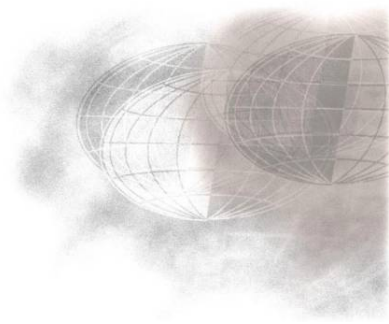




UNESCO CHAIR for Problem Based Learning

UCPBL Annual Report 2010



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Aalborg University

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1. Introduction

The annual report for 2010 is different from previous years. There has been no organisational change and therefore the presentation of the fundamental organisation is not presented in this year's report but only the actual activities that have taken place. However there has been a change in the staff – first of all we have welcomed 9 new PhD students to the UNESCO Chair; secondly we welcome a new full appointed professor and postdoc. Most of the year has been committed to enrolment of new PhD students, establishment of new PhD courses, writing new research applications, revising the Master programme (MPBL) and developing and running new excellence programme for staff development.

For the global network there have been several activities and not at least the planning of the third International Research Symposium on PBL at Coventry University, UK that will take place November 28-29, 2011. We have as usual welcomed several guests and especially having faculty from India and Thailand visiting the UNESCO Chair for a month funded by the ERASMUS Mobility project.

2. New Research Applications and projects

Marie Curie application: TRENDS

The UNESCO Chair has handed in a EU application for the programme People applying for a Marie Curie Initial Training Network: TRENDS (Training for Research on engineering education – New Developments and Sustainability).

TRENDS aims to build a long lasting European-wide network for the research-based development of Engineering Education and to establish a European PhD programme for Engineering Education Research and Sustainability. The purpose of TRENDS is to educate engineers who are capable of contributing to a more innovative and sustainable Europe. TRENDS will study how engineering educators are responding to 1) identification and integration of new sustainable knowledge and competences, 2) avoidance of overloaded curriculum and 3) development of IT and innovation that includes sustainability. TRENDS contains three work packages on Sustainability, Engineering Curriculum and IT and Innovation in Engineering Education. Each work package consists of 4-5 subprojects (fellowships) and there will be 14 fellows employed (13 ESR and 1 ER. 11 formal partners and 10 associate partners from academia, industry, international and professional organisation will interact within the consortium at different levels of involvement. TRENDS has formulated a comprehensive PhD training programme consisting of six PhD courses that will be open for PhD students outside TRENDS and as a way to build up a strong vibrant European Engineering Education community.

ASSESSMENT of the NEW AAU PBL model

AAU has developed a new PBL model with a new coherence between courses and projects and with more and a diverse range of assessment methods. The Faculty of Engineering and Science has funded an evaluation of this new model. DKK 200.000.

3. Externally Funded Research Projects

The UNESCO Chair is running several external funded research projects – some of them recently initiated.

EU project: PBL as practice based, problem based and project based learning

Institut Technik & Bildung, University of Bremen is coordinator for this new project. The overarching aim is to promote European capability to develop problem based learning (PBL) within Higher Education curricula and related programmes for Continuing Professional Development. The specific aim is to develop such capability in the selected three fields of expertise (business administration, engineering, TVET teacher education) and with related interest areas for promoting competences (managerial competences, pedagogic competences, competences in HRD). Budget EUR 40.000.

UNESCO Chair participates as partner.

Nordforsk funded Network: Nordic Network on Engineering Education Research

Participating in the Nordic Network on Engineering Education Research. The objectives are to establish Nordic collaboration among Nordic engineering education research in order to improve the level of research, research training and not at least the impact on development of engineering education. Coordinator is Linköping University and the UNESCO chair is partner.

