

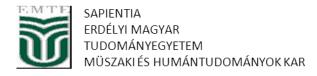
### A few considerations on dual education.....

..... Learning.... Innovation ..... Production......

Ideas and experience of SC PLASMATERM SA Tg. Mures (Marosvásárhely) Romania

Prof. Dr. Zoltán Kolozsváry



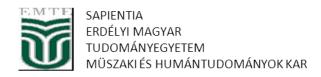


#### The state of art:

#### what is missing:

- general knowledge on fundamental disciplines, especially physics and chemistry –
- the logical connection between the theory and practice
- the logical relationship between "what...why ...how...
  when " the time-gap between innovative ideas and
  industrial application is alarmingly increasing
- interdisciplinarity in both the gradual- and post gradual education is almost disappearing



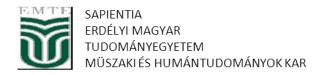


#### What the industry wants:

with special emphasis on SME-s

- "engineers" and not just graduated people of "fictional" specialities
- solid basic general- knowledge which may fundament specialization in a selected field of interest
- young graduates with dedicated professional interest
- a general view –at basic level- on the system shaping industrial activities
- understanding the permanent need for learning and innovation
- understanding the system and reasons of work discipline





#### A general problem of our era

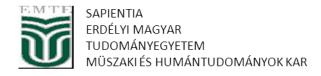
.....IT, communication, management, etc. seem to be more attractive though all these are practically part of a "second level" in the industry, which may not survive without the "hard core" of creating goods..

Engineers have to find the optimum in applying all known scientific theories and technological solutions for solving a problem...

...nothing can be out of interest, if it may result in a better solution.

(Kocsis Maria Baan)



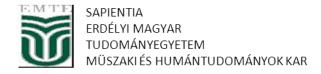


#### *The state of art:*

#### what we see and experience:

- Strong orientation towards informatics without the knowledge to select and prioritize- tendency to accepting artificial statistics as the gospel
- A firm belief, that the computer (internet etc) can solve anything and thus there is no need to learn specific elements or nuances within each discipline





#### Characteristic of our era on a scale of the society

• The scale of values has lost its sense, the only "parameters" of significance are money and position

#### Consequence for young people after graduating

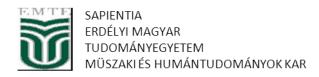
- Too much interest for the money from the beginning of the professional carrier prevents a serious, deep training for a more general interest creating real values later
- Lack or incorrect view on the general trends of the society

#### In education

too many, too specific disciplines and lack of a more general approach to the science and applied science.

PEER LEARNING ACTIVITY ON HIGHER LEVEL DUAL EDUCATION BUDAPEST 29-30 September 2016



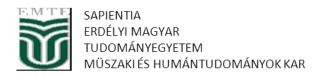


#### The pillars of a successful economy:

- solid professional knowledge
- innovation –in a strong connection with applied research and development
- efficient logistics
- efficient and stable legislation

Innovation and applied research need a strong collaboration between companies and universities involving students as well





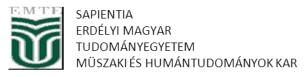
## Should be a solution –at least partially- a more generalized dual education system?

#### Problems with the dual education system

 mostly the "dual education" system is formal and the students are not really interested. Most of the companies

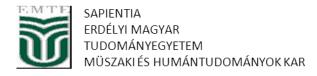
 especially SME-s - have no system or personal for an efficient mentoring and training









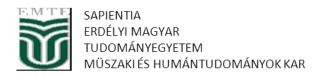


### An experiment:

#### The experiment considered three steps:

- 1. Students from the last two years are part-time employed in the company with a well shaped program
  - a kind of a dual system is created combining production and R&D activities
  - the students have the possibility to be involved in international research projects with specific tasks based on the support of both the university and the company.
    - students are part of a "bridge" connecting company's applied research with that of the university
- 2. Depending on the dedication (!) and performance after finishing the studies at BS level these students may be employed by the company
  - the company is ready to support their MS studies in conditions of a mutual agreement



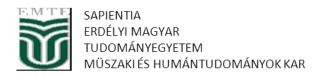


#### 3. A kind of a "domestic" post-graduate training is organized.

- once a week all the young engineers and students involved in the system attend a "scientific training meeting" (absolute compulsory!) lead by the managing director of the company
- the meeting has a pre-defined object concerning one of the problems of interest for the company and for the attendees as well
- presentations are prepaired by one of the participants or by invited speakers of recognized professional authority
- foreign partners involved in research projects are "special invited speakers"
- free discussions follow the presentations

Observation: a great interest of the participants is beyond any doubt!

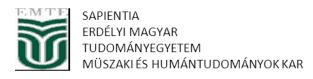




### **Examples of R&D project with joint company/university/student involvement:**

- Technology of preformed ceramic cores for investment casting
- EU funded international joint research project LoCoLite (EU acronym) for the automotive industry –project coordinator the London Imperial College
- Active screen plasma nitriding/nitrocarburizing with the support of the Miskolc University and the Sapientia in Tg.Mures



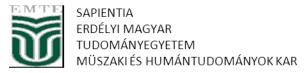


# ...an R&D project originated in the need of solving production problems: Preformed ceramic cores for investment casting





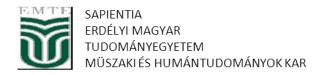












#### **Summary**

- The education has to be based more on a general need of society and more "user friendly" for SME-s and not only of multinational giants
- More efficient contact between companies, universities and R&D sector
- Financing R&D programs has to be more "problem solving" correlating with the universities Less bureaucratic and more globally cooperatively oriented strategies; more 'bottom up' generation of proposals for support, instead of the present 'top down' approach to selection of projects;
- Better understanding of the science and technology issues by governments and international organizations
- The politics should be more concerned for the future of society then that of the multinationals