

## **Mistakes Can Teach You Things!**

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It is said in some circles (other geometric configurations as well) that we learn most when we make mistakes. Whether or not “most” is appropriate is not the issue. It is the fact that we do learn from mistakes, and not just with regard to attempts not to make them again. I relate several mistake situations in my career, some significant, some frivolous.

### **Lessons from managing academic journals**

I edit two journals, PRIMUS and Cryptologia. I have been doing the latter for over 25 years. When an issue comes back from the printer I usually open a sample copy, scan it with some pride, feel the “stuff” of an academic journal, gaze at the covers, check the binder, touch the edges, etc. In the past I would also open to a page at random and read, just read. Many times I would find typos, mistakes in the setting of the text or an equation. I vowed to do something about it and I did. I never do the reading part anymore! I just open the page at random and then close it!!! From those mistakes made – the typos and also reading to find them, I vowed to work harder to eliminate error, but I know such things will happen and as hard as I try, the journal will not be free of errors. Indeed, years ago, after one of my bouts of “depression” at finding such typos from these random reads, my fellow Cryptologia editor, Greg Mellen, sent me a full back page ad for automobile sales from a Minneapolis newspaper in which the top headline read in full 48 point font, “PUBLIC AUCTION,” only the “L” was missing. So I could do worse, but I will try better to minimize the typos and I will not make the mistake of random reads after the fact.

I have learned from my time here at West Point that it is better to be direct, to be up front, and to be prompt, than to wallow in indecision, to delay, to put off. I have learned this from my association with military folk here, from my own aging and maturing(?) process, and from a mistake I made a few years back. In Cryptologia we published a book review, a very critical review, of a vanity press book in which a “secure” cipher system was advocated. Incidentally, after the initial publication of the book the book’s author came out with a 50 page errata list!!!! The author was incensed at the review and demanded an apology. Reviews are reviews. They contain opinions, but have facts that can be substantiated – these were! We stood by the review, but offered the author a chance for rebuttal. He ranted about lost sales and issued veiled threats, but never came forth with a rebuttal. The author of the book wrote to the Dean at West Point saying that “There was a dishonorable faculty there in the midst of an honorable institution.” He went on to describe to our Dean his concerns. The Dean sent the message to my department head (chain of command, you know) who shared it with me and asked me to

look into this and clear it up. While I was working up yet another letter of appeasement to the author, another missile was launched at our Dean by the book's author, suggesting that he would be contacting his Senator about this dishonorable individual at the Academy. The Dean now suggested to my department head that I "get rid of this crack pot." So my position was understood by my chain of command. However, I still had the author to deal with. Each time I would send a new letter of appeasement I got back a nastier letter with more accusations, all of which I shared with my fellow editors. Finally, I got a copy of a hand written letter from one of my editors to this particular author. The editor's letter began, "I just read your latest whine . . ." and went on to blast away at the author for unprofessional conduct. I had made a mistake in thinking "the customer is always right" and sending letter after letter of appeasement. The customer is not always right and sometimes needs to be told so. Such telling should be direct, up front, and prompt. The mistake of pandering to this author was mine, but it will not be made again.

### **Issues involved in parents of students relationships**

During the spring of my first year of teaching in a liberal arts setting I received a letter from concerned parents. They "demanded" a meeting with me to talk about their son's performance. I wrote back and suggested the following; "Since you are arriving over a lovely spring weekend I suggest we meet at the third base seats at the baseball field at 2:00 PM Saturday, for the college has a good team. We could enjoy a good game and have a good conversation. I shall have a gold corduroy jacket." They never showed up!! On Monday when I told my chairperson (he was not at the game!) about this he laughed (at me!) and we had a frank discussion about decorum and the proper way to respond to such parents. I did meet with them several weeks later, after calling and apologizing, and we did our business in the office, across the desk, in the manner in which they would expect a PROFESSOR to conduct him/herself. I learned to put myself in their shoes, to take their concerns seriously, to say that while customers may not always be right, they need a respectful hearing in a zone in which they are comfortable.