EU-project: EUGENE (EUROPEAN AND GLOBAL ENGINEERING EDUCATION)

Eugene is a new Thematic Network (Academic Network in the EU Lifelong Learning Programme) with the main goal of improving the impact of EEE on competitiveness, innovation and socio-economic growth in a global context. EUGENE is a 3 year network project and it starts the operations in October 2009. Project's headquarters activities are carried out by University of Firenze (Università degli Studi di Firenze - Facoltà di Ingegneria). The EUGENE Network aims at improving the impact of European Engineering Education (EE) on competitiveness, innovation and socio-economic growth in a global context. This goal will be achieved by setting-up and a top-level "discussion & action" forum to monitor and support the continuous evolution of EE in the EHEA and to open its competition and cooperation borders beyond Europe. In the EUGENE Network, the UNESCO chair is leading the line on engineering education research.

Danish research council: Opportunities and Challenges in Engineering Education in Denmark

The UNESCO Chair participates in a Research council funded strategic alliance on engineering education research. This research alliance will examine how engineering educational institutions are responding to challenges on sustainability, social issues and technoscience and propose ways in which they might respond more effectively, so that engineers are better able to turn them into new opportunities, both commercial and societal. The UNESCO Chair is especially involved in a subproject on learning outcomes and curriculum construction. Aalborg University is coordinator.

4. Centre for PBL and Sustainability

The activities in the Centre for PBL and Sustainability in 2010 have focused on developing the homepage as a platform for open source activities (<http://www.pbl-sus.plan.aau.dk/>), PhD course activities; and creating new network relations.

Two course activities for PhD students have been arranged. A half day seminar on inter-disciplinarity in sustainability science took place in Aalborg March 23, 2010, and was followed up by a 5 ECTS PhD course on PBL and Sustainability in May-June.

The overall purpose of this course was to explore the synergies of combining a problem-based approach to learning (PBL) with sustainability research. Students from communication studies, engineering educational research and sustainability science were represented and the course provided a common knowledge platform making them able to combine their diverse expertise and discuss the possibilities for PBL to support the integration of sustainability in higher education. By use of concept-mapping and brain-shopping the students created a row of problem formulations on PBL and Sustainability and formed groups to address selected problems. They addressed these problems and documented their efforts at a seminar and in a paper published on the website of the Centre.



The network activities have included representation of the Centre in Managing board of the UN Regional Centre of Expertise Denmark for Education for Sustainable development (ESD). Furthermore the centre is represented in the SEFI taskforce for ESD, and joined the EMSU network on ESD.

5. PhD programme

During the year 9 PhD students have been enrolled.

Three with Erasmus Mundus scholarship:

Vikas Shinde: Working as an Assistant Professor in Mechanical Engineering Department at Sinhgad Institute Of Technology, Lonavala, India. Within PBL environment research area is PBL based curriculum design to achieve relevant skills which is demand from new age engineers. Also, to develop the methodology which will leads to successful engineering projects? Hope to contribute to engineering education both in Denmark and India.

Prarthana Coffin: employed at Mae Fah Luang University (MFU) in Thailand. PhD proposal is about implementing PBL into language education, particularly with a special focus on English as a Foreign Language (EFL) context. Studies will also involve syllabus design in PBL organized for EFL courses and also look into staff training, a preparation for a PBL organized learning environment.

Tanveer Maken: holds a Master degree in Science Education (M.S.Ed) from the Institute of Education and Research (IER) Punjab University Lahore, Pakistan. Later got the Erasmus Mundus scholarship for European Master Degree in Lifelong learning: Policy and Management. Works on intercultural competences and PBL.

Two PhD students from Malaysia under the Malaysian government scholarship programme:

Mohamad Borhan: have been appointed for a faculty position in Sultan Idris Education University, Malaysia and am now given the opportunity to pursue higher studies towards getting my PhD in Aalborg University, Denmark. Working on the synergy of the problem-based learning (PBL) and Education for Sustainable Development (EfSD) in teacher education.

Mahyudin bin Arsat: from Universiti Teknologi Malaysia (UTM), Malaysia. Previous research: Acoustic analysis in passenger cabin and Radio over Fibre Communication system design and analysis. Current research: Problem based Learning, Sustainability and Engineering Education.

Two co-financed PhD students:

Annette Grunwald: from Aalborg University. The project is concerned within the research field "Problem Based Learning" and focuses on methodologies for attractiveness/recruitment to technical education and institution's outreach activities. The research is attached to established projects and deals with the effects of new ways of learning and collaborating within a network among university, The University College VIA is cofounding the project.

