



Newsletter

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From the Director

At the invitation of the Australian Vice-Chancellors' Committee (AVCC), the body responsible for the establishment of the Asia-Pacific Higher Education Network (APHEN), the USICEE established an APHEN sub-network in Engineering Education (APHEN-EE) in 1994. With the continuing growth of the sub-network, it became obvious that a forum was needed for engineering educators to discuss issues of innovation in engineering and technology education, to build and to consolidate contacts and friendships. To this end, the USICEE has organised the *1st Asia Pacific Forum on Engineering and Technology Education* for 6-9 July 1997, to be held at Monash University in Melbourne, Australia.

It is anticipated that more than 100 delegates from over 25 countries will attend the Forum, a promising number for an inaugural meeting, and that over 80 papers will be presented, with 78 included in the Forum proceedings.

An encouraging sign that the USICEE is successfully fulfilling its role as a facilitator of the globalisation of engineering education is the interest shown in the Forum from outside of the Asia-Pacific region, with a number of participants arriving from Central and Eastern Europe, Africa and South America. The Forum embodies the fundamental objectives of the USICEE in its bringing together people from all over the world to exchange information and friendship, to strengthen networks and improve engineering education for the educational, social and economic benefit of all.

The USICEE happily welcomes all participants to the Forum, with the hope that your visit will be enjoyable and profitable, and that your journey home will be a safe one.

A meeting of the UNESCO International Committee on Engineering Education (ICEE) was held at UNESCO headquarters in Paris on 21-22 April 1997. It was opened by the Director-General of UNESCO, Dr Federico Mayor, assisted by Dr Adnan Badran, Deputy Director-General, Dr Mauricio Iaccarino, Assistant Director-General for Science, and Mr Torben Krogh, President of the UNESCO General Conference. Dr Mayor briefed the Committee on issues of importance for UNESCO in engineering and technology

education.

The USICEE Director, a member of the Committee, attended the meeting and reported on the range of USICEE activities which were undertaken in the nine months since the last meeting.

The highlight of the meeting was the launch, by the Director-General, of the USICEE's new *Global Journal of Engineering Education*.

GJEE launched by UNESCO

The USICEE's new journal, the *Global Journal of Engineering Education* (GJEE) was launched by the Director-General of UNESCO, Dr Federico Mayor, at the April meeting of the UNESCO International Committee on Engineering Education (ICEE) held at UNESCO headquarters in Paris.

The GJEE, which is set to become a benchmark for journals of engineering education, is edited by the USICEE Director, A/Prof. Zenon J. Pudlowski, and has an impressive advisory board, comprising close to thirty distinguished academics from around the world, including deans of some key Australian faculties of engineering.

The journal is an exciting development for the USICEE in its role as a clearinghouse of innovation in engineering education. It is a further step in the Centre's quest to fulfil its commission of human resources development within engineering through engineering education, in this instance, by providing both a global forum for debate on, and research and development into, issues of importance to engineering education, and a vehicle for the global transfer of such discourse. Whilst the new journal adopts an intensive global focus on the subject, it is intended, however, that the journal will operate to promote Australian engineering education worldwide.

Considering the global focus of the new journal, it seems fitting that the first two issues collate opening and wel-



USICEE Partner



come addresses, and expanded versions of keynote addresses and award winning papers presented at a recent international congress, the *3rd East-West Congress on Engineering Education*, under the theme *Re-vitalising Academia/Industry Links*.

The GJEE is available to members of the USICEE in hardcopy and, along with the Centre's Newsletter, information about the Centre's activities, and various publications, on the Internet at: <http://www.eng.monash.edu.au/usicee>

The photograph shows Dr Federico Mayor, Director General of UNESCO, launching the GJEE, assisted by (l-r) Dr Mauricio Iaccarino, Dr Adnan Badran and Mr Torben Krogh.

VicRoads Partnership

The USICEE and Roads Corporation, Victoria (VicRoads), a leading State Road Authority, expert in road management, have joined forces in the quest for excellence in global engineering education. The two organisations signed a Memorandum of Understanding on 30 May 1997, following several months of discussion.

