

The Development of the Managerial Education in a Technical University

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Abstract

The needs of developing the managerial education system in the "POLITEHNICA" University of Bucharest, Romania, in transition conditions to the market economy are discussed. A cooperative program with the Washington State University, USA, starting with a Center set up to offer consultancy to small and medium size enterprises, was then developed as a Center for Business Excellence (CBE) with a direct influence on the engineering management in the "POLITEHNICA". Moreover, this cooperation became an incentive and a model for implementation of the managerial education in other technical universities of Romania. The extension of CBE to several university cities of the country is a confirmation of the model consistence. An interaction between the two educational systems - the engineering and the management - is possible to the mutual benefit.

A. Introduction

Romania, a central european country, is now in transition from the rigid, centralized communist system to the free market economy. The transition started after December 1989 when the dictatorial regime was overthrown. About 45 years of totalitarianism had dramatic consequences on the higher education as well, first of all on economical and social sciences. The technical universities had less to suffer due to the objective character of natural sciences. In addition, the policy of forced industrialization required engineers capable to introduce and use high technologies. In time, the most talented young people chose to study in a technical university, as they desired to do science and research more freely from political constraints. As a consequence, a large part of the best human resources is now among the graduates of technical universities, constituting a valuable potential that can be retrained with minimum effort and expenses. The main direction of re-training is the managerial education, as the courses taken before in this area were: the "Political Economy" the "Scientific Socialism" and the "Lead of the socialist enterprises". At the same time, the whole system of the managerial education in technical universities has to be radically changed.



B. First attempts to improve the managerial education in the

POLITEHNICA of Bucharest after 1989.

The "POLITEHNICA" of Bucharest with origins in 1818, is the oldest and the largest technical university in Romania. In 1990, the number of students amounted to 25000 (including evening courses) in 11 schools of engineering. The main profiles are: mechanical engineering, electrical engineering, chemical engineering and materials science. Because the giant industrial factories of the former regime collapsed, the industrial activity decreased by about 60% and the affluence of young people towards engineering was also drastically reduced, especially for mechanical and chemical engineering. As a response to the increasing interest of the population for management and business, the various schools of "Politehnica" adopted three different strategies.

1. introducing of new courses such as Management and Marketing;

2. creating new streams of specialization related to engineering management with new curricula. The School of Technology for Machine Building even changed its name and became the "School of Engineering and Management of the Technological Systems". The School of Electrotechnics created a specialization of Economical Engineering;

3. developing post-graduate courses in various areas, related to business. The most successful were the intensive courses to teach the use of computers for book keeping, design, text edition, etc.

The difficulties to obtain results at a large scale were related mainly with the lack of specialists in the new areas. Even when the domains seemed to be similar, the required methods proved to be completely new. The competition on the free market, either for products or for ideas, seemed to obey totally unexpected laws. Many of the former economists, in spite of their goodwill, could not get through. The professors of the existing Department of Management in "Politehnica" needed themselves training. On the other hand, young new people had to be formed and promoted.

C. The cooperation with the Washington State University.

On July 1991, a memorandum of understanding between Washington State University and "Politehnica" University of Bucharest became the inception of a large program funded by the American government through the United States Agency for International Development (USAID). The program objective was "to assist the Politehnica University of Bucharest (PUB) and its cooperating institutions in Romania to implement, institutionalize, expand and develop new programs in the areas of business management and business counseling training, market economics education and related support programs".

The project had four inter-related goals:

1. Upgrade managerial skills of private companies and state-owned enterprises on the privatization list through small and medium size enterprise counseling and counselor training. Targeted clientele included: business faculty from UPB and



collaborating institutions, business managers from small and medium private enterprises or undergoing privatization, government officials, bankers and credit institutions etc.

2. Provide continuing education in management training, with special emphasis on management training for privatization. Targeted clientele: as above, including as well non-management faculty (those with other disciplinary specialties, but with the need to understand and utilize management skills).

3. Upgrade human resources management (HRM) and student job placement capabilities, including establishment of an HRM Office.

4. Improved access to and distribution of technological information in support of business counseling, management training, production, international trade and related topics for: business manager, research institutes, chambers of commerce, business faculty counselors, representatives of the Romanian Development Agency (recently created), targeted companies, etc. For each of the four objectives, projected indicators of objective achievement have been tentatively identified, then refined and accordingly modified with respect to quantity, quality and timing, in consultation with USAID, PUB and other stockholders. The program was carried-out, practically, in three steps:

1. In the first step a Consulting Center for Small and Medium size Enterprises was created at PUB. The consultancy was given freely by the american specialists from WSU. In parallel, members of the academic staff from the PUB Department of Management were trained, both in the USA and Romania, at various levels:

Professional Business Counselor (PBC);. Master Business Counselor (MBC);. Master of Business Administration (MBA);. Philosophy Doctor Degree (Ph D) in Economics (Management, Marketing, Financing, etc).

