

Doctoral Programmes for the European Knowledge Society

Salzburg, February 3-5, 2005

Maria Rimini-Döring, Robert Bosch GmbH, Germany

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Good morning, ladies and gentlemen,

First I would like to thank the organizers for giving me the possibility to talk about employability of doctoral candidates as a representative of the industrial sector.

My name is Maria Rimini Doering,

I am Italian now living in Germany just about 20 years.

I joined Bosch after my PhD, first as a Trainee, later as project manager in different R&D Divisions.

Currently I also supervise PhD and Diploma Students working on different research projects.

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Now to my talk: I begin with a short overview of Bosch and proceed with a few considerations on

- **competence profiles** for a changing labour market, including **permeability between the public and private sector** to increase the attractiveness of research career paths
- and **industrial degrees** as one new route to research training

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What maybe few people know, is that Bosch is a private company and is not present on the stock market.

Bosch belongs after the will of his founder to a **Foundation**

with goals exclusively of public interest, such as

medical research,

education and

people's understanding.

92% of the net income of Bosch flows to the foundation, which since 1964 has devolved more than half a billion EUR in such projects.

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Here are some key figures about Bosch, I will point to only three numbers:

The 2004 data have been released just a few days ago:

40 billion Euro sales,

Over 240000 employees and

3 billion Euro expenditures on research.

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AUTOMOTIVE TECHNOLOGY:

Gasoline Systems	Car Multimedia
Diesel Systems	Automotive Electronics
Chassis Systems	ZF Steering Systems
Energy and Body Systems	Automotive Aftermarket

INDUSTRIAL TECHNOLOGY:

Bosch Rexroth

Industrial hydraulics, mobile hydraulics, pneumatics,
assembly and linear-motion technology,
electric drives and controls, service

Metal Technology

Buderus castings and special steel businesses

Packaging Technology

Packaging machines and lines for the food and
confectionery industry and for the pharmaceutical,
chemical-technical, and cosmetics industries

CONSUMER GOODS AND BUILDING TECHNOLOGY:

Power tools	Thermotechnology
Household Appliances	Security Systems

(Broadband Networks)

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We used to say that the distribution of sales in the regions of the world was about 1/3 - 1/3 - 1/3 but the trend shows that the German “third” is getting smaller, and the perspectives are more of

25% - 35% - 40%

(the Asian portion is naturally growing fastest).

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It is interesting to see the world-wide distribution on employees, less than half in Germany, a fourth in Europe and a growing part in America and Asia where not only new production sites but also new development and competence centres are created.

The sales percentage in these two regions (32,5%) already corresponds very nicely to the number of associates (28,3%)

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This is a brief overview of what Bosch offers students and academics.

The interesting figure for us today is the relative big number of **PhD students** that Bosch is training and supervising each year.

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In the following I would like to concentrate on the three following issues as in my opinion crucial to EMPLOYABILITY:

- the skills we consider essential to be acquired and so to speak „internalised“ in research training
- the problem of lacking permeability between the public and the private sectors and
- a possible model of curricula integrated with an industrial experience.

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I will skip the general requirements and will proceed directly to what I think is definitely necessary for a **research training**

And I would like to stress the word TRAINING, because it's something that requires time, motivation, exercise, repetition, discipline, reflection:

I think that these skills of "independence of judgement, flexibility, **system's understanding**" need to be internalised, to become a mental "habitus".

At the same time and on a more economic point of view, they also mean

- *long-term employability* even in a changing environment

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In a team it's important to blend and bring to their best all different approaches and capabilities, not only the personal ones but also the "cultural, environmental" ones.

In particular for the **research training** - there is almost no individual research any more, except some theoretical mathematics maybe,-

I would like to stress the followings skills:

- the understanding of "**complexity**", in all disciplines and between the disciplines (natural & social sciences, technology & humanities)
- and at the same time the crucial and urgent issue of **sustainability**.
- The training of **different roles** belongs in my opinion to research training, first of all because of the hermeneutic aspects of bringing out the "**New**" but also as element of future employability and of social relevance
- Team work, project structures, multicultural co-operation should follow from day-to-day experience and belong to the training programme as a whole.

This yields/means a WIDE-RANGE EMPLOYABILITY

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All of the mentioned ingredients can increase the effectiveness of research training.

One further issue I would like to bring out is the issue of **PERMEABILITY** between the public and private sector, something that is in several European countries far more difficult than in the USA.

The main point of this slide is to stress the importance of the POSSIBILITY of "Life" & "work"-experience in different kinds of structures, at different ages, with different roles,

BACK AND FORTH

A higher permeability would mean

- ATTRACTIVENESS and recognition for young people.
- Advantage for both the public and private stockholders,
- and a higher EFFECTIVITY (return on invest) in a global (social) dimension.

Last but not least, permeability would also stretch the possible time-span of a productive life, especially inside the private sector

(way over 50% of all German enterprises do not have ANY employees OVER 50 years old):
What a loss of experience!

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At this point I would like to suggest possible elements of an “industrial degree” by shortly describing the doctoral Programme at Bosch:

...

The training of language skills in form of “documentation and transfer” is a fundamental part of an industrial training (and daily life).

Flexibility in programmes and structures will allow better exchange of methods - in the case of an “industrial degree” I would plea for an integration of the industrial experience with some theoretical work at the university - seminars for example (**and vice-versa** of course) – we don’t have that at Bosch yet.

As a contribution to “life-long learning” the industry could offer mentoring programmes especially after the research training itself.

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I will conclude with a short remark on flexibility, on a PERSONAL and SOCIETAL level.

The research training I am thinking of is a training to

“educated creativity” to master the changing challenges around us

As a motto I chose a quote, by Blaise Pascal

Let us beware of those who

DON’T THINK because THEY KNOW (or believe to know).

THANK YOU for your attention.