The agreement promises to be a fruitful partnership for both organisations in the coincidence of their particular expertise and agendas. The broad scope of the agreement is their joint promotion of further engineering education, particularly in the areas of VicRoads' technological expertise.

The jewel in the crown of this agreement is the organisations' investigation into the practicality of establishing a program of further engineering education delivery in South East Asia. Such an objective meets the key criteria of the USICEE's commission, human resources development within engineering through engineering education, with a principal focus on the transfer of expertise from developed to developing countries. The objective of human resources development is, fundamentally, the provision to industry of appropriately qualified personnel, and the on-going educational development of that personnel, which is precisely what VicRoads, with its expanding operations in the region, requires.

The Memorandum of Understanding was signed at the office of Deputy Vice-Chancellor Professor Peter LePoer Darvall, Chairman of the USICEE Academic Advisory Committee, by Mr Kerry Burke, Director - Production Services, on behalf of VicRoads, and Associate Professor Zenon J. Pudlowski, Director of the USICEE. The Dean of Engineering, Professor Michael L. Brisk, Messrs John E. Coles and Peter Benson, both of VicRoads, witnessed the signing.

UNESCO Course

Following the USICEE's successful running, in 1994, of the UNESCO sponsored training course for academic teachers on *The Application of Computer-Assisted Training Programs in Engineering Education*, the USICEE was awarded a follow-up grant to rerun the course

in 1997; the course is based upon the USICEE developed book of the same name. Twelve academics from countries throughout the South-East Asia and Pacific regions have been selected to undertake the course in July, following their participation in the *1st Asia Pacific Forum on Engineering and Technology Education*. Participants are from China, Fiji, Indonesia, Lao, Papua New Guinea, the Philippines, Thailand and Vietnam.

On completing the course, participants will be encouraged to teach the course on returning home, thus further disseminating skills and knowledge, and assisting human resources development, throughout the region.

New Network Members

The globalisation of engineering education has found two new advocates with the recent signing of collaborative agreements by the USICEE with institutions in Germany and the United Kingdom. The new members of the continually expanding USICEE global network of collaborating organisations are, in Germany, the Fachhochschule Mannheim, under the direction of Professor Klaus-Jürgen Peschges, and in the UK, the University of Portsmouth, under the direction of Professor Michael R.I. Purvis. The latter agreement follows many years of successful collaboration with the University of Portsmouth's Faculty of Engineering, including the organisation of the *3rd World Conference on Engineering Education* in 1992. Both institutions are the second to sign such agreements with the USICEE in their respective countries, with Sheffield Hallam University in the UK and Fachhochschule für Technik und Wirtschaft in Berlin, Germany, as the forerunners.

The total number of such cooperative agreements is now a pleasing seventeen.

Membership Drive

This last year has seen a refocusing of the activities of the USICEE with two essential shifts in its paradigm. The first is a greater attention to the globalisation of engineering education, spearheaded by the development of its new journal, *the Global Journal of Engineering Education* (GJEE). The second has entailed an opening up of the USICEE and its activities to members, international and national, academic and industry, to pursue more projects and programs.

In the short period since circulating the Centre's membership brochure with its various grades of membership devised to suit both individual and organisational needs, the number of new members has been extremely encouraging. The USICEE has a new partner in VicRoads; three Supporter institutions in the Technical University of Denmark (which was the first Supporter to join, under the leadership of Professor Hans-Peter Jensen), Auckland Institute of Technology and the Australian National University; two Institutional Contributing members in Kaunas University

of Technology, in Kaunas, Lithuania and the Middle East Technical University (METU), in Ankara, Turkey; and over thirty individual members, the first of whom to join was our good friend and supporter Professor Trevor Cole of the University of Sydney.

Liaison with Commission

A meeting of the Science and Technology Network of the Australian National Commission for UNESCO was held in Canberra on Thursday 15 May, and was attended by the USICEE Director. Several key issues concerning science, technology and engineering activities were discussed, and it was acknowledged that the Commission should be more involved with these areas as they are key factors in economic development.