Aida Guerra: from Oporto University, Portugal. The main themes are: Problem-Based Learning (PBL), Engineering Education and Sustainability. Has a degree in Science Education which allows teaching Biology and Geology up to secondary levels and also, a Master degree also in Science Education, specifically in PBL, Sustainability and Environment Education in the Department of Geology at the Faculty of Sciences of Oporto University.

Two tuition fee waiver:

Fenzhi Zhang: Doctoral student of a continuous academic project that involves postgraduate and doctoral study in School of Education, Beijing Normal University and Aalborg University. Work on innovative competences and PBL.

Mahasti Tafahomi: working on international mobility and competence development for refugees.

Guest PhD students

10-23 October: Drs. Sonia M. Gomez Puente, University of Technology, Eindhoven – Netherlands

PhD courses

February – May 2010. Nordforsk funded PhD course: Doctorate course in Engineering Education Research (15 ECTS). The course aimed at promoting participants' understanding of the EER field as a whole, covering issues such as relevant literature in EER, current EE research subfields, samples of research questions, EER and other fields of science, how to carry out research in EER and designing research projects. The course was organized and taught jointly by [Helsinki University of Technology](#); [Uppsala University](#); and [Aalborg University](#). There were 16 participants from the Nordic countries. UNESCO Chair participates as partner and has been responsible for the first part of the course.

6. Master Education and training

During 2010, new study regulation for the Master in Problem Based Learning (MPBL) was further developed. The new MPBL contains three modules:

1. Module 1: Teaching portfolio, 10 ECTS
2. Module 2: Design of MPBL, 20 ECTS
3. Module 3: Master thesis, 30 ECTS.

Master in Problem Based Learning in Engineering and Science (MPBL)		
<i>Module 1: Development of Teaching Competences</i>		
Course: -Teaching and Learning in engineering, science and health	Assessment: -Written examination -Internal censorship -Assessed by the 7-step scale	5 ECTS
Project: -Teaching portfolio	Project assessment: -Internal censorship -Assessed by Passed/Non-passed	5 ECTS
Module 2: PBL experiments		
Course: -PBL models and change strategies	Assessment: -Participation in seminar -Internal censorship -Marked by Passed/Non-passed	5 ECTS
Course: -Process competences and project supervision	Assessment: -Active participation in workshop -Internal censorship -Marked by passed/Non-passed	5 ECTS
Project: -PBL as experiment	Project assessment: -External censorship -Marked by 7-step scale	10 ECTS

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Module 3: Research based design of PBL programme		
Course: -Theory and method	Assessment: -Written examination -Internal censorship -Marked by 7-step scale	5 ECTS
Optional course: -PBL and sustainability -PBL and intercultural learning -PBL and management	Assessment: -Oral examination -Internal Censorship -Marked by Passed/Non-passed	5 ECTS
Master thesis:	Project assessment: -External censorship -Marked by 7-step scale	20 ECTS

All courses have been revised.

February 2011, 12 participants started at both module 1 and module 2:

- Anthony Doggett – Australia
- Jon Sticklen - USA
- Shobha Muthukumaran – Australia
- Javier Blasco – Spain
- Amaia Gomendio – Spain
- Daniel Lai – Australia
- Nestor Arana – Spain
- Johannes Toit – South Africa
- Nirdosha Gamage – Australia
- Thomas Yeager – Australia
- Anthony Parker – Australia
- Lizette Jespersen - Denmark

Excellence Teaching Practice Programme

The UNESCO Chair has developed and accomplished a special excellence programme for ISEL, Lisbon, Portugal. 35 participants have participated and the course consists of four main activities:

- Introduction workshop (face-to-face) of 4 days. Introducing tools and methods for design of curriculum and especially student centred curriculum.
- Period for participants to work on experiments in own class with possibilities of supervision from Aalborg University and work on a teaching portfolio. Material will be available at the internet and there will be facilitation sessions by using SKYPE.
- Reflection workshop (face-to-face – 2 days) based on participants' documentation and reflection on their teaching experiments and final assessment.
- Assessment of participants' portfolio and reflection on and for practice.

