ABSTRACTS

ICA-CEDIA-KULeuven Conference

Models for successful collaboration and partnerships of purpose between universities, businesses and NGO's

- **in education, research and innovation**

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University-Business collaboration - the EU perspective

Peter Baur,

DG Education and Culture, European Commission, Brussels, Belgium

Peter.Baur@ec.europa.eu

The Faculty Senate: Challenges, Opportunities and Experiences in engaging with corporate representatives

Staf Van Reet[1] and Jos Van Pelt[2]

Managing Director Viziphar Biosciences[1] and Secretary of the Senate of the Faculty of Bioscience Engineering, Katholieke Universiteit Leuven[2]

staf.vanreet@viziphar.com

In 2006 an accreditation by the Flemisch government of the educational programmes in Bioscience Engineering was held at Belgian universities. One of the main considerations of the commission concerned the large supply of different educational programmes and possible combinations of these programmes in relation to the social demand. The commission proposed a suggestion to design a vision on the profile of the Bioscience Engineer for the next coming ten years- based on the need of the market. On that purpose a 'Senate' was composed by the dean of the Faculty of Bioscience Engineering of the K.U.Leuven. Fourteen leading members in different industrial and agronomical sectors, most of them alumni of the Faculty of Bioscience Engineering, were invited to participate in this advisory body. During the past two years, this body has completed a model to simplify and reduce the number of educational programmes. Besides, this model needs to lead to a better fit between the programmes and the recent and expected evolutions in science, society and entrepreneurship. The model served as a guide to the faculty in restructuring the educational programmes focussing on the priorities proposed by the senate. This collaboration will lead to a more flexible and future orientated educational programmes and a perception of research, focussed on priority issues in our society.

University spin-offs a commercial reality - models for successful technology transfer

Koenraad Debackere

General Manager, Katholieke Universiteit Leuven, Belgium
koenraad.debackere@abh.kuleuven.be

Spin-offs have become an important mechanism to transfer and exploit technology developed in academic environments. In order for spin-off based technology transfer policies to be successful, they should be embedded in an integrated technology transfer policy and framework. During the presentation, the critical success factors of such policy and operational framework are described and discussed. It is shown that spin-offs benefit from a well articulated IP policy, available sources of funding and substantial coaching and mentoring processes. At the same time, it is shown that involvement in technology transfer activities may generate interesting cognitive spillovers for academia itself.

The key role of industry and universities in public-private partnerships to drive innovation, growth and competitiveness

Peter Olesen

ActiFood ApS, Denmark
po@actifoods.com

The processes driving innovation are basically the same in both private and public sectors. In principle, the innovation triangle has three major components: ideas, management and time/money. Modern societies are subject to brutal globalisation processes which requires optimal coherence, coordination and transparency between the major players. Universities, public research funding agencies and companies/consortia are urged to find optimal collaboration schemes to ensure that new knowledge, competences and skills are developed and shared and used in innovation processes across the society. Public-private partnership models are gaining importance not only at national levels but increasingly also in the EU research communities. This constitutes both an invitation but certainly also challenges to both universities and companies to work together in more open innovation environments and using less bureaucratic tech transfer models – both building upon the power of complementarity to drive faster and more interactive innovation processes.

Regional Clusters and strategic development of Kiel University

Ingmar Schmidt

Director General Research and Planning, Kiel University, Germany

ingmar.schmidt@uv.uni-kiel.de

Kiel University is focusing its research activities based on its strengths and regional economic focuses. As Schleswig-Holstein is a state, having a broad basis on agriculture and energy, these fields have a long tradition of co-operation between University and local economy. Within its focuses Kiel University is developing research in Bio energy. Kiel University strengthens these co-operations by supporting applied research via intensifying long term basic research in related fields. The applied research is concentrated in a Centre of Competence, which was set up in co-operation with local economy and research organisations. The scientific input from Kiel University will be supported by strategic projects in sciences in plant breeding, Modelling and Economy. So Kiel University matches goals and funds of several funding programs from applied and basic research to create a sustainable research basis in the university.

