

<p><b>S. Joe Bhatia</b>  President and CEO  American National Standards Institute</p>	<p><b>“It’s Hard to Win if You Don’t Know the Game: The Critical Importance of Education on Standardization in Universities”</b></p> <p>Joint Meeting of the APEC SCSC Project Advisory Group on Education and the ANSI Committee on Education  February 28, 2011 – Washington, DC</p>
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Good morning, everyone. It is my pleasure to join you here today to talk about the critical importance of standards education.

Plato once said that, “the direction in which education starts a man will determine his future life.”

In other words, education lays a vital groundwork for success.

If we – the standards and conformance community – are to be a part of what Plato called the “future life,” we simply cannot overstate the importance of educating the next generation of standardizers.

A critical part of the creation of technology standards rests entirely on the multidisciplinary skills of the men and women who participate in the process.

The key question in the U.S., and everywhere else, is how to train and education the next generation of standardization experts. For more than 100 years, the United States has depended almost exclusively on the private sector for this. Since the year 2000, the private sector has significantly increased its efforts to train the next generation of standardization experts. For example, ANSI and standards development organization such as IEEE, ASTM, ASME, API, UL, and others have created or significantly enhanced their education efforts. There are also a number of large U.S.-domiciled global corporations that have significantly increased their efforts; for example Microsoft, Intel Corporation, Oracle, IBM, Caterpillar, and others.

Today, the U.S. depends almost entirely on private companies and associations for its standardization education.

ANSI has also made a significant effort in the formation and advancement of its Committee on Education and stimulating the creation of standardization programs in universities. I will speak more about this topic a bit later.

So... although the standards education activities in the U.S. private sector continue to be impressive, the effort of the U.S. academic sector to create education programs is, in my view, inadequate. For example, among the 380 schools of engineering in the United States, only four offer a standards course: Catholic

University, University of Colorado – Boulder, Purdue University, and the University of Pittsburg. Among law schools, only two offer a standards course: Arizona State University and Yale. To the best of my knowledge, there are no business schools in the U.S. that offer standards courses.

There needs to be a significant increase from the academic sector in standards education programs if the U.S. intends to remain competitive in global markets. This is a challenge for every country in the world, particularly the large economic powers, and those that aspire to be. If they want to succeed in the long run, they will need to invest in standards education.

We need to get standards in the classroom . . .

we need to do it often . . .

and we need to do it as early as possible in the learning environment.

Why is standards education so vital? Because standards and conformance play a critical role in the economy, impacting more than 80% of global commodity trade. In today's numbers that equates to over 13 trillion dollars every year.

Put simply – a new graduate who is familiar with the standards relevant to their industry and how the standards system works is a strategic asset to their future employer.

Effective utilization of standards and conformance promotes technological interoperability and drives the global competitiveness of businesses.

Furthermore, active participation in standards development provides an opportunity to exert influence on technical content and align its products and services with changing market demand. It provides insiders' knowledge and early access to information on emerging issues, and helps reduce redundancy, minimize errors, and shorten time to market. Businesses not only decrease the economic risk of their R&D activities by participating in standardization, they can also lower their costs by relying on previously standardized technologies. These are benefits that cannot be undervalued.

Time and again, we have seen that those who understand how to effectively influence and address standardization and compliance issues have the greatest success in the international marketplace. And ANSI is committed to spreading that message and building the collaborations that make it possible – here in the U.S., in the Asia-Pacific region, and globally.

But one of the biggest challenges we face as a community is a lack of knowledge:

- The general public does not understand what we do and why it's important.
- Business and government leaders often do not completely grasp the value of standardization.
- And most crucially, the average American high school or college student is apathetic, disinterested, and even bored by the idea of standardization.

We have got to do something to fix this.

All of us are in this room today because we already know that standards do a lot . . . for industry, for consumers, and for our economy. But we need to share that knowledge with others.

Knowledge of the economic, technical and social importance – and benefits – of standards therefore becomes imperative in the curricula of future managers, scientists, and technologists.

So how do we get standards education into the curriculum? Today's higher education environment offers both some unique challenges and opportunities for us, especially in the fields of science and engineering.

According to the U.S. National Science Foundation<sup>1</sup> the number of bachelor's degrees awarded in science and engineering disciplines reached a new peak of nearly 486 thousand in 2007. This means that more American students are choosing to pursue studies in these disciplines, which represent about one-third of all bachelor's degrees. The news is even better in Asia, where science and engineering majors account for 63% of graduates in Japan, 53% in China, and 51% in Singapore.

This is a clear opportunity for the standardization community, because it means that our base of future standardizers is continuing to grow. More and more students in the Asia-Pacific area are choosing to enter technical fields – disciplines that rely heavily on the power of standardization to boost innovation, manage systems, and facilitate research and development.

But with every opportunity comes a challenge. In the United States, the higher education environment is highly decentralized, with a larger number of private institutions than public institutions. This means that the decision to commit the resources required for an effective education on standardization is largely left up to each individual college or university. According to the latest count by UNESCO – the United Nations

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<sup>1</sup> <http://www.nsf.gov/statistics/seind10/c2/c2h.htm>

Educational, Scientific, and Cultural Organization – there are 5,758 individual institutions in the U.S. alone. I am exhausted just *thinking* about knocking on all of those doors.

It might help if we narrow the scope a bit . . .

Before I became part of the workforce and later joined ANSI as president and CEO, I came from an electrical engineering background.

How many others in the room are engineers, or have some engineering training?

