

2020 NZDE/ BENGTECH TEACHING & RESEARCH FORUM

Waikato Institute of Technology
Rotokauri Campus, 51 Akoranga Rd
Hamilton

10 & 11 February 2020
contact@nzbed.org.nz



Welcome

The NZBED and BEngTech Management Group extend a warm welcome to all attendees at this year's forum.

We appreciate your interest and enthusiasm in attending and taking part in this event in the midst of all the changes that are underway in the tertiary education sector and we are pleased to have a representative from the RoVE project with us to update us on current developments in the process.

The forum is a great opportunity for the sharing of ideas and meeting with colleagues across the country and we hope you can make some valuable connections over the two days.

This booklet includes the programme for each day and brief outline of each presentation. If you need any assistance during the forum please don't hesitate to ask.

We would like to acknowledge the support of the Wintec Engineering and administration team in arranging this event and we look forward to an interesting and informative two days in Hamilton.



Day one schedule

9:00 AM Welcome: Lisa Drysdale (NZBED) & Shelley Wilson (NZBengTech)

09:25 AM Plenary session: Owen Embling, Managing Director, Convex Plastics

10:15 AM Morning tea

10:45 AM Plenary session: Aidan Bigham - Design Factory

12:00 PM Lunch

13:15 PM Concurrent session

Keith Willey

Michael Mullens

13:50 PM Concurrent session

Glenn Nicholson

Ken Louie

14:25 PM Afternoon tea

14:55 PM Concurrent session

Momen Bahadornejad

Frank Cook

15:30 PM Concurrent session

Mike Mullany

Edward Chai

16:00 PM Plenary session: Jac Field- NZDE Fire

16:40 PM Day one close

18:30 PM Complimentary dinner for those who registered.

MONDAY 10 February 2020

0900 - 0920	Plenary GG.25: Welcome reception		
0925 - 1015	Plenary GG.25: Owen Embling, Discussion of graduate opportunities in the area and the links between Wintec and local employers Managing Director, Convex Plastics		
1015 - 1045	Morning tea		
1045 - 1200	Plenary GG.25: Aidan Bigham Design Factory New Zealand Using the Design thinking process to explore what opportunities exist for our students to work across institutes and across the world		
1200 - 1315	Lunch		
	Concurrent one: Room GG.25	Concurrent two: Room GG.19	
1315 - 1345	Keith Willey University of Sydney Authentic Learning and Assessment validity	Michael Mullens Otago Polytechnic Learner Engagement in Community Health and Development: Islands, Isolation & Impact	
1350 - 1420	Glenn Nicholson Unitec First semester students who fail at the first hurdle — how can we help?	Ken Louie Wintec No magic bullet: using MuPad to learn and teach engineering mathematics	
1425 - 1455	Afternoon tea		
	Concurrent one: Room GG.25	Concurrent two: Room GG.19	
1455 - 1525	Momen Bahadornajad Unitec A comparison between moderation in NZDE & BEngTech	Frank Cook Wintec Experience with online delivery	
1530 - 1600	Mike Mullany Northtec Mindfulness in Engineering Management teaching	Edward Chai Unitec Institute of Technology The performance of ex NZDE (Civil) Engineering students in BEngTech programme at Unitec	
1605 - 1635	Plenary GG.25: Jac Field Institution of Fire Engineering (IFE) NZDE Fire: Igniting interest for future fire engineers		
1640 - 1700	Plenary GG.25: Conclusion to the day		



Day one content

Owen Embling, Managing Director, Convex Plastics

Convex Plastics have been operating for over 40 years and have built a strong international reputation for product innovation and the development of world-first technologies and products – including several slider innovations, the lapsealing process that is now used worldwide, and Econic® compostable packaging for coffee and dry foods.

Aidan Bigham - Design Factory

For graduates working across the world we ask what opportunities exist for our students to work across institutes and across the world? We'll use the Design Factory process to explore this question and have some fun along the way!

Keith Willey- Authentic Learning and Assessment Validity

Authentic Learning and Assessment practices often rely on indirect behavioural evidence that students are acquiring, integrating and applying the knowledge and skills we consider essential to our chosen disciplines. Given this, how can we get an accurate picture of what's going on inside our students' heads? What is valid evidence of demonstrated learning achievement? What approaches can we employ to promote deep learning and strengthen the validity and reliability of our chosen assessment practices?



Michael Mullens- Learner Engagement in Community Health and Development: Islands, Isolation and Impact

This presentation discusses international WASH projects undertaken by Otago Polytechnic (2018/19). This International program now in its third year, focuses on civil engineering WASH projects in the South Pacific. Presentation: Objectives & aims, stakeholders, capacity building (local and global), sustainable development, financial & funding raising, project based learning and future opportunities interested organisations.

