

We extend a warm invitation to you to participate in the Research in Engineering Education Symposium being held at Palm Cove, North Queensland, Australia.

This is the third in the series, which began with the ICREE conference in Hawaii in 2007 followed by the first REES conference in Davos in 2008.

### **Symposium Theme**

The focus of this conference is “building an international community of engineering education researchers”.

With papers from more than 20 countries, the conference is a wonderful opportunity to share ideas and to seek collaborative opportunities. Sessions commence on Tuesday 21 July 2009.

# rees2009: Planning Committee

## *Planning Committee members*

### Local organizing members:

**Dr Llewellyn Mann**

CQUniversity  
Australia

[l.mann@cqu.edu.au](mailto:l.mann@cqu.edu.au)

**Dr Prue Howard**

CQUniversity  
Australia

[p.howard@cqu.edu.au](mailto:p.howard@cqu.edu.au)

**Dr Lesley Jolly**

Strategic Partnerships (and University of QLD)  
Australia

[ljolly@bigpond.net.au](mailto:ljolly@bigpond.net.au)

**Dr Les Dawes**

QUT  
Australia

[l.dawes@qut.edu.au](mailto:l.dawes@qut.edu.au)

**James Trevelyan**

Professor, Discipline Chair for Mechatronics  
The University of Western Australia  
Perth, Western Australia

[James.Trevelyan@uwa.edu.au](mailto:James.Trevelyan@uwa.edu.au)

---

### International advisory committee:

**Barbara M. Olds**

Vice Provost for Educational Innovation, and Professor of Liberal Arts & International Studies  
Colorado School of Mines, USA

[bolds@mines.edu](mailto:bolds@mines.edu)

**Caroline Baillie**

DuPont Chair in Engineering Education Research and Development  
Queen's University, Canada

[caroline.baillie@queensu.ca](mailto:caroline.baillie@queensu.ca)

**Jonte Bernhard**

Engineering Education Research Group  
Linköping University  
SWEDEN

[jonbe@itn.liu.se](mailto:jonbe@itn.liu.se)

**Elliot Douglas**

University of Florida  
USA

[edoug@mse.ufl.edu](mailto:edoug@mse.ufl.edu)

**Demetra Evangelou**

Purdue University  
USA

[evangeloud@purdue.edu](mailto:evangeloud@purdue.edu)

**Cynthia Finelli**

University of Michigan  
USA

[cfinelli@umich.edu](mailto:cfinelli@umich.edu)

**Lorraine Fleming**

Howard University  
USA

[lorraine.fleming@gmail.com](mailto:lorraine.fleming@gmail.com)

**Norman L. Fortenberry**

Director, Center for the Advancement of Scholarship on Engineering Education  
National Academy of Engineering, USA

[nfortenb@nae.edu](mailto:nfortenb@nae.edu)

**Jeffrey E. Froyd**

Director of Faculty and Organizational Development  
Office of the Dean of Faculties and Associate Provost  
Texas A&M University, USA

[froyd@tamu.edu](mailto:froyd@tamu.edu)

**Erik de Graaff**

Adjunct Professor, Aalborg University  
Associate Professor, Delft University of Technology  
Faculty of Technology, Policy & Management

[E.deGraaff@tudelft.nl](mailto:E.deGraaff@tudelft.nl)

**Kamyar Haghighi**

Head, Department of Engineering Education  
Purdue University, USA

[haghighi@purdue.edu](mailto:haghighi@purdue.edu)

**P. K. Imbrie**

Associate Professor, School of Engineering Education  
Purdue University, USA

[imbrie@purdue.edu](mailto:imbrie@purdue.edu)

**Jennifer Karlin**

Assistant Professor, Industrial Engineering  
South Dakota School of Mines and Technology, USA

[Jennifer.Karlin@sdsmt.edu](mailto:Jennifer.Karlin@sdsmt.edu)