French competitiveness clusters: example of Picardie-Champagne Ardennes world class cluster on bio-renewable resources.

Speaker to be announced

Collaborations in research in agriculture and food at Laval University, Canada

Jean-Paul Laforest

Faculté des sciences de l'agriculture et de l'alimentation, Université Laval, Québec (QC), Canada

jean-paul.laforest@fsaa.ulaval.ca

In 2008-2009, the research budget at Laval University was approximately $230 M (all amounts are in Canadian dollars). Out of this total, $72.7 M comes from non public sources, mainly from private enterprises. This is one of the highest proportions of research money coming from private sources in the Canadian and Québec university network. Within the University, the Faculty of Agriculture and Agri-Food (FSAA) is considered as one of the most successful for its collaboration with the private sector. Indeed, in 2006-2007, 26 % of the research budget of $22 M came directly from more than 50 different private partners. This collaboration with the private sector has not only a strong positive effect on the financial support available for research but, also for supporting undergraduate and graduate students. For instance, in 2008-2009, 197 students from the FSAA received $241,000 in scholarships, mainly from private sources. Many reasons could explain this success. Among them, FSAA is the only institution of agriculture and food offering the formation in French in

North America. Most people in decisional positions in private enterprises from this sector in Québec graduated from FSAA and have kept strong links with their *alma mater*. Also, most professors are regularly involved in extension activities, participating in colloquia, committees, etc. that have a direct impact on the private sector. They have developed strong abilities in responding rapidly to the needs of the industry. Moreover, the federal and provincial governments offer many granting programs that combine financing from the public and private sectors. Usually this is done with a "matching" amount by the public sector that corresponds to the amount provided by the industrial partners (on a one for one basis). Actually, most of the industry funding at the FSAA is obtained through such programs, and only a small percentage comes from contracts with the industries. Another important factor for the FSAA's successful collaborations is that both the Canadian and Québec governments are offering financial incentives to the private sector to promote research in collaboration with universities and public research centers. Last but not least is the importance to have a strong willingness to collaborate with the private sector. This has been a major component of the orientations taken within the strategic planning of the FSAA in the past and will continue for years to come.

Collaboration and partnerships between universities and companies – a research benefit

Ole Green

Department of Agricultural Engineering, University of Aarhus, Denmark
Ole.Green@agrsci.dk

As part of a modern approach to university research, a dedicated strategy involving company R&D in a comprehensive integration with university research can provide both the individual scientist and the research group/department a unique opportunity to transfer basic research from the laboratory to the marked within a short time frame.

Within the Research group – Automation and System Technology at Department of Agricultural Engineering, most of the research projects are being performed with a high degree of involvement of company R&D, putting up challenges both to the university legal advisors and the project managers. But more importantly, it allows the individual scientist to acquire an updated knowledge of product applications as well as having the possibility of using pilot- and full-scale research and testing facilities.

In terms of the companies, benefits in the form of updated knowledge acquisition are obtained from the close contact and interaction with the international collaboration community and networks of the scientists and the stabile continuity of a research focus with yearlong experiences within the same field of expertise.

In practice, this strategy has already proven and holds a significant potential for producing new publications types e.g. patenting, and at the same time, other funding sources will be available when the close collaboration with companies becomes a reality.

The described process toward intensified research and company collaboration at the Department has largely been motivated by the overall strategy of the Faculty of Agricultural Sciences at University of Aarhus, which encourage technology transfer through cluster collaboration with companies and scientists aimed at specific topics

The presentation will focus on the good example, which is also used as a way to motivate young and "old" scientists to engage in company research collaboration.

