

AUSTRALASIAN ASSOCIATION FOR ENGINEERING EDUCATION

NEWSLETTER

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An International UNESCO Conference on Engineering Education - ICEE'95 - will be held in Moscow, Russia, between 23 and 25 May 1995. It is envisaged that the Conference will provide significant input into the 1995 International Congress of Engineering Deans and Industry Leaders at Monash University. AAEE members are encouraged to submit a paper proposal and attend the Conference. Picture above shows the Tsar's summer residence in Pushkin town, near St. Petersburg. Participants will have the opportunity to visit many interesting places like this in Russia as a social program, including post-conference tours, will be organised in conjunction with the Conference (details elsewhere in this issue).

FROM THE PRESIDENT



Prof. Peter Darvall

Bright days for engineering education

E-mail and fax have provided us with the *universal tearoom* in which to share, immediately, our initiatives, impressions, and reactions on methodologies in engineering education. Previously, we had this immediate feedback facility only in our own tearooms, where we *unloaded on our colleagues (and they on us)*. How valuable this process is in advancing our common purpose of providing engineering education to the limit of our abilities!

Quality reviews, in a régime where considerable money hangs on the outcome, have also concentrated our minds. This is general across the University, and the University system, but impacts on engineering, as it does on the other faculties. We are prompted to think of appropriate performance measures, and invited to demonstrate that our assertions and beliefs have substance. The only galling part of this process is that we do it at someone else's behest, and not our own.

In most universities, there has been an increased emphasis in taking teaching quality into account in the promotion process. This phase was in the making, but was accelerated by the Quality Review régime. The second-class citizens, who were kept in the shade by their devotion to teaching and learning, are now having their *day in the sun*.

The Committee for Advancement of University Teaching (CAUT) process and outcomes are providing exemplars for those who are setting the pace in engineering education. I invite all members of the AAEE to review the CAUT Annual Report for 1992-1993, which lists the Grant outcomes for 1993 and for 1993/94, to network with those engineering educators who have won CAUT grants in hard competition, and particularly with those winners where you share their areas of interest. This is a very effective way of spreading innovation through the system, and through cooperation rather than rivalry, will demonstrate our overriding commitment to our students. I am sure that the winners of CAUT grants will be happy to provide their e-mail addresses, and share their experiences.

Internationalisation of engineering education grows apace. We all have our own favourite experiences, but mine is of the Matriculation Ceremony at the Opening of the Academic Year 1994/95 of the International Faculty of Engineering (IFE) at the Technical University, Lodz, Poland, in September this year. Inspired by the faith and energy of our 1st Vice-President and Executive Director, Associate Professor Zenon Pudlowski, the Technical University of Lodz took the bold step of daring to teach an international engineering curriculum in electromechanical engineering, in English, in Central Europe, for an international clientele. Thus students, from as far afield as Kuwait and Bolivia, are studying engineering, in English, in Poland, at the instigation of an Australian engineering academic. Only the archest of conservatives could fail to be impressed, as I was, by this achievement. The students who have chosen to study in the IFE are clear in their understanding, and adamant in their commitment to the value of the international flavour of their engineering education.

There is new glamour in computer-aided engineering education - or should we, as a result of recent Prime Ministerial pronouncements, now use only the word *multimedia*. This will certainly be the buzziest of buzz words for the next little while, with a hard rolling real or imaginary gravy train behind the banner.

Interest groups (facilitated by e-mail and fax) are springing up within the UNESCO Supported International Centre for Engineering Education (USICEE) in areas of engineering education, which are inherently of considerable interest. These include, for instance, computer-based learning, problem-based learning, environmental engineering education, distance

education and open learning, engineering education methodology, and biomedical engineering education, etcetera. There are many others. Such interest groups add immediacy and an interest focus to the sometime day-to-day demand drudgeries of the engineering educator. The interest groups provide a stimulus for a lively association.

These are bright days for engineering education.

*Professor Peter LePoer Darvall
Deputy Vice-Chancellor (R&D)
Monash University
President of AAEE*

DESPERATE GLOBAL TIMES CALL FOR INNOVATIVE MEASURES

As undergraduate engineering students in the early 1970s we were told by lecturers that there was nothing new in engineering. Yet in a mere 20 years even the term Engineer is now virtually obsolete.

Industrialisation began in England in the mid 1800s with innovations such as the water powered spinning jenny, the steam engine by Watt, and the purification of iron by Cort. These, along with other developments, turned England into the wealthiest and most powerful nation in the world. It was around about this time that the term **Engineer** was born. From steam to internal combustion, to electricity, to fluid power, the noble craft of engineering grew into a science labelled, for example, electrical, civil or mechanical.

