
Balkan Region Centre for Engineering Education (BRCEE)

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The *Balkan Region Centre for Engineering Education* (BRCEE) is part of the Faculty of Engineering at *Lucian Blaga University of Sibiu* (LBUS), Sibiu, Romania. The BRCEE was developed to provide a focus for international engineering educational activities in order to stimulate the development and maintenance of mutually beneficial education and research exchanges with partners on a global scale. The BRCEE was established as a satellite centre of the UNESCO International Centre for Engineering Education (UICEE), which is based at Monash University, Melbourne, Australia. In the article, the authors review the role of the BRCEE in relation to research and development of work-based and workplace learning as a focus for continuing professional development and life-long learning for engineers.

LUCIAN BLAGA UNIVERSITY OF SIBIU

Romanian higher education in Sibiu dates back to 1786. After the December 1989 Revolution, the Ministry of National Education on 5 March 1990 decreed the foundation of the University of Sibiu.

The name was changed in 1995 to *Lucian Blaga University of Sibiu* so as to honour one of Romania's greatest thinkers, Lucian Blaga. He was a poet, philosopher, essayist, playwright and translator of poetry who tackled various issues that included philosophy, science, history, religion and art. He was a professor at the University of Cluj, where a special chair of Philosophy of Culture was founded to acknowledge his activity as an intellectual. He was also a Nobel Prize nominee in the 1950s [1].

The LBUS incorporates 10 faculties, namely: Economics, Engineering, Food Processing, History, Journalism, Law, Letters, Medicine, Sciences, and Theology. The University offers Bachelor, Master and PhD programmes. It has over 20,000 students plus 500 PhD students, as well as a total number of 1,200 academic staff.

The *Hermann Oberth* Faculty of Engineering is the successor to the Faculty of Mechanics, which was originally established in 1976 as part of the Institute for Higher Learning. Currently, the Faculty hosts the following Departments: Computers and Automation

Science, Electrical Engineering, Mechanical Engineering, Machine Design Fundamentals, Machines and Equipment, Science and Technology, and Economic Engineering. In 2003, there were 1,955 undergraduate students and 338 postgraduate students enrolled in the Faculty.

As a University that is constantly reinforcing and expanding its international linkages, the LBUS plays host to the *C.P. Magrath* Center for Romanian-American Academic Interaction, and the Romanian-French Cultural Center *Emil Cioran*, and has various international programmes in place. It is also a Partner member institution of the UNESCO International Centre for Engineering Education (UICEE), which is based in Melbourne, Australia.

SCIENTIFIC ACTIVITIES OF THE LBUS

As academic research becomes increasingly significant because of the advent of the knowledge economy, so too will universities have to strengthen their research activities. Further, scientific research has to involve more students, especially from the engineering fields.

In Sibiu, Central Romania, the base for R&D work is rather weak. Labour-intensive and technology-oriented industry is limited. Yet, the LBUS must promote research. Indeed, research centres that have already been set up at the LBUS include the following:

- Quality Management and Engineering Research Centre.
- Research Centre in Plastic Deformation.
- Research Centre in Integrated Technologies.
- Research Centre in Electronics.
- Research Centre in Material Science.
- Research Centre in Textile Production.
- Centre for Research into Unconventional Technologies.

Office of Research Services

The Office of Research Services has been set up to stimulate research by using university resources. The Office aims at creating competitive research teams, both from a specialisation point of view and at the professional level (professors, students, etc). The Office of Research Services is a window on the active research life of the LBUS. It seeks to inform interested parties about the LBUS’ capabilities and strengths in all fields and to encourage the development of research linkages with other organisations. As a central contact point, the LBUS can help identify and make contact with its researchers working in different areas of interest.

Within the University, the Office helps researchers to create links with the private and public sectors by promoting a variety of cooperative research activities (joint projects, research centres and institutes, etc), by assisting in the preparation of research proposals and by negotiating research and technology transfer agreements with outside agencies. The Office also actively seeks to identify, protect and transfer technology to end-users.

