Proceedings of the
24th Annual Conference of the
Australasian Association for Engineering Education
AAEE2013

Work Integrated Learning – Applying Theory to Practice in Engineering Education

Hosted by
Griffith School of Engineering
Griffith University, Australia

Crowne Plaza Hotel, Gold Coast, Queensland
December 8-11, 2013


Editors
Charles Lemckert, Graham Jenkins and Susan Lang-Lemckert
All full papers accepted for publication in the Proceedings of the 24th Annual Conference of the Australasian Association for Engineering Education were submitted as full papers and were blind peer reviewed. Authors were given the opportunity to amend their paper in light of these reviews before the decision to accept and publish the paper was made. This process of reviewing is in accordance with the criteria set for research papers by the Department of Education, Employment and Workplace Relations (DEEWR) and the Department of Innovation, Industry, Science and Research (DIISR) of the Australian Government.

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Welcome to Delegates

On behalf of the Organising Committee, it is with great pleasure that I welcome you to the 24th Annual Conference of the Australasian Association for Engineering Education (AAEE2013).

The ongoing resource boom and strong Australian economy has seen the demand for quality engineering graduates continue to grow. More and more, industry is expecting engineering graduates to start their employment as contributing engineers as opposed to engineering trainees (as was the case in many workplaces in the past). As such, undergraduate teaching programs now need to ensure students have a workplace-ready approach, so that as graduates they can add value to their employer from Day One. In recognition of these changing demands, the proposed theme for AAEE 2013 is:

   Work Integrated Learning – applying theory to practice in engineering education

AAEE2013 continues the strong tradition of embracing an ever-changing educational and training environment, and aims to create an atmosphere conducive to hearty discussion and knowledge transfer amongst Engineering educators.

I hope you enjoy your time at AAEE2013, and that you will learn new approaches and strategies to enhance student learning and teaching activities on your return to your learning institutions.