With the advent of computers and global data communications, the axis of technology has shifted. Software, computer and data communications technologies are the vibrant frontiers of today and tomorrow with the more traditional disciplines being relegated to commodity status.

Australian education has enjoyed an extraordinary reputation throughout the world with Australian professionals being recognised as amongst the most innovative. At present South East Asia, the growth centre of the world, is awash with Australian engineers.

But now more than ever the Australian engineering community must establish new paradigms.

With the labour market now demanding professionals with broad based skills and less research orientation, our universities and education system need to be reinvented. Industry in the future will be choosing people on competencies rather than qualification.

We could, for starters, look at the title **Engineer**. Perhaps, as in the 1800s, a new word needs to be framed that describes the new age focus of the discipline and provides a distinct recognisable function that is in harmony with past and present engineers - perhaps something like **Technovator**.

The new age engineering may not be split into disciplines, as in the past, but by industry. Instead of civil, mechanical and electrical, an undergraduate degree in manufacturing would consist of a wide range of technology studies to a basic level. These graduates would not only have strong cognitive and creative skills but also a full range of vocational competencies such as commercial acumen, team skills, communication skills as well as boundless enthusiasm to learn. Management and specialised skills could be introduced at Master's level at a later stage, after the graduate has spent several years in the workplace (the school of hard knocks). However, in these tempestuous times we must all be aware that specialisation is often a ticket to obsolescence.

The universities of the future will probably be more like a commercial business with a

greater client focus. Students, parents and industry will be looking for quality outcomes through cost effective and time efficient delivery. Teleteaching, multimedia and self-managed learning with *real world* technology will be the features of the new-age learning centres that will boast accelerated learning and learning coaches that have current real world experience. These learning resources will replace the now obsolete lecturer in front of the class and budget allocations will gradually shift from Salaries to Resources, enabling students greater opportunity to learn by doing rather than learn by hearing.

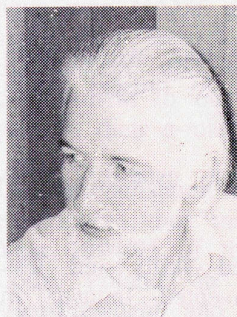
These learning centres will have close links with industry as industry will be involved in more applied research. There will be less emphasis on paper-based assessment, as this has been more of a tool for educators than anyone else. This may lead to less student versus student competition and more team learning - the Japanese discovered 30 years ago that cooperation is far more productive than competition.

One such new-age Learning Centre (in the field of Industrial Technology) is currently being developed in Rochbach, Germany by Festo in partnership with the German Government.

With Australia housing the UNESCO Supported International Centre for Engineering Education (USICEE), we now have a great opportunity to develop new paradigms in engineering education and to provide leadership to the world.

Barry Drew
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FESTO DIDACTIC
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INNOVATIVE APPROACH TO ENGINEERING EDUCATION



Abstract

Graduates need experience before they are useful.

There has been a reluctance to employ engineers with theoretical backgrounds to tackle design and other problems that require practical solutions, because theory has ignored feedback from practice.

Education systems that rely on memory training do not necessarily achieve an ability to analyse, postulate, solve and follow through engineering problems.

Mr John Hurle

Bringing real problems from industry into the universities will make engineering education more relevant, reduce the initial *learning* period of graduates in industry, and assist industry by tapping a youthful, inventive resource.

Education

Theories of education are in abundance. Education faculties at various institutions teach people how to teach, and theories of learning are many and varied. Research in education, through organisations like Australian Council of Educational Research (ACER) and education faculties, has become institutionalised and self-perpetuating as the subject itself is philosophical, in nature.

Education is manipulated by politics. The winners of *Best Teacher* award this year were two teachers:

* One from the outer suburbs, who put her good teaching practice down to keeping class

sizes down and coping in the stressful circumstances imposed by a Government intent on cutting the education budget.

- * One from country Victoria, who was awarded for internationalising classes via computers, modems and Internet, the so-called new technologies.

No mention of innovation by students, and no mention of learning by discovery!

Epistemology

The theory of knowledge or how we come to know about things is different to the question of why do we remember some things and not others.

This is again different to actually applying what you know or what you have remembered, in the most practical and best manner when placed in the most stressful situation: *What is the solution, now, or else - catastrophe!*

Why do some people choose to have knowledge of some topic and not another topic? People are interested in topics for all sorts of reasons:

- * genetic (hereditary),
- * peers,
- * impending wealth (greed),
- * emotional gratification (sex),
- * survival (death, fear).

We are bombarded with opportunities to turn media (press, TV, film, etc) and other sense-data into knowledge, which is the stuff stored in memory via a sieve or filter which sorts out *important* from *non-important*.

