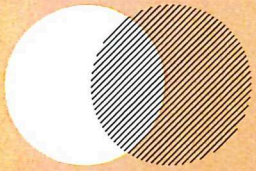


2021 NZDE/ BENGTECH TEACHING & RESEARCH FORUM

Tech Park
Manukau Institute of Technology
58 Manukau Station Road.
Manukau, Auckland

03 & 04 February 2021
contact@nzbed.org.nz



Welcome

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

What a year 2020 turned out to be! But how we rose to the challenge as a sector and really delivered to all our learners, whilst managing our own personal circumstances. This resilient spirit, innovative drive and commitment to Engineering in New Zealand will steer us well over the next phase of change to come. We thank you for your support while we develop new ways to collaborate across the two qualifications, such as the cluster moderation held prior to forum. We are committed to delivering the best outcomes possible whilst streamlining all our workloads.

This booklet includes the programme for each day and a brief outline of each presentation. The power point presentations from each of the sessions will be uploaded to Moodle after the event along with the other abstract submissions that were unable to be presented on the day.

If you need any assistance during the forum please don't hesitate to ask.

We would like to acknowledge the support of the Manukau IT Engineering and administration team in arranging this event and we look forward to many informative sessions where we can share best practice and continue to make valuable connections between colleagues.



Day one schedule

9:00 AM Mihi Whakatau/Welcome reception

09:50 AM Plenary session: Stephen Town, Chief Executive, Te Pūkenga.

10:55 AM Morning tea: Lab tours available at this time

11:45 AM to 12:15 PM Concurrent sessions

- Establishing virtual labs for Te Pūkenga Engineering Programmes
 - Collaborating for a changing future in education
 - Fire: Blazing a trail for Fire Engineering education in New Zealand
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12:15 PM to 12:45 PM Concurrent sessions

- Alternative assessments and academic integrity
- Effectiveness of Newman's Error Analysis (NEA) in Enhancing Student Calculation Skills
- Workshop: How graduates can meet EWRB industry requirements

12:45 PM Lunch

13:50 PM Plenary: Tony Pike, President Civil Contractors New Zealand
What do employers want from a good technician?

14:25 PM to 14:55 PM Concurrent sessions

- Relationship between Levels and Prerequisites
 - Microcredentials and us
 - The linkage between work placements and engineering projects
-

15:00 PM Afternoon tea: Lab tours available at this time

15:45 PM Plenary: Graduate Attributes/Student Profile learnings workshop.

16:45 PM Plenary: Conclusion to the day

18:30 PM Complimentary dinner for those registered. Held at DINE AT MIT-Gate 14, 55-59 Alexander Crescent, Otara

WEDNESDAY 3RD February 2021

0900 - Plenary: Mihi Whakatau/Welcome reception
0945

0950 - Plenary: Stephen Town, Chief Executive, Te Pūkenga
1050 [Room TP220]

1055 - Morning tea

1140 [Lab Tours available at this time]

	Concurrent one: [Room TP220]	Concurrent two: [Room TP226]	Concurrent three: [Room TP227]
1145 - 1215	<p>Establishing Virtual labs for Te Pūkenga Engineering Programmes Doug Rogers, Naveed Rehman, Rehan Masood, Southern Institute of Technology</p>	<p>Collaborating for a changing future in education, Sarla Kumari, Mohammad Al-Rawi, Waikato Institute of Technology</p>	<p>Fire: Blazing a trail for Fire Engineering education in New Zealand Jac Field, Institution of Fire Engineers</p>
1215 - 1245	<p>Alternative assessments and academic integrity Alireza Gheitasi, Manukau Institute of Technology</p>	<p>Effectiveness of Newman's Error Analysis (NEA) in Enhancing Student Calculation Skills in Online Class during COVID-19 Pandemic Carlo Mateo Gabriel, Southern Institute of Technology</p>	<p>Graduates to meet EWRB industry requirements. Workshop Ashley Yan, Unitec Institute of Technology</p>

1250 - Lunch
1350

1350 - Plenary: Tony Pike, President Civil Contractors New Zealand
1420 What do employers want from a good technician?
[Room TP220]