The Office of Research Services’ main purpose is to enhance excellence in research at the LBUS by ensuring proper management and offering advice to the university community on activities related to research. The Office is the unit with an overall view of research activities. It is accountable to external agencies and to the community in general for the University’s research activities [2].

Quality Promotion at *Lucian Blaga* University

Starting from the national and international trends and constraints in the field of higher education, and from the *Lucian Blaga* University of Sibiu strategic plan, a plan for developing and implementing a quality system at the LBUS was set up. The LBUS has the experience of developing the first Quality Manual for a Romanian faculty [3]. The Quality Manual for the Faculty of Engineering became a framework for developing the future policies and models in Romania higher education.

The main steps of the strategic plan for implementing the quality system are:

- Establishing the quality policy.
- Establishing the quality objectives.
- Creating the quality structures at the university, faculty and department levels and appointing the Quality Management Director.
- University internal and external evaluation.
- Selecting the Quality Management model.
- Implementing the Quality Management model.
- Maintaining and updating the model.

The Quality Management Director at the LBUS was appointed on a competitive basis and relevant structures at the university, faculty and department levels were created (see Figure 1).

University Evaluation at the LBUS

On different levels of the education system, quality evaluation functions as an instrument to measure and evaluate whether the education system lives up to the objectives set. Evaluation implies dialogue between all concerned parties, and through proper follow-up, adjustment is made to fulfil new quantitative and qualitative criteria [4].

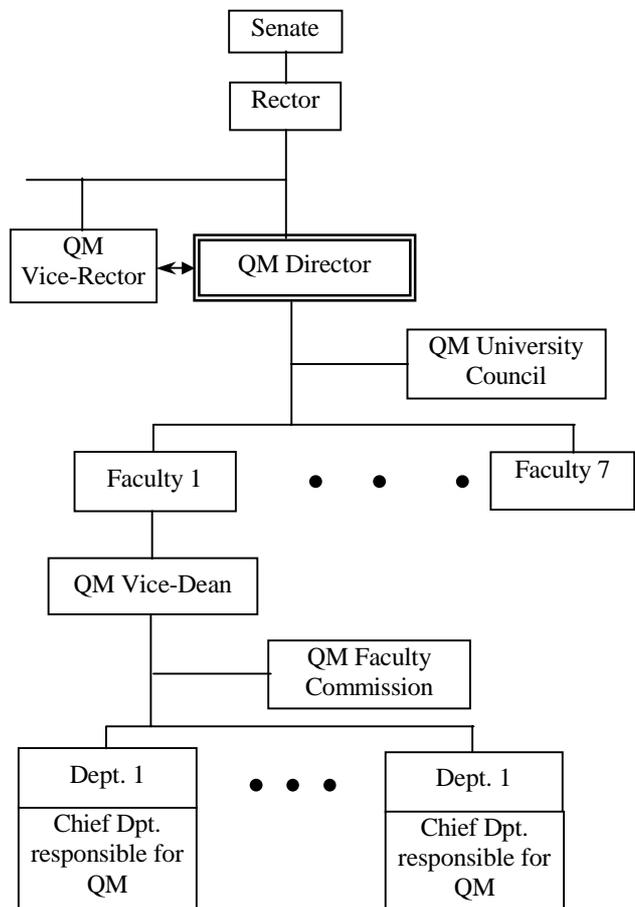


Figure 1: Quality structure at the LBUS.

The LBUS has developed a framework for evaluation, which is presented in Figure 2.

Two perspectives of quality evaluation were identified: external evaluation and self-evaluation. *External evaluation* is an attempt by the central government to ensure that quality education is provided and that schools use their resources efficiently. External evaluation is the means to control and guide schools from the central level. From the perspective of bringing the democratic debate on quality in education down to the local level, self-evaluation is empowering schools themselves to undertake the task.