2. In the second step, the Counseling Center was transformed in a Center for Business Excellence, the contribution of the romanian part being sensible increased. A PBC training model was worked-out. Management Training for Privatization (MTP) have been a major part of the WSU/PUB Center for Business Excellence activities. The major financial effort was still supported by the american part. A separate building and a seminar/training room for CBE were arranged. The counseling activities were developed, the number of counseling sessions increased, both in the CBE and at companies. The formation of PBC was extended to include the training of faculty from other universities in the country.

3. In the third step, starting approximately at the end of 1994 and now in progress, the CBE had to become self-sustained. On one hand, a matching contribution of PUB was demanded and covers by now about 50% of the total expenditure. Two new Consultancy Centers for Small and Medium Enterprises Development were established in two other university cities of the country. The activity of consulting, assistance and training is revised and more relevant standards are imposed. The establishment of these standards is done mainly by the Romanian counseling team (now consisting of about 10 MBC, 5 certified counselors for international business and a Ph.D) as people who have the experience and knowledge to accurately define the objectives in



the actual situation. An important shift of responsibility to the Romanian part will occur, more and more, in other areas, for example in running the MPT program. In addition, a direction of research is going to be implemented, the inception being a secondary research.

Of course, all the three steps are inter-related, many activities lasting for the entire duration of the program. The distinction between steps was made taking into account the quantitative and qualitative aspects as well as the shift of responsibility to the Romanian part. The project, ending in 1998, will fully institutionalize the management and business counselor training at PUB; on the other hand, the MTP will be totally transferred to the Romanian business faculty and counselors.

D. Effects of the WSU/PUB cooperation on the managerial education in technical universities.

The seven-years cooperation program between WSU and PUB has already important effects on the managerial education in Politehnica of Bucharest, representing, at the same time, a model for any technical university of Romania.

The main achievements in this direction are:

a. the cooperation with the excellent team of WSU top specialists from the highest developed country in the world USA, a real model for what business practices and free marked competition means;

b. the training and up grading at WSU of a large number of faculty members (about 25 people);

c. the material support to establish and endow a CBE, a seminar room and a computer - laboratory for students in engineering management (including the soft and data).

Although, according to the American practical spirit, the main direction was dedicated to consulting and training of a various clientele, MTP etc., the benefit for the higher education is evident. Consequently, the PUB took this great opportunity to improve its managerial system of education.

The directions of action now are:

. create a section of engineering management at each of the eleven existing schools of Politehnica; . combine then the eleven sections in a school of engineering management with three profiles: mechanical, electrical and chemical - materials science.

This strategy has the advantage of using the traditional profiles and therefore already admitted students.

The curricula could include:

- 20% background disciplines (Mathematics, Physics, Chemistry) trained by existing departments;
- 40% management disciplines trained by the Department of management and CBE specialists;



- 40% engineering disciplines (basic + specialization) trained by the existing engineering departments.

The proposed structure of the School of Engineering management at PUB is able to train 1100 -1400 students with an average graduation figure of 250 - 300 students/year. The duration would be 5 years for an engineer-manager degree (see the enclosed diagram in Appendix).

The proposed scheme stimulates an interaction between the already existing engineering educational system and the management. The engineering system of Politehnica, with about 180 years of experience, is able to contribute by:

- a top level training in the general background (Mathematics, Physics, Chemistry, etc.);
- a sound engineering education, both theoretical and practical, due to a leading team of specialists;
- a top level organization, with positive influence on the formation of a structural manner of thinking and solving problems. Indeed, the experience of the last six years in Romania has confirmed the high performances of PUB graduates when they chose to become managers.

The contribution of the managerial system of education is to acquaint the future specialists with demands different from the technical ones, mainly with:

1. the necessity of making not any kind of a product, but products that can be sold;
2. the influence of social environment;
3. the importance of a good organization and administration;
4. the possibility of job mobility etc..

As a matter of fact, the majority (about 90%) of the academic staff from the Management Department are engineers from all profiles (mechanical, electrical and chemical) with supplementary training in Economics. Likewise, the majority of trained specialists through PBC, MBC, MBA and Ph.D in Economics programs comes from engineering.

The participation in the process of "pure"economists is important as the other pole, to equate and complete the dynamics. In the Politehnica exists a Department of Economics. However, the University has not specialists in Business Law and this problem can be solved in the frame of a School of Engineering Management. In some way, the interaction between the engineering and management is an interaction between microscale and global scale, between quantitative, detailed manner of acting and a more qualitative manner, but with a larger degree of uncertainty.

The best solution is to combine the two aspects, to obtain a refined model able to describe a comprehensive part of reality with increasing relevance and accuracy, as well as with a better capacity to respond in real time and even to control the dynamics of the system.