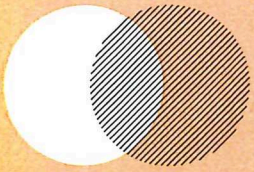
	Concurrent one: [Room TP220]	Concurrent two: [Room TP226]	Concurrent three: [Room TP227]
1425 - 1455	<p>Relationship between Levels and Prerequisites, Hossein Askarinejad, Ara Institute of Canterbury</p>	<p>Microcredentials and us Hugh Wilson, Unitec Institute of Technology</p>	<p>Preliminary findings of graduate mechanical engineers' views on the linkage between work placements and engineering projects Siju Joseph Thomas, Waikato Institute of Technology</p>

1500 - Afternoon tea

1545 [Lab Tours available at this time]

1545 - Plenary: Graduate Attributes/Student Profile learnings workshop
1640 [Room TP220]

1645 - Plenary: NZDE & BEngTech Student Project awards 2021 - Conclusion to the day
1700 [Room TP220]



Day one content

Stephen Town, Chief Executive, Te Pūkenga

Stephen will speak briefly about the establishment of Te Pūkenga to date and outline major milestones for 2021.

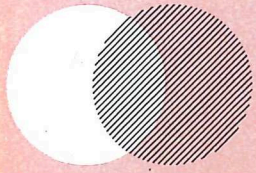
He will also speak to Forum attendees about the opportunity to unify the NZDE and BEngTech under a single governance arrangement by working collaboratively with all key stakeholders.

Establishing Virtual labs for Te Pūkenga Engineering Programmes

- Doug Rogers, Naveed Rehman, Rehan Masood: Southern Institute of Technology

COVID19 has enhanced reliance on e-learning. Key constraints still prevail for conducting practical lab sessions in most engineering courses in these circumstances. The concept of virtual labs has been investigated to establish a digital learning platform to simulate actual lab work. A computer simulation-based virtual lab, embedded with state-of-the-art technologies, has been developed for a common engineering course.

Learners' feedback is then to be evaluated to assess the effectiveness of this innovative experiential learning approach, using qualitative comparative analysis. A framework using virtual labs, is proposed to support engineering programs under Te Pūkenga.



Collaborating for a changing future in education

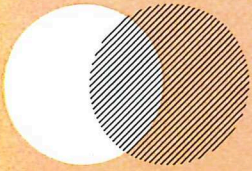
- Sarla Kumari, Mohammad Al-Rawi : Waikato Institute of Technology

As technology and demand changes day by day, we as educators must be up to date too in the area of education. We must adapt and grow our-self first in this environment. It is each teacher's accountability to invest learners to adapt changes, face challenges, be innovative and grab any opportunities that come their way. So to collaborate in teaching for the future we teachers must be ready and organised to be information accumulators, developers, predictors, curriculum professionals, researchers and problem-solvers.

Fire: Blazing a trail for Fire Engineering education in New Zealand

- Jac Field, Institution of Fire Engineers

Developed in collaboration with industry experts and external consultants, the new NZDE Fire has been designed with a view to filling a void in educational offerings for New Zealand's aspiring fire engineers, and producing graduate engineering technicians to provide a much-needed skilled cohort of professionals for New Zealand's growing fire safety industry. This talk will introduce the NZDE Fire, give an overview its content, and will discuss industry perceptions of ways in which the NZDE Fire will contribute positively to fire safety in NZ.



Alternative assessments and academic integrity

- Alireza Gheitasi : Manukau Institute of Technology

Traditional closed-book exams are known to be the most trusted method of evaluating students learning. Students often experience a very different way of doing their workplace duties. The COVID pandemic provided an opportunity to investigate alternative assessment frameworks with reasonable academic integrity. This presentation compares the assessment methods in New Zealand, Australia, and the Middle East before and after the pandemic and opens the door for potential improvements and alignments.