*(take a look around, encourage them not to be shy to raise their hands, give a rough count)*

OK, so for all of us engineers, some of the first classes we took at university covered the fundamentals – or building blocks – of engineering. In my case, I took classes on topics like physics, electrical circuits, and power generation systems, to name just a few. These educational building blocks give students the tools they need to be successful – not only in the classroom, but beyond into their future careers. With a certain level of fundamental knowledge, students will be able to adapt to any workplace situation and can examine different problems with confidence.

But in my view, one of the biggest fundamentals of all is often only mentioned in passing or ignored completely. I am talking, of course, about standardization.

In the United States, the Accreditation Board for Engineering and Technology’s criteria for engineering curriculum now requires that faculty incorporate appropriate engineering standards into their programs.

This is a great start, but engineering is by no means the only opportunity for us. Let us also consider those other areas of study that would benefit heavily from even the most basic education about standards and their importance to the global economy:

- the sciences,
- technology,
- government and public policy,
- business,
- economics,
- and law, to name just a few.

In each of these areas, incorporating standards into the curriculum reaps rewards for students and faculty alike. Not only will students get clarification about the specifications and guidelines that affect their

discipline, they will also better understand how standards are developed, as well as the regulatory policies and agreements that have been written surrounding standards. For example, in the areas of business, economics, law, and public policy, a good knowledge of standardization is crucial to understanding the principles of the World Trade Organization (WTO) Technical Barriers to Trade (TBT) Agreement. Most engineers probably do not think about the WTO TBT, but you can bet that their lawyers do!

Looking at the agenda for today's meeting, I am proud to see that we are already doing a lot to make our collective goal a reality. We have representatives here today from universities all over the world to talk about their success stories:

- San Jose State University
- Korea University
- Purdue University
- Catholic University
- University of Colorado
- Toyo University
- Arizona State University
- University of the Military, Hamburg
- Australia National University

I look forward to hearing from these professors and university representatives about how standards education has become a priority for them.

Here in the United States, ANSI and its Committee on Education have made it a priority to promote general awareness of the value and use of standards to executives in industry and government and to the public at large. We have also worked alongside the academic community, including many of the universities I just mentioned, to promote the use and value of standards to students. And finally, we have prioritized education initiatives as critical to our mission as a non-profit organization.

The ANSI Committee on Education oversees all Institute initiatives related to standards and conformity assessment education and outreach, including implementation of the education-related aspects of Strategic Initiative #10 of the United States Standards Strategy (USSS).

This initiative reads:

“Education programs covering the development and implementation of standards need to become a high priority within the United States. These programs must focus on the needs of leaders and top executives, standards developers, university and college students, and other interested parties”

The committee is working with the standards and conformity assessment community to introduce the importance of standards to the academic community and to the public at large. We are accomplishing this by doing six things:

Number one: we are developing programs and tactics that raise awareness of the importance of standards and conformity assessment among university faculty in engineering/technology, business, public policy, and law schools.

Number two: we are developing materials and resources that university faculty can easily integrate into their courses.

Number three: through the ANSI University Outreach Program, we are collaborating with faculty from a select group of universities<sup>2</sup> to incorporate information about standards and conformity assessment, as well as knowledge of the appropriate standards, into their unique curricula.

Number four: As the U.S. member body to the International Organization for Standardization (ISO) and, via the U.S. National Committee, to the International Electrotechnical Commission (IEC), ANSI has been authorized to provide, upon request, free access for students and faculty to selected standards. Nearly 20,000 standards are now made available to faculty and students in all disciplines in institutions of higher learning throughout the United States.

Number five: we are focused on the opportunities presented by the online learning environment. ANSI administers a website called StandardsLearn.org as an online resource for standards and conformity assessment education. It contains courses, reference materials such as a database of commonly used acronyms, and links to the standards education activities underway by U.S. and international standards-setting organizations.

And number six, recently we unveiled a series of free case studies that demonstrate real-world implementation of several standards, ranging from fire safety to biodiesel fuel. Since the site was revitalized in 2007, we are proud to say that we have had over 120,000 visitors.

While it is fair to say that we have had some success, on the whole I think we would all agree that there is much more to be done.

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<sup>2</sup> Some of the universities that have participated in the program include: Carnegie Mellon, Arizona State, University of Minnesota, University of Southern California, Iowa State, Georgia State, Oklahoma State, UCLA, Illinois Institute of Technology, Purdue University, Texas A&M, Penn State, and University of Washington.

Emerson once said that “the secret in education lies in respecting the student.”

In order to effectively share knowledge, we must consider and respect our audience. As I said earlier, the average American high school or college student is apathetic, disinterested, and even bored by the idea of standardization. I am hopeful that this is not the case for all of the countries represented here today, but it is definitely a very real concern here in the United States. In order to get these students engaged, I think that we need to speak to them in a way that is compelling and understandable. We need to think beyond the “old way” and look to the future if we are to have an impact.

Many of you have children that are now teenagers or young adults. My own sons are in their twenties. And I can tell you, they are 100% convinced that the entirety of what there is to know in the world is available for free on the internet.

Googling for a quick answer on Wikipedia has replaced the hours that used to be spent at the library. An entire generation of people that is accustomed to downloading music for free – or paying 99 cents for a song if they are feeling virtuous – is just not going to operate comfortably in a world where we expect to receive hundreds of dollars for a standard.

This is a larger concern than we can possibly hope to address during today’s meeting, but I think we will all need to find a solution to this issue sometime soon. Also, it is especially worrying here in the U.S., where there is no doubt that the standardization community is graying. This means that fewer and fewer young faces are joining our ranks to replace our retiring colleagues.

For our standardization system to work, we must have robust participation.

And without knowledge, there is no participation. It’s just as simple as that.

In closing, I urge you all to make sure that our students understand this above all . . . Standards are a significant factor in who wins and who loses. And we all know that it is hard to win if you don’t know the game.

Thank you.

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