Glenn Nicholson- First semester students who fail at the first hurdle - how can we help?

Students in the first semester of study in the NZDE programme are faced with three courses assessed by national exams. A fail grade in these courses has a serious impact on the progression of students through the programme. This presentation will look at strategies that have been implemented to address low pass rates in first semester courses, the effectiveness of these strategies, and plans for future action to improve student success rates in these courses.

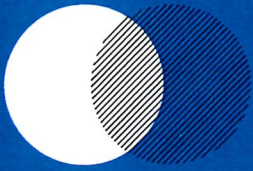


Ken Louie- No magic bullet: using MuPad to learn and teach engineering mathematics

This talk will describe using a computer algebra system (CAS) to reinforce problem-solving techniques taught in the first-year BEngTech mathematics course (MG5004). The CAS used is MuPad, which is an add-on to the more well-known Matlab software. MuPad allows for "natural" manipulation of symbols and can be used to solve quite demanding problems with a minimal amount of additional syntax knowledge. This has two main benefits. Firstly, students can be asked to tackle more "realistic" problems than the traditional textbook questions and secondly, tutors can assign individualised problems which have auto-generated solutions.

Momen Bahadornejad- A comparison between moderation in NZDE and BEngTech

Moderation is the review process that is used to assure the quality of assessments. It adds value to the qualifications by providing assurances they are credible and also to the teaching and learning by providing teachers with the feedback on where and how to improve assessment practices. While internal moderation is for quality control, the external moderation is for reviewing the quality of the programme delivery: It provides assurances that assessments are acceptable to stakeholders. In this presentation the external moderation processes of NZDE and BEngTech programmes are compared and advantages and disadvantages of the two systems are highlighted.



Frank Cook- Experience with Online Delivery

Over an eight year period I have delivered MG7022, Energy Engineering, online. The delivery was to students from Wintec, Weltec and Ara who were in their final B Eng Tech Mechanical year. Delivery was over one semester and comprised 2 two hour classes each week, with each class being recorded and available online. Most students received the course synchronously - the preferred option - while others accessed it asynchronously. Most used both at some point or other. A number of approaches to delivery were tried with varying success. The talk discusses the lessons learned over this 8 year period.

Mike Mullany- Mindfulness in engineering management teaching

Many modern project management courses include a section on mindfulness as a means of coping with the attendant stresses. This technique has gained recent credibility after research established the existence of the default mode network of the brain. Mindfulness is shown to embrace techniques, which are quickly and easily learnt and practiced as a means of ridding oneself of stress-inducing thoughts, and hence of stress in general. This paper provides information on mindfulness as a management tool, and then explores the possibility of teaching it as part of DE6101 Engineering Management.



Edward Chai- The performance of ex New Zealand Diploma in Engineering (NZDE) Civil Engineering students in BEngTech programme at Unitec

For BEngTech new student intakes between semester 1, 2014 and semester 1, 2016 at Unitec, the ex NZDE (Civil) comprised about 22% to 32 % of the total intake figures. It is important to find out the performance of this group of students and to see if they are doing well or need some support during their study. Out of the 79 ex NZDE students enrolled, 89% has since completed BEngTech, 8% in the process of completion, and 3% has dropped out. This presentation may help to show if 14 cross credits given to the ex NZDE students is justifiable.

Jac Field- NZDE Fire: Igniting interest for future fire engineers

With the NZDE Fire qualification now developed as a viable option for study in the polytechnic sector, showcasing fire engineering as a career path for secondary school students has proven challenging. IFE, FENZ and Jac Field (formerly of NorthTec) have developed an innovative approach: The Ignite Project brings fire engineering to life for secondary school students, using a mixture of STEM education, rock and roll, and the untapped knowledge of kiwi kids to prime and prepare the next generation of home-grown fire engineers.



Day two schedule

9:00 AM Welcome and judging of student awards

09:35 AM Plenary session: A taste of AAEE Summer School – Introduction to Engineering Education research

