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Feature



A Standards Education Snapshot

by Donald Purcell

Standards generally go unnoticed. They are mostly quiet, unseen forces, such as specifications, regulations and protocols, that ensure that things work properly, interactively, and responsibly. How standards come about is a mystery to most people should they even ponder the question. (1)

DNA is one of the essential building blocks of life, and yet very few individuals understand the significance of DNA or the role that it plays in everyday life. Standards perform a function similar



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Next month: A Standards Education Roundtable

to DNA s by providing the essential building blocks for economic, political and social networks. Indeed, standards have the potential to control the future of entire industries on a global scale. And yet, the role standards play in everyday life is not well understood, not only by laypeople, which is to be expected, but by future standards developers and users graduates of business, engineering, and law programs.

As a way to help remedy this situation, the Center for Global Standards Analysis was formed in 1999 as a non-profit corporation located at The Catholic University of America (CUA) in Washington, D.C. The center s purpose is to create global standardization education programs for university graduate students, associations, corporations, government departments and agencies. (2) From 1999 to 2001, the center offered a course on Strategic Standardization to graduate engineering and law students. Experts from standards development organizations, associations, corporations, government departments and agencies, law firms, and testing laboratories were brought in as speakers to help support the course.

Additionally, members of the center have given lectures and presentations on standards education issues to associations, corporations, government departments and agencies, and standards development organizations from around the world. In 2001, the center co-sponsored a joint standards education conference with George Washington University.

Standards Education Survey

In the fall of 2002, the center s board embarked on a survey of individuals experienced in the development of private sector voluntary standards. In part, the survey was motivated by a decision in the fall of 2002 to discontinue the joint course on Strategic Standardization because of insufficient registration. (Note, however, that the course will be continued this fall at the CUA School of Engineering.)

The purpose of the survey was to gather information, ideas and concepts to help facilitate the development of standards education programs in the undergraduate and graduate academic environments as well as continuing education programs provided by employers. Each board member contacted at least 10 individuals and requested their participation. Participants in the survey included individuals from standards development organizations, associations, corporations, government departments and agencies, and testing laboratories. Of the 75 individuals contacted, 53 responded. Participants in the survey tended to be very experienced standards practitioners.

The center's Standards Education Survey was published in March 2003 and is available on its Web site. (2) The survey's three major conclusions are:

The United States continues to rely on an informal education and training system concerning the development of private sector voluntary standards.

A very strong consensus exists for the development of a multi-disciplinary approach to standards education.

Fairness is critical to the standardization process.

Comments from Participants

One of the best ways to express the current condition of standards education in the United States is to use the language provided by those professionals who participated in the survey. Typical comments are the following:

College graduates come to industry with virtually no understanding of standards and are thrust into positions that require them to use and understand these documents daily. In most cases, older more experienced engineers that also had little formal training in the standards field mentor them. Poor practices are then handed down from one generation to the next. To break this cycle it is critical that education be done in the universities where our technical people will come from. Industry invests thousands of dollars in the standards process and needs to see a return on that investment. The benefits are enormous, but like any proposal it has to have a sound business plan that quantifies the return.

The history of my involvement in the development of standards is to rely on others for technical expertise. A technical understanding of the product for which a standard is being developed is necessary, but the engineers that design the product are the real experts. My experience indicates most of the engineers I'm referring to do not get involved in the standards development process itself. They advise rather than attend the standards meetings.

Unfortunately in the U.S., legal issues have quickly become one of the highest priorities to consider when developing a standard. Consideration of the language used within a standard is now more critical than it was 20 years ago.

The [standards] environment is evolving at an unprecedented rate. The dynamics of SDOs, corporations, and governments are going to be interesting to teach in such a course!

What Are the Next Steps for Standards Education?

So what should academia and standards developers do to answer the call, apparent in comments such as these, for a more formalized approach to education? In the United States, the development of standards education programs is likely to remain firmly in the hands of standards practitioners for the foreseeable future. This de facto policy is consistent with the sector-based management philosophy of the diversified U.S. standardization system. One of the significant challenges for a practice-based education system will be to develop and sustain a multi-disciplinary approach to standards education.