**Deborah Kilgore**

Research Scientist  
University of Washington  
USA

[kilgored@u.washington.edu](mailto:kilgored@u.washington.edu)

**Anette Kolmos**

Professor and Vice Director of the UNESCO International Centre for Engineering Education—

Centre for Problem-Based Learning  
Aalborg University, Denmark

[ak@plan.aau.dk](mailto:ak@plan.aau.dk)

**Gregory Light**

Searle Center for Teaching Excellence  
Northwestern University  
USA

[g-light@northwestern.edu](mailto:g-light@northwestern.edu)

**Thomas Litzinger**

Penn State University  
USA

[tal2@psu.edu](mailto:tal2@psu.edu)

**Jack R. Lohmann**

Vice Provost for Faculty and Academic Development, and Professor of Industrial and Systems Engineering  
Georgia Institute of Technology, USA

[jlohmann@gatech.edu](mailto:jlohmann@gatech.edu)

**Krishna Madhavan**

Clemson University  
USA

[cm@clemson.edu](mailto:cm@clemson.edu)

**IL Moon**

Professor of Chemical Engineering at Yonsei University  
President of Korea Association of Directors of Engineering Education Research Center

[ilmoon@yonsei.ac.kr](mailto:ilmoon@yonsei.ac.kr)

**James Pellegrino**

University of Illinois at Chicago  
USA

[pellegjw@uic.edu](mailto:pellegjw@uic.edu)

# rees2009: Program with Papers

## Monday 20<sup>th</sup> July

17:30 Registration Welcome Reception and BBQ at Novotel Palm Cove Sprigs Lawn

## Tuesday 21<sup>st</sup> July

8:30 Registration Desk Opens Foyer of Convention Centre

9:00 – 10:30 Welcome Plenary Arlington Room

10.30 – 11.00 Refreshments Terrace

Session 1	Session 1A – Student Motivation Thetford room; Chair: Nadia Kellam	Session 1B – Values & Ethics Hastings Room; Chair: Anna Carew	Session 1C – PBL Flinders Room; Chair: Prue Howard
11:00 – 12:30	<a href="#">54. How Do Engineering Educators Take Student Motivation into Account? Jennifer Turns, Kathleen Gygi, Michael J. Prince</a>	<a href="#">3. Engineering Values: An Approach to Explore Values in Education and Practice Caroline Baillie, George Catalano, Yamun Nahar, Eric Feinblatt</a>	<a href="#">20. What Student Attributes Affect Experience of PBL in Virtual Space? Peter Gibbings, John Lidstone, Christine Bruce</a>
	<a href="#">80. An Exploration of Self Motivation Factors among Engineering Students Aini Nazura Paimin, Roger Hadgraft, J. Kaya Prpic</a>	<a href="#">9. Engineering Culture and the Ethical Development of Undergraduate Students Trevor Harding, Donald Carpenter, Cynthia Finelli, Janel Sutkus</a>	<a href="#">27. Comparison of PBL Project Assessment Rubrics Lyn Brodie, Peter Gibbings</a>
	<a href="#">90. Rule, Role and Value Orientations as Motivations for Engineering Ida Ngambeki, Sara Branch, Demetra Evangelou</a>	<a href="#">7. Transforming the Culture, Delivery and Content of an Undergraduate Engineering Program: Process, Pitfalls, and Potential for Lasting Change Roberta Herter, Trevor Harding, Linda Vanasupa</a>	<a href="#">28. Virtual Teamwork and PBL - Barriers to Participation and Learning Lyn Brodie</a>
	<a href="#">48. What Does "Motivation" Really Mean?: An Example From Current Engineering Education Research Holly Matusovich, Ruth Streveler, Ronald Miller</a>		<a href="#">49. A Program Logic Approach to Evaluating Educational Innovations Caroline Crosthwaite, Lesley Jolly, Elizabeth Brown</a>

