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# CONTINUING ENGINEERING EDUCATION—A ROMANIAN CASE: THE INTERNATIONAL CENTRE FOR ENGINEERING EDUCATION, IASI

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## SUMMARY

The International Centre for Engineering Education (ICEE) was established in January 1990 within the Polytechnic Institute of Iasi, Romania. It is a non-governmental, non-profit academic organization and has been integrated into the Iasi branch of the Romanian Academy.

ICEE has been established to support and enhance lifelong technical education and training, and advanced engineering education aimed at meeting the present immediate needs of Romania. These objective will be pursued through various activities to be determined by the membership.

The paper briefly describes the background of the Centre, giving an outline of its objectives, membership, project activities, as well as examples of initiated projects.

## 1 BACKGROUND

The International Centre for Engineering Education (ICEE) was established following a decision of the Senate of the Iasi Polytechnic Institute in January 1990.

The goal of the Centre is to identify the means and to promote the ways in which the new engineering education tools can be used to improve the quality and the efficiency of the technology transfer in the context of the ongoing socio-economic reforms in Eastern Europe, particularly in Romania. The Centre is aimed at increasing the awareness of all persons involved in the changes now taking place in Central and Eastern Europe, and their knowledge of the various university-enterprise exchanges and interactions with an impact on their activities.

The most important resource today is human intelligence, creativity and ingenuity. Therefore education and training must be the top priority in any carefully thought out development strategy. As a developing country, the only chance for Romania's technological progress is to develop an up-to-date engineering educational system.

ICEE has established relationships of co-operation with various international organizations such as UNESCO's European Centre for Higher Education (CEPES) in Bucharest and the European Society for Engineering Education (SEFI). ICEE has also joined IACEE and will be integrated in the TEMPUS programme of the European Community.

## **2 PURPOSE AND OBJECTIVES**

ICEE aims at promoting engineering education and training in the framework of information technologies and of scientific and technological progress worldwide.

The Centre fulfils its functions by directing its activities at:

- \* creating and maintaining a documentation fund for the various branches of applied engineering sciences;
- \* facilitating national and international exchanges of scientific documentation in key fields;
- \* promoting the mutual interdisciplinarity information of scientists, academics, and researchers;
- \* facilitating the creation of interdisciplinarity means for the training of engineers, with emphasis on the new educational technologies;
- \* ensuring the involvement of students and young researchers in scientific achievements in various socio-economic areas.

## **3 ORGANIZATION**

ICEE is governed by a Council. The overall management is the responsibility of the Executive Steering Committee and of the Director. The Centre is organized into specialized commissions, broken down by groups of activities and branches of sciences; a student commission is also included.

The Headquarters of ICEE are located in Iasi Polytechnic Institute, Romania.

## **4 MEMBERSHIP**

ICEE is a non-governmental, non-profit organization and has been integrated into the Iasi branch of the Romanian Academy. The Centre can be affiliated with similar cultural-scientific, educational and professional engineering bodies, both national and international.

ICEE has a wide-ranging membership:

- \* academics and researchers of Iasi Polytechnic Institute;
- \* founder members;
- \* honorary members;
- \* institutional members;
- \* students members.

Honorary members are designated by the Executive Steering Committee in recognition for outstanding merits in the field of engineering education. The Council validates the status of honorary members.

To name a few of the most important founder members, who have been actively involved in the creation and expansion of the Centre from the very beginning, and to whom acknowledgement should be given:

- \* Professor Alexander E. Emanuel, Worcester Polytechnic Institute and IEEE, U.S.A.
- \* Professors Jacques Neiryck and Frédérique de Coulon, École Polytechnique Fédérale de Lausanne, Switzerland
- \* Dr. John K. Lowell, Associate Editor-in-Chief, IEEE Circuits and Devices, U.S.A.
- \* Dr. Zenon J. Pudlowski, 1st Vice-President, Australasian Association for Engineering Education, University of Sydney, Australia.
- \* Dr. M. G. Hartley and Mrs. A. Buckley, Editors, International Journal of Electrical Engineering Education, University of Manchester Institute of Science and Technology, UK
- \* Professor Frank E. Burris, member of the IACEE Council, American Society for Engineering Education, University of California Los Angeles, U.S.A.
- \* Professor Markku Markkula, Secretary General IACEE, SEFI Director WG Continuing Engineering Education, member SEFI Task Force for Eastern Europe
- \* Professor Peter Nüesch, EPFL Lausanne, Switzerland, Past President SEFI
- \* Professor Michael S. Wald, Editor-in-Chief, International Journal of Engineering Education, Hamburg Educational Partnership
- \* Dr. Theo Veenkamp, Director, EC TEMPUS Office
- \* Dr. Claus Henning, Director, British Council, Bucharest
- \* Eur. Ing. Peter Hector, Assistant Secretary, the British National Committee for International Affairs
- \* Mrs. Carin Berg, Director, European Centre for Higher Education, CEPES/UNESCO, Bucharest
- \* Professor F. A. Benson, University of Sheffield, UK
- \* Professor Reginald W. Revans, University of Manchester, UK