Associate Professor Charles Lemckert

Chair AAEE2013
## Program Schedule

### Sunday 8 December, 2013

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<td>Welcome Reception</td>
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<td>Official Opening by Professor Ian O’Connor, VC, Griffith University</td>
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<td>Keynote Presentation by Dr Karsten Zegwaard</td>
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<tr>
<td></td>
<td>What is this thing called Work-Integrated Learning?</td>
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<tr>
<td></td>
<td><strong>Norfolk Room</strong></td>
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<tr>
<td>9:00 - 10:30</td>
<td>Morning Tea</td>
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<td>10:30 - 11:00</td>
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<tr>
<td>11:00 - 12:30</td>
<td>Session 1A Effective Use of Alternative Learning Environments</td>
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<td>Facilitator: Douglas Hargreaves</td>
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<td>Session 1D Blended Learning, and Engineering Curriculum</td>
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<td>12:30 - 1:30</td>
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<td>1:30 - 3:00</td>
<td>Session 2A Effective Use of Alternative Learning Environments</td>
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<td>Session 2B Addressing the Changing Industry Requirements</td>
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<td>3:00 - 3:30</td>
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<td>3:30 - 5:00</td>
<td>Workshop 1A Design Verification: A peer generated cyclical formative feedback tool</td>
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<td>Michael Jennings, Lydia Kavanagh, Liza O’Moore and Benjamin Babao</td>
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<td>Workshop 1D Star Trek Voyager: Navigating your way in the engineering education landscape</td>
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<td>Workshop 1E Project-based Learning using Raspberry Pi® with MATLAB and Simulink for Teaching Video and Image Processing Abhaya Parthy</td>
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Presentations are 5 minutes per paper plus 1 hour for open discussion.
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<td>Registration</td>
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<tr>
<td>9:00 - 10:30</td>
<td>Work Integrated Learning to Professional Development for Academics: Not such a long bow to draw.</td>
<td>Norfolk Room</td>
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<tr>
<td>10:30 - 11:00</td>
<td>Morning Tea</td>
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</table>
| 11:00 - 12:30| Session 3A: Effective Use of Alternative Learning Environments  
Facilitator: Cheryl Desha | Norfolk Room |
| 11:00 - 12:30| Session 3B: Addressing the Changing Attributes of Our Student Cohort  
Facilitator: George Banky | Kauri Room     |
| 11:00 - 12:30| Session 3C: Authentic Assessment  
Facilitator: Lesley Jolly | Cypress Room |
| 11:00 - 12:30| Session 3D: Practical Skills Development  
Facilitator: Benoit Gilbert | Waratah Room   |
| 11:00 - 12:30| Session 3E: Diversity in Engineering Education  
Facilitator: Roger Hadgraft | Acacia Room    |
| 11:00 - 12:30| Session 4A: Effective Use of Alternative Learning Environments  
Facilitator: Robin King | Monaco 2       |
| 11:00 - 12:30| Session 4B: Addressing the Changing Industry Requirements  
Facilitator: Charles Lemckert | Session 4B     |
| 11:00 - 12:30| Session 4C: Reflection as a Learning Tool  
Facilitator: Aaron Blicblau | Session 4C     |
| 11:00 - 12:30| Session 4D: Effective Use of Alternative Learning Environments  
Facilitator: Matt Elliot | Session 4D     |
| 11:00 - 12:30| Session 4E: Project- Based Learning  
Facilitator: Lydia Kavanagh | Session 4E     |
| 12:30 - 1:30| Lunch                                                                                           |                 |
| 1:30 - 3:00| Session 2A: Beyond Graduation: Exploring the transition from Stage 1 to Stage 2 competencies.  
Hansani Thebuwanaa and Roger Hadgraft | Workshop 2A     |
| 1:30 - 3:00| Workshop 2B: Industry Engagement in Engineering Degrees  
Robin King and Sally Male | Workshop 2B     |
| 1:30 - 3:00| Workshop 2C: I do and I understand: practiced pedagogy during experimental learning by engineering students.  
George P. Banky, Aaron S. Blicblau, Hari Vuthaluru and Prasanna Egodawatta | Workshop 2C     |
| 1:30 - 3:00| Workshop 2D: Empowering Indigenous Viewpoints through Alternative Decision Making Frameworks  
Kepa Morgan, Robyn Manuel and Tumanako Fa‘a‘ui | Workshop 2D     |
| 1:30 - 3:00| Workshop 2E: Development of Learning and Teaching Standards of Final Year Engineering Projects (FYEPPs)  
Mohammad G. Rasul, Fons Nouwens, Justine Lawson, Prue Howard, Fae Martin, Roger Hadgraft, Colin Kestell, Faisal Anward, Alan Henderson, Alex Stojcevski, Guy Littlefair and Rob Jarmang | Workshop 2E     |
| 3:30 - 5:00| Workshop 2F: EEERE Project Peer Review: Energy Efficiency Education Resources for Engineers  
Cheryl Desha and Charlie Hargrove | Workshop 2F     |
| 6:00 - 10:00| Conference Dinner and Awards  
Facilitator:         | Norfolk Room    |

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<td>9:00 - 10:30</td>
<td>Panel Discussion hosted by Dr. Graham Jenkins <em>Norfolk Room</em></td>
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#### Norfolk Room | Kauri | Cypress | Waratah

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<td>Hong Zhang</td>
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<td>Topic:</td>
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Session 1A
Effective Use of Alternative Learning Environments
Norfolk Room

1. Measuring team-member effectiveness in Australia and the United States
   Ohland, M. W.; Loughry, M. L.; Woehr, D. J.; Layton, R. A.; Ferguson, D. M.

2. Strategies for developing effective communication skills in engineering students
   Bowering, R.

3. An inverted remote laboratory - makers and gamers
   Maxwell, A.; Orwin, L.; Kist, A. A.; Maiti, A.; Midgley, W.; Ting, W.