12.30 – 14.00 Lunch Terrace

Session 2	Session 2A – Engagement Thetford room; Chair: Maura Borrego	Session 2B – P-12 Hastings Room; Chair: Lesley Jolly	Session 2C – Engineering Practice Flinders Room; Chair: Caroline Baillie
14:00 – 15:30	<a href="#">5. Development and Validation of the Engineering – National Survey of Student Engagement (E-NSSE) and Engineering – Faculty Survey of Student Engagement (E-FSSE) Elizabeth Cady, Norman Fortenberry, Malcolm Drewery, Stefani Bjorklund</a>	<a href="#">14. Implementing Engineering Education In The Middle School Lyn English, Les Dawes, Peter Hudson, Terry Byers</a>	<a href="#">52. Engineering Education Requires a Better Model of Engineering Practice James Trevelyan</a>
	<a href="#">41. BUZZ – Acoustical Engineering Methodologies to Measure Student</a>	<a href="#">56. Integrating Engineering Experiences within the Elementary</a>	<a href="#">11. A Study of the Understanding of Knowledge and Learning of a</a>

<a href="#"><u>Engagement Johannes Strobel, Neal Evans, Emily Wigley, Woei Hung</u></a>	<a href="#"><u>Mathematics Curriculum Nicholas Mousoulides, Lyn English</u></a>	<a href="#"><u>Cohort of Mature Age Students David Dowling, Lorelle Burton</u></a>
<a href="#"><u>44. When Critical Mass is Not an Option: Diversifying Smaller Faculties Jennifer Karlin, Andrea Surovek</u></a>	<a href="#"><u>106. An Examination of Web-Based P-12 Engineering Curricula: Issues of Pedagogical and Engineering Content Fidelity Aikaterini Bagiati, Demetra Evangelou</u></a>	<a href="#"><u>105. Steps Toward a Better Model of Engineering Practice James Trevelyan</u></a>
<a href="#"><u>66. Beyond Exam Results: 3 Years of Student Admission Interviews for Undergraduate Engineering Study Carol Russell, Zlatko Spralja</u></a>		<a href="#"><u>74. An Effective Way to Measure Practical Intelligence From a Laboratory Experience Zol Bahri Razali, James Trevelyan</u></a>

**15.30 – 16.00 Refreshments (Terrace) 16:30 Depart Palm Cove at Hartleys Crocodile Adventure and Dinner**

## Wednesday 22<sup>nd</sup> July

**8:30 Registration Desk Opens**                      Foyer

Session 3	<b>Session 3A – Retention</b> Thetford room; Chair:	<b>Session 3B – Competence &amp; Assessment</b> Hastings Room; Chair: Lorraine Fleming	<b>Session 3C – Engineering Design</b> Flinders Room; Chair:
9:00 – 10:30	<a href="#"><u>29. A Phenomenological Inquiry of the Major Choice Processes of an Overlooked Demographic: First Generation College Students in Engineering Julie Trenor</u></a>	<a href="#"><u>38. Influences of the Cohort on Engineering Students' Competence Formation Joachim Walther, Nadia Kellam, David Radcliffe</u></a>	<a href="#"><u>12. Development of a Hands-on Instrument Measuring Understanding of Engineering Design Adam Carberry, Gay Lemons, Chris Swan, Linda Jarvin, Chris Rogers</u></a>
	<a href="#"><u>51. The Relationship Between First Year Engineering Students' Perceptions of Workload and Stress Euan Lindsay</u></a>	<a href="#"><u>58. Metrics and the Holistic Learner Jennifer Karlin, Stuart Kellogg</u></a>	<a href="#"><u>61. Phase change in engineering knowledge production - from an academic to an entrepreneurial context Bill Williams, José Figueiredo</u></a>
	<a href="#"><u>73. Student Retention Modelling: An Evaluation of Different Methods and their Impact on Prediction Results PK Imbrie, Joe J.J. Lin</u></a>	<a href="#"><u>93. Identifying Teaching Approaches that Develop Engineering Students' Graduate Attributes Anna Carew, David Lewis, Chris Letchford</u></a>	<a href="#"><u>89. Influencing Student Designers Towards Safe Design - Transdisciplinarity and the Journey of the Devox Prue Howard, Yvonne Toft</u></a>
		<a href="#"><u>79. Towards an Integration of Formal and Informal Curricula in Engineering Schools Mario Letelier, Rosario Carrasco</u></a>	<a href="#"><u>101. A Cognitive Framework for Understanding the Role of Students' Expectations and Motivations in Interdisciplinary Design Collaboration David Richter, Marie Paretti</u></a>