What makes some sense-data important while others are rejected from entering memory? Is it interest, guilt that you **should** remember this or **should have** remembered that, fear that if you don't remember it you will fail, or look stupid. Whatever it is, some people remember some things, others do not even register that they had a choice of remembering it.

A further filter occurs in recalling things. Do we purposefully forget things that are not important, are not interesting or that we do not like or that cause harm? When we forget things that we should not have forgotten, has the filter become faulty? Do we then go about remembering them? How do we clean the filter so that we remember everything, become sharp as a tack? (Eat razor blades for breakfast).

Learning is a means of storing data into memory. Learning implies some form of repetition so that data enters deep, long-term memory. Things learnt are said to come out, or be recalled, by *instinct*, or they are natural (eg driving a motor car, playing music *by ear*). Why do some things get stored in deep memory and others not? Certainly, if there was some enjoyment in the experience it will stick. But also, if the experience brought about pain, it could be learnt (Pavlov's dogs). So emotional state, tiredness, age, virility, surroundings, peers, genetics, environment, etc all affect learning ability [1].

These questions plagued the educators before they set up the Victorian Certificate of Education (VCE) which superseded the Higher School Certificate (HSC) which superseded the Matriculation Certificate. This used to be the ticket into colleges of higher learning.

Engineering Education

Engineers should be educated in an enjoyable manner, to raise their self esteem, by encouraging achievement of reasonably difficult and practical problems. The objectives should be:

- * to reduce the amount of that time considered *apprenticeship* when engineers first go out into the workplace,
- * teach *rules-of-thumb* and *of the order of* and *roughly, should be abouts*,
- * to get their hands dirty as soon as the course starts, to let them know limits of human capacity,
- * to give practical training in knowing limits of time, space, structure, etc,
- * to provide a concise handbook of engineering formulae, laws, rules and regulations,
- * to teach jargon, symbols,
- * to teach how to design.

What makes a Good Engineer

Engineers are generally conservative, dull, technocrats. To develop innovative problem solvers, the education system must question traditional values and methods. Most of the time in education is spent learning these without having time to debate or question these values or methods.

If these are questioned in the engineering workplace, the other engineers think *they are inexperienced*, or *what a stupid question*, or *this person is plain dangerous or nuts!* [2].

A *Good Engineer* solves problems. The term *trouble shooting* means the same. Problem solving can be done by people who know what they are doing, if they have done it before, if they know the jargon, and how to interpret contradictory evidence. They must be investigators, detectives and file managers. They sort evidence, analyse situations, make economic judgments and put into practice best solutions. They are clear thinkers, logicians, interpreters of facts, practical commentators of strange events.

The problem is how do you teach this without resorting to the catch cry: *You can only get this from experience*. The *experience* must be brought back into the colleges and universities.

Encouragement, learning by increasing self esteem, achieving by passing, creating, doing and facing problems are the keys [3][4][5].

Very often, the main problem is definition of the problem and specifying the brief within practical limits [6].

A *Good Engineer* is a designer.

Aptitude and Initiative

Before students start an engineering course, they should be given an aptitude test, to find out how suitable they would be as engineers. The test should not be just to check the rationality or logic capability of students, but should also indicate flair, lateral-thinking ability and creativity.

An interesting point, here, is that when IBM or other software companies interviewed prospective programmers, they used to shy away from engineers in preference to arts and humanities graduates, who could express themselves and show creative abilities.

Engineers should be trained in how to get jobs. Specific courses to develop initiative should be prescribed, for those that need it. If jobs are not available, there are still many situations and problems in the community that need engineering. The *engineering* solution should be promoted, and differences between a solution that has been *engineered* and one that has been thrown together should be taught.

Some engineering graduates are employed because of their computer skill. These graduates are not doing engineering but are quickly recognised as useful data-base maintenance personnel, or as bug-solvers for secretaries having difficulties word-processing. A lot depends

on the individual, but a common trait is *initiative*.

It is not *What is there to do in this job?* or *What can I do?*, but rather *This is what the problem is, these are the alternatives and this is the way to do it and I am now doing it, what do you think?* A pro-active approach shows initiative, and this is the attitude needed for graduates.

Co-operative Education

One university boasts 90 weeks of approved experience in industry, alongside an academic program. What is approved experience?

Successful engineering companies operate flat-out, very efficiently with little time for training undergraduates, especially if there is not commitment to stay working at the company. Without a *bond* or apprenticeship agreement there may never be a pay-back for investing the time and skill in training. Many companies do not have the skill to teach on the job, where the potential for loss of a client is much riskier with somebody *green*. Extra checking time is required for the new-comer, and all external communication would be vetted.

