I recently got a note on LinkedIn about the usefulness of a book I referenced in one of my previous Metrologist articles. It’s nice to know these articles are valuable! I recently instigated a thread in a Facebook group about metrology text books and asked; what books would you recommend to instructors as good texts and whether the books will be more likely and useful as e-books or as traditional hard copy. These two items got me thinking about professional development, networking with other educators, and about what I have been reading. I hope to get you thinking about these things too.

**Professional Development of Trainers**

My initial thought to share is that professional development for educators and trainers has to go beyond subject matter content. Let me digress for a moment and take a look at the IACET criteria (our benchmark for our continual improvement in training, and training excellence efforts). In my opinion, to be a good instructor, you need to have ongoing interactions with other educators. It helps to share best practices and have peer reviews. We need to continue professional development in adult educational concepts and methods (andragogy versus pedagogy) in addition to subject matter content. It is critical to have an ongoing professional development plan that addresses qualifications as a subject matter expert and as an adult educator. Key aspects of the IACET criteria include qualifications in program planning and instruction and participation in professional development and training activities to maintain competency in subject matter material and in learning methods.

NCSLI has provided opportunities at the annual conference to obtain training through Train the Trainer tutorials. Of course we have many opportunities to develop our subject matter expertise. We have another Train the Trainer tutorial scheduled this year in Sacramento. We also provide resources and references in our Training Aids Library that are free for members to check out. This regular column is another tool for ongoing professional development as a trainer.

**How are you connecting?**

NCSLI provides excellent opportunities to interact and network with other metrology subject matter experts. We have LinkedIn and Facebook sites for engaging in the community. As trainers, interacting with other educators and our own self-study can often be as valuable as formal education and training courses in educational concepts and training methods. If you are a trainer I would encourage you to get connected on LinkedIn or Facebook and join in the discussions. On LinkedIn, we have a subgroup on metrology education and training under metrologically speaking. On Facebook, you can search metrology education. I would also encourage you to get involved with professional educational associations such as the American Society for Training and Development (ASTD) or the International Society for Performance Improvement (ISPI), both of whom have local section meetings and groups on LinkedIn. I also found a local ISD CoP (Instructional System Development, Community of Practice) where they have interesting presentations and sharing of best practices locally and on a quarterly basis. I learn new ideas at every meeting and make some great contacts.

**What are you reading?**

I wanted to share four of my current favorite publications that you might be interested in reading. Two of them tie together our metrology subject matter and educational methods. Two are more related to the management of the training function and the partnership among the manager, trainer, and learner and the design and development of training content.

*Introduction to Measurement in the Physics Laboratory*

This is my latest favorite reference and I’ve already shared it with quite a number of other metrology instructors. In my experience it presents uncertainty training at the level that many people need – not just entry level engineering and physics students – although that is who the material is targeted for. This material is by Andy Buffler and Saalih Allie, Department of Physics, University of Cape Town, South Africa and Fred Lubben and Bob Campbell, Science Education Group, Department of Educational Studies, University of York, UK, 2009, and is available free online www.phy.uct.ac.za/people/buffler/labmanual.html. The authors’ associated research is also available and extremely interesting. My favorite thing about the material is that it
provides simple explanations, practical hands-on experiments that anyone can do, and addresses compliance with the Guide to the Expression of Uncertainty in Measurement (GUM). I have found it pretty rare to find university materials that use the latest International Vocabulary of Metrology (VIM) and the GUM. This is a refreshing read and may give trainers some creative ideas for their next uncertainty training session. It is also something I recommend to engineering professors when they ask about applicable or useful texts to integrate into their current courses.

*Train the Trainer*

I found this book while researching effectiveness of “active learning” and “project-based learning” in lieu of traditional lecture-based instruction. I was researching this topic because I have found that there is data to suggest that lecture-based courses produce results essentially comparable to self-study. That was not very encouraging to me; or anyone who does a lot of lecture-based teaching (think conference sessions!) This book is by Randall D. Knight, California Polytechnic State University, San Luis Obispo, and is published by Addison Wesley Publishing Company, 2004. The book is a little on the heavy side in terms of educational research in teaching physics. But, that was okay for me because it is written in an easy-to-understand style. Further, the research to support shifting from a lecture-based classroom to a more effective active learning is supported with additional references and a lot of great ideas. What is most wonderful about this book is that over 80% of it provides specific examples of applying active learning to specific physics topics such as vectors and mathematics, waves, current and conductivity, quantum physics, and so on. Each chapter of specific topics covers a number of sections, including learning objectives, teaching approaches, how to use class time, and example quiz or discussion questions.

*Transfer of Training, Action-Packed Strategies to Ensure High Payoff from Training Investments*

This book is a classic in managing performance improvement. It is one of the original source texts that is referenced and covers the concepts of a partnership between the manager, trainer, and learner. If you read the article in the October issue of Metrologist, by Maria Chilcote, and were interested in learning more about a partnership model, this book provides a more extensive treatment of the topic. It is by Mary L. Broad and John W. Newstrom, and published by Addison Wesley Publishing Company, 1992. I ended up buying a used copy through Amazon since it was a little more expensive than I wanted. From a manager’s perspective, the book will provide some ideas for how to ensure that the training you approach will achieve the performance goals you need in your organization. From a trainer’s perspective, it will give you some ideas on how to best partner with the learner and his or her manager. It is more about how to improve the impact of training and performance management than how to teach. My thought is that it is more valuable for training directors, managers, or someone seeking to ensure that training is implemented effectively.

*ISD From the Ground Up, A No-Nonsense Approach to Instructional Design*

This book is by Chuck Hodell, ASTD Press, 2006. Instructional system development (ISD) is a body of knowledge for training developers. The book covers the basics of instructional systems and the ADDIE model, which we have covered here before, but to review: Analysis, Design, Development, Implement, Evaluate. It also covers more advanced topics such as analysis of training content and effectiveness and quality rating of lesson plans. The book comes with a CD-ROM with additional lessons and references and is used as a text for the ISD graduate program at the University of Maryland, Baltimore County where the author is an associate program director. I have personally used this book in developing new courses and content and when sharing ideas about the ADDIE model with...
other metrology trainers who do not have a formal educational background in ISD. Since many of us conducting metrology training don’t have a formal education in ISD or in Education, and since we also don’t have the luxury of having extra staff who trained in ISD, developing the knowledge and skills in this field can improve our training efforts. This is a core working book on my shelf.

**Final Thoughts**

So, give some thoughts to your professional development as a trainer – both formal and informal. How are you connecting with other educators and trainers? What best practices are you sharing with others? What are you reading? What are your favorite references? Are you going through the motions as a trainer or are you working to improve your effectiveness with each and every course? Let me know what you’re thinking about trainer needs and what you’re reading – join me on LinkedIn or Facebook and engage in the conversation.

gharris@nist.gov