**10.30 – 11.00 Refreshments Terrace**

Session 4	<b>Session 4A – Diversity</b> Thetford room; Chair:	<a href="#"><u>Session 4B – Knowledge Frameworks</u></a> Hastings Room; Chair: Jeff Froyd	<b>Session 4C – Active Learning</b> Flinders Room; Chair:
11:00 – 12:30	<a href="#"><u>50. New Constructions of Gender Inclusive Engineering Curriculum Julie Mills, Judith Gill</u></a>	<a href="#"><u>16. A Knowledge Framework for Analysis of Engineering Mechanics Exams Thomas Goldfinch, Anna Carew, Timothy McCarthy</u></a>	<a href="#"><u>43. Use of Guided Inquiry as an Active Learning Technique in Engineering Elliot Douglas, Chu-Chuan Chiu</u></a>

<p><a href="#">60. Using a model-building task to compare the design process of service learning and non-service learning engineering students</a> <i>Adam Carberry, Gay Lemons, Chris Swan, Linda Jarvin, Chris Rogers</i></p>	<p><a href="#">35. Enhancing Student Awareness of Conceptual Variations in a Key Nanoscience Concept: The Effect of a Teaching Intervention in an Engineering Course</a> <i>Eun-jung Park, Su Swarat, Greg Light, Denise Drane</i></p>	<p><a href="#">70. Where the Social meets the Cognitive in Classroom Interactions: Mapping the Intersecting Spaces between "Teaching &amp; Learning" in the Classroom Community</a> <i>Pamela Theroux</i></p>
<p><a href="#">100. Teacher Influences on Child Interest in STEM Careers</a> <i>Meara Habashi, William Graziano, Demetra Evangelou, Ida Ngambeki</i></p>	<p><a href="#">72. Use of Item Response Theory to Facilitate Concept Inventory Development</a> <i>Teri Reed-Rhoads, PK Imbrie</i></p>	<p><a href="#">77. Patterns of Technology Adoption and Perceptions of Virtual Laboratories Among Undergraduate Engineering Students</a> <i>Krishna Madhavan, Jacob Schroeder, Hanjun Xian</i></p>
<p><a href="#">104. An Examination of the Paths Influencing the Post Baccalaureate Decisions of High Achieving Black Engineering Students</a> <i>Lorraine Fleming, Dawn Williams</i></p>	<p><a href="#">96. Unpacking Student Conceptions of Surface Area to Volume Ratio in the Nanoscience Context: An Empirical Application of the Construct-Centered Design Framework</a> <i>Su Swarat, Gregory Light, Eun Jung Park, Denise Drane</i></p>	<p><a href="#">86. Places for Learning Engineering: The Role of Informal Learning Spaces</a> <i>Rosemary Chang, Linda Stern, Harald Sondergaard, Roger Hadgraft</i></p>

12:30 departure from Palm Cove for Kuranda Skyrail excursion (return to Palm Cove 17:15)

Conference Dinner depart Palm Cove 18:30 (Depart Palm Cove 18:15 and return 22:30)