How relevant is the work experience? Is it simply computer data entry, floor sweeping, lathe work, morning tea preparation? The experiences of problem definition, briefing, client liaison, problem solving, design, cost estimating, specification writing and drawing, construction management, quality control, inspections, negotiation, bargaining, and investigating how things work are useful engineering experiences.

In Summary

Education of engineers is left up to people who have previously gone through the system, who have received recognition, qualifications, degrees etc, which have enabled them to get experience and speak with authority.

Their views and ideas are biased towards their own experiences in education and experience. Thus, while maybe detesting the memorisation needed in mathematics, electronics, quantum physics, or whatever subject, they have suffered, they have more or less, memorised and regurgitated sufficiently accurately to score some sort of recognition.

There is an awful lot of dead-wood out there! Those who are qualified, but who could not respond to a problem, who could not delegate, search, show any initiative, are virtually brain dead. There is also the class of the verbose bureaucrat, who, with excessive delegating or paper-shuffling skill, can fob off problems with a few key management phrases, and by re-pitching the jargon can appear knowledgeable and up-to-date (computer literate enough to e-mail). These survive as engineers, but are a waste of *could-a-been* talent, never able to jump in, think rationally on a broad scale, unwilling to find out how things work, and are quite useless as engineers.

Engineering education must promote pro-active problem defining and solving, practical engineers.

This is best done by an active inter-action with real and up-to-date engineering problems, and by learning to solve them with a recent, keen, broad minded engineer, who is in a hurry for a quick and simple solution.

References

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WORLD CONFERENCE ON ENGINEERING EDUCATION

15-20 October 1995
Minneapolis-Saint Paul, Minnesota, USA

THE CONFERENCE

This major World Conference on Engineering Education, the fourth in a series, is held every three years and follows the World Conference on Engineering Education, held in Portsmouth, England in September 1992 and the previous conferences held in Sydney, Australia (February 1989) and Cologne, Germany (April 1984). It is organised by the Technology Based Engineering Education Consortium, which is an organisation within the William C. Norris Institute. The University of Minnesota will be the local university host.

The Conference is organised on behalf of the **International Liaison Group on Engineering Education (ILG-EE)** and supported by the State of Minnesota, the General Electric Foundation and numerous professional and industrial organisations.

CONFERENCE THEME

The main theme of the Conference will be *Restructuring Engineering Education for Meeting World Needs*. Within this theme, the following important issues will be addressed:

- Productivity, Quality and Accessibility of Engineering Education
 - Maintaining Excellence at Lower Cost
 - Applying Technology to Expand Educational Access (to the student, to the workplace)
- Addressing Energy and Environmental Issues
 - Designing and Manufacturing Products - raw material to salvage
 - Educating Engineers to Effectively Manage Energy Use
 - The Role of Engineering in Energy Utilisation Alternatives and Practices
- Management and Utilisation of Technology
 - Preparing Engineers to be Management and Decision Makers in Technological Innovation
- Engineers in a Multicultural Society
 - Educating Engineers for Social Responsibility
 - The Ultimate Manufacturing Engineer
- Learning and Curriculum
 - International Differences in Engineering Education
 - Interdisciplinary Issues
 - Applying Appropriate Technologies in Engineering Education
- International Collaboration in Engineering and Technology
 - Government-Industry-University Programs and Projects
 - International Technology Sharing
 - International Accreditation and Cooperation
 - Exchange Students/Faculty Staff

For further information on the Conference please contact the Conference Chairman:

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Technology Based Engineering Education Consortium
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1995 INTERNATIONAL CONGRESS OF ENGINEERING DEANS AND INDUSTRY LEADERS

3-6 July 1995
Melbourne, Victoria, Australia

THE CONGRESS

This Congress is being held to maintain the progress on issues concerning engineering education on a worldwide basis. It is arranged as a follow up to the previous extremely successful International Symposium and Congresses for Engineering Deans and Industry Leaders at Ohio State University in 1989 and at UNESCO Headquarters in 1991. The 1993 Congress was held at UNESCO and was organised by UNESCO and UATI, with appropriate engineering education groups, including the Australasian Association for Engineering Education. These meetings were intended to assist technological development in developing countries by improving engineering education there with the help of institutions in developed countries. They resulted in the development of an action-oriented agenda of specific projects.

The Congress is hosted and organised by the UNESCO Supported International Centre for Engineering Education within Monash University, and is sponsored by The Institution of Engineers, Australia, with other organisations as co-sponsors.