Self-evaluation is an instrument to organise the democratic debate on what constitutes quality in school education at the local level. Self-evaluation often asks for the involvement of all relevant parties and it provides instruments to support decision-making and learning.

Internal Quality Assurance System Project

For an analysis of the actual situation at the LBUS, several empirical studies (written questionnaires) were planned and executed with:

- Graduates;
- Students' evaluation of: lecturers; teacher performance; concept of seminar; didactic aspects;

relevance for the job; overall satisfaction with the class and the teacher;

- Teaching staff: workplace; situation in study, teaching and examination; working conditions; time budgets; identification with the LBUS; satisfaction with job;
- All employees of the LBUS: health and work; physical and mental aspects; burden and stress situations; working climate; preventive measures for better health; coping strategies for stress-situations [5].

Master Programme in Quality Management

The Master in Quality Management (MQM) is a programme offered by the Faculty of Engineering at the LBUS to those who seek to identify and develop their abilities and interests in the field of quality.

Since 2000, the MQM programmes and services have been providing accessible, affordable and high quality higher education opportunities in a learning environment that encourages challenging and innovative teaching methods and systems that enhance student learning. Indeed, the MQM programmes are innovative, educational and are designed to meet a variety of academic, career and personal educational goals [6].

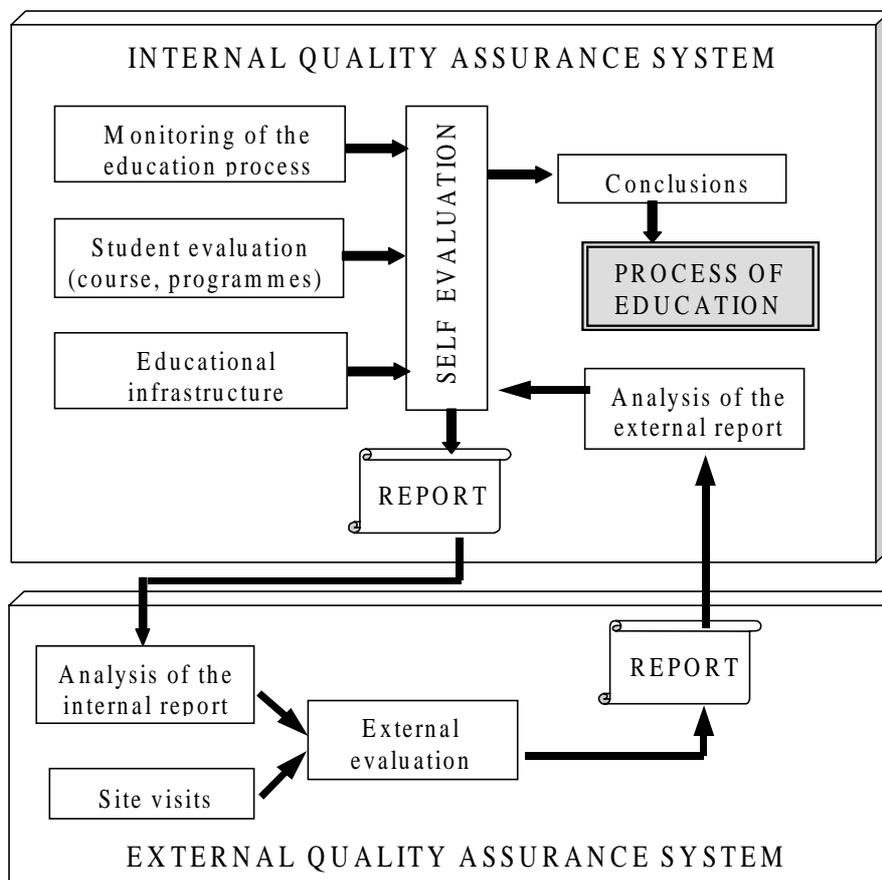


Figure 2: The LBUS framework for evaluation.

