a mark of strength and maturity, not weakness, to seek help.

I realize now that the most important aspect of these dance parties for surviving my master's degree was learning that, despite everything, I would survive, I would achieve, I would come out on top. Even if I can no longer remember, among all my many high school dance memories, which specific episode caused me to break down in tears of frustration and despair, I do remember that at every dance I always reached the finish line. I always got my most favorite moment—the moment where I could step back from my friends and watch them carrying on and having a good time, and realize that I created that. After all the long, frustrating work, tracking down people, agonizing over prices, rushing around at the last second to get the house ready for the coming invasion, in the end I made people happy. I gave them something to remember, and I was proud of that. I think those twin memories of passing moments of misery followed by real triumph in planning these dance parties propelled me through many moments of despondency on the way to grad school and then during it. Whenever I found myself at rock bottom, I could think back to those high school parties, when I had also thought all was lost, and then think further to the many times when I came out on top. These memories always help me realize that any current state of despair is also, ultimately, temporary.

Planning those dances is probably the one thing I really wish I could put on my resume but can't, because the experience taught me so much about how to write, how to manage chaos, how much I loved collecting and playing with data, how to ask for help, and, most importantly, what it felt like to take pride in my work after a long struggle, to have faith that there *would* be a light at the end of the tunnel. And all this... from something that boiled down to an excuse to dress up like a princess and party with my friends. So never sell yourself short because you think your experiences aren't "sciencey" enough – science skills can hide in some surprisingly "frilly" places!