AIMS AND OBJECTIVES

The aim of this Congress is to provide an international forum to continue the dialogue on the effectiveness of methods of adapting engineering education and research to the needs of national and international economies and cultures, and the development of international collaboration. The Congress aims to encourage and stimulate academia/industry co-operation with particular emphasis on developing countries and countries evolving towards a market economy.

CONGRESS THEMES AND TOPICS

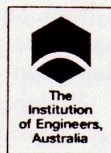
The Congress streams will consider themes included in the action-oriented agenda determined in previous congresses. However, other important issues of concern will be addressed. Suggested topics for Congress papers include, but are not limited to, the following areas:

- Sister University programs
- Industry-university interaction
- Database on engineering education
- Transfer of information on engineering education and industrial training
- Completion of education of faculty at engineering schools in developing countries
- Curriculum development and curricular standards in engineering education
- Application of new media in engineering education and industrial training
- Effective methodologies in engineering education and industrial training
- Application of satellite technology in engineering education and distance education
- Recognition of foreign qualifications and accreditation systems for engineering courses
- Management of academic institutions and engineering faculties
- Participation of women and minorities in engineering and engineering education
- Community relationships with engineering and engineering education
- Education for the protection of the environment; sustainable development
- Professional development; promotion of continuing engineering education and industrial involvement
- Co-operation between Engineering Deans and Industry Leaders
- Technology linkages between developed and developing countries

ENQUIRIES

All correspondence relating to the Congress academic program and proposals for papers should be addressed to the General Chairman:

Associate Professor Zenon J. Pudlowski
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Fax: +61 3 905 6069
e-mail: ZJP@eng.monash.edu.au



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- [4] McRae, R.R., Creativity, divergent thinking, and openness to experience. *Journal of Personality and Social Psychology*, 52, 6, 1258-1265 (1987).
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John Hurle

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USICEE UPDATE

The UNESCO Supported International Centre for Engineering Education continues to be a very busy place in the middle of the Faculty of Engineering at Monash University. Apart from making contacts with engineering education academics in Australia and overseas and negotiating agreements with other tertiary institutions, the Director has been very active in carrying out the Centre's aims through preparing submissions to various funding bodies and presenting papers to a number of conferences. There have been several visits to the Centre by overseas academics. As part of its commitment towards utilising modern methods of information transfer, the Centre has also facilitated the establishment of a number of Interest Groups and computer networks, hosted by Monash but spreading out into the wider engineering community.

Established links with other institutions

It is apparent that tertiary institutions involved in engineering education are realising the importance of research into, and development of, educational technology and knowledge engineering, as well as the relevant cognitive sciences. This carries with it serious implications for the training of undergraduate and postgraduate students. Academics involved in this area are still few in number and financial support is very limited.

The process of engineering training cannot be improved without the establishment of a network of centres which will combine engineering specialists and experts in the area of engineering education, and will be able to direct engineering education towards the requirements of a modern society. The Centre is currently in the process of setting up a number of regional centres, linked with the USICEE to form a worldwide network. The establishment of a regional Centre for South-East Asia based in Vietnam is our immediate goal.

An important aim of the USICEE is to encourage academics in developed countries to pursue educational research and to assist new staff to take teaching and educational research more seriously.

Contacts have already been made with academic institutions in the Philippines, Indonesia, Vietnam, Thailand, Fiji, People's Republic of China, India, Turkey, Israel, Iran, the Czech Republic, Hungary, Poland, the Slovak Republic, Romania, the Russian Federation, the Ukraine, Lithuania and Latvia. Visitors from Fiji, Thailand, the Philippines, Vietnam, Germany, South Africa and China have all spent some time at the Centre.

Already co-operative agreements have been signed between the USICEE and The Centre for Information Technology (CITE), Vietnam, the Russian Association for Engineering Education, the University of Mining and Metallurgy in Cracow, Poland and the Faculty of Electrical Engineering, Technical University of Budapest (FEEITUB) in Hungary. Other agreements with the UK, South Africa, Pacific Russia and the Middle East Technical University (METU), Ankara, Turkey are being actively pursued.

UNESCO Course

The UNESCO sponsored training course for academic teachers from a number of South-East Asian countries on *The Application of Computer-Assisted Training Programs in Engineering Education* has been completed in November. Young engineering academics from Cambodia, Fiji, Malaysia, the Philippines, Papua New Guinea, Thailand and Vietnam spent a week at Monash participating in both theoretical and hands-on sessions on topics such as roles for the computer in the learning process, principles of instructional design, multimedia authoring tools, hypermedia in a problem-based learning environment, computer-managed testing and using the Internet.