Other Notable Programmes at the LBUS

Other programmes of note underway at the LBUS include eUniv, which is an e-business solution for a university academic environment. Further research has been undertaken into communication problems encountered in engineering and technology education, particularly as they relate to behavioural models.

UICEE SATELLITE CENTRES

As a global centre, the UICEE has instituted numerous satellite centres, with each additional satellite centre contributing further to the expansion and international recognition of engineering education. The satellite centres remain important elements for the successful globalisation of engineering education. Hence, one of the UICEE satellite centres has been established at the *Lucian Blaga* University of Sibiu.

THE BALKAN REGION CENTRE FOR ENGINEERING EDUCATION (BRCEE)

In September 2002, a Memorandum of Understanding (MoU) between the UNESCO International Centre for Engineering Education (UICEE), and the *Lucian Blaga* University of Sibiu (LBUS), Sibiu, Romania, was signed. The main purpose of this MoU was to establish and develop a *Balkan Region Centre for Engineering Education* (BRCEE) as a satellite centre of the UICEE. Generally, this satellite centre is intended to provide a focus for the development of academic and research related activities in engineering education across the Balkan Region and, where appropriate, work with the UICEE in order to advance the globalisation of engineering studies.

The BRCEE is one of an increasing number of UICEE satellite centres being established worldwide and across the continents to further the cause of international engineering and technology education, and to advance engineering education regionally. The various centres are listed elsewhere in this issue.

MISSION AND SCOPE OF THE BRCEE

It is envisaged that the BRCEE will concentrate on the development of academic and research related activities in engineering and technology education. Also, when appropriate, the BRCEE will collaborate with the UICEE to advance globalised engineering and technology education.

The scope of such collaboration will be as follows:

- The UICEE will work with the LBUS to develop

education capabilities of the satellite centre at the LBUS, which will enhance and facilitate engineering and technology education in the Balkan Region and, indeed, throughout the entire UICEE Global Network of Engineering Education.

- Establish a range of activities that reflect the mission, aims and objectives of the UICEE.
- Exchange scholars as appropriate in order to take forward academic and research related activities in engineering and technology education.
- Work together so as to take forward seminars, workshops, conferences and other academic meetings, as appropriate, and to support the production of publications, books and software in engineering and technology education.

Given that the LBUS is in a privileged position in the development of engineering and technology education in Romania and the Balkan Region, the BRCEE will provide a focus for academic and research activities related to the work on engineering and technology education in the UICEE Global Network of Engineering Education. In particular, the Centre's activities will involve the transfer of information on engineering and technology education from developed countries to Romania and the Balkan Region. Special attention will be given to the development of effective strategies in the transfer of information on modern technologies, production processes and business ventures suitable for countries in economic transition.

INTEREST GROUP

An Interest Group has underpinned the development of the Centre to date, with the following objectives:

- To bring together staff with an interest in engineering/technological education in a forum where they could exchange ideas leading to innovation and creativity;
- To provide staff with opportunities to develop projects that reflect improvements in the teaching/learning of engineering/technological education;
- To encourage and support refereed publications of results and the development of projects at refereed conferences;
- To provide staff with contacts within the UICEE who are interested in developing collaborative links.

2ND BALKAN REGION CONFERENCE ON ENGINEERING EDUCATION

In its commission to cultivate the transfer of information on engineering education, *Lucian Blaga* University

of Sibiu, with the support of the UICEE, organised the highly successful 2nd *Balkan Region Conference on Engineering Education*, which was held in Sibiu, Romania, between 16 and 19 September 2003.

Close to 30 international delegates from 10 countries attended, with about the same number of Romanian participants. The Conference Proceedings included almost 60 highly informative papers raising important issues relevant to engineering and technology education in general, and the situation in Romania in particular.

The Conference can be characterised by an excellent academic programme, as well as a rich social programme, which included a field excursion to the ASTRA Outdoors Folk Museum in Dumbrava Forest, as well as a visit to the medieval town of Sighisoara.