Anne Gardner & Keith Willey,

10:40 AM Morning tea

11:10 AM Concurrent session

Group presentation Wintec Debbie Hogan

11:45 PM Plenary session: **Grant Klinkum, Deputy**

Secretary, Ministry of Education

12:35 PM Lunch

13:30 PM Concurrent session

Hugh Wilson James Mackay

14:05 PM Level 5/6 alignment working groups

16:35 PM Conclusion to forum

TUESDAY 11 February 2020

0900 - 0930	Plenary GG.25: Welcome reception: NZDE & BEngTech Student Project awards 2019	
0935 - 1035	Plenary GG.25: A taste of AAEE Summer School – introduction to engineering education research Anne Gardner, University of Technology Sydney, & Keith Willey, The University of Sydney. Australasian Association for Engineering Education Research Summer & Winter Schools	
1040 - 1110	Morning Tea	
	Concurrent one: Room GG.25	Concurrent two: Room GG.19
1110 - 1140	Sarl Kumari, Thilanga Ariyaratna, Mohammad Al-Rawi, Jai Khanna Wintec Building connections with new teaching and learning approaches	Debbie Hogan The advantage of using drone survey in Civil engineering
1145 - 1230	Plenary GG.25: Grant Klinkum Deputy Secretary, Ministry of Education. An update on the Reform of Vocational Education	
1235 - 1330	Lunch	
	Concurrent one: Room GG.25	Concurrent two: Room GG.19
1330 - 1400	Hugh Wilson Unitec Micro credentials, now and in the future	James Mackay Weltec Update on the BEngTech degree apprenticeship in Asset Management
1405 - 1415	Plenary GG.25: Conclusion to forum for those not required for Alignment Project	
	Level 5 & 6 Alignment project	
	Concurrent one: Room GG.25	Concurrent two: Room GG.19
1415 - 1645	Civil	Concurrent Three: Room GG.33 Mechanical
1645 - 1700	Plenary GG.25: Recommendations from alignment & Conclusion to forum	



Day two content

Anne Gardner & Keith Willey- A taste of AAEE Summer School – Introduction to Engineering Education research

In this session, participants are guided through a research cycle beginning with:

- Identifying phenomenon
- Situating this phenomenon in the literature to identify a research question
- Using theories as lenses
- Methodologies and evidence
- Methods of collecting and analysing evidence to produce discussion and findings.

The session will suit new researchers and those transitioning to engineering education research and established researchers are also welcome to contribute their experience and expertise.

Sarl Kumari, Thilanga Ariyaratna, Mohammad Al-Rawi and Jai Khanna Building connections with new teaching and learning approaches

This study is based on the teaching and learning approaches to build good and healthy relations within the classroom. To create an effective teaching and learning environment, student engagement and motivation is the most important aspect. We have considered group assignments and group project-based tasks to validate our approaches. Learners are getting more involved in class when they are given group assignments and projects instead of individual tasks. Having a healthy and comfortable learning and working environment in regular classes, found a good influence on learners to develop strong bonds and better understanding between fellow learners..

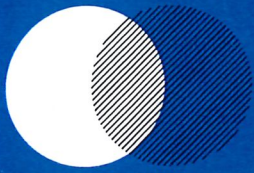


Debbie Hogan- The advantage of using drone survey in Civil Engineering

Land Surveying is the cornerstone of the civil engineering profession. First came measuring ropes used by Ancient Egyptians, then Gunter's chain was standardised in 1620, while the first theodolite was created in 1576, and in 1725 a telescope was added. In the last 5 years, advances in drone and GPS technology is opening up new ways of mapping the world we live and work in. Following an introduction on the power of drone surveying, please consider the following question; Is it time to update our course descriptors to equip our students with the knowledge and skills on drone surveying?

Plenary session- Grant Klinkum Deputy Secretary, Ministry of Education

Grant has been Acting Deputy Secretary for Graduate Achievement, Vocations and Careers since the beginning of January. He brings the perspective of someone who has worked across two tertiary education sub-sectors and two government education agencies. Grant's education sector experience includes two roles as Dean of Faculty and one as Deputy Chief Executive of a polytechnic. Grant has a PhD in Political Science from Victoria University of Wellington, a Master's in Education Administration from Massey University and a Master of Arts degree from the University of Canterbury



Hugh Wilson- Micro credentials now and in the future

Microcredentials recognise smaller packages of learning than traditional educational qualifications. There are a number of potential benefits that may be offered by using these small packages of learning before, during and/or after the delivery of traditional courses. However, there are also some concerns about the approach. This presentation will look at what microcredentials are, their potential benefits and issues, how they are used and how they could be used in the NZDE and BEngTech programmes.

James Mackay- Update on the BEngTech degree apprenticeship in Asset Management

This presentation provides an overview of the development of a curriculum for the BEngTech degree apprenticeship in Asset Management. In the last 12 months, approval for the addition of an asset management pathway to each major has been granted by Engineering NZ. Approval by NZQA for the delivery of an asset management pathway was also given in early December. This will allow us to move into the third phase of the project, the piloting of the new curriculum and the detailed development of a set of blended online learning materials for the use of all polytechnics offering the BEngTech.