7. Hosted Conferences Workshops and Seminars

March 9-11: Workshop for staff from Toyama National College of Technology, Japan.

September 22: Euronet-PBL Workshop, the Danish evaluation workshop: Self-evaluation of students' *practice-based learning* activities promoted by Aalborg University.

November 8-9: PBL workshop with 20 participants from various Universities.

November 26: 4 persons from Bahrain Polytechnic.

8. PBL Consultancy visits

February 22 – March 2: Centro de Investigaciones y Pruebas Electroenergéticas (CIPEL), Instituto Superior Politécnico José Antonio Echeverría (CUJAE), La Habana, Cuba. Problem Based Learning Workshop: Preparation of new staff; coordinating new activities; recommendations for further PBL. (CMS)

March 4-5: Hochschule Heilbronn, Germany, PBL-workshop for MPBL-students.

March 9-10: Workshop for teachers from Universities of Applied Sciences in Hessen, Germany.

March 11: Workshop for teachers at Friedberg-Giessen University of Applied Science, Giessen, Germany.

9. Keynotes

February 3: Inauguration of new Learning Centre (LESEC), Leuven University, Belgium. (A. Kolmos keynote)

April 22-24: Valencia Global 2010 (E.d Graaff)

May 18: Annual Conference on Pedagogical Development, Faculty of Science & Technology, Uppsala, Sweden (E.d Graaff)

June 12: Nordtek annual conference: Universities of Tomorrow, Aalborg University (A. Kolmos keynote)

June 20-23: ASEE Annual Conference, Louisville, Kentucky (A. Kolmos panel presentations)

June 29-30: International Conference on Remote Engineering and Virtual Instrumentation, KTH, Stockholm (A. Kolmos keynote)

July 1-2: Second Ibero-American Symposium on Project Approaches in Engineering Education, Polytechnic University of Catalonia, Barcelona-Spain (Chunfang Zhou Keynote).

July 18-22: International Conference on Engineering Education, ICEE-2010. Gliwice Poland (E.d Graaff)

August 25-27: International workshop of the National Confederation of the Industry – CNI, Sao Paulo, Brazil (E.d Graaff)

September 9-10: Engineering Practice at Educating Engineering Leaders (“E2L”) Meeting challenges for globally focussed research-led institutions Imperial College, London

September 19-22, Welcome speech, SEFI-IGIP annual conference, Trnava, Slovakia

November 11-17: BEST President’s Meeting, Krakow, Poland (E.d Graaff)

November 16-17: EUGENE First Scientific Meeting, Gothenburg, Sweden (E.d Graaff)

10. Participation in conferences

June 8-11: Chunfang Zhou participated in the Excellence in Education 2010 Conference “Research Strategic Planning and Development”, Harokopio University, Athens, Greece.

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June 19-25: Anette Kolmos participated in ASEE annual conference, Louisville, USA.

June 29 -July 1: Anette Kolmos participated in REV2010 Conference Stockholm, Sweden.

July 1-5: Chunfang Zhou participated in Barcelona, Spain.

September 8-11: Anette Kolmos participated in the conference: EDUCATING ENGINEERING LEADERS CONFERENCE AT IMPERIAL COLLEGE, London, UK.

September 18-24: Huichun Li, Chunfang Zhou, Anette Kolmos participated in the Joint International IGIP-SEFI Annual Conference 2010 "Diversity unifies-Diversity in Engineering Education", Trnava, Slovakia.

October 18-21: Anette Kolmos participated in the 9th Annual ASEE Global Colloquium on Engineering Education and IFEEES conference, Singapore.

11. Visits to Aalborg University

Every year, UCPBL is the host of visitors. This year, UCPBL has been responsible for organising 14 visits at Aalborg University.