REAL project: the platform for collaboration between companies and university research units in north of Portugal and Spain- Galicia

Eduardo Rosa

University of Trás-os-Montes and Alto Douro, Vila Real, Portugal
erosa@utad.pt

The Euroregion of Galiza-North of Portugal is featured by a strong activity in the Agri-Food and Sea-Food sector which has an high economic impact regarding employment and social importance. However the sector relies on a large diversity of small size companies, with little innovation and reduced investment on research. Thus, to improve the competitiveness of the companies through research and innovation we build a Network, called REAL, to bring together the two agents the science providers and the science users. These will show, through a portfolio, what is available in the scientific research units within the Euroregion, particularly the critical mass, the equipment and the major scientific results whilst the companies shall explain their needs and difficulties regarding research. The staff, directly involved in the production systems and/or in research are invited to visit for a short period the Research Units to observe and discuss what are the possibilities of joint research and further cooperation. Thus, we planned to organize specific workshops to discuss the scientific progress and main achievements on the area and what the near future priorities. The dissemination of the Network REAL is one of the major activities within the Euro-region and at international level.

Experience with research collaboration between University of Applied Science and the agricultural and forestry sector

Harald Menzi

Swiss College of Agriculture (SHL), Zollikofen, Switzerland
harald.menzi@bfh.ch

Together with the status University of Applied Science the Swiss College of Agriculture (SHL) in 1999 received the mandate to perform applied research and development. The main challenge when building up research in a sector with few SMEs and well established Federal Agricultural Research Stations was to acquire enough third party financing. The key to success proved to be a close collaboration with the agricultural and later also the forestry sector. This meant a) close collaboration with sector organizations (e.g. Swiss Dairy

Producers Association) and authorities, b) the identification of promising niches where the sector is ready to invest and which are not dominated by the Research Stations c) “on site research” with direct involvement of stakeholders, d) strong emphasis on knowledge transfer and e) a dense collaboration network of research partners in Switzerland and abroad. With this strategy we managed to establish several fields of research which are respected nationally and partly internationally, e.g. optimization of dairy production strategies, potato quality, sustainability evaluation of agricultural production systems, livestock environment interactions or sustainable and production oriented forestry systems. A good scientific basis, the focus on practical application and a holistic system approach are important elements of most projects. An important aid was the Commission for Technology and Innovation (CTI) which supports market driven projects, provided that the industry contributes at least halve of the total expenditures, including in-kind contributions. Sector organizations are often “industry partners” in such projects and extension services are involved in the field work. This also facilitates a rapid and wide dissemination of the experience gained in the projects. This dissemination and knowledge transfer is supported by broad communication in farmers journal’s and by planning and decision support tools derived from the project results. A further important element is the collaboration with public authorities at the Federal and Cantonal level who also support a variety of projects. However, we are well aware that we cannot be successful alone. Nearly all our projects involve other research partners. Thus we can share experience and infrastructure and rely on expertise in fields which are not within our own key competences. All in all we collaborated with around 100 research partners in 2008, about 60% in Switzerland and 40% abroad. About 60% were research institutions, 25% from industry and 15% from the public sector. Apart from research we are active with services in about 20 countries worldwide, especially in development projects.

Networking in a Development Cooperation context, with focus on sustainable resource management in Ethiopia

Willibald Loiskandl

Institute of Hydraulics and Rural Water Management University of Natural Resources and Applied Life Sciences, Vienna, Austria

willibald.loiskandl@boku.ac.at

Our cooperation in Africa focuses on applied research and aims to support solutions to overcome life constrains of partner countries. Water scarcity along with economic and social problems is dominating. Hence, projects in this context have to be treated in a holistic way engaging the local population as widely as possible.

A successful European community 6th framework project “Waterman” (Specific Support Action) is used as an example for the discussion of dissemination approaches. The objective of the project WATERMAN is to disseminate research results by linking up people. The specific activities are:

- Linking universities in Ethiopia and connecting them with partner universities in Europe. Cluster strategy is relatively new in Sub Saharan countries.
- Connecting the participating universities with stakeholders (NGOs and local and regional policy makers). To bring research and application closer together.
- Using modern technology for communication. Forster information transfer.
- Establishing relations with and amongst farmers. To ensure end user participation and to learn with and from farmers

Ethiopian partners are 3 Universities (Hawassa, Haramaya and Mekele) and the Ethiopian Institute for Agriculture Research. One more partner based in Addis Ababa is the branch office of the International Water Management Institute (IWMI, CGIAR-Centre). From East Africa are Egerton University from Kenya and the NGO "Participatory ecological land use management" (PELUM) based in Uganda. The consortium is completed by 3 European universities, from United Kingdom, Cranfield University, from the Czech Republic, the University of Life Sciences Prague and from Austria, the University of Natural Resources and Applied Life Sciences (BOKU), as co-ordinator of the project.