The highlight of the proceedings was the official launch of the *Balkan Region Centre for Engineering Education* (BRCEE) on 16 September 2003. The Centre is being directed by Prof. Constantin Oprean, Vice-Rector of the University, with the aid of two Vice-Directors, Assoc. Prof. Claudiu V. Kifor and Assoc. Prof. Nicolaie Georgescu.

AWARDS AND PARTICIPATION AT CONFERENCES

Staff representing the BRCEE have participated at the following UICEE-organised conferences:

- 4th UICEE Annual Conference on Engineering Education, Bangkok, Thailand, 7-10 February 2001.
- 5th UICEE Annual Conference on Engineering Education, Chennai, India, 6-9 February 2002;
- 6th Baltic Region Seminar on Engineering Education, Wismar/Warnemünde, Germany, 23-25 September 2002;
- 6th UICEE Annual Conference on Engineering Education, Cairns, Australia, 10-14 February 2003;
- 3rd Global Congress on Engineering Education, Glasgow, Scotland, UK, 30 June - 5 July 2003;

Prof. Constantin Oprean, the BRCEE Director, was awarded the *UICEE Silver Badge of Honour* in recognition of his contribution to the globalisation of engineering education and to the UICEE. The award was presented to him during the 6th *Baltic Region Seminar on Engineering Education*, which took place in Wismar/Warnemünde, Germany, in late September 2002.

FUTURE ACTIONS

As a member of the network of satellite centres, the BRCEE works closely with the UICEE to facilitate the delivery of engineering education worldwide.

The BRCEE will continue to take a leading role in providing consultancy services alongside seminars, workshops and conferences sponsored by the UICEE to underpin the global development of off-campus, life-long learning within the workplace environment as the future focus for engineering education.

The BRCEE will continue to support new developments through action research, such as exploring the change in the mindset needed in order to support the growth of new high technology workplace developments and the change in the mindset of society in relation to the contribution of engineers to global society.

It is anticipated that the result of a review of the BRCEE and the Faculty will strengthen the focus of the Centre and bring an increased range of activities to further the goals of the UICEE in realising the globalisation of engineering education.

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BIOGRAPHIES



Constantin Oprean was born in Spring, Alba County, Romania, in 1948. He graduated as an engineer in mechanical engineering in 1971, gained his doctorate in industrial engineering in 1985. He went to become a professor in 1978 and a PhD adviser in 1985 at *Lucian Blaga University of Sibiu*

(LBUS), Sibiu, Romania, after accomplishing experience as an engineer in the industrial production field between 1971 and 1978.

In 1992, Prof. Oprean was promoted to Vice-Rector for Quality Management and Scientific Research at the LBUS. In this role, Prof. Oprean coordinates policies in the field of quality at the LBUS. He also supervises the evaluation procedures for the University and the implementation of the quality system. He coordinated the work for the first Quality Manual in Romanian education: the Quality Manual for the Faculty of Engineering. In recognition of his noteworthy contributions to the field of quality and university management, Prof. Oprean was elected Vice-President of the National Council for Quality Management in Higher Education.

Prof. Oprean is a recognised specialist in the fields of quality management, university management, strategic management and technological transfer. He has participated in numerous international conferences and congresses in the USA, France, the UK, Italy, Germany, Sweden, Denmark, Belgium, the Netherlands, Finland and Australia.

He has written over 21 books/handbooks and published 254 scientific papers, 75 of them being presented at international conferences. He is the author of 22 inventions and has coordinated over 50 scientific research projects at the national and international levels.



Claudiu Vasile Kifor was born in Avrig, Sibiu County, Romania, in 1970. He graduated as an engineer in mechanical engineering in 1994 and was awarded a doctorate in industrial engineering in 2000. He is presently an associate professor at *Lucian Blaga University of Sibiu (LBUS)*, Sibiu,

Romania, in the fields of quality management and quality engineering.