The USICEE was invited to present an exhibition of its achievements to the full meeting of the National Commission in Melbourne on Wednesday 21 May. A typical reaction of Commission members was amazement at the output of the Centre in so little time and with so few staff. The Commission was so impressed by the USICEE's work that it has recommended to UNESCO that the Centre should receive full status as a UNESCO Centre.

USICEE European Seminars

Preparations are in full swing for two USICEE collaborative seminars to be held in Europe this September. It is intended that these seminars be particularly focused affairs with a intentionally low participation rate relative to previous international meetings organised by the USICEE. The focus is very much on the exchange of information and upon deliberation on directions for the development of engineering education in the Mediterranean and Baltic regions. The respective seminars will be hosted by the University of Pavia in Italy, from 14-16 September, and the Vilnius Gediminas Technical University in Lithuania, from 26-29 September.

Proposals for paper presentations are still being accepted, and will continue to be accepted until late August as it is intended to publish the proceedings after the seminars.

ILG-EE General Meeting

The 1997 ILG-EE Annual General Meeting will be held in conjunction with the 1st Asia Pacific Forum on Engineering and Technology Education on Wednesday, 9 July. The group's current activities, including a number of conferences scheduled for 1997-98 in the lead up to the Global Congress in September 1998, will be discussed. Other issues and activities in engineering education, such as special projects targeting the developing world, will also be high on the agenda.

Following the meeting, participants will be able to relax at the annual dinner, which will be held in conjunction with the

USICEE Network dinner at the Monash University Staff Club.

Pan-African Forum

Organisation by the USICEE of the 1st Pan-African Forum on Engineering and Technology Education, under the theme *Building Human Resources for Africa*, is now well underway. The Forum is to be hosted by the Jomo Kenyatta University of Agriculture and Technology (JKUAT), Nairobi, Kenya, from 18-21 January 1998, with Professor Ratemo Michieka, Vice-Chancellor of JKUAT, as Honorary Host.

The main objective of the Forum is to establish an African network for engineering and technology education, with the USICEE keen to share its considerable experience in developing the necessary infrastructure. Such an infrastructure will require the establishment of an *Association for Engineering Education in Africa* (AEEA), with its own means of publication and distribution. It is envisaged, at this stage, that the USICEE will assist in the publication and distribution of the AEEA newsletter and, should funds become available, an *African Journal of Engineering Education*.

It is anticipated that the Forum will generate an action oriented agenda for the African network to develop engineering education and to strengthen the collaboration and exchange of information between countries of the African region.

A number of tours, including the world famous Kenyan safari, will be arranged for participants and guests.

A call for papers is available on the Internet and in hardcopy.

Hypermedia

Recognising the importance of the application of hypermedia to facilitate the transfer of knowledge and skills, the USICEE has setup a postgraduate project titled *The design and investigation of the effectiveness of a hypermedia knowledge base for comprehensive self-study procedures*. The project is to be undertaken by Ms Shi Tao, originally of Wurumugi, China, recipient of the 1997 USICEE Women in Engineering Education Scholarship. Ms Tao is concerned with the development of a hypermedia knowledge base for comprehensive self-study procedures, the aim of which is to assist students in their early studies of electrical engineering, in particular, of circuit theory.

A multidimensional knowledge base model has been devised, enabling the development of teaching procedures presented in the hypermedia system, with which students will be able to analyse problems (problem-oriented strategies), identify important concepts and principles (conceptual knowledge), determine which strategies have to be adopted for solving tutorial and laboratory problems (procedural knowledge), verify the knowledge by setting up relevant experiments, interpret experimental results, and write conclusions (synthesis).

A particular issue, the extension of state-of-the-art computing and communication infrastructure to allow access to flexible learning as it develops so rapidly worldwide, will be addressed and investigated in the study. This will be of tremendous importance with the increasing convergence of distance education, open learning and traditional educational methodologies, which have become more central to the role of the USICEE.

Environmental Engineering

The Centre is undertaking a timely project to investigate the status and quality of environmental engineering education. The project is being undertaken by Miss Duyen Q. Nguyen, the USICEE's Project Officer and a part-time postgraduate student.

The first stage of the project, already completed, involved a survey of industry and academic views on the inclusion of issues and topics of sustainable development and environmental engineering education in engineering curricula, and on the desirable qualities and attributes for practising graduate engineers.