### **Issues involving teaching**

While at Rose-Hulman Institute of Technology, I was part of a team that developed a revolutionary way of teaching all the first-year science, engineering, and mathematics coursework – put 60 students together with 5 faculty (mathematics, computer science, physics, chemistry, and engineering) into one giant team-taught, 12 credit course and integrate the science, engineering, and mathematics whenever and wherever possible. We had been planning the course for over two years, including a delay because of National Science Foundation hold-ups on awards. So when we finally "unleashed" on our first class we literally almost killed them. We came on like the Furries, we assigned design projects from the start on top of homeworks with no class time devoted to discussions of the projects, we did all of our correspondence with them electronically, posting all the material on an internal site (this was at the infancy of email and networks), and we assigned them tough, challenging, and integrating problem activities. After three

days of class we CALLED-OFF class for the next two days and locked the computer labs. We had a “town meeting” with the students and let them vent their frustrations. They said things like, “Give me a piece of paper with the homework on it.” “We know complex problems can teach us more than simple drill problems, but you should not replace 10 drill problems with 10 complex problems.” We had made a mistake, BIG TIME!!! 5 smart (well???) PhD’s whose ideas had convinced foundation after foundation to give us money to try out our theories, did not have an ounce of common sense between us when it came to visualizing the onslaught we were planning to perpetrate upon our students.

We were guilty of an overzealous attack on the students’ time, on their intellectual abilities to absorb and function, and on their confidence in us to teach them in this new setting. We had planned too much, assigned too much, demanded too much, pushed too much, etc’ed too much! We needed to back off and they had told us with their actions as well as with their ebbing energy levels as they honestly tried to meet our absurd expectations. We listened, we changed, we did back off, we became more reasonable in view of our coming to realize we were dealing with mortal students not Olympian gods. This first pass at the new, integrated curriculum, this fiasco of absurd expectations by the faculty served to hurt the propagation of the curriculum, indeed, it was a lightning rod for critics, both students and faculty and the sense of mistake never left me personally nor did it ever wash off the curriculum which is still available at Rose-Hulman. Since this incident, I have decided to plan for a new course in the following manner. Generate new ideas, create activities, build new visions, BUT only use a modest amount of the material on hand, be sensible in estimating what you believe students can accomplish, do not flood students, rather be gentle and reasonable in expectations. Always listen to students, always keep a sense of the pace of activities in their lives, in your course - and, if necessary, change!

A few years ago two of my younger colleagues here at West Point had invested a great deal of effort into designing a wonderful project for our students in a course I was directing. One of the cadets emailed me with questions about plotting in MathCad. I opened the “Approved Solution” file on this project which my colleagues had prepared and cut out the appropriate code for just the plotting, not the answers to the project, mind you, just the plotting. I cleaned it up a bit, wrote some generic plotting advice issues on the page, pasted it into email, and fired it off, hoping this would help finesse presentation graphics issues for the cadet once she had accomplished the mathematics of the work. Little did I know that you cannot just send parts of MathCad in email – email sends the ENTIRE MathCad file. So what I had done was to send the cadet the entire solution to this huge class project. I learned later that night when I got a message that read, “Sir. Now that you have apparently sent me the entire solution to the project, I need guidance in how to proceed.” I translated this into, “Look, you turkey, you sent the answer to the project questions to us [there were several to whom I sent it in response to similar queries]. Given our honor system and our unfair advantage this solution in hand gives us, what are we to do now? Oh, by the way, thanks a lot!”