Effectiveness of Newman's Error Analysis (NEA) in Enhancing Student Calculation Skills in Online Class during COVID-19 Pandemic

- Carlo Mateo Gabriel : Southern Institute of Technology

In this study, the researcher will employ Newman's Error Analysis procedure during online class lectures that would enhance the learning of the course. Information from this action research will help educators to realise the need of understanding the learners in order to remedy the difficulties encountered by the Engineering students on solving and learning calculations in online class during the COVID-19 pandemic. Findings from this research will pose a challenge among engineering educators on how to come up with teaching strategies that will be responsive to students' difficulties in learning calculations in online class during COVID-19 pandemic.



Graduates to meet EWRB industry requirements: Workshop

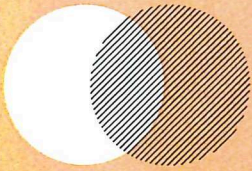
- Ashley Yan, Unitec Institute of Technology

The most common questions from our NZDE electrical engineer graduate students was how can i have registered as an EST technician or Electrical Engineer to be legally work in New Zealand. This presentation looks at what should we do to close the gap between the EWRB industry requirement and our NZDE qualification so that our students can be smoothly transitioned from the academic world to the industry environment.

What do employers want from a good technician?

- Tony Pike: Civil Contractors New Zealand President and Downer GM - Major Projects

Tony has worked on a huge variety of civil engineering projects over the course of his career. In this presentation he will explore the role of skilled and qualified technicians in the workplace, and give information on what employers are looking for from a good technician along with what the industry hears from new degree and diploma graduates joining the workforce.



Relationship between Levels and Prerequisites

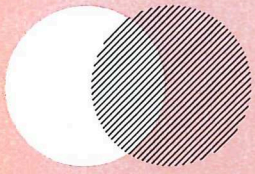
- Hossein Askarinejad : Ara Institute of Canterbury

Looking at the structure of NZDE and BEngTech programmes, some inconsistencies between levels and prerequisites can be observed. The common practice has been that the prerequisite considerations are on a course-by-course basis only based on the relationship between the Learning Outcomes (LOs). While the relationship between LOs is important, this should not be the only item to consider. The consistency and continuity of the levels within the programme is equally important; there should be a logical continuity from level 4 to 7. In this presentation, some examples of inconsistencies will be highlighted to generate some discussions.

Microcredentials and us

- Hugh Wilson : Unitec Institute of Technology

Microcredentials can be defined as a formal recognition of a person demonstrating mastery of a specific competency. One opportunity they offer is for microcredentials to be used to offer formal education programmes in a different format that is more relevant for some learners, especially working learners. This presentation will present the results of TEC funded research project that looked at how microcredentials could be used to provide more flexibility in how our programmes are delivered.



Preliminary findings of graduate mechanical engineers' views on the linkage between work placements and engineering projects

- Siju Joseph Thomas : Waikato Institute of Technology

Modern engineering education applies advanced teaching and learning approaches, among which work-integrated learning (WIL) and problem-based learning (PBL) are two effective approaches used in engineering curriculum in New Zealand. These approaches help students enhance understanding, knowledge retention, and skill development. Mixed methods were used in this study. This presentation will provide an insight of preliminary findings of this research study related to linkages between WIL and PBL in engineering education in New Zealand.

Graduate Attributes/Student Profile learnings workshop

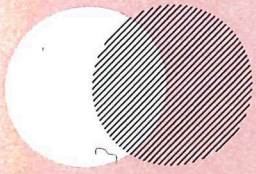
Workshop for increasing consistency and reducing variability in students meeting Graduate profile outcomes by way of sharing best-practice examples.

Conclusion to day one and student project awards

Complimentary dinner for those registered from **18:30 PM** at

DINE AT MIT

Gate 14, 55-59 Alexander Crescent, Otara



Day two schedule

9:00 AM Plenary: Jim Doyle, Shelley Wilson

NZBED & BEngTech in the new world

09:50 AM Plenary: Nicky Smith, HEB – Chair, Unitec Civil Engineering IAG.