The key feature of WATERMAN is the sustainable water management and the project aims for closing the gap between research results and use of these towards development outcomes on the ground. WATERMAN addresses the fact that knowledge is not always available, often not accessible - it sits in papers, in journals – or it is not in the right format, language or location. WATERMAN also aims to be a model for improving international relations through joint research and technology transfer within Eastern Africa. This was also reflected in the final symposium "Mobilising water research for development: *Thinking differently about dissemination".* An Open Space was available for people to hold discussions or share knowledge and experiences of their own. A Market place offered opportunities for people to present examples of their dissemination methods or to do dissemination of their research results in marketplace via posters, literature, photos, websites etc. To engage young researchers a specific project award and a gender award was incorporated in the project.

The final project goal is to motivate participants through successful project experiences and sharing information between stakeholders to work closer together for the benefit of regional development. Many experiences made in this specific project are transferable to similar activities.

"Grandes Ecoles" and Companies in France : a story of strong ties – Illustration trough the case of the Institute Polytechnique LaSalle Beauvais

Valerie Leroux and Philippe Choquet,

Executive Vice President and Executive President, Institute Polytechnique LaSalle Beauvais, France

philippe.choquet@lasalle-beauvais.fr

Through this communication, we would like to show that Grandes Ecoles in France have a strong tradition of relationships with companies. Curricula of French Engineer are designed

to guaranty a high level of scientific competences as well as strong professional capacities in specific sectors. Companies are involved in the definition of those education programs and are members of the national accreditation institution for the diploma of engineer. We will use the case of Lasalle Beauvais Graduate School to show the numerous ways we cooperate with companies: for training periods, for professional projects inside the curriculum, trough conferences, through the preparation of the professional project of the students, trough research contracts or services.

The development of strong relationships between universities and companies is based on a win-win strategy and should be designed at multiple levels from an institutional to a very operational one.

EuroAquae: university industry collaboration in the design, delivery and evaluation of the joint Master degree programme

Philippe Gourbesville

EuroAquae Coordinator, Director Polytech'Nice-Sophia, University of Nice-Sophia Antipolis, France

philippe.gourbesville@unice.fr

The water sector is a major economic domain in Europe with the public services provides to the communities. During the last decade, the water utilities like Suez Environment or Veolia have strongly invested and recruited numerous professionals. In parallel, it is really surprising to see the limited investment made by the educational environment in order to answer to the demands of the companies and more generally of the society. The educational sector in Europe is still offering "traditional curricula", focused on disciplinary approach like hydraulics and fluid mechanics and has difficulty to promote the multi disciplinary and technical changes needed by the professional environment. This adaptation process is not achieved yet. On the contrary, the number of curricula is globally decreasing with a real increasing demand. This situation has been pointed out by several national entities underlying the urgency to redevelop curricula in such field. In order to answer to the intensive demand of Hydro-informatics educated engineers and managers in public services and private sector, five European Universities have decided to establish and promote a two years joint master degree: "EuroAquae – Euro Hydro-Informatics and Water Management". The EuroAquae consortium is composed by: University of Nice–Sophia Antipolis (France), Brandenburg University of Technology Cottbus (Germany), Budapest University of Technology and Economics (Hungary), Polytechnic University of Catalonia (Spain) and Newcastle University (United Kingdom).