When I discussed this with my younger colleagues who had worked so hard to develop the project I was embarrassed and I felt as though I had truly let them down. They were fully forgiving of my mistake and they advised we had only one recourse – send the entire solution to the project to all the cadets in the course. This meant we were going to deny them all the “doing” of the project. However, we wanted them to get something out of this experience, so we designed some questions as add-ons to the project. This is where I really learned from my mistake. Sure, taking care in sending email was something I learned, but wait ‘til you here what I really learned from this mistake. I learned that our cadets really valued creative opportunities; they really meant it when they told us in course-end evaluations that they learned most by doing the projects. In doing the projects they saw things coming together which would otherwise not happen for them and this occurred only in the tough going of the project requirements. This I denied them with my mistake. These cadets, loudly and clearly, said they were disappointed in not being allowed to create their solutions, to build their own success, and to grapple with the hard issues of the project we had originally designed. In its place they recognized the weak, cosmetic questions we asked, based on the solution we denied them! They were not happy. My mistake in emailing the “small” MathCad material, which turned out to be the solution, made the cadets mad, not my colleagues! Most importantly, it gave me new insight into the student mindset and I really liked what I saw in them. I saw a willingness to accept challenge, to want to tackle difficult problems, and to be creative.

### **Purposeful mistakes – one someone else’s and one all my own**

There are mistakes that, if repeated, can serve you well. I give two examples. The first is a description of two overheads that I saw Ron Graham use. He is a distinguished researcher from the old Bell Labs, a world-class juggler, and a much sought-after speaker. When you set a transparency on the overhead projector you usually put your fingers over a section of the edge to line it up, and then withdraw fingers after it is suitably set. What Graham did was to cut out a piece of paper in the shape of his fingers and tape this cutout to the edge of the transparency so that when he removed his hand and stepped back and proceeded to carry on with his speech his hand “stayed” on the overhead. Practically everyone in the audience did a double take and laughed. His “mistake” was leaving his hand behind! I have used this numerous times, in Kiwanis Club talks, classes, seminars, conference presentations, etc. It never fails to get a laugh, and there are times in ANY presentation when you need that, when you need a break, you need your audience to stop taking you and what you are about too seriously. The other slide Graham uses is one in which NO MATTER how he puts it up, or turns it, or flips it, there is something which reads backwards or upside down. You can produce such a slide using your copy machine, overheads and paste, or some computer software to reverse/invert some texts and images. He would try to respond, feverishly as one does when a slide is incorrect, to the calls of the crowd, “do this” “do that” etc., all to no avail, at which point he would simply chuck the overhead and say, “Well it probably was not important anyhow.” But again his mistake was important, it served at some point in his

presentation as an alerter, as a grabber, as a point of humor – something all of us can use now and then, be we presenter or listener.

Now for my own intentional mistake. When I was particularly anxious to be sure to announce a seminar to my students at the end of class I wrote the word “Seminar” on the upper right hand corner of the board. I put a box around it. However, in the fury of lecturing (I did a lot more of that in those days) I would erase the box and the word, “Seminar.” So, I would pause and remount the reminder, by writing “Seminar” and boxing it in the upper right hand corner of the board. As I was in the fury of the last theorem being proved, I again erased the word and the box for the last of many times during the class. Then after the last “QED.” I proceeded out the door. “Wait,” the students said. “What about the seminar?” They were asking me about the seminar I was supposed to announce to them. They wanted to know what it was all about. So I told them. But they were very much aware of what was being erased and redone through out the class. It got their attention, it piqued their curiosity, and it gave me an idea. I would consciously make this mistake when I had such an announcement to make, e.g., throwing a pizza party for the class, a test(!), a class drop for a project, etc. By making the mistake, over and over, during the hour class, of erasing the message and re-doing the message I could get them to ask about the message. To this day I use this technique. This “mistake” works EVERY time.

## **Conclusion**

I realize in reading these (and you may too) there is the “Duh” effect on some of them, but the important fact is that these mistakes are made by informed, rational beings, who are trying to do the right thing, but perhaps have a momentary, slipped link somewhere which permits bad things to happen. Perhaps the Situation is Normal and All Fouled Up (SNAFU), but it is not the end of the world, the situation can be remedied. Most importantly, it is an opportunity to learn, and the good news for me is that I have had lots of such learning opportunities, only a few of which I dared to share with you .