Particularly interesting results were forthcoming from Australian industry chief executive officers. The results will be used in future curricula development.

USICEE Visitors

Since the release of our last Newsletter in March, the USICEE has hosted two international delegations, from Thailand and Sweden, as well as a number of individual visitors. The Thailand delegation, lead by Dr Surasit Ratre of King Mongkut's Institute of Technology, Ladkrabang, Thailand, reinforced our excellent relationship with Thailand. It is hoped that we can undertake joint projects in the near future for the benefit of Thailand and the international community.

The Swedish delegation, from the Royal Institute of Technology, Stockholm, was lead by Asa Nilson, of the institution's External Relations Office. The Swedes, in particular, are enthusiastic about collaborating with Australia for the benefit of developing countries.

USICEE Annual Conference

The 1st USICEE Annual Conference, under the theme *Globalisation of Engineering Education*, is being organised for 11-14 February, 1998, to be held at Monash University, Clayton, Melbourne, Australia.

The objective of the Conference is to bring together members and supporters of the USICEE from all over the world and to discuss issues of importance to engineering education; to debate the activities of the USICEE; and to foster collaborative ventures and friendships already established.

The world has become a global community which now provides more opportunities for collaboration. The increased

level of internationalisation of engineering education has placed academic institutions in a new and challenging situation as they strive to prepare their graduates for the global arena. The Conference theme was chosen to address this situation and to discuss issues of concern.

A call for papers is now in circulation, available both on the Internet and in hardcopy, obtainable from the USICEE.

Forthcoming Conferences

The following is a list of conferences, forums and congresses which are to take place around the globe over the next two years:

- Philippines, Manila, 17-20 August 1997 - *5th International Conference on Engineering Education. AEESEAP*. Organised by: College of Engineering, University of the Philippines, Diliman, Quezon City 1101, Philippines. Contact person: Dr Jonathan D.L. Salvacion, Tel/Fax: +632 928-3144 or +632 922-4714, E-mail: jonats@engg.upd.edu.ph
- Italy, Pavia, 14-17 September 1997 - *Mediterranean Region Seminar on Engineering Education*. Organised by: The USICEE, Monash University, in collaboration with the University of Pavia. Contact person: Mr John Zakis, Tel: +61 3 990-32467, Fax: +61 3 990-51547, E-mail: zakis@eng.monash.edu.au
- Lithuania, Vilnius, 26-29 September 1997 - *Baltic Region Seminar on Engineering Education*. Organised by: The USICEE, Monash University, in collaboration with the Vilnius Gediminas Technical University. Contact person: Mr John Zakis, Tel: +61 3 990-32467, Fax: +61 3 990-51547, E-mail: zakis@eng.monash.edu.au
- Kenya, Nairobi, 18-21 January 1998 - *1st Pan-African Forum on Engineering and Technology Education*, under the theme *Building Human Resources for Africa*. Organised by the USICEE in collaboration with the Jomo Kenyatta University of Agriculture and Technology. Contact person: Assoc. Prof. Zenon J. Pudlowski, Tel: +61 3 990-54977, Fax: +61 3 990-51547, E-mail: ZJP@eng.monash.edu.au
- USA, Seattle, WA, 28 June - 1 July, 1998 - *The 1998 American Society for Engineering Education (ASEE) Conference*. Contact person: Dr Muthar Al-Ubaidi, College of Applied Science, University of Cincinnati, 2220 Victory Parkway, Cincinnati, Ohio 45206-2822; Fax: (513) 556-4015, E-mail: Muthar.AI-Ubaidi@UC.Edu
- Poland, Cracow, 6-11 September 1998 - *Global Congress on Engineering Education*, incorporating the *5th World Conference on Engineering Education*, the *4th East-West Congress on Engineering Education* and the *1998 International Congress of Engineering Deans and Industry Leaders*. Organised by: The USICEE, Monash University, Clayton, Melbourne, Australia. Contact person: Assoc. Prof. Zenon J. Pudlowski, Tel: +61 3 990-54977, Fax: +61 3 990-51547, E-mail: ZJP@eng.monash.edu.au