Dates and period	Institution	No. of participants	Programme	Special interests
March 9-11	Toyama National College, Japan	4	The Aalborg Model Staff Development Dep. of Biotechnology Presentation of first year Dep. of Production	
April 22	Ni2design, India	1	PBL Training	PBL training
May 3-31	Mobility for Life Project Staff from India, Pakistan and Thailand	10	First Year Presentation AAU PBL Conference PBL & Staff Development Dep. of Biotechnology Dep. of Computer Science	
June 3	University of Zaragoza, Spain	1	Research Collaboration	
June 10	University of Mondragon, Spain	1	Master in Problem Based Learning	Master in PBL
June 14-18	Central Queensland University, Australia	1	Group Assessment Environmental Management	
September 9	Mae Fah Luang, Thailand	2	PBL and Sustainability Signing Memorandum of Understanding Future Collaboration	
November 8-9	Siauliai University, Lithuania University of Basque Country, Spain	1 4	Why PBL: problem based and project based learning and definition of PBL The Aalborg Model examples of project examples The Maastricht Model	

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	Mie University, Japan	2	Curriculum change	
	University of Limerick, Ireland	1	PBL research collaboration	
November 15	Dortmund Technical University, Germany	1	PBL research collaboration	
November 26	Bahrain Polytechnic University, Bahrain	4	Dep. of Electronics Visiting Students AAU PBL Model	
December 10	University of Washington, USA	1	Guest Lecture: Undergraduate perceptions of and approaches to engineering design	

12. Publications

[A Knowledge Building Approach for Learning Engineering : A Case Study of GENSO \(Student Satellite\) Project.](#) / Nielsen, J. D. ; Du, Xiangyun ; Kolmos, Anette. : [International Journal of Electrical Engineering Education](#), Vol. 47, No. 10, 2010.

[A Story of Organizational Change to PBL in Australia.](#) / Li, Huichun ; Henriksen, Lars Bo.

Proceedings of the Joint International IGIP-SEFI Annual Conference 2010. European Society for Engineering Education, 2010.

[A Tool for Preventing Teamwork Failure: the TFP Questionnaire.](#) / Qvist, Palle ; Rebollar, Rubeén ; Lidón, Iván ; Cano, Juan L. ; Gimeno, Fernando, I: [International Journal of Engineering Education](#), Vol. 26, No. 4, 2010, p. 784-794.

[Accompagner le développement pédagogique des enseignants universitaires à l'aide d'un cadre conceptuel original.](#) / Frenay, Mariane ; Saroyan, Alenoush ; Taylor, K. Lynn ; Bédard, Denis ; Clement, Mieke ; Colet, Nicole Rege ; Paul, Jean-Jacques ; Kolmos, Anette.: [Revue Francaise de Pedagogie](#), No. 172, 09.2010, p. 63-76.

[Accreditation and Standards for PBL : A critical investigation.](#) / Henriksen, Lars Bo ; Jørgensen, Kenneth Mølberg 2010. Abstract from Visions, Challenges and Strategies for Problem Based Learning, Aalborg, Denmark.

[Creativity Development for Engineering Students : Cases of Problem and Project Based Learning.](#) / Zhou, Chunfang ; Holgaard, Jette Egelund ; Kolmos, Anette ; Nielsen, Jens Frederik Dalsgaard. 2010. Poster session presented at Joint International IGIP-SEFI Annual Conference 2010, Diversity unifies-Diversity in Engineering Education, Trnava, Slovakia.

[Creativity Development for Engineering Students : Cases of Problem and Project Based Learning.](#) / Zhou, Chunfang ; Holgaard, Jette Egelund ; Kolmos, Anette ; Nielsen, Jens Frederik Dalsgaard.I: Proceedings of the Joint International IGIP-SEFI Annual Conference 2010. European Society for Engineering Education, 2010.

[Danish Faculty Development Strategies.](#) / Kolmos, Anette.I: Building Teaching Capacities in Higher Education : A Comprehensive International Model. red. / Alenoush Saroyan ; Mariane Frenay. Stylus Publishing, 2010.

[Enhanced democratic learning within the Aalborg Model.](#) / Qvist, Palle. I: [PBL 2010 International Conference: Problem-Based Learning and Active Learning Methodologies](#), 2010.

[**Factors Influencing Group Creativity in Project-organized Teams in Engineering Education in China.**](#) / Zhou, Chunfang ; Luo, Lingling ; Du, Xiangyun ; Kolmos, Anette. I: [International Journal of Engineering Education](#), Vol. 26, No. 6, 12.2010, p. 1524-1535.