In survey questions seven and eight, the survey sought the perspectives of participants on the need for a multi-disciplinary approach to standards education. Participants were given the choice to indicate whether they believe a multi-disciplinary approach is necessary, and whether one or more of the following subjects should be part of a standards education course:

- Standards process;
- Policy issues;
- Legal issues;
- Regulatory issues;
- Trade issues;
- Technology and engineering issues; and
- Access to standards.

There was an overwhelming response from participants for support of a multidisciplinary approach to standards education.

In survey question 7, 95% of the respondents saw the need for such a course at the university level, and in survey question 8, 81% saw the need for such a course for employees. To create a multidisciplinary course, those involved in the development of such a course should carefully consider the appropriate balance of standards education issues best suited to meet the specific needs of university students or professionals that will participate in the program. The philosophy, one size fits all, will not work. For example, technology and engineering issues may be particularly important in a given program while regulatory issues may deserve special attention in another program." [From the text of the survey results; see Reference two for Web site address.]

An important management challenge for standards development organizations, and participants in standards programs, will be to identify multi-disciplinary education features best suited to the

needs of their specific standards program. Although the academic community will play an important role in standards education, it is likely to be a supporting role. Creating a university standards education course is likely to be more effective through offering a short term course for senior executives in an executive management program, including one or more lectures in an existing course, or creating individual education modules rather than through a standards education course that lasts an entire semester. For example, a course on cyber law at CUA's Columbus School of Law now contains a lecture on global standardization and its effects on the Internet. While semester-long courses will continue to exist, they are likely to be an exception rather than the rule. The use of Internet technology is likely to help facilitate the development of standards education programs.

One of the roles the academic community may play in the development of standards education courses is to constructively challenge and improve any standards education programs that may be developed by standards practitioners. The academic community may, for example, be helpful in defining which multi-disciplinary features of standards education are relevant to a specific standards program from a public policy point of view. The identification of potential applications of the National Technology Transfer and Advancement Act is one good example. In addition, educational institutions might be able to offer significant insights on how regulatory policy issues may be integrated into a standards project (e.g. the use of a voluntary standards program to address segments of health, safety or environmental concerns as part of an overall regulatory program).

In the final analysis, standards education programs will reflect the increasingly complex nature of standards development activities taking place on a global scale. Standards education programs will change, expand or be modified as necessary in order to address emerging economic needs in an increasingly diverse global marketplace. In real economic terms, there is no choice but to do whatever is necessary to improve the effectiveness of standards education programs because the potential economic consequences are so significant. As W. Edwards Deming reminds us, "If you control an industry's standards, you control that industry's lock, stock, and ledger." (3)

Article References

- (1) See Congressional Office of Technology Assessment Report, *Global Standards: Building Blocks for the Future* (1992).
- (2) For a discussion of the center's formation, see the articles in *ASTM Standardization News* (September 1999), and *Standards Engineering* (June 1999). For further information on the center, the

course for Strategic Standardization and lectures given in the course, please consult [the center s Web site](#).

(3) See Out of the Crisis, by W. Edwards Deming, page 302 (published by the Massachusetts Institute of Technology, 1982).

Sidebar

One Example of Cross-Disciplinary Standards Education in the Academic Environment

Student Comments on Catholic University s Standardization Course

From 1999 to 2001, a course on Strategic Standardization was offered on an experimental basis at Catholic University of America. It was the first graduate education course sponsored jointly by the School of Law and the School of Engineering. During the time the course was available, the Schools of Law and Engineering made a significant effort to promote the course to all CUA law and graduate engineering students, national engineering societies in Washington, D.C., and the Washington, D.C., Consortium of Universities. (1)

In three years, 14 law students and four engineering students attended the course. The course was offered in a seminar format that provided an opportunity for a number of expert standards practitioners to make presentations on a variety of legal, policy, technology and engineering subjects. In short, the course offered a broad multi-disciplinary education environment staffed by experts in standardization. (2)

As with the main survey described in these articles, the comments of a few of the students questioned offer the most eloquent glimpse into the advantages of a multi-disciplinary standards education program. To gather these comments, the author contacted several former students and posed the following questions

1. Did you find that the course on Strategic Standardization contributed to your academic education? Did it have value?
2. What are the significant lessons you learned in the course?
3. In your judgment, would you recommend that a college or university include a standards course in its curriculum? If so, at what level undergraduate or graduate?

