Knowledge and Education

- Knowledge is built up from interaction with the world, and is organized and stored in each individual's mind.
- Education is the key to knowledge.
- Education creates the atmosphere where knowledge can be acquired and processed to make it useful to each individual.
- Education creates the stage for knowledge to be shared.
- Education makes us life long learners. That is the education that we believe in, we should make everyone WANT to learn.

Knowledge and Economy

- The emergence of the Knowledge Society, building on the pervasive influence of modern information and communication technologies, is bringing about a fundamental reshaping of the global economy.
- The application of knowledge to economic activity, to the extent that has become the predominant factor in the creation of wealth. As much as 70 to 80 percent of economic growth is now said to be due to new and better knowledge.
Tacit knowledge: It is personal, un-codified not reduced to rules and recipes, difficult to diffuse.

- Originates from the abstraction over time of the cultural and technical activity of an individual, including the relationships with customers, suppliers, and partners.
- Vital to the organization because organizations can only learn and innovate by somehow leveraging on the implicit knowledge of its members.

Explicit knowledge: object based or rule based

- Permits an efficient transformation of knowledge into products.
- A widespread use of standardized approaches increases the reliance on methodologies but reduces motivation to probe more deeply and creatively into the underlying assumptions and rules.
Cultural Knowledge: it is the cognitive and affective structure of an organization or a community. It is the set of beliefs, norms, and values that govern the behavior of the organization members.

- Cultural knowledge of a community is its particular common sense.
- Constitute the glue of the community: mix of communities involve the difficult task of harmonizing different cultures while quickly spreading the new resulting cultural knowledge.

Basic Research
Taylorism
R & D
R&D
Research and Development

- R and D are the initials of two activities that “&” joins together.
- Research is for satisfying needs for erudition while development answers the demands of production and profit.
- Research belongs to the “republic of science”; development is part of the “realm of technology”.
- Just a few decades ago: a sequence of distinct phases, separated in time: the generation of tacit intellect, its pre-coding presented at technical meetings and published in scientific literature, the disclosure of pre-codified knowledge to possible end-users, the transformation of intellectual products into codified knowledge, and its optimal application to industrial products.

Research for Knowledge Societies

- What kind of research now?

GUIDELINES

- To generate knowledge for obtaining a key competitive advantage.
- To generate “knowledge for future business” (within a 3-6 years perspective) resulting from a realistic and “proactive” vision of the future world.
- To produce a stimulating environments capable to favor interactions, cultural confrontations, and exchange of information.
- To resolve the increasing difficulty in having in the same entity or in the same geographical site the right conditions that favor high-tech creativity by effectively networking knowledge generators.
- To protect knowledge, that in high-tech is a perishable good, by a fast exploitation, more than by patents or secrecy.
Therefore,

- It is urgent to activate mechanisms for a more efficient knowledge creation and a suitable forging of creative people.
- It is necessary to speed up mechanisms for the transformation of new knowledge into wealth. This results by closer links between the knowledge creator and the knowledge transformer.
- It is essential to activate processes for a careful and visionary forecast of the future social growth and its impact on science and technology developments.

“Produce” Excellent Knowledge Workers

Knowledge use: use of tools and methodologies (product engineer, operational manager) 50%

Knowledge transformation: coding knowledge for systematic use 15%

Knowledge leverage: patents, transfer of knowledge, knowledge dissemination 15%

Knowledge creation 20%
University for the Future

Knowledge User
- Wide spectrum curricula
- Use of tools and methodologies
- Homework and laboratories
- Crisp teaching approach
- Weak link with external world

Knowledge Transf. & Lev.
- Wide spectrum curricula
- Use of tools and methodologies
- Deep understanding of methods
- Crisp teaching approach
- Moderate link with external world

Knowledge creator
- Special and focused topics
- Un-perceptible directions
- Challenging targets
- Fuzzy teaching approach
- Strong link with industry

Motivation

IMS University of Pavia
Right background for a bright and challenging future

To favor human progress and ... to win!
My strategy (and vision) on Research

- Do research that provide an answer to real needs but is not development
- Remain young and stay with young persons
- Avoid avenues with no-return
- Avoid bureaucracy
- Use and exercise the brain
- Strictly follow scientific ethics
- Walk with your own legs

- Enjoy what you do!!

University for the Future

Some Suggestions

Find the Right Balance

The key point is that scientific research and high education are essential for social development but they are not (and can not be) the direct instruments for achieving market competitiveness; instead, they are the cultivation soil of technical innovation and social progress.
How to Find the Right Balance

✧ Global view and international dimension.
✧ Unfettered information flows.
✧ Balanced research-industry relationship.

The link between research, invention, innovation and competitiveness is quite complex. The best approach is the following: researchers receive hints, stimulus for ideas from the productive world; these hints are able to trigger the technical curiosity that generates that brain processing which can transform problems into solutions, theories, methodologies.

Look for Effective Social Results

◆ Personal and society grown.
◆ Long term perspective and short term objectives.
◆ Co-ordination between scientific organizations
◆ Favor use and development of state-of-the-art technologies.
◆ Seek for proper government legislation.
◆ Stimulate customer feedback.
Before I conclude ….

◆ *Just a Reflection:*

“Try to find the right track that enables you to have fun and, at the same time, to favor innovation and social happiness”.

◆ *And a recommendation:*

The care for the man and his destiny must be the top concern of your scientific and technical efforts. Never forget this, … you, flooded by your diagrams and your equations.

Albert Einstein

Thank you!