What industry requires from graduates

10:25AM Morning tea: Lab tours available at this time

11:10 AM to 11:40 AM Concurrent sessions

- The Treaty of Waitangi, the Resource Management Act and the Safety at Work Act
- Early delivery of the Degree Apprenticeship; What have we learnt and where to from here?
- Online Collaborative moderation – A futuristic approach

11:45 AM to 12:30 PM

Plenary: Grant Klinkum, Chief Executive, New Zealand Qualifications Authority

12:35 PM Lunch

13:40 PM to 14:10 PM Concurrent sessions

- NZDE National Exams: A Nightmare and a Limiting Barrier,
- Designing a research project that meets industry-defined student learning outcomes
- More blended learning for CAD

14:15 PM Plenary: Conclusion to the 2021 forum

14:30 PM to 16:00 PM Concurrent sessions

- Civil – Lecturers Guides workshop
- Mechanical – Lecturers Guides workshop
- Electrical – Lecturers Guides workshop

THURSDAY 4TH February 2021

0900 - Plenary: Welcome Reception
0945 - Jim Doyle, Shelley Wilson, NZBED & BEngTech in the new world.
[Room TP220]

0950 - Plenary: Nicky Smith, HEB – Chair, Unitec Civil Engineering Industry Advisory Group.
1020 - What industry requires from graduates.
[Room TP220]

1025 - Morning Tea
1105 [Lab tours available at this time]

	Concurrent one: [Room TP220]	Concurrent two: [Room TP226]	Concurrent three: [Room TP227]
1110 - 1140	<p>The Treaty of Waitangi, the Resource Management Act and the Safety at Work Act: implications for engineering practice and training Mike Mullany, Northtec</p>	<p>Early delivery of the Degree Apprenticeship; What have we learnt and where to from here? Hana Cadzow, Sarah Hexamer, Otago Polytechnic</p>	<p>Online collaborative moderation – A futuristic approach Babar Mahmood, Unitec Institute of Technology</p>

Plenary: Grant Klinkum, Chief Executive, New Zealand Qualifications Authority.
1145 - Grant will provide the Forum with an update on the RoVE work that NZQA is responsible for
1230 [Room TP220]

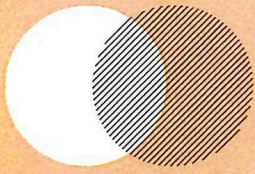
1235 - Lunch
1335

	Concurrent one: [Room TP220]	Concurrent two: [Room TP226]	Concurrent three: [Room TP227]
1340 - 1410	<p>NZDE National Exams: A Nightmare and a Limiting Barrier, Momen Bahadornejad, Unitec Institute of Technology</p>	<p>Designing a research project that meets industry-defined student learning outcomes Mohammad Al-Rawi, Sarla Kumari, Jai Khanna & Thilanga Ariyaratna, Waikato Institute of Technology</p>	<p>More blended learning for CAD Adam Liberatore, Otago Polytechnic</p>

1415 - Plenary: Outcomes of Joint Forum
1430 [Room TP220]

	Concurrent one: [Room TP220]	Concurrent two: [Room TP226]	Concurrent three: [Room TP227]
1430 - 1600	Civil – Lecturers Guides workshop	Electrical – Lecturers Guides Workshop	Mechanical – Lecturers Guides Workshop

1600 - 2021 NZBED & BEngTech Joint Forum ends



Day two content

NZBED & BEngTech in the new world

- Jim Doyle : NZBED Executive Officer, Shelley Wilson: Chair BEngTech Management Group

Exploring the benefits, challenges and opportunities of greater alignment and collaboration between the NZDE and BEngTech including a joint operational and governance model.

Unitec Industry Advisory Groups

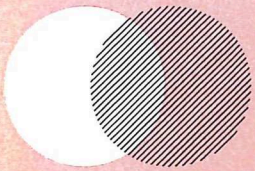
- Nicky Smith: HEB (Chair Unitec Civil Engineering IAG)

Industry advisory groups form an important part of the delivery of the NZDE and BEngTech programmes. In this presentation the chair of the Civil Engineering IAG at Unitec will discuss how the group works and her views on what industry requires from graduates.

