

**Speech at Plenary Session, “Summaries from Concurrent Sessions”  
- Summarizing Track D Concurrent Sessions -  
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Mr. Chairman,

The Three sessions that I am reporting on dealt with Science literacy for all; universities in the 21<sup>st</sup> century; and science and technology for/in developing countries. The discussions were very rich. Some issues such as IPR, the digital divide and the gender dimension were recurring background themes but have been formally addressed in other sessions. Even leaving all these points aside, this is still only a partial rendering of some of the highlights of our explorations of these topics.

**Session D1: Science Literacy for All:**

The main vectors for science literacy are the education system, the media and the internet.

The education system must emphasize math and science and learning to learn. It must engage children’s curiosity and emphasize a fourth R: reasoning! If we are talking of lights and shadows, then the former are the brains of children with their innate curiosity, and the latter are the inability of the educational system to nurture that sense of wonder. Scientists must work with educators in promoting this kind of learning in our school systems. Teach the history of science and let people see science as a human journey of discovery.

The media in most countries gives very little coverage to science, and when it does it tends to sensationalize the findings or slant the issues. Fellowships for science journalists can help, but scientists must learn to communicate better and to devote more time to the media.

The internet today provides enormous quantities of information, much of it of dubious quality. Scientists must create the means of sifting the wheat from the chaff, and for that, they must be trusted by the public. They must also devote some time to combating

quackery, whose corrosive effects on decision makers and public attitudes cannot be underestimated.

The UK experience of paring scientists and parliamentarians, where each spent at the other's work environment is worthy of study and emulation.

But the scientific community values publications and citations, and provides no incentives for investing time in communicating with the media or debunking quackery or in working with educators on reforming curricula.

Science literacy will help create a better labor force, but, more importantly, it helps fight obscurantism and extremism, creates better citizens, more predictability and more healthy and satisfying lives for all.

### **Session D2: The Role of Universities in the 21<sup>st</sup> Century:**

Universities have structures largely inherited from the 19<sup>th</sup> century not particularly designed to cope with the challenges of the 21<sup>st</sup> century. Their disciplinary rigor frequently translates into vertical silos and inadequate attention to horizontal cross-cutting issues. Their research is insufficiently related to the needs of society or of industry.

American universities dominate the top ranked schools in global surveys. They have learned to work with industry while creating "steeples of excellence" that provide creative environments for researchers. Beyond such elite schools, the American system offers enormous variety from land-grant universities to small community colleges to highly specialized training centers, all nourished by a highly competitive system where institutions compete for students, teachers and funds. Yet they too have serious challenges to continuously adapt to a rapidly changing world.

In Europe, pending reforms include the adoption of the BA, Masters, PhD structure across all universities. This will maintain diversity within a common reference structure. Europe also seeks to encourage links with industry, diversification of funding sources and more funding through competitive grants.

East Asia shows enormously successful models, including a focus on excellence and broad-based participation in tertiary education.

In many developing countries, politics demography, and societal pressures for degree

rather than quality education, have created huge mediocre institutions with inadequate budgets and poor facilities. Top down management has not helped.

We must promote institutional pluralism and good governance. We need reforms where the autonomy of the university is enhanced, its links to industry reinforced, its commitment to excellence strengthened, and its mandate broadened to turn out leaders, thinkers, and innovators... not just well trained workers! And in many cases, we will have to turn brain drain into brain gain.

### **Session D3: Science and Technology for/in Developing Countries:**

There is a growing gap amongst the developing countries, with some 80 lagging countries being left behind as the more forceful developing countries accelerate efforts to catch up with the rich industrial countries.

This is a serious problem, requiring South-South cooperation, including fellowships, as well as more North south cooperation in capacity building. Capacity building for S&T requires attention to:

- National S&T policy, integrated with the policies of education and of industry;
- Human resources, focusing on better teaching of math and science throughout the system on attracting and retaining women and minorities in the sciences, and on targeting the new generation through science fairs, science clubs and internet;
- Promotion of centers of excellence, and virtual networks of excellence;
- Collaboration and complementarity between the private and public sectors; and
- Better funding mechanisms that fund research, not just salaries.

Development will require linking knowledge to action. Development needs both scientists and managers. Managers manage scientists as well as corporations. They will help develop markets and use new opportunities such as enhanced bandwidth, to promote innovation and rapid movement from lab to market.

Inspiration exists in places like Korea, which went from the 3<sup>rd</sup> poorest country in the late 50s to 11<sup>th</sup> largest economy now! It was done through real and sustained commitment to promoting science and technology, a highly prioritized investment program, a focus on building a developmental infrastructure for the whole country.

**Conclusion:**

Mr. Chairman,

We live in the globalizing world of the knowledge based society and the technology driven economy. Nations rely on the talents of their people, the knowledge they possess and their capacity to harness that knowledge to improve their well-being in a sustainable fashion.

We need a world where the values of science are celebrated: free inquiry, free speech and a healthy skepticism, all coupled with a sense of wonder, a respect for the truth and an ability to reason.

A world where fairness and cooperation are prompted, innovators are rewarded and society benefits from their innovations.

A world where access to knowledge is a fundamental right and the sharing of knowledge is a fundamental duty.

It can be done, it must be done, and it will be done.