Interest Groups

A number of special interest groups have been established at Monash University, with the aim of expanding their membership to other institutions. The groups include the Engineering Education Methodology Group with joint Conveners Bruce Field and Zenon Pudlowski, the Engineering Management Group, the Engineering Medical Technology Group to be formed in 1995 by Ian Brown and the Engineering Graduates Group to be formed in 1995 by Terry Berreen.

The first meeting of the Problem-Based Learning/Engineering Design Group convened by Roger Hadgraft was a video presentation *Making The Most of Problem-Based Learning* by Prof. Don Woods, of McMaster University, Canada and at the next meeting Julian Seidel will discuss the PBL approach to 4th year soils engineering.

The Environmental Engineering Education Group (Convener Gary Codner) will deal with the theme *Perspectives on EEE - An Overview* at its next meeting while the Distance Education/Open Learning Group, Convened by William Young, was recently addressed by Brendon Parker on *Distance Education - The Gippsland Perspective*. The group's next meeting is to be arranged at the Monash University Distance Education Centre, Gippsland.

The well-established Computer-Based Learning Group, convened by Qi Su, has 51 members. Recent topics included *An Overview of the Results of the Survey of Computer-Aided Instruction for Engineering Students in the Faculty of Engineering, Monash University*; *Development of Software for Engineering Education*; *Land Interactive Software - An Educational Tool for Engineers* and a talk led by Ian Donald on *Soil and Rock Slope Stability Programs - Educational Tools in Undergraduate Teaching*.

The **USICEE Academic Visitors Seminar Series** was addressed by A/Prof. Duncan Fraser on *Curriculum Development in the Engineering Faculty at the University of Cape Town*.

Industry Survey Proposal

A Draft USICEE Industry Questionnaire is being prepared with its main purpose being to ascertain industry views on skills required of graduate engineers, industry's needs on engineering education and what form collaboration with USICEE could take.

7TH ANNUAL CONVENTION & CONFERENCE OF THE AAEE

The AAEE has can now claim to have established an extremely successful annual convention and conference. It has become the tradition to hold our annual convention and conference in the second week of December, permitting engineering academics to complete their examination duties. Over the last years potential hosts have been recruited through the AAEE Executive Committee. On this occasion, the Executive Committee wishes to express its sincere gratitude to the following universities which have provided venues for the AAEE annual events:

- * The University of Sydney (1989)
- * Monash University (1990)
- * The University of Adelaide (1991)
- * The University of Queensland (1992)
- * The University of Auckland (1993)
- * University of Technology, Sydney (1994)

As from 1995, the Executive Committee wishes to open the organisation of its annual meeting to all Australasian universities with engineering courses. A call for expressions of interest to hold the **7th Annual Convention and Conference** between 10 and 13 December 1995 is therefore made. Academic institutions from Australasian states and territories, as well as from neighbouring countries, which have not, as yet, had the opportunity to hold an AAEE meeting are particularly encouraged to submit their proposals.

The AAEE Executive Committee cordially invites potential organisers to submit proposals as early as possible. Written proposals must include:-

- * Profile of the host institution (Engineering Faculty or School);
- * Conference objectives;
- * Conference themes and special areas of interest;
- * Academic staff interest and support (suggested Organising Committee);
- * Local support by academic institutions, government, industry and professional organisations;
- * Conference facility to support lecture program;
- * Facility for registrants and transport needs;
- * Estimate of financial situation and proposed budget;
- * Statement of acceptance of net conference profit to be transferred to the AAEE;
- * Statement of acceptance of close collaboration on the organisation of the convention and conference programs with the AAEE Executive Committee, through the AAEE Executive Director.

All proposals must be submitted by **Friday, 10 February 1995**. The Executive Committee of the AAEE reserves the right not to proceed with the annual convention and conference and/or to select its own host. Proposals are confidential and should be addressed to: Assoc. Prof. Zenon J. Pudlowski, AAEE Executive Director, USICEE, Faculty of Engineering, Monash University, Clayton, VIC 3168, Australia.

INTERNATIONAL UNESCO CONFERENCE ON ENGINEERING EDUCATION - ICEE'95 23 - 25 MAY 1995, MOSCOW, RUSSIA

UNESCO now considers Africa and the former Soviet territories as an area of special concern. Also human resources development, and in particular engineering and technology education, is a priority area essential for harmonious national and international development. Hence, UNESCO decided to sponsor the *International UNESCO Conference on Engineering Education - ICEE'95* to be held between 23 and 25 May 1995 in Moscow, Russia.

The organisers and sponsors of this Conference include key organisations in Russia concerned about science, technology and engineering, with the State Committee on Higher Education of the Russian Federation (Russian Ministry of Higher Education) and UNESCO being the main supporters.

