

# PREPARING FOR THE FUTURE: ALIGNING ENGINEERING COMPETENCY STANDARDS

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## ABSTRACT

The evolving landscape of engineering education necessitates a shift in pedagogical approaches to better prepare graduates for industry demands. The Australian Council of Engineering Deans' (ACED) Engineering Futures 2035 report highlights the defects of current curricula, which emphasise technical skills over professional competencies. To address this gap, the paper explores the newly proposed 'Competency in Professional and Authentic Skills for Success (COMPASS)' framework, which is derived from the Washington Accord and tailored to the Australian and New Zealand contexts. This framework includes 35 sub-skill descriptors across 10 attributes, emphasising the importance of lifelong learning, adaptability, and critical thinking. The aim of the framework is not to propose a new competency structure but an enhancement in language such that all stakeholders may engage. The paper also discusses the integration of feedback literacy and self-agency into the framework, highlighting their role in fostering independent and proactive engineers. The proposed framework aims to bridge the gap between educational outcomes and industry needs, ensuring that engineering graduates are equipped with the necessary skills to thrive in a rapidly changing professional environment.

## KEYWORDS

Professional Skills, Graduate Capabilities, Equity & Standards: 1, 9, 10, 12

## INTRODUCTION

The Australian Council of Engineering Deans (ACED) Engineering Futures 2035 Engineering Education Programs, Priorities & Pedagogies report has indicated that engineering graduates are currently not going to be prepared for the industry with the current pedagogical approach to engineering education (Crosthwaite, 2021). This is partly due to the traditional engineering curriculum being focused on developing technical skills and placing less emphasis on professional skills. The Engineering Futures 2035 report documented industry perspectives about the pedagogy required to meet the demands by 2035. The report states: “Many industry participants observed that whilst theoretical content is important within the curriculum, future Engineering pedagogy must focus upon replicating the types of environments, projects and settings within which future graduates will work”. Furthermore, Burnett et al. (2021) affirm: “Industry wants to see a re-balancing of the theory-practice components of professional engineering education, with a greater emphasis on practice, including the human dimensions of engineering”.

A crucial aspect of being an industry-ready graduate is the personal and professional skills required to succeed as a professional engineer (Crosthwaite et al., 2018). To graduate with an engineering degree, undergraduate students are required to meet defined graduate competencies/performance standards. In Australia, these competencies are outlined by the Engineers Australia (EA) Stage 1 Competencies (Engineers Australia, 2019), which is based on the International Engineering Alliance (IEA) Washington Accord. However, the EA Stage 1 competencies are specific to Australia, with a more detailed framework for assessing engineering graduates' readiness to enter the workforce by incorporating additional national priorities and expanding on specifics not captured within the WA. In New Zealand, these competencies are defined by the Engineering New Zealand (ENZ) Engineering Performance Standard (which is more directly aligned with the Washington Accord). Whilst EA and ENZ provide the list of competencies required by an engineering graduate, it is equally important that students not only understand what they mean but also that their perceptions of these skills align with industry expectations. As such the WA can be used to define and list the professional skills that an engineering graduate may require.

In a recent systematic literature review of how students, academics and industry priorities professional skills (Quince et al., 2024) revealed that there were differing opinions on their importance between stakeholders across the globe. Several studies state that the competencies outlining the professional skills were difficult to understand as the combination of key tasks or skills within a single competency requires personal interpretation which may be a contributing factor as to why opinions of the stakeholders differ (Hirudayaraj et al., 2021; Munir, 2022; Ortiz-Marcos et al., 2020). The review indicated that no empirical studies offered the viewpoints of all three stakeholders in the same study, highlighting the need for further investigation. It is crucial to align the stakeholders priorities to foster a cohesive and effective engineering education system and to avoid skill gaps, unmet expectations, and insufficient workforce readiness (Quince et al., 2023).