The EuroAquae consortium awards a joint degree defined as Master of Science (M.Sc.) recognized by the five participating countries and carrying the Erasmus Mundus label. The partners of the consortium share the same vision and the same ambition for the future. Consequently, the main objective of the Master course is to prepare and train future scientists and executive engineers in charge of modeling and managing projects in hydro-technologies and environment. These professionals have vocation to assist local, regional,

national and international bodies/entities, public services and to be involved in private companies. The implementation of this new curriculum based on cooperation and joint activities is organized around a specific mobility scheme. The coherence of the scientific contents and of the community of participants is promoted around the concept of virtual university. For the 4th semester, EuroAquae students have the possibility to join a company for an internship of 6 month. During this period, they participate, as professionals, to an ongoing project with a joint supervision from academic and industrial tutors. During this period, the students have the possibility to understand the reality of the industrial and professional life and at the same time, to demonstrate their knowledge and skills. After 4 years and similar experiences carried out in different master or engineering degrees, it is obvious that the internship represents the best option to obtain employment for the Alumni. In fact, most of them – over 90% - receive an offer to stay into the company after graduation. This approach confirms both the needs of the professional sector and the coherence of the curriculum developed by EuroAquae.

Since the very beginning the EuroAquae course has the willingness to establish a close partnership with industry. This objective answers the normal and basic need for a curriculum to be able to answer to a real need of the profession. At the same time, this partnership established for the curriculum development and permanent improvement is also a key strategy for the professional insertion of the graduates. The proximity with the main companies involved in the water field at the international level brings to the curriculum an essential added value which allows for an evolution and adaptation of the contents. The professionals have been not only involved in the curriculum definition but take an active part in the teaching activities with the full responsibility of several technical courses. Professionals deliver also, in the different locations, several "professional conferences" focused on practical aspects of engineers' life in order to train and initiate progressively the participants. In addition the “Club of Friends of EuroAquae” has been set up in order to strengthen the links between the course and the professional sector. This initiative provides expertise for improving the curriculum and develops job opportunities for the students.

IAAS support of the engagement of students with industry

Stephanie Klaedtke

International Association of Students in Agricultural and Related Sciences, Leuven, Belgium
vppartnership@iaaworld.org

Being the biggest students’ network targeting the field of life sciences, the International Association of Students in Agricultural and Related Sciences (IAAS) reaches out to thousands of students in its global network. IAAS provides non-formal learning opportunities for intercultural and problem solving skills and develops pro-active entrepreneurial characters among its members.

IAAS activities and services are organized solely by students and target students and interested youth. The three pillars of IAAS activities consist of the Exchange-Program, formal and informal meetings such as seminars and conferences or exchange weeks and cultural

activities. In the Exchange-Program we strongly cooperate with local farms and SMEs for training places and collaborate with relevant universities to get the offered trainings accepted and supported within the academic curricula. The program's aim is to extend the level of experience of students to practical skills which will be needed in their professional work and to create and strengthen the link between students and their future employers. Furthermore, the program aims at offering these internship placements in foreign countries to extend the learning experience towards intercultural aspects and international teamwork. Seminars and conferences are often organized in close cooperation with local and international companies, governmental and intergovernmental institutions and NGOs working on the topic covered. Apart from the presentation of scientific aspects through contributions from professors and students, excursions and keynote speeches as well as workshops and discussions with SME partners and NGOs are elements to include the professional perspective and engage in the exchange of ideas between current and future leaders in our sector. The international aspect is a central part of this type of events which helps prepare the participants for the global scale of their future careers. Occasionally, universities even recognize the learning outcomes of IAAS events as credits for their study courses. Third pillar activities are normally of lesser importance to external partners but simply work towards establishing strong cohesion between youth on international level.

IAAS further cooperates with ICA to increase students' mobility by supporting the cooperation, coordination and publicity of international study courses. Stronger acceptance of IAAS learning outcomes for university curricula is aimed at, too. Concerning our cooperation with companies and NGOs, we hope for stronger long-term commitments to invest in their future employees, taking full advantage of the opportunities IAAS offers to connect to students in life sciences and attract their target group in well adapted non-formal learning networks.