The goals of the Conference are to define main tendencies in the development of engineering education for the 21st century; to stimulate contacts between colleagues in different countries; to facilitate the exchange and acquisition of knowledge and experience in engineering education just to mention a few.

Apart from formal Conference sessions, a program of technical visits to various plants and

industrial organisations, as well as research institutes, is envisaged. Also, an extensive social program, accompanying person program and post-conference tours are planned in conjunction with the Conference.

Prospective authors should submit an abstract in triplicate in English by 1 January 1995 to Prof. M.R. Liberson, 27 Petrovka St., Moscow, 103767 Russia. Further details may be obtained by contacting the Russian Association for Engineering Education on telephone number +7 095 292-1098 or fax: +7 095 200-6127. AAEE members are encouraged to submit a paper proposal and attend the Conference.

POLISH SEMINAR OF ENGINEERING DEANS AND INDUSTRY LEADERS (EDIL'94)

A *Polish National Seminar of Engineering Deans and Industry Leaders*, called *EDIL'94*, was held at the Technical University of Lodz between 26 and 27 September 1994 under the patronage of the Chairman of the National Council of Higher Education, Professor Jerzy Osowski, and the Rector of the Technical University of Lodz, Professor Jan Krysinski.

The Seminar was instigated by the Director of the UNESCO Supported International Centre for Engineering Education (USICEE) at Monash University, Assoc. Prof. Zenon J. Pudlowski, who is also General Chairman of the 1995 International Congress of Engineering Deans and Industry Leaders (ICEDIL'95), which will be held at Monash University between 3 and 6 July 1995. The Seminar was organised and chaired by Professor Janusz Turowski, Vice-Rector for International Co-operation at the Technical University of Lodz.

The Polish Seminar was the first in a series of national seminars instigated by the USICEE. The objective of this series of national seminars is to set the stage for the 1995 International Congress in Melbourne where issues of concern to academics and industry leaders, raised and discussed at national seminars, can be aired and presented as national cases at the 1995 Congress. Another objective of this series is to evoke an international debate on the topics suggested for the 1995 Congress and to elicit national presentations and paper contributions to the Congress. Electing individual academics and industry leaders to a national delegation to attend the 1995 Congress is also an important objective of this series.

Altogether close to 100 Rectors, Vice-Rectors, Deans and Vice-Deans of Engineering, representing about 20 technical universities in Poland, as well as several industry leaders attended the seminar. The meeting addressed almost all the topics suggested for the 1995 Congress in a format which included several keynote and introductory addresses. Three main topics of importance for Poland were dealt with in plenary discussions. They were: *The impact of engineering curricula on the reduction of unemployment among engineering graduates*; *The requirements and considerations of engineering education for industry* and *The scientific and research co-operation between academia and industry*.

All the participants expressed their opinion that the seminar was extremely useful, so much so that they suggested a follow-up seminar to be organised in June next year. Several academic institutions have expressed their desire to host the next seminar.

The second meeting in this series is an *International Conference on Engineering Education - An Indian Experience*, which will be held at Andhra University in Visakhapatnam, India, between 21 and 23 November. This conference was initiated jointly by Professor Janaki Rao of Andhra University and the USICEE Director. The conference program includes discussions on the topics envisaged for the 1995 Congress. It will be extremely important for the 1995 Congress organisers to receive input information from the second most populous nation in the world and one of the rapidly growing economies in Asia.

It is projected that another meeting in this series will be held in Moscow in June 1995. The USICEE Director is working tirelessly on the possibility of staging similar national meetings in countries in Asia in the near future.

INTERNATIONAL FACULTY OF ENGINEERING (IFE) - INTO SECOND YEAR OF TEACHING

Monday, 3 October 1994, was a special day for close to sixty first year students enrolled in two courses in the International Faculty of Engineering (IFE) at the Technical University of Lodz, Poland, as they were matriculated by Professor Andrzej Koziarski, Dean of the Faculty of Mechanical Engineering and Professor Czesław Szmidt, Dean of the Faculty of Management, on behalf of the His Magnificence, the Rector of the Technical University of Lodz, Professor Jan Krynski.

The IFE was established in July 1992 and commenced undergraduate teaching in electromechanical engineering, with English as the main medium of instruction, after the Opening Ceremony which was held on 29 September 1993. We should emphasise the Australian nature of this project which has involved a number of Australian academics and which has been supported financially by the Australian Embassy in Warsaw. His Excellency Anthony C. Kevin, then the Australian Ambassador to the Republic of Poland, played an important role in the establishment of the IFE so he was the Guest of Honour at the Opening Ceremony in 1993 (for more details see AAEE Newsletter, Vol.5, No.4).