The Treaty of Waitangi, the Resource Management Act and the Safety at Work Act: implications for engineering practice and training

- Mike Mullany: Northtec

This paper explores risks to engineering firms associated with Treaty of Waitangi issues, the Resource Management Act and Health and Safety at Work Act. It identifies key aspects which civil and other engineers need to know and act upon when working in the environment, as well as some associated additional requirements for the education of engineering students.



Early delivery of the Degree Apprenticeship: What have we learnt and where to from here?

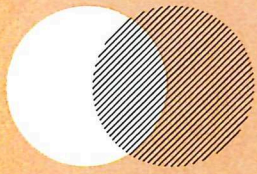
- Hana Cadzow, Sarah Hexamer: Otago Polytechnic

This presentation focuses on the initial stages of delivery of the new BEngTech Degree Apprenticeship model. Consideration will be given to the process of forming Individual Learning Plans with Apprentices and Employers as well as the ways in which workplace learning has been and might further be integrated into the BEngTech outcomes. The impacts of COVID-19 and the TTAF model will also be discussed. The presenters will also be asking the question "where to from here?" and seeking to highlight and explore, with audience participation, other spaces in which the model may be applied, within engineering education and beyond.

Online collaborative moderation – A futuristic approach

- Babar Mahmood : Unitec Institute of Technology

External moderation is undertaken to assess the Quality Assurance (QA) material submitted by 6 ITPs of New Zealand. The purpose of this moderation is to evaluate how effective are assessment activities and how fair & consistent is the marking. The experience showed that this online collaborative moderation model was successful in order to (i) get engaged in discussion regarding assessments, learning outcomes, graduate profile, consistency, etc. (ii) develop a community to share good assessment practice and to identify the issues/challenges that are being faced by ITPs.



Grant Klinkum, Chief Executive, New Zealand Qualifications Authority

Grant will provide the Forum with an update on the RoVE work that NZQA is responsible for.

NZDE National Exams: A Nightmare and a Limiting Barrier

- Momen Bahadornejad : Unitec Institute of Technology

It is apparent that the pass rate in NZDE first-year modules with national exams is lower than all other courses in the programme and main barrier appears to be the national exam. ITPs have tried different strategies to address the problem however it still remains as a major issue for the programme. In this presentation, the reasons why students struggle in the national exams are discussed and the issues for the providers are highlighted. A new model for the national assessment is then introduced to overcome the issues while the quality is assured and all stockholders are also satisfied.



Designing a research project that meets industry-defined student learning outcomes

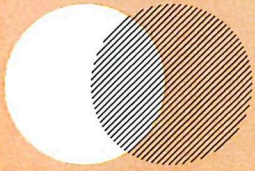
- Mohammad Al-Rawi, Sarla Kumari, Jai Khanna & Thilanga Ariyaratna:
Waikato Institute of Technology

We investigate how research project objectives may be integrated into student projects and how student projects may be aligned to the broader institutional goal of sustainability. The engineering standard and quality of products is seen as the factor by which success is measured. However, an individual Engineer's success in the workplace just as frequently depends on their mastery of "soft skills", such as teamwork, flexibility; professionalism and leadership, since few industrial Engineering projects are completed by a single person working on their own. Therefore, industry has placed increased emphasis on developing these skills, especially in an environment of global competition.

More blended learning for CAD

- Adam Liberatore : Otago Polytechnic

Teaching CAD (computer-aided design) became very challenging during lock down. One of the biggest obstacles was assessing progress without seeing a student use the software. The formative assessments that occur while walking around a computer lab were no longer applicable. Student frustration was also higher as the quick fix now took long video calls and sharing screens. These obstacles created some great opportunities by looking at new techniques. This presentation will share some of these ideas and techniques developed during lock down, and how to use them to help our learners succeed.



Conclusion to forum

Outcomes of forum and timeline for work to come.

Feedback from attendees on event and content.

Civil. Mechanical. Electrical workstreams

The opportunity for attendees to split into discipline groups and begin work on updating lecturer guides. Work can be shared off line between working groups and continued after forum. Support for working groups will be provided throughout the year.