The MBA in Agribusiness and Commerce (AGRIMBA) as a tool in life long learning for professionals and academics

Wim Heijman

Regional Economics, Wageningen University, Netherlands and member Executive Board AGRIMBA
wim.heijman@wur.nl

AGRIMBA started 14 year ago as a successful Tempus project in Warsaw and Prague. Since that time the network has developed into an efficient way of upgrading the management knowledge of young managers mainly in Central and East Europe. However, the main message of this paper is that the MBA is not only a way of improving the business skills of the students but also an effective way of intensifying the participating teaching staff's (mainly academics) contacts with the globalised world of agribusiness and their colleagues of participating institutions. This two way approach is the main incentive for taking part in the programme, both for students and teaching staff. In this way AGRIMBA works as a highly needed medium of communication in the field of agribusiness between theory and practice and therefore is an effective tool in life long learning.

Successful cooperation of stakeholders in the lifelong learning model focusing on water disasters

Pavel Kovar

Vice Rector, Czech University of Life Sciences, Prague
kovar@fzp.czu.cz

The paper shows the possibility of lifelong education in water-focused programmes, delivered not only for university students, but for young water specialists already employed in water industry and also for their employers. An enterprise management interested in higher education for their specialists can thus give financial support and facilitate distant studies. CULS Prague has a long tradition in this type of cooperation with the industry. The Departments of Land Use and Improvement and of Water Resources and Environmental Modelling jointly organised the International Postgraduate Hydrology Courses sponsored by UNESCO more than twenty years ago.

After 2002, when a devastating flood heavily impacted many regions in Central Europe, CULS Prague initiated, with the support of the Czech Hydro Meteorological Institute and the Water Board Vltava, the Workshop on "Natural Disaster Prevention (NDP)." This Workshop lasted ten days. Since 2004 it is organised on a regular basis in the form of a Summer School for local as well as for international students and young employees working in the field of water disaster management. Last year (in 2008) the NDP Workshop was running for the fifth consecutive year.

The main purpose of these annual workshops has been to acquaint the participants with techniques used in the identification of origins of disasters (hazards) and vulnerability of concerned regions, with assessment and monitoring, data collection, processing, transmission and use, implementation of early warning systems (EW), local, regional and national preparedness, disaster management and the role of civil society, education and training. The Workshops included hands-on exercises and two field trips. Detailed information is available at: www.eu-workshop.czu.cz .

The principal themes of lectures and exercises have been listed as follows: Basics of Hazard, Vulnerability and Risk Assessment, Early Warning Systems, Flood Forecasts, Drought Forecasts, Impact of Land Use and Climate Change on Water Regime and on Hydrological Extremes, Role of Civil Society in Emergency and Legislation, etc. The NDP Workshops are included in the intensive courses offered in the framework of the University Consortium Euroleague of Life Sciences (ELLS) in the subject area "Environmental Sciences". Many students from member universities of ELLS participated in this workshop in the last three years. Of course, the organisation of this kind of lifelong learning programmes could hardly be successful without external funding and cooperation. Stakeholders supporting the Workshop are from two areas. First, there is UN ISDR (UN International Strategic Disaster Reduction, Geneva), the Czech Ministry of Education, Youth and Sport and the Czech Ministry of Environment. CULS Prague and its partners, University of Natural Resources and Applied Life Sciences (BOKU Vienna, Austria) and Wageningen University (WUR, The Netherlands) regularly send their teachers and students and thus contribute to the high

professional and scientific level of the Workshop. In conclusion, there is not only a significant financial support from the organisations mentioned above but also an active role of the participating stakeholders who regularly participate in distant education and also in the Workshop evaluation. The form of the quality assessment is based on both teachers/tutors and students on the other side. The questionnaires are evaluated with all participants and progressive conclusions and good ideas are applied in future courses.

Professional accreditation of agronomists in Spain

Charo García Moreno

National Council of Professional Associations of Agricultural Engineers, Madrid, Spain
c.g.agro@iies.es

The introduction of the three-cycle degree system in the Agronomic studies in Spain, as the results of the Bologna Process in Europe, will bring the competence to the professional associations to decide the technical accreditations for each of the different programs offer by the educational system. In this sense, the professional associations will participate in the system through consultation in the technical requirements of the different academic programs offered to the future professionals in the different agronomic fields.

The context requires that the different institutions in the system: universities, professional associations and companies, have very well defined the technical competences of each and the role they are playing in the professional system for the agronomic competences.