In the academic year 1994/95 the IFE has introduced a new undergraduate program in marketing and management engineering. Both programs, the electromechanical course and the management course, filled their set quotas. There are three foreign students in first year so far, two from Bolivia and one from Kuwait. The Faculty has established a top-of-the-range computer laboratory for 30 students and a high-tech computerised audio-visual language teaching laboratory. So far, the students have been using English language textbooks provided by the General University Library. This year a separate IFE library is going to be established. IFE students are offered high standard accommodation in a university student house at modest prices. The courses are economically highly competitive with the cost of tuition fee plus accommodation not exceeding \$US4,000. The enrolment cost is kept low because the university heavily subsidises student accommodation.

In the opening address Professor Krynski expressed his appreciation for the operation of the IFE. He emphasised that the IFE, and its courses, was a unique engineering education venture in this part of the world. Its curriculum, and the way the course has been taught by several international professors, has influenced other university courses. This has resulted in a rising standard for many undergraduate courses throughout the university. The address by the Foundation Dean of IFE, Zenon J. Pudlowski, Professor of the Technical University of Lodz, summarised the results of the first year's operation of the IFE in the academic year 1993/94, pointing out the strengths and weaknesses of the Faculty. Future plans were also presented with the possibility of offering two new courses in the academic year 1995/96.

Telecommunications and medicine are the two planned specialities for the year 1995/96. The IFE is now exploring the possibility of establishing these courses in collaboration with other academic institutions in Lodz. For example, the planned course in medicine is envisaged to be offered jointly with the famous Military Medical Academy in Lodz.

Our AAEE President, Professor Peter LeP Darvall, Deputy Vice-Chancellor (R&D) of Monash University, was the Guest of Honour at this year's Matriculation Ceremony. Professor Darvall gave a short address in which he greeted international guests and students in English and Spanish to the delight of the two Bolivian students. Professor Darvall charmingly apologised to the student from Kuwait for his inability to speak Arabic.

It is the Polish tradition that ceremonies which commence a new academic year include an inaugural lecture, so on this occasion, Professor Darvall was invited to present such a lecture. He spoke about the status and quality of engineering in an era of technological and social advances, and in particular, about the need for change in engineering education to keep pace with such advances. The lecture touched on such specific issues as



The Vice-Dean of the International Faculty of Engineering (IFE) at the Technical University of Lodz, Poland, Dr Tomasz Wolski, demonstrates the IFE's computer teaching laboratory. The IFE received a grant from the Australian Program of Training for Eurasia (APTEA) in 1992 for the establishment of this laboratory.

Congress Proceedings

The 2nd East-West Congress on Engineering Education, under the theme *Enhancing Engineering Education Research*, sponsored by the Electrical Engineering Education Research Group (EEERG) and the Australasian Association for Engineering Education (AAEE) was held at the Technical University of Lodz, Poland, between September 20 and 24, 1993.

The Congress papers cover almost every aspect of engineering education, addressing several important issues related to the topics originally suggested for the Congress papers. The papers present important concepts, ideas and achievements of engineering educators and industry leaders, who are involved in engineering education and industrial training with particular emphasis on curriculum development, effective methods in training engineers and technologists and the role of computer technology in the contemporary teaching-learning process.

Close to 150 participants from 25 countries, including about 30 rectors and vice-rectors, industry experts and representatives of numerous professional organisations registered and presented over 100 papers. The Congress Proceedings consists of a total of 406 pages. A few extra copies are available for those association members and interested parties who were unable to attend this Congress.

Copies of the Proceedings may be purchased for \$A100, postage free, from:

Associate Professor Zenon J. Pudlowski
Faculty of Engineering
Monash University
Clayton, Melbourne, VIC 3168, Australia

internationalisation of engineering education, student life and the qualities required from young engineering graduates who intend to practise engineering in the international arena. In conclusion, Professor Darvall commended the IFE's students for their courage and determination to enter the international engineering community through these courses.

Apart from Australian academics, the international guests included several academics from the United Kingdom, specifically from the University of Strathclyde. The Technical University of Lodz and the University of Strathclyde have a long lasting twinning arrangement which goes back to 1968.



Picture above shows the AAEE President, Professor Peter LePoer Darvall addressing the guests and students at the Matriculation Ceremony of the first year students enrolled in the International Faculty of Engineering (IFE) at the Technical University of Lodz (TUL), Poland, on Monday, 3 October 1994. Seated are the Rector of the TUL, Professor Jan Krynski (r) and the Foundation Dean of IFE, Zenon J. Pudlowski (l), Professor of TUL.

For details of the Association and membership applications write to the Editor:

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Association members and academic institutions are invited to contribute to the Newsletter on matters relating to membership and engineering education.

Send contributions to the Editor at the address above.