[**Guest Editorial.**](#) / Kolmos, Anette ; de Graff, Erik ; Du, Xiangyun. I: [International Journal of Engineering Education](#), Vol. 26, No. 3, 2010.

[**Introduction.**](#) / Bogaard, Maartje van den ; Saunders-Smiths, Gillian N. ; Kolmos, Anette. I: [European Journal of Engineering Education](#), Vol. 35, No. 4, 08.2010, p. 345-347.

[**On the Engineering Profession, Reflexivity and Modernity.**](#) / Henriksen, Lars Bo. I: Annual Review of Management & Organizational Inquiry. red. / Carolyn Gardner. Vol. 6 1. edition. Tamaraland Publications, 2010.

[**Palle Qvist's Blog about Digital Teaching.**](#) / Qvist, Palle.2010,

[**Practicum in University Educations : Problem and Practice Based Learning - The Aalborg Case .**](#) / Henriksen, Lars Bo. Aalborg University , 2010. 113 p.

[**Premises for Changing to PBL.**](#) / Kolmos, Anette.I: [International Journal for the Scholarship of Teaching & Learning](#), Vol. 4, No. 1, 2010.

[**Problem-based Learning.**](#) / Kolmos, Anette ; Dahms, Mona-Lisa ; Du, Xiangyun. I: Engineering: Issues, Challenges and Opportunities for Development . France: UNESCO, 2010. p. 337-340.

[**Problembased learning and social responsibility in higher education.**](#) / Jørgensen, Kenneth Mølberg ; Henriksen, Lars Bo.2010. Abstract from Visions, challenges & strategies for Problem based Learning, Aalborg, Denmark.

[**Quality of Higher Education: A Perspective of Faculty/Staff Development for University Teaching and Learning.**](#) / Zou, Yihuan ; Zhao, Yingsheng ; Du, Xiangyun ; Du, Ping. 2010.

[**Research in engineering education.**](#) / de Graaff, Erik ; Kolmos, Anette. I: Engineering: Issues, Challenges and Opportunities for Development France: UNESCO, 2010. p. 347-349.

[**Responses to Problem Based and Project Organised Learning from Industry.**](#) / Kolmos, Anette ; Holgaard, Jette Egelund. I: [International Journal of Engineering Education](#), Vol. 26, No. 3, 2010, p. 573-583.

[**Sustainability in the practise, mindset and heart of engineering.**](#) / Holgaard, Jette Egelund ; Graaff, Erik de ; Kolmos, Anette. 2010. Paper presented at ESRSCP-EMSU Conference, Delft, Holland.

[**Tailor-made CEE in Europe, case stories.**](#) / Nørgaard, Bente ; Rokkjær, Ole ; Hannemose, Niels ; Murphy, Anne ; Allen, Declan ; Corrigan, Tom ; Collins, Kate ; Ausina, Isabel Tort ; Garcia, Israel Quintanilla. I: Proceedings of the Joint International IGIP-SEFI Annual Conference 2010. Brussels, Belgium, 2010.

[**The Analysis on Impact of Chinese and International University Student Science and Technology Competitions on Creative Motivation.**](#) / Wu, Qingyan ; Luo, Lingling ; Li, Xin ; Zhou, Chunfang.

I: [The 32nd Annual Conference of Japan Creativity Society : Creativity and Innovation in Management and Education](#), 10.2010, p. 189-196.

[**The Comparative Research on Creativity of Postgraduate Students between Mainland China and Taiwan.**](#) / Luo, Lingling ; Zhang, Song ; Zhou, Chunfang. I: [The 32nd Annual Conference of Japan Creativity Society : Creativity and Innovation in Management and Education](#), 10.2010, p. 2-11.

[**The Aalborg Model and management by objectives and resources : Preliminary theoretical frame.**](#) / Qvist, Palle ; Spliid, Claus Monrad. 2010.

[**The Aalborg Model and The Problem.**](#) / Qvist, Palle. 2010. Paper presented at Visions, challenges & strategies for Problem based Learning, Aalborg, Denmark.