Education is the Key to the 21st Century

By Donald E. Purcell[1]

The 21st century is dominated by technology, science and globalization. Because the world of global standards and standardization systems directly affect virtually all world trade, it is of critical importance that individuals and organizations that participate in the development of complex global technology standards have and maintain multidisciplinary skills to be successful. The significant challenge for individuals and organizations is how best to develop and maintain these skills. *Education is the key to this critical question.*

Global Survey

To better understand recent standards education efforts, The Center for Global Standards Analysis ("Center") conducted a global survey from March-July this year. The following question was distributed by the Center to corporations, standards development organizations, government departments, universities and firms around the world – *Do Standards Education Programs Have a Strategic Value?* 11 major standards organizations, government agencies, universities and firms from China, Japan, the United Kingdom and the United States responded to the survey. *The responses indicate a unanimous view that standards education programs do in fact have a strategic value.*[2]

Significance of Standards and Standardization

Because significant global economic, political and social circumstances are being driven by technology, science and globalization, the Center anticipates a future which is more complex, competitively intense, and in which standards and standardization systems will play an increasingly important role.

Since 1999, it has been generally accepted that private sector standards and government technical regulations directly affect at least 80% of world trade.[3] In 2005, Congress estimated that private sector standards and government technical regulations directly affected at least $7 trillion (US) of world trade in 2003.[4] In a world dominated by rampant globalization that will remain so for the foreseeable future, technology standards play a critical role. (*The World is Flat*, Thomas Friedman (2005)).[5] Standards influence everything we do (UK National Standards Strategy (2003)).[6] Standards control markets (German National Standards Strategy (2005)).[7] Moreover, standardization is one of the most powerful sources of competitive economic intelligence

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[2] For a copy of the Center's survey report, send an email to donpurcell@strategicstandards.com .

[3] *See Regulatory Reform and International Standardization* (OECD 1999).

[4] U.S. House of Representatives Congressional Hearing: China, Europe and the Use of Standards as Trade Barriers: How should the U.S. respond? (May 11, 2005)

[5] http://www.thomaslfriedman.com/worldisflat.htm

[6] http://www.nssf.info/resources/documents/Guide_to_NSSF.pdf

[7] http://www.din.de/sixcms_upload/media/2896/DNS_english%5B1%5D.pdf

available (French Standardization Strategy (2006); Canada National Standards Strategy (2005)).[8] Put simply, the evidence is overwhelming that standardization programs offer one of the best, most important means to evaluate current technology and provide a glimpse of where future technology innovations may occur.[9] Standardization programs are indispensable for the strategic evaluation of technology and the analysis of competitive issues. In strategic terms, "If you control an industry's standards, you control that industry lock, stock, and ledger" (Out of the Crisis, by W. Edwards Deming, Advanced Engineering Center, MIT Press at 302 (1986)).

Purpose of Survey

For decades, most nations and industries have employed on-the-job training ("OJT") programs to address and resolve standardization issues. This global management tradition raises several significant questions related to the survey. First, given the growing complexity and intensity of globalization, can nations continue to rely on OJT programs? Second, it is expected there will be a significant demographic shift among individuals with significant standardization skills and experience in the near future (3-5 years) because of retirement. Estimates are that for some nations at least 50% of experienced standardization practitioners will retire in the near future.[10] This transition poses these significant questions: (1) how will the next generation be educated and trained to replace the current generation of standardization practitioners? (2) How will this critical standardization knowledge and experience be transferred to the next generation?

From the Center's perspective, standardization will continue to play a significant role in future globalization, indeed, the Center does not believe it is possible to reengineer the global marketplace without affirmatively addressing many complex international standardization issues. In addition, the Center does not believe that continued exclusive reliance on OJT programs will be successful, and that comprehensive standards education programs addressing the needs of the global marketplace are necessary. The Center recommends that all nations establish a combination of comprehensive standards education programs in their private, public and academic sectors.

The Center also believes that this survey and the recent International Standards Education Workshop held by the U.S. National Institute of Standards and Technology ("NIST") in February 2008, *Global Perspectives and Strategies for Education about Standardization Workshop* offer significant support for the proposition that a growing number of nations now recognize the need to develop comprehensive standards education programs to facilitate their national interests.[11] The scope, quality and range of perspectives presented in the NIST workshop from around the world make clear that important changes are going on in the field of standards education, and that all nations must reevaluate their current standards education programs to ensure they remain competitive in a world dominated by globalization, technology and science.

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[8] http://portailgroupe.afnor.fr/v3/pdf/strategystandardization_2010.pdf ; http://www.scc.ca/en/nss

[9] *See* IEC Case Study Analysis, "*What the world says about us*," http://www.iec.ch/benefits/worldsays

[10] For example, see *AT&L Human Capital Strategic Plan v3.0* (2008) published by the U.S. Department of Defense at 9-12, http://www.dau.mil/workforce/hcsp.pdf .

[11] *See* http://ts.nist.gov/Standards/ICES-Workshop-Presentations.cfm for workshop presentations.

Being a Good Engineer is Not Good Enough

The world of global standardization is a complex environment that typically involves engineering, science and other significant technology issues. There are however other important issues involved in global standardization, for example, economic and business considerations, global trade, health, safety, the environment, sustainability, public policy and legal considerations such as intellectual property. Being a good engineer, therefore, is not good enough to succeed as an active participant in the complex world of global standardization. Multidisciplinary skills are necessary in order to be effective.

Even current participants with decades of experience in global standardization are struggling to maintain and further enhance their standards development skills. In short, the world of global standardization is under considerable stress to effectively deal with increasingly complex issues based upon a standardization process that requires openness, transparency, fairness, excellent administration and communications, and that gives due consideration to the needs of developing nations. Moreover, global standardization is increasingly expensive. Demands for a more effective global standardization system have become a world wide chorus.

Conclusion

In the Center's recently published survey, Professor Shiro Kurihara, Hitotsubashi University, offers the following comments on the need for standards education programs:

> *The national economy of every nation depends upon its ability to develop and maintain an effective international standards system best suited to its needs. Given that standards are the essential building blocks by which every nation develops and maintains a competitive national economy, the challenge is to develop international standards education programs which meet the specific needs of a particular country in their private, public and academic sectors. For decades, private corporations, government departments and agencies have carried the burden of standards education by preparing their best and brightest employees to work in the complex field of international standardization [in the form of "on the job" training]. There is no question that international standards education programs offered by private corporations and government departments must be continued and expanded where ever possible. But in today's fast-paced and highly competitive world, are these efforts enough? A key question we must now address is whether nations need to make significant investments in creating academic opportunities for their best and brightest students to study the complex field of international standardization.*[12]

If success in the world of global standardization is of importance, development of multidisciplinary skills and a global perspective will be essential to achieving success.

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[12] Kurihara, Shiro "Foundations and Future Prospects of Standards Studies: Multidisciplinary Approach," International Journal of IT Standards and Standardization Research, Vol.6, No.2 July-August 2008, pages 15-17, emphasis in original. *See* footnote 29 on page 33 of the Center's report.