4. In-class and recorded physical demonstrations in enhancing student understanding of structural mechanics courses
   Gilbert, B. P.; Guan, H.; Qin, H.; Drew, S.

5. Design of Computer Simulator Based Learning Modules and Assessments for a Subject in Control Engineering
   Nguyen, H.

6. Stakeholders’ Perspectives of a Work Integrated Learning Program: The Chemical Engineering Practice School

Session 1B
Addressing the Changing Attributes of Our Student Cohort
Kauri

1. Are engineering students’ interests and attitudes to study different from scientists?
   Wilkes, J.; Burton, L.; Glencross-Grant, R.; Albion, M.

2. Targeted orientation: A continuing study of the perceptions of transitioning first-year engineering students
   Elliot, D.; Banky, G. P.; Blicblau, A. S.

3. Heat Maps: Evidence-Based Addressing of Generic Graduate Attributes
   Fernandez, G.; Bevinakoppa, S.

4. In search of key drivers for success in first year engineering courses
   Leaver, J. D.; Fernando, D. A.

   Mackie, S. A.
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Authentic Assessment
Cypress
1 Combining Information Literacy Development and Teamwork through Authentic Assessment
Cavenett, S.; Rawson, C.

2 Team Work Breakdown: A tool for increasing individual accountability and integrated learning across group projects
Sharma, R.; Eschenbach, E. A.

3 Assessing Graduate Attributes in Large Classes without Sampling
Easa, S.

4 Does the Multiple Choice Question structure in examinations have an effect on student performance?
Klimovski, D.; Cricenti, A.

5 Benchmarking of Final Year Engineering Projects
Gibbings, P.; Snook, C.

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Blended Learning, and Engineering Curriculum
Waratah
1 Reflections on Learning Through Peer Convening
Town, G.; Svensson, C.

2 Better engagement of off-campus students through the use of Virtual Classroom
El Hanandeh, A.

3 Engineering curriculum structure and mapping: accreditation and beyond

4 Benchmarking the learning outcomes of formative Australian Engineering Degrees: national and international perspectives
King, R. W.; Hoffmann, P. H.

5 Epistemological problems in engineering education
Jolly, L.; Jolly, H.; Brodie, L.

Session 1E
Embedding Work-Integrated Learning Within the Curricula
Acacia
1 Project based Learning for First Year Maritime Engineering Students: Manufacturing and Testing of Skateboards
Lisson, D.; Garaniya, V.; Chin, C.; Salter, S.

2 To what extent does the professional practicum develop or change an engineering student’s identity?
Nguyen, K.; Male, S.; Bennett, D.; Maynard, N.

3 Challenges of developing and sustaining a Co-operative Education Program in Maritime Engineering
Harte, D.; Symes, M.

4 Developing University-Industry Partnership for Work Integrated Learning: A Case Study
Rampersad, G. C.

5 Work integrated learning: Exposure to professional practice: expectations and challenges
Boles, W.; Peach, D.
Monday 9 December, 2013

Session 2A
Effective Use of Alternative Learning Environments
Norfolk Room
Facilitator: Julia Lamborn

1 Video in engineering courses to promote active online learning environments
Jackson, N.; Quinn, D.; Lonie, A.; Rathore, P.; James, P.

2 Reimagining the Dissemination of Engineering Education Practices Through a Global Learning Partnership
Reidsema, C.; Kavanagh, L.; Jolly, L.; Long, P.; Adams, R.

3 Developing understanding of the carbon cycle through play with physical analogues
Browne, C.; Newell, B.; Compston, P.

4 Back to basics: Investigating the effect of problem-based tutorial sessions on solving quantitative exam problems
Banky, G. P.

