# EDITORIAL

## It's music to my ears

***Greg Goetchius**, Contributing Editor*

I have been reading, with great interest, amusement and concern, the last several editorials by my esteemed colleagues at S&V regarding the state of engineering education. The words written here have had a profound impact on me and caused me to reflect on my own education and my subsequent career in the world of sound and vibration.

What I can say about my own particular experience is that *I survived despite my education*. I applaud the undergraduate program at the University Massachusetts Lowell described by Pete Avitabile. But, it is a far cry from the undergraduate program at my *alma mater* (it shall remain nameless; send me an e-mail if you'd like to know).

My undergraduate program prepared me for graduate school. That's it. No more. Ironically, when I finally did get to graduate school, pursuing a Masters in Mechanical Engineering, I found myself in a course concerning the fatigue of metals. I was embarrassed to admit to the professor that I did not know what a Goodman Diagram was, nor did I have any formal education in the (mostly empirical) field of metal fatigue. He was appalled.

Later, I approached the dean of engineering at my undergraduate school and relayed this embarrassing experience to him. His response was typical of a "higher institution:" He said, "We have made a conscious choice here at the university, to follow a more theoretical curriculum. We feel that teaching the fundamentals in theory provides the basis upon which all other learning is possible. In fact, most of the empirically based disciplines (included metal fatigue) can be learned once you have a job in the industry. We don't teach that here . . ." or something to that effect. In other words, "get out of here kid, you're bothering me."

I'll admit that my theoretical background is strong and has helped me in my career in sound and vibration, although the last 20 years in industry has dulled my memory of most of it. But I had very little practical, hands-on training as an undergraduate. In fact, my undergraduate education had absolutely no specific curriculum on sound and vibration, data acquisition, etc. Yet I'm still doing ok as a professional in the field. How did this happen? The answer has two parts – one part luck, the other part personal initiative.

I was lucky to somewhat accidentally fall into an assignment early in my career at a major automaker, where my main job was to perform experimental modal analysis on body structures. I consider this lucky, because in hind sight, I firmly believe that learning the basics of modal analysis gave me the foundation for all future sound and vibration learning that I eventually acquired. Secondly, I felt a very strong, intuitive connection to the whole world of noise and vibration because of my lifelong passion for music. Classically trained in piano, playing electronic keyboards in rock bands was my idea of fun outside of work. Somewhere in the first year of learning all about modal analysis, it hit me how much it all made sense, and everything I knew about musical tones, scales, timbre, dissonance, frequency, etc., fit perfectly into this new discipline I was learning at work. Funny, I'd never thought of this before.

Once that connection in my mind was made, my appetite for learning increased exponentially. Much to my surprise (I was originally headed for engine performance engineering), I really enjoyed it! I began to treat the act of driving an automobile the same as playing a musical instrument. It is a real-time, interactive activity, there are inputs from the driver/musician, the instrument responds in a (hopefully) pleasing way, and so on. The noises and vibrations made by a car in operation were 'music' to me and I thoroughly enjoyed studying them, improving them, and ultimately making the automobile a fine instrument to play.

The connection in my mind between music and industrial sound and vibration engaged my desire to learn and gave me problem-solving skills that I may not have achieved had I chosen a different mechanical engineering discipline. Twenty years later, I am still challenged and excited by the opportunity to solve noise and vibration problems.

Here is my point in sharing all of this – the educational system can only do so much in preparing students for real-world challenges in industry. Let us never forget that most of the success or failure of any education rests solely on the shoulders of the students themselves. Professors can only teach; students choose to learn. Good educations can be squandered by poor initiative, lack of desire, and bad choices on the part of the student/engineer. Bad or incomplete educations can be overcome by the will of the student/engineer to learn and to never stop learning.

You may ask, how do you make someone want to learn? Ah, yes, the impossible question facing all educators. I cannot claim any general wisdom in this area. But I can only look at my own experiences and say that I chose to learn because I found (or it did it find me?) a professional discipline that provided me deep personal satisfaction and great joy.

Is it the role of our educational institutions to help engineering students connect their technical training with their personal passions? How about the companies that hire these young engineers? I'd like to think so in both cases, but I don't see a lot of that happening, and it is certainly not discussed on these pages in great length. I know that there are career counseling activities at most institutions, but I have not personally seen many that are very effective (my undergraduate program was a joke) and most professors focus on teaching the subject matter.

So where do you fit in? Let's help these students and young engineers make good choices so that they connect with their work in a way that makes them want to learn. Then, their contribution to the world of engineering will be beyond measure. SV

The author may be contacted at: greg.goetchius@matsci.com.