Teaching Standards to Engineers

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ABSTRACT

This article focuses on the training needed by technical experts, and explores the type of academic course work as well as training that they need in the field of standards and standardization.

Keywords: isology; standards education; standardization education

INTRODUCTION

Standardization has been practiced for a long time. Until recently, the people who attended standardization meetings were predominately trained in the technical field associated with standardization efforts. As the Internet has become more important to all of society, more people recognize the importance of standardization; some Internet standardization activities (e.g., ICANN) now attract significant nontechnical participation. Standards impact many fields (e.g., law, economics, business, etc.), and creating functional standards in every area requires experts in every area (termed technical experts). This article focuses on the training needed by technical experts, sometimes called engineers, and explores the type of academic course work as well as training that technical experts need in the field of standards and standardization.

Successful technical courses are quite different from successful nontechnical courses. Lucky (2006, p. 84) states:

We engineers are used to building on the foundation of a relatively small set of rules—Maxwell’s Laws are the proto-typical example—where everything can be reduced to the application of a few equations. This kind of ordered world fits very nicely into textbooks and test questions.
Some existing standardization courses focus on technical students successfully, but no existing standardization course describes standardization using a relatively small set of rules where the use of such rules allows inference into future system behavior.

The current focus of standards and standardization education is on standardization: the process of creating, implementing, or using a standard, usually with examples of different standardization processes. Such courses do not offer the student a theoretical basis to understand standards and standardization. A standard describes a concept or realization based on common agreements. The concept of a standard may be described by a small set of rules based on set theory (Krechmer, 2005). While learning about standardization is desirable, as it offers insight into the importance of standards in every technical and commercial field, this short article argues that academic courses would be better if they focused on teaching the theoretical rules that underlie standards and used specific standardization examples for demonstration that the rules function as proposed.

With the view that there are basic rules that systematize it, the discipline of standards and standardization is a science and thus can be termed *sology*: the science of standards. The author argues that studying the science of standards is an academic endeavor, while creating standards is a practiced skill.

**REVIEWING STANDARDIZATION EDUCATION WORLDWIDE**

In a 2003 European survey on standardization education, Acyl and Borde (2003, p. 2) state that:

> the survey shows that very little effort is done in Europe related to standardization training and Education [sic]. It also shows that although standardization is above all an issue of business more than a technical issue, Business Schools are not in general involved in any curriculum or session in a curriculum on this matter. More important, it appears a general feeling of lack of understanding about the subject itself [sic].

Courses with some standardization focus identified in this survey include IT security, quality engineering, and software engineering.

In a report on the standards education in Korea’s university programs, Kim (2006) indicates that a common standardization course is given in 35 technical universities and has achieved an enrollment of 2,639 spring-semester and 2,323 fall-semester students (roughly 100 students per course in 2005) with a good satisfaction rating from the students. Initially the courses suffered from low enrollment, but recommendations from previous students, some publicity, and the course being required by the engineering schools increased enrollment (D. Kim, personal communication, November 16, 2006).

A course titled Strategic Standardization was offered jointly by the School of Law and the School of Engineering at the Catholic University in Washington, DC, from 1999 to 2001. In 3 years, 18 students attended. The course was then discontinued (Purcell & Kelly, 2003).

In a U.S. engineering school survey in 2004 (Center for Global Standards Analysis, 2004), the major findings were as follows:
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