Bibliographic Information



1. Jim Marten, Training Director, Washington State University, "Setting the standards " CBE Bulletin, Issue 1 Bucharest, Romania, 1995.
2. C. Berbente " The Dynamics of University - Industry Cooperation in Romania. Hopes and Realities ", Conference of European Schools for Advanced Engineering Education and Research (CESAER) on Technology Transfer from University to Industry, Louvain-la-Neuve, Belgium, 23-25 May 1994.

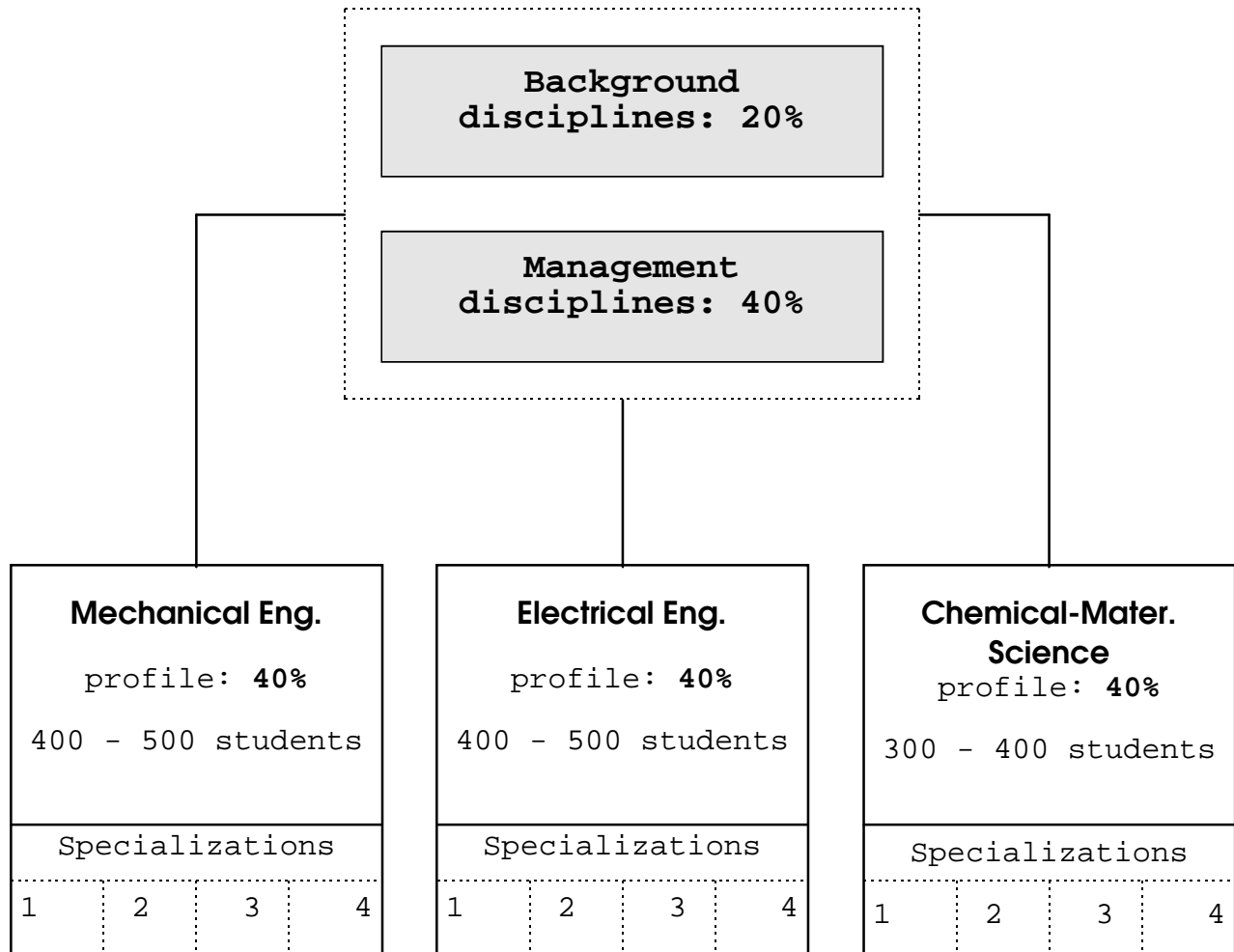
Biographical Information

CORNELIU BERBENTE, born on 8.08.1938, Stavropoleos, Romania.
Professor of : Gasdynamics and Aerothermochemistry ; Numerical Methods ; Heat and Mass Transfer . Ph. D. in Aerodynamics.
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SCHOOL OF ENGINEERING MANAGEMENT AT P.U.B.

(5 years study, engineer - manager degree)



Input: 300 - 350 students / year
Output: 250 - 300 engineer-managers / year
 representing 8 - 10 % of the total graduates of P.U.B.