He is the author of three books and over 30 papers in the field of industrial engineering, process management and quality management. He has participated at national and international conferences in the fields of quality and university management. As a result of his significant contribution in the fields of quality management and process management, he was invited by foreign universities to present the modelling of processes in quality systems.

With a very rich experience in implementing quality systems in different organisations, he has participated in consultancy teams and has developed and implemented ISO 9000 quality systems in enterprises, and public administration and service organisations.



Nicolaie Georgescu was born in Berbesti, Vâlcea County, Romania, in 1946. He graduated from the Agronomic Institute, Bucharest, in 1972 and the Academy of Economic Studies, Bucharest, in 1980. He has also graduated from course on product quality and services in the field of

agriculture and food industry since 1974. In 2000, he became a doctor of agriculture sciences at the University of Agriculture Sciences and Veterinary Medicine.

After gaining a strong level of experience in agriculture and the wine industry, including top positions at various wine factories, he moved in 1995 for an academic career at *Lucian Blaga University of Sibiu (LBUS)*, Sibiu, Romania, where he is presently associate professor. He has published 17 books and more than 160 papers at national and international conferences. He has also participated in various national and international scientific projects.

Prof. Georgescu is member of prestigious national

and international organisations like the Romanian Association of Economists, the Romania Marketing Association, the Romanian Association of Agronomy

Engineers, plus others. He is the founder and the President of the University Foundation Alma Mater; presently, this Foundation has about 7,000 students.



WORLD TRANSACTIONS ON ENGINEERING AND TECHNOLOGY EDUCATION

The UNESCO International Centre for Engineering Education (UICEE), based at Monash University in Melbourne, Australia, has established a new publication series called the *World Transactions on Engineering and Technology Education*. This new journal publishes high quality international, fully refereed papers on engineering and technology education and covers a wide and diverse range of issues including case studies, regional and country issues, pedagogical issues, etc, thereby facilitating the transfer of information, expertise and research and development on engineering education and thus realising the UICEE's mission. The *World Transactions* contributes to the publication of engineering education papers globally, essential for academic life and the continued growth and evolution in knowledge and understanding.

The current international situation has unfortunately generated a climate that curbs and disrupts attendance at international conferences. This, in turn, impedes the discussion and interaction between international academics and contributes to the retardation of knowledge expansion and exchange. However, the need to publish remains: not just for the recognition of individual and institutional work achieved, but more importantly for the exchange of ideas and the advancement of engineering education globally. The progress of knowledge for all humankind should not be confined to borders, or indeed regions, and it is certainly not bound by particular modes of dissemination.

A definite need has been identified for the publication of refereed papers by engineering and technology educators who are unable to attend conferences due to cost restrictions that inhibit international travel. Such cost factors can unfortunately lead to excellent papers being neglected and may result in grossly reduced involvement from less privileged nations. However, the *World Transactions* counters this by providing a forum for engineering debate where authors offset the production of publication costs, as with conference registrations, but without the further time and money spent on travel, accommodation and additional expenses.

High quality is maintained through peer referee evaluations by distinguished academics, language correction, editing, as well as standard formatting, as with all UICEE publications. Furthermore, it is envisaged that the authors of the best three to five papers in each issue, based upon the referees' reports, may be invited to revise and expand their papers for inclusion in the *Global Journal of Engineering Education* (GJEE).

Interested persons should submit their original papers to the UICEE for inclusion in the *World Transactions* but must be aware of the standard formatting structure, which will essentially be the same as for UICEE conference proceedings. Papers are to be submitted in Word format in 10pt font, single-spaced, double column, and a *maximum* of 4 pages in total, including abstract and figures (additional fees will apply for extra pages). Fees are based on cost recovery and every paper will cost \$450 Australian; this includes one copy of the *World Transactions* and airmail postage to anywhere in the world. The kit for authors, incorporating standard formatting details and submission forms, covering copyright, will be supplied on request. Please e-mail Mr Marc Riemer on marc.riemer@eng.monash.edu.au