

An Education in Standards

An interview with Jay Bhatt,
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Q How does your background shape your work as an engineering librarian?

A I have a background from a variety of disciplines. I have a graduate degree in electrical and computer engineering, but I also have master's degrees in education, instructional design and library and information science. This background helps me provide research and information skills to our faculty and students. I have done research, which helps me to understand their needs and how they go about finding information. I am also involved in different projects, whether it is teaching or helping students to find information – or working with researchers, Ph.D. students, and graduate students.

Q In what way do standards factor into your work in engineering?

A I'll respond to this question based on the Accreditation Board for Engineering & Technology (ABET) criteria. Their Criterion 5 (Curriculum) requires students to have “a culminating major engineering design experience that 1) incorporates appropriate engineering standards and multiple constraints, and 2) is based on the knowledge and skills acquired in earlier course work.”

As a result, students and faculty require a lot of information about standards. A professor once emailed me to ask about teaching standards in a course on experimental mechanics, which concerned manufacturing, 3D printing, and

standards for drones, including their safe design, weight and cost, and effectiveness. Biomedical engineering often requires students to refer to orthopedic standards, and students request ones such as the standard practice for care and handling of orthopedic implants and instruments (F565). We have a big research initiative on nanotechnology-related disciplines, which is quite interdisciplinary in nature. We have non-destructive testing requirements. Of course, we have concrete standards for civil engineers.

Q As an educator, how do you help students gain a deeper understanding of what standards are and why they matter?

A Students must not only know how to find the standards, they must also understand the mechanisms of the standards. Many times, what happens is a faculty member tells students “Find standard F565 for me,” and the student has no idea what that means. If they come for a consultation, I spend time explaining how those standards are created, what F means within F565, and so on.

Developing this understanding is very important. From the education perspective, it is not just telling them “Go to ASTM or go to ISO and find the standard.” It is about understanding the process of why they need a standard, what they are going to test with it, and how they are going to be satisfied that what they are designing meets the specifications.

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It also helps them to understand the ethical implications of their project. Many times, engineering failures happen because people have not used appropriate standards. There's a lot of literature that shows why unethical practices have facilitated so many failures. That becomes a part of the educational process. It requires a lot of collaboration between faculty, students, libraries, and even corporations.

Q You have been an active participant in the broader standards and research community. What led you to be passionate about this work?

A I really enjoy working with ASTM and have learned a lot from them. It has been productive to converse, exchange ideas, and brainstorm with experts. They really gave me an excellent perspective on how critical it is for researchers to be able to find and discover standards.

In the Special Library Association (SLA) engineering community and the science and technology community, members use standards, and they in turn are also working with their respective constituencies, whether it's corporations, educational institutions, or organizations. It really helps in spreading knowledge from the SLA perspective.

In the American Society of Engineering Education (ASEE), we are very active as engineering librarians to teach, understand, and apply knowledge of standards. I have collaborated with librarians from different universities across the U.S. It really helps to make our vision broader. We learn from each other. It has just been a wonderful experience for me as I have developed insights into the process and have continued to evolve and learn many new things as time goes by.

Q You've maintained a professional interest in accessibility. How does the question of access to information relate to standards development and use?

A Access to standards is very important. It is a question of how to make sure that critical standards are available to faculty and students and researchers working on projects in a cost-effective manner. The need for these standards is going to increase more and more as new initiatives and designs are evolving.

One interesting thing I would like to point out is recently one of our students asked for historical ASTM standards. It was critically important for them on the project they're working on. I reached out to ASTM staff. They were able to find those standards and send them to us. Sometimes students may have the need for historic standards, and we need to have those needs met. Researching information in databases like Engineering Village to understand historical developments is also very important.

Q The COVID-19 pandemic changed how we approach education and research. How was your work impacted by the pandemic, and what are key challenges and opportunities affecting research going forward?

A During the first few months when the pandemic started, I was getting emails from faculty. They were looking for a standard or working on a project that would help safety, even designing masks or protecting people from COVID-19. We had lot of questions and we were working remotely. Because everything was online, it was sometimes difficult. The questions were coming late in the night, sometimes at odd times, and sometimes they needed this information very quickly. We didn't even have time to schedule a Zoom session in some cases. The challenge was how to quickly provide information that was so time sensitive.

The digital environment truly helped. At the same time, it also required the researchers to become familiar with our website. We started creating video tutorials immediately, including an ASTM standard video tutorial. They were published to make sure that our researchers, faculty, and students were able to access them anytime.

These challenges and opportunities are beneficial over the long run because students now have a way to access information virtually. The digital environment has helped and will continue to evolve. Students will be able to access standards online from wherever they are.

At the same time, face-to-face education is still important. This quarter, we have started doing face-to-face teaching sessions, and I can see the difference. Many students are not willing to ask questions in a virtual situation, but somehow are more comfortable asking questions in a face-to-face setting. Informal learning – connecting with students, having them ask questions and asking them questions, having dialogue – that is really helpful. That's why I feel the hybrid environment is becoming more and more important as new technologies are created. ■



Jay Bhatt is the engineering librarian in the Scholarly Connections Department at Drexel University. He holds master's degrees in library and information science, education, instructional design, and electrical and computer engineering. He is involved with the American Society for Engineering Education, the Special Libraries Association, and ASTM, where he serves on the committee on publications.