## 5 ACTIVITIES

ICEE organizes and participates in workshops, round tables, seminars, and symposia in all fields of engineering education. ICEE defines successful technology transfer as university-industry collaboration that realizes both research potential for university and practical business potential for industry. As an open university, the Centre promotes activities intended to integrate Romanian technical education into the European academic community.

ICEE publishes a quarterly journal, Iasi Polytechnic Magazine (IPM) - Review Essays about Engineering Education Technologies, as well as research reports, monographs, interdisciplinary scientific papers, and proceedings of conferences and symposia.

The IPM serves the need to disseminate among its readers the latest developments taking place in the international engineering education community. The principal aims of the IPM are:

- \* to promote textbooks, reference works and software tools (programs, packages)
- \* to show their direct relevance to practice and thus
- \* to help in the application of new technologies in developing countries.

The IPM is distributed in some 40 countries worldwide.

## **6 PROJECTS**

Projects are to play a prominent role in the activities of ICEE. Below is the description of the first ICEE project: a proposal made by the University of Sussex at Brighton, UK, in co-operation with Iasi Polytechnic Institute:

**Iasi Project/TEMPUS - A Joint European Project (JEP)**

"Iasi/TEMPUS" is a project intended to restructure and update the educational and training potential of Iasi Polytechnic so that the latter will be able to act as a focus for the economic growth of the Iasi region (North-East Romania). The potential for this lies in the central role that Iasi Polytechnic currently has in relation to high-level engineering training. The relations between the Polytechnic and industry are based substantially on student placements, but there is considerable scope to expand collaboration and relevance, particularly in terms of updating the content of the training, including management, delivery methods and means by which curricula are constantly adjusted to industrial needs. Furthermore, the local economy will benefit considerably if the Polytechnic sets up comprehensive technology transfer facilities which will allow the results of local and external research to be applied to regional industry, and problems and inefficiency within industry to be resolved by joint co-operation with the Polytechnic. With these conditions in place, the Polytechnic will in time be a valuable source of applied research and, together with adequate consultancy services, there is the opportunity to diversify the Polytechnic's sources of income away from a unitary student base.

To reach these objectives, the project recognises that the outcomes and the means by which they will be achieved are dependent upon local history, attitudes and aspirations. The processes, therefore, proposed within the project, are based on self-development facilitated by European partners who possess the necessary expertise which the Polytechnic will need in order to restructure itself and update its curricula in order to meet the set objectives.

In view of the ongoing changes, it will be necessary to set up new organizations (for example, institutions concerned with open learning, multi-media and technology transfer) and existing organizations may need to be restructured in order to achieve the desired results. Management education will be essential to ensure that these matters can be handled effectively by the local personnel, with EC advice at first. But, it will also be necessary to introduce management education in the curricula, as the restructuring of industry will depend to a large extent on the competence and qualifications of its newly trained managers.

The supporters of the JEP - University of Sussex, Iasi Polytechnic, University of Limerick, University of Twente, Helsinki University of Technology, Sussex Technology Transfer Centre, FORTUS S.A. (a heavy engineering industrial company, based in Iasi), Iasi Chamber of Commerce, the Prefecture of Iasi county - believe that the priority within Iasi region is the regeneration of its economy and that, with assistance from outside, Iasi Polytechnic will be a key institution to achieve the needed changes.

## 7 CONCLUSIONS

ICEE serves as a model of progressive university-industry consortium, with participative attributes, as it focuses on individuals, on close university-industry collaboration, and on infrastructure development.

While the technological dimension requires joint collaboration of business and industry, the funding dimension requires, in addition, the support of the government. ICEE is striving to build a transfer of technology infrastructure in the Iasi region which will achieve broad-based development in the industrial use of modern technology; university expertise in technology; and university output of technology- and business-skilled graduates. This goal extends beyond the self-interests of either the universities or the business world, as it clearly meets the country's interest to achieve higher standards of economic development.

ICEE has formulated a model wherein each partner (universities, business, and government) is willing to share the economic burden of technology development activities. ICEE is continuously adjusting itself with a view to strengthen areas of success, to modify problem areas, and to meet the needs of all its members. We believe these changes make the project developed by ICEE and the University of Sussex an even stronger model for industry-university technology transfer in an international context.

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