The present paper will develop the technical accreditation system defined in Spain for the agronomist in the new academic and professional system under the requirement of the Bologna process, and the international context.

Accreditation of work-based and lifelong learning for rural professions and professionals: A UK case study

Andrew H Cobb

Harper Adams University College, Newport, UK
ahcobb@harper-adams.ac.uk

Harper Adams was established in 1901 as a specialist training centre for the agricultural and rural industries. It currently has c. 2,300 students on a range of courses, from diploma to PhD, studying in both full and part-time modes. A survey by the Independent Newspaper, published on 30 April 2009, ranked Harper Adams as the leading University for Agriculture in the UK, based on student satisfaction, research assessment, entry standards and graduate prospects.

The development of work-based and lifelong learning at Harper Adams has involved employers, learning and other training providers from the public and private sectors. We

currently have a range of ongoing projects relevant to the rural economy. These include professional institutions (e.g. Royal Institution of Chartered Surveyors), trade regulatory bodies (e.g. AMTRA and BASIS), government agencies (e.g. Environment Agency) and private companies (e.g. JCB and Marks and Spencer).

AMTRA is the Animal Medicines Trade Regulatory Authority. All suppliers of animal medicines must in future be certified as "Suitably Qualified Persons", if they are not already a veterinary surgeon or pharmacist. There has therefore been a need for several thousand suppliers in the UK to obtain this qualification. Harper Adams has worked with other universities and private training providers under contract with AMTRA.

The Environment Agency is the government agency in the UK responsible for the protection of the countryside from pollution. Its advisors therefore need a thorough understanding of agriculture, and especially the use of fertilisers, as they have a profound impact on water and soil quality.

BASIS is the British Agro-Chemical Supply Industry Scheme. Suppliers and users of pesticides and fertilisers in the UK must be registered with the BASIS scheme. They must therefore satisfy stringent requirements for their knowledge of soil and water, plant nutrient requirements and environmental safeguards. The BASIS Certificate in Crop Protection can build up to a Diploma in Agronomy.

Other examples will also be presented with an overview of how these courses are credit rated and accredited.

Providing a framework for CPD Management for Professional Agriculturists in Europe

Maureen Murphy

Aurion Learning, Belfast, UK
maureen.murphy@aurionlearning.com

Continuous Professional Development (CPD) is a term that has emerged from a variety of continuing education and lifelong learning trends over the last 50 years. Whilst the term may differ across regions (Continuous Professional Education, Continuing Education) the main tenet of CPD lies with individuals taking responsibility for their own personal and professional development in order to maintain a level of competence within their domain/subject area. The need to maintain CPD can be driven by the employer, membership requirements of a Professional Body or an external Regulator to show fitness to practice as in the health and financial sectors within the UK.

There are a variety of models of CPD which can be broadly centred around input-based and output-based CPD. Input–based CPD focuses on the requirement to show points or learning hours attained in professional development, whilst output based approach emphasises the development of the reflective practitioner where the focus is not on learning hours attained,

but rather how professionals have developed as a reflective practitioner showing behavioural or attitudinal changes.

What are the CPD requirements for professional agriculturists across Europe today, is or should there be commonality and what services should a professional body provide to meet the needs of their members and continue to be sustainable and relevant at the same time?

This presentation focuses on some of the core issues facing Professional Bodies today, and presents findings from a pilot study with 2 Professional Bodies in Ireland that focused on the development of a core competency set and the provision of an online CPD portfolio for a variety of professional agriculturists across Ireland. In addition, an innovative online CPD Management System is presented highlighting how a range of Professional Bodies have adopted and configured the system to meet the specific needs of their members. This system includes a competency assessment tool, a portfolio where users can plan and record their CPD and an integrated catalogue of CPD opportunities which can drive professionals to find CPD that meets their ongoing career and professional development needs. A model for how this system could be adopted for a pan European approach to CPD management and CPD provision is also presented for consideration.