## Thursday 23<sup>rd</sup> July

8:30 Registration Desk Opens

Foyer

Session 5	Session 5A – <b>Student Success</b> Thetford room; Chair:	Session 5B – <b>Knowledge Development</b> Hastings Room; Chair:	Session 5C – <b>Team Learning</b> Flinders Room; Chair:
9:00 – 10:30	<p><a href="#">10. A Study of Key Factors that Influence Engineering Student Success at University</a> <i>David Dowling, Lorelle Burton</i></p>	<p><a href="#">65. Confronting the Methodological Challenges of Engineering Practice Research: A Three-Tiered Model of Reflexivity</a> <i>Nicki Sochacka, Joachim Walther, Lesley Jolly, Lydia Kavanagh</i></p>	<p><a href="#">8. Learning Engineering in Teams: Perspectives from Two Different Learning Theories</a> <i>Senay Purzer</i></p>
	<p><a href="#">46. Analysis of the Results of the Continuous Assessment in the Adaptation of the University to the European Higher Education Area</a> <i>Jorge Enrique Pérez-Martínez, María Jesús García-García, Wilmar Hernandez, María Jesús Villamide-Díaz</i></p>	<p><a href="#">47. The Role of Prior Knowledge on the Origin and Repair of Misconceptions in an Introductory Class on Materials Science and Engineering</a> <i>Stephen Krause</i></p>	<p><a href="#">75. Changing Student's Perceptions of Self and Peer Assessment</a> <i>Keith Willey, Anne Gardner</i></p>
	<p><a href="#">82. The Relationship Between Academic Self-Confidence and Cognitive Performance Among Engineering Students</a> <i>Maizam Alias, Nurul Aini Hafizah Mohd Hafir</i></p>	<p><a href="#">15. Problem Identification During Model-Eliciting Activities: Characterization of First-Year Students' Responses</a> <i>Heidi Diefes-Dux, Amani Salim</i></p>	<p><a href="#">76. Self and Peer Assessment: A Necessary Ingredient in Developing and Tracking Students' Graduate Attributes</a> <i>Keith Willey, Anne Gardner</i></p>
	<p><a href="#">69. An Adaptive Response Model to Predict Emergent Engineering Education System Properties</a> <i>Nadia Kellam, Joachim Walther, David Gattie</i></p>		<p><a href="#">83. Stakeholder Perceptions of Online Peer Mark Moderation in University Teamwork</a> <i>Peter Willmot, Keith Pond</i></p>

## Guidelines for fully refereed papers submitted to REES for publication (change this heading into your paper title)

*Abstract: An abstract of no more than 150 words should be provided here in the format given in the style 'Abstract'. The word 'Abstract' should be made bold as shown. Simply replace this italics text with your Abstract.*

### Introduction – overall layout

The preferred file format for submission of your paper is **PDF**. However, we are expecting you will prepare your paper in MS Word. This document defines the preferred style to be used to format your paper for submission to REES conferences.

### Structure

As you prepare your short paper, please follow the **organization** outlined here. The second review in April/May will be more searching than the first review and it is essential that your paper demonstrates each of the items 1-6.

1. What is the **context** or background of the study? What are the most significant findings from other research studies which influenced your work?
2. What are the **research questions** you investigated? Why are they important to engineering education?
3. What **theoretical framework(s)** did you use? Explain any theoretical concepts which are critical to the research.
4. Discuss your **methodology**. How did you collect **data** to investigate your research question? From whom did you collect it? How did you **analyze** the data?
5. Discuss your major **findings** and/or **conclusions**. Outline your chain of reasoning from data analysis to findings. Are there other interpretations which could fit your data and analysis? Are there alternative interpretations which you ruled out?
6. Discuss any **recommendations** for engineering education. Indicate **future research plans** or additional questions raised by this research project.
7. Acknowledge any support you received for this project.

### Copyright statement

The following copyright statement should be included at the end of your paper. Substitute authors' names in final copy only.

Copyright © 2009 Authors listed on page 1: The authors assign to the REES organisers and educational non-profit institutions a non-exclusive licence to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The authors also grant a non-exclusive licence to REES to publish this document in full on the World Wide Web (prime sites and mirrors) on CD-ROM and in printed form within the REES 2009 conference proceedings. Any other usage is prohibited without the express permission of the authors.