Lessons Learned

In this issue, JAB is starting a series of editorials from highly impactful faculty and researchers on “lessons learned” throughout their careers or lives. The hope is that the rest of us can benefit from their experiences. I would like to thank these individuals in advance for sharing their thoughts with us. I hope you enjoy their editorials as much as I will.

—Michael Madigan, Editor-in-Chief

I retired from my position at the University of Massachusetts Amherst in May, 2016 although I continue to work in the Biomechanics Laboratory and now doing research that I always wanted to do but, for various reasons, could or did not do. However, I do have more time now to think about the lessons that I have learned over the last 40 years. Quite often, I meet and talk to young researchers at conferences, and I am often asked what lessons I have learned over the years. With this editorial, I now have the “soapbox” to respond to these questions. Obviously, I cannot talk about the many lessons that I have learned because there are so many, but I will discuss just a few here.

The major lesson that I have learned over the years is that the radical changes in equipment in biomechanics laboratories do not always mean that the research done now is better than it was when I was a student in the 1970s. Thinking back to when I started my graduate work in 1976 at the University of Oregon, the changes in equipment now available have been phenomenal. Most laboratories in the 1970s had the facility to collect and analyze kinematic data, but kinetic data were different because few laboratories had force platforms. Professor Roger Enoka of the University of Colorado, in his recent Borelli Lecture at the American Society of Biomechanics meeting, suggested that only about 10 laboratories in the United States had access to a force platform in the 1970s. Regardless of the equipment, researchers made do, and many landmark studies were published at this time. The equipment that has been developed leading up to today is light-years ahead of that used in my formative years in biomechanics. The time it takes now to collect and analyze data is significantly shorter than that 30 years ago. However, this new equipment has not changed the main thrust of research. The “lesson learned” here is that we still need to ask good research questions that are hypothesis-driven. Whether the equipment we used many years ago or the equipment we use today, the research question asked is paramount. A bad question with no hypotheses is still a bad question regardless of the sophistication of the laboratory equipment use. Developing a research question requires a thorough understanding of the literature and helps the young researcher to develop a focus on a line of research. Research studies are never done in isolation. One study leads to another and so on, thus forming a “focus” of research.

An important lesson that I learned early in my career is that, to be a competent researcher, you must continue to learn whether it be new research techniques, new methods of analysis, or new

statistical procedures. It is imperative to understand that you do not stop learning when you complete your doctoral work. Shortly after completing my PhD, I was at a conference and met Dr Alf Thorstensen, a professor at the Karolinska Institute in Sweden. He told me that he spent the first hour each day reading research papers from the literature. I adopted this idea, and I think it is a good “lesson learned.” Reading the literature keeps a researcher abreast of what is current in the discipline and often helps to develop new research questions.

I also learned early in my career that attending professional meetings (ie, American College of Sports Medicine, International Society of Biomechanics, American Society of Biomechanics, Canadian Society of Biomechanics, International Society of Biomechanics in Sports, etc.) is essential for the development of a young researcher. By interacting with senior researchers from other institutions, particularly if you both have interests in common, you can refine some thoughts on your research focus and possibly get new ideas for studies. Many years ago, a conversation that I had with Professor Benno Nigg of the University of Calgary at an American College of Sports Medicine meeting made me think differently about the nature of the variability in the measurement of human movement. This meeting led me to develop a new line of research on coordinative variability. In addition, professional meetings also provide opportunities for collaboration.

A lesson that I learned over the years is that biomechanics trains individuals for many types of jobs. I had always thought that I was training PhD students for a career in academia. Now, I am asked, “what type of job should I aim for?” There is obviously no correct answer to this question; at least not one that I can give. I suggest to young researchers the following question: “Do you want to work in industry or academia?” As I have never worked in industry, I really cannot answer this question. Another question is “Do I pursue a job at a research-intensive university or a less research-intensive teaching college?” Once again, this is not a question that I can readily answer as I have always worked at a research-intensive university. The lesson that I learned is that each person is an individual, and the decisions that they make are also individual. I offer the advice that they should consider the type of environment in which they will feel most comfortable and an environment that is conducive to their work–life balance. As unsatisfying as it may seem, I can only describe my experiences and what I felt was important to me throughout my career, and I hope that the questioner can relate to my experiences.

Although the lessons that I learned over the years may seem trite, I hope that my experiences presented here can be helpful. However, I also hope that young researchers take less time to learn these lessons than it took me.

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