Benchmarking of university-enterprise co-operation – possible indicators

Nadine Burquel

Secretary General of the European Centre for Strategic Management of Universities (ESMU), Brussels, Belgium

nadine.burquel@esmu.be

The presentation will outline potential indicators to measure performance on university-enterprise cooperation, based on the work of a two-year EU-funded project on benchmarking (Benchmarking in European Higher Education).

Based on extensive desk research, ESMU defines benchmarking as *a process inside an organisation with the aim to improve its performance by learning about possible improvement processes and by looking at those processes in other, better performing organisations*. It is a voluntary process of self-evaluation through systematic and collaborative comparison of practices.

When benchmarking university-enterprise co-operation at least the following areas should be taken into account:

- national and regional context (e.g. regional industrial structure by sector compared to the national average) ,
- university finance for business engagement,
- university governance structure and degree of autonomy,
- support structure and staff,
- knowledge transfer

"University - Enterprise Cooperation" in Biosystems Engineering : an ERABEE Thematic Network European survey

Antonio Comparetti[1] Pierluigi Febo[1], Giacomo Scarascia Mugnozza[2], Demetres Briassoulis[3], Panagiotis Panagakis[3] and Effie Nikopoulos[3]

University of Palermo[1], Italy, University of Bari[2], Italy, Agricultural University of Athens[3], Greece

comparetti@unipa.it

This survey was carried out through the data analysis of the "University-Enterprise Cooperation" questionnaire, which was developed and distributed to all the partners of the EU funded ERABEE-TN[a]. 37 industries involved in the area of Agricultural and Biosystems Engineering (i.e. industries of machines, equipment and materials for agriculture, food processing industries, companies of renewable energy systems and services for agriculture and environment) from 13 European countries replied to this questionnaire.

The most significant result of this survey is the importance given to the cooperation between Universities and enterprises specialised in Biosystems Engineering. In fact, the majority (60%) of the enterprises is available to employ highly specialised graduates (M.Sc.) and/or post-graduates (PhD).

Moreover, almost all the enterprises aim at a higher involvement in the development and/or restructuring of degree study programs. They believe that the entrepreneurial spirit must be developed within the University itself. Some replies demonstrate that the enterprises aim at an easier and faster transfer of knowledge from University to industry and vice versa and at a permanent route of dialogue with the Universities.

One way for satisfying the demand of cooperation by the industries could be a network project, aimed at funding the exchange of human resources (especially M.Sc. and PhD students, and enterprise staff) between the Universities and the enterprises.

The encouraging results obtained suggest the need of addressing this survey to a higher number of industries, including the relevant ones from the missing EU countries.

The results of this survey are to be widely disseminated to all the stakeholders involved in the area of Biosystems Engineering (i.e. Universities, enterprises, research centres, national associations of agronomists and agricultural engineers, Ministries of Education, Agricultural Politics and Industry), in order to facilitate, at a European level, the transition from the traditional Agricultural Engineering discipline to the emerging Biosystems Engineering one and its better exploitation by all parties involved, including graduates and enterprises.

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[a] **E**ducation and **R**esearch in **B**iosystems **E**ngineering in **E**urope - A Thematic Network (Contract No. 2007-2564/001-001).

Research and Innovation: Measuring and Capturing the Benefits of Public Investment

Patrick Cunningham

Chief Scientific Adviser to the Government, Dublin, Ireland
Patrick.Cunningham@chiefscientificadviser.ie

The Lisbon target for the overall investment in R&D is 3% of GDP by 2010. Only 5 countries in the EU are likely to meet that target. The further aim is that one third of it should be from public sources. Across the EU, this amounts to a commitment of over €100 billion of public funds per annum. Measuring and capturing the benefits from this commitment of public resources is therefore an essential part of a public policy.

Yet the challenges are enormous. In the first place, the time lag between investment and societal benefit can be decades, or even generations long. Secondly, the realisation of benefits is affected by many other factors such as the receptiveness of society to innovation, the availability of capital, and the long term evolution of economic structure in societies.

This paper attempts to describe the methodologies which can be used to follow the path from investment to benefit, with particular emphasis on the linkages necessary to translate university-generated knowledge into products, services and benefits to society.