5 Clicker Approach in Engineering Design Classrooms
Cvetkovic, D.; Chandran, J.

Session 2B
Addressing the Changing Industry Requirements
Kauri
Facilitator: Llewellyn Mann

1 The Skills Towards Employment Program: Lessons Learned
Shen, B.; Ooi, A.

2 Integrating Building Information Modelling (BIM) into Engineering Education: An Exploratory Study of Industry Perceptions using Social Network Data
Panuwatwanich, K.; Wong, M. L.; Doh, J. H.; Stewart, R. A.; McCarthy, T. J.

3 Graduate engineers as project implementers – implications for engineering education
Smith, J.

4 Competencies Required of Industry-Based-Learning Students
Blicblau, A. S.; Nelson, T. L.

5 Virtual teams much? – Overcoming disparate participation in a distance education construction management program
Pienaar, J.; Adams, N.; O’Brien, D.

6 Integrating Delivery of Core Knowledge and Generic Skills for an Undergraduate Construction Management Course
Topkar, V. M.; Bhonsle, M.
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Reflection as a Learning Tool
Cypress

Facilitator: Lynette Brodie

1. Developing a Self-Report Measure of Students’ Interest and Motivation for Studying Engineering
   Burton, L. J.; Albion, M. J.

2. Deep understanding of Engineer’s Social Responsibility in Themes of Ethics Education

3. Do engineering students learn concepts better when required to link them?
   Moors, T.

4. Reflecting on Reflexivity
   Grant, P.; Basson, M.

5. Challenges of progressive feedback in engineering management
   Abdekhodae, A.; Dini, K.

6. Evaluation of reflective writing in a first year engineering course
   Quental, D.

Session 2D
Practical Skills Development
Waratah

Facilitator: Stephen So

1. Student Design Teams: How are teamwork and leadership negotiated?
   Kootsookos, A.; Edwards-Hart, T.; Steiner, T.

2. Student Society Based Learning
   Armstrong, C.; Brick, M.; Symes, M.; Forrest, A.

3. Developing student teamwork and communication skills using multi-course project-based learning
   Schaller, C. G.; Hadgraft, R. G.

4. Enriching architecture courses with engineering knowledge
   El Hanandeh, A.; Dupre, K.; Gilbert, B. P.

5. Student Focus and Prioritization of Design Parameters in First-year Engineering Design Projects
   Goncher, A.; Johri, A.; Boles, W.

Session 2E
Embedding Work-Integrated Learning Within the Curricula
Acacia

Facilitator: Deborah Peach

1. Proper Selection of Learning Projects in Teaching Telecommunications Engineering

2. A Work Integrated Learning Approach to Teaching Water Resources Engineering
   Jenkins, G. A.

3. A retrospective on work integrated learning by engineers
   Skinner, I.; Carey, K.; Lucien, F.

4. Engineering Graduate Program – how it affects the skills, attributes and career development of graduate engineers
   Preston, V.; Goh, S.
### Session 3A
**Effective Use of Alternative Learning Environments**
**Facilitator: Cheryl Desha**

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<td>1</td>
<td>A moon observation system for learning the lunar concepts in astronomy education</td>
<td>Liou, H. H.; Yang, S. J. H.; Tang, W.; Lin, C. P.; Lin, Y. S.</td>
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<td>Klimovski, D.; Keane, T.; Branch, P.; But, J.; Cricenti, A.</td>
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**Addressing the Changing Attributes of Our Student Cohort**
**Facilitator: George Banky**

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**Authentic Assessment**
**Facilitator: Lesley Jolly**

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<td>1</td>
<td>Reflections on Assessment: Comparison of Assessment Processes for Postgraduate Engineering Management Courses</td>
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<td>McCredden, J. E.; O'Brien, K. R.; Roberts, A. P.</td>
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Facilitator: Benoit Gilbert

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Kauri

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**Facilitator:** Stuart Palmer

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### Session 6A

**Effective Use of Alternative Learning Environments**

**Facilitator:** Graham Jenkins

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| | When Engineering and Architecture students meet: a French case study |
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| | Enhancing Engineering Qualities by Adopting the Total Design Approach in Final Year Projects |

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