The comments below are typical of those from students who took the course from 1999 to 2001.

Morgan J. Hurley, P.E., Technical Director, Society of Fire Protection Engineers

1. This course helped round out my graduate engineering education by providing insight into the interface between technology and legal and regulatory structures. Typically, knowledge of standards development may not be formed until engineers have an opportunity to participate in the development of standards. For many engineers, such an opportunity may not present itself until they have established a fair amount of seniority if such an opportunity ever presents itself. Courses such as this provide insight into how standards are developed and how standards can affect engineering practice, commerce, and liability.
2. How standards can affect commerce, and consequently, the duty that standards developers have to ensure that their standards are developed in a fair, open and transparent manner.
3. At most, if not all colleges and universities, undergraduate students are required to take courses in areas outside of their field of study. The goal is to make sure that college graduates are well rounded. Similarly, graduate engineering students should be required to study how technology interfaces with the real world. A course on standards would clearly fit this bill.

Pete V., M.B.E., former CUA graduate biomedical engineering student, currently an examiner in the U.S. Patent and Trademark Office, and studying for his Ph.D.

1. In a word, I found the course to be pragmatic. As an engineering grad student, the majority of the material in my coursework up until the standards course was theoretical, conceptual, and sometimes not obviously applicable to real world problems. The standards course was useful in the sense that even though it was light on math (which might be why some Engineering profs would guide prospective students away from it) it was heavy on the interactions of engineering products in the real world and the challenges (often legal) that the real world poses to implementation of those products.
2. What did I learn? I learned that theories in textbooks might be absolute and objective, but effective use of those theories in developing adequate engineering solutions must accompany consideration of real world issues (which are often legal and sometimes unforeseen).
3. I d definitely recommend it as a part of a more balanced engineering grad curriculum.

Jeffrey J. VanHooreweghe, former editor-in chief, Law Review, CUA Columbus School of Law; currently an attorney with the U. S. Department of Justice, Antitrust Division.

1. Yes, the course had tremendous value. The value was unlike the value of other law school courses in that it did not provide an in-depth education in a specific area of the law or train me to identify specific legal issues, but it provided a very good general overview

of standards and how law and business affect the development, implementation, and use of such. The value in this is that it provided an excellent big-picture understanding of what standards are and their purpose. This understanding is essential in practice when trying to analyze a legal issue that involves standards.

2. In addition to the general understanding of standards I mentioned above, Strategic Standardization taught me to analyze a legal issue that involves standards from many different perspectives, not just a legal one. It taught me the value of considering the business, technical, and policy reasons for the development of a standard or a company's use or non-use of a standard.

3. Yes. The course could be offered through a law school, business school, or engineering school, as it raises issues in each area. That said, I would recommend the substance of the course changing slightly depending on which school it is being offered through or on the students taking the course (e.g., focusing on legal issues if offered in a law school, or business issues if offered in a business school). I would strongly recommend that the course be offered only at the graduate level. I think that only after a student focuses his or her career in law, engineering, or business and begins to gain a better understanding of what law, engineering, or business really is can he or she appreciate such a course. What standards are, how they affect markets and business decisions, and how the law treats them was a total mystery for me before taking this course. I realized after the course and especially in my practice how important it is to understand these issues. I am very grateful for having been presented the opportunity to take the course, as it has proven to be very beneficial to my practice. Yet, I don't think it would have benefited me as much, meaning I would not have engaged in the subject matter to the extent I did, if I had taken it during my undergraduate studies before focusing my career in antitrust law.

Sidebar References

(1) See the [Consortium's Web site](#).

(2) For a discussion of the Strategic Standardization curriculum, see ASTM Standardization News, September 1999, page 28.

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