Sixty, Female, and Tech-Savvy: One Educator’s Journey

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By Chris Macfarlane

It was a serendipitous moment – one I would have never predicted; yet it created a tidal wave of reflection about my career as an educator and corollary expertise in technology. Breakfast, coffee, and the chance to work away from my office for a few uninterrupted hours sounded perfect. I settled into a small table by the window, opened my laptop, laid my smart phone where I could see/reach it (my wireless earpiece in place), and began to tackle email.

The cafe crowd dwindled. I was concentrating – so much so, I was a little unnerved when a voice beside me said, “You look very nice today.” I turned to see a woman about my age kneeling beside me camera in hand. Not quite sure, I responded, “Thank you.” She asked if she could take my picture. I must have given her a quizzical look because she quickly followed, actually stammered, to say women of our age weren’t usually thought of as being so comfortable with technology. I somehow defied this view.

She was a feminist. She liked to take pictures and was especially motivated to take pictures that could serve as role models for young women. We decided on a non-posed picture. After realizing I was also a professor, she snapped my picture and was gone. In less than 5 minutes I’d been reminded of several perceived stereotypes encountered in my lifetime: female, educated, mature, and technology skilled.

First, am I, in fact, a role model for young women? And, if they need role models, in what areas or ways should we provide role models? Are women considerably less visible in STEM (Science, Technology, Engineering, Math) fields? While more than half of undergraduates are women, we still lag in geosciences, mathematics, and physical science, although degrees in social sciences and life sciences have increased significantly [1]. Unfortunately, the number of women earning degrees in computer science, computer engineering, and engineering has plateaued or dropped since 1984 [2]. The effect is compounded by our increased need for a workforce in a technology-oriented society. Further, women who enter STEM fields, leave sooner than their male
counterparts resulting in a significant lack of women in higher-level positions [1]. I would also posit, we need educators who can teach in a technology-oriented society and prepare a future workforce.

The truth is I am a role model; however, I am not in a hard-core scientific field. I am a special educator who prepares teachers. Throughout the course of my career, though, I’ve developed, utilized, and taught others about technology. The question I’ve been asking myself is whether this is enough or not?

During 1983-1984, we began to experiment with the use of computer technology with one of my students, a 12 year old with severe cerebral palsy. He used his eyes to communicate yes/no, but we all knew he had more to say. One of the classroom consultants gained access to a TI-99 home computer with a speech synthesizer (Texas Instruments). Using a cassette tape recorder as a linear drive (32K), he developed a communication program for Doug. Doug pushed any key and the computer talked. The first time he pressed a key and told one of his peers to “bug off,” he laughed hard; I had goose bumps. Several weeks later at the Christmas program, his mom cried when he pressed the keyboard and sang, “Tomorrow, tomorrow, I love you tomorrow.” I knew tomorrow had arrived for students with disabilities and technology would become the great equalizer.

I left the classroom at the end of that year and began my doctoral studies in the Department of Special Education at Utah State University (USU), intent on learning as much about assistive technology as I could. Dr. Alan Hofmeister had received a leadership grant from the US Department of Education to train doctoral students in the use of microcomputers in education. Computer scientists were not knowledgeable about education and educators were not knowledgeable about computers. The idea was to create a cadre of special education leaders who understood computers and how to use them in education.

In addition to working on technology-related research projects, we were required to take courses and participate in a weekly seminar. The first and primary lesson we learned was that the promise of computers in education was not to replicate current paper and pencil tasks. Instead, we were to think of technology as a tool that could improve instruction and create more powerful learning opportunities for students.

My second lesson came in an undergraduate computer science course. Learning program languages did not come easy and I failed the first test, a definite first for me. The 18-year old males in my class got it. I did not. When I met with the professor, the only empathy he offered was having failed his first test in an undergraduate computer class while a doctoral student – the move from electrical engineering to computer science had been hard for him as well. What he said next, though, was golden. He explained computer scientists really did not know how to teach computer programming. Besides, computer languages were evolving and having learned one, you would probably need to learn more. Thus, learning to program was more about the ability to learn on your own. The most successful programmers were students who could teach
themselves or problem-solve. I've never forgotten that insight and I did pass the course. In doing so, I learned to read documentation, poorly written or not, ask others, watch others, and experiment with assurance that I should always save, create a back-up, and keep notes and I really couldn’t blow up the computer. The worst thing that would happen, at least in my world, was unplugging the computer in order to start all over. That was my fail-safe reset button.

Opportunities presented themselves during my doctoral studies and eventually led to research positions at USU. I co-authored three expert systems, two funded by federal grants. I was the knowledge engineer on those two expert systems and developed and validated a methodology for determining the content validity of a knowledge base as my dissertation. I provided pre-service and in-service training, wrote manuals, and conducted research on these expert systems. I also wrote a computer-assisted testing system for one of the department’s courses. Eventually, I moved into a faculty position and taught the assistive technology course. In addition, I published and presented on technology topics.

One other facet of my USU experience was teaching at the extension campuses. The experience of flying in a small airplane with 3 to 6 other instructors over the Uintah Mountains with all the nuances of the jet stream and changing seasons was unforgettable. I once experienced what felt like 3 seconds of weightlessness as we encountered severe turbulence. During the winter, I needed matches to warm my key enough to unlock my truck when we returned sometime after midnight, if the fog didn’t force us to land a canyon’s drive away. Thus, when the opportunity presented itself to teach via the early electronic distance learning system (two-way audio; slow-scan, 15-second delay video), I immediately said, yes. Despite a less than optimal learning environment, I reached students throughout the state, saved time, and saved nerves. I was hooked.

In 1991 I arrived at the University of Northern Iowa (UNI) to coordinate the Mental Disabilities Program and begin a tenure-track career. Interestingly, I was back in a small airplane within a year flying to western Iowa.

Consequently, when I learned the state of Iowa was building a statewide fiber-optics network with two-way audio, two-way, real time, full motion video, I immediately met with administrators. I began teaching on the Iowa Communications Network (ICN) fall 1993. When I left in 2000, I had logged more hours on the ICN than any other faculty member. I also developed strategies for supervising at a distance.

The ICN classroom became my research lab. The television monitors resembled computer monitors and I realized I could put the tenets of well-designed computer instruction to work in the delivery of distance learning. US congressman, foreign scholars, fellow faculty, and university administrators observed me teach and demonstrate the capabilities of the system.

My students vicariously learned about technology in their special education courses. I worked diligently to utilize technology in all my class and encouraged/required my students to utilize
technology when teaching students with disabilities. I continued to write and present on technology.

In 2000 I came to Pacific University to develop and implement a special education program. I continue to approach technology in education from a problem-solving perspective and as a means to improve learning. In addition to teaching pre-service teachers about assistive technology, I also teach a technology class. I have learned to podcast and use other forms of distance learning. Recently, I observed one of my students teach using SKYPE as the video interface. It was awesome.

Having come to a reflective point in my career and prodded by a stranger in a coffee shop, I realize I’ve never stopped learning about technology and thinking about how I might use it to promote/foster learning and provide equity for students with disabilities. Each and every time I teach, I am a role model.

I sincerely hope Dr. Hofmeister’s vision of computer-savvy special education leaders created the far-reaching sphere of influence he sought. While not a STEM field, I am inclined to think the applied use of technology within education serves the greater good. And, somewhere, out there is a picture of a white-haired lady, comfortable with technology, defying stereotypes and, hopefully, encouraging someone to think.

Endnotes