## PROFESSIONAL ENGINEERING SKILLS IN EDUCATION

A study by (de Campos et al., 2020) found that 85% of the skills desirable for employability are related to professional skills, while only 15% are technical. Communication and teamwork were ranked in the top quarter of competencies engineers require, based on the perceptions of students, engineers and academics, (Gómez et al., 2021; Khoo et al., 2020; Passow, 2012; Simmons et al., 2021). This data underscores the ongoing need to prioritise the development

of professional skills in engineering programs to adequately prepare graduates for the workforce. Whilst embedding development into the curriculum is crucial, students must understand where their current levels of these skills sit so that over their programs of study, their capacity building can commence. A study by Ramadi et al. (2016) showed that there was a substantial disparity between the perceptions of the importance of professional skills between recent engineering graduates and the industry. Despite the disparity, the study showed that there was no gap between their self-assessed competency levels and the importance they place on those competencies. In other words, students believed they were competent in the areas they believed were important as a graduate. However, this study did not go into detail to evaluate the level of competency the students had suggested. It is clear that the role of engineers and engineering requires a broader professional skillset to deal with the fast-paced modern society. To address this transition, expanding on Ramadi et al. (2016), it would be useful to review the current state by evaluating what professional skills students believe they possess within their engineering programs and the skills and competencies they believe are important for an engineering graduate of the future. To extend further, understanding the educational, dispositional, circumstantial and cultural strengths and inhibitors that influence professional development is key due to the diverse background of engineering students (Quince & Phythian, 2023).

## **PROFESSIONAL SKILL TERMINOLOGY AND DEVELOPMENT**

There is a vast difference in the terminology of professional skills, sometimes referred to as soft (de Campos et al., 2020; Hirudayaraj et al., 2021; Munir, 2022) or transferable (Pinto et al., 2023; Rizzo et al., 2013). Various studies have indicated that there is a difference in understanding what these are, and that wording can be detrimental to these skills. To this end, in this work, we will refer to these skills under a new banner term which captures both the skills and abilities that may be transferable to other fields but also those specific to engineering, 'professional engineering skills'. This incorporates some skills that have recently be include into the technical skills but are more generic in nature.

This new banner is somewhat novel, it does have previous approaches that have been designed. From the initial version of the CDIO syllabus report they proposed a personal and professional and interpersonal skills diagram. They incorporated professional skills which encompassed problem solving, knowledge discovery and system thinking. This was parallel to teamwork and communication which overlapped, and all encompassed by personal skills. Their justification was "professional integrity and professional behaviour, and the skills and attitudes necessary to plan for one's career, as well as stay current in the world of engineering" captured by professional skills. "The subset of personal skills which are not primarily used in a professional context, and are not interpersonal, are simply labelled Personal Skills" which included "These include the general character traits of initiative and perseverance, the more generic modes of thought of creative and critical thinking, and the skills of personal inventory (knowing one's strengths and weaknesses), curiosity and lifelong learning, and time management."

It was found that in Australian Universities there is typically one class in the first year of their degree where the majority of the syllabus for the professional engineering skills were mapped against. This was a large, multidisciplinary first year project-based learning class. Common themes included the engineering design cycle, group-based project work and explicit professional engineering skills assessment. Fang (2012) investigated the professional skills developed in a third year technical project based course. Through the highly technical tasks throughout the course, it was demonstrated that communication, entrepreneurship and

teamwork were well ranked as positive (3/4 Likert scale) through the course survey. Shuman et al. (2005) reviewed how professional skills are taught. Through several high quality implements it was demonstrated that key professional skills are able to be captured by students within PBL courses. It was noted by (Popli & Singh, 2024) that students did not demonstrate skill acquisition until the end of the course when there was a presentation and reflection. Professional engineering skills as teamwork, communication skills, understanding of the design process and self-directed learning were perceived to be improved by students in a PBL course by (Beagon et al., 2019). Picard et al. (2022) showed that PBL was a good method to develop professional engineering skills but only if they are embedded into the project as an explicit task or goal.

This paper presents the consolidated and revised list of competencies that addresses both educational and industry needs. The list of professional engineering skills has been derived from the Washington Accord (WA) but serves also the EA and ENZ professional skills. This framework will be utilised across a multi-institutional, trans-Tasman study. The study which aims to explore students' perceptions and understanding of their professional skills development and readiness to enter the industry. The project aims to identify the strengths and barriers to students' professional skill development. Additionally, the project will explore whether there are differences in the priorities placed on professional skills by students, academics, and industry. This will be achieved by conducting a survey of the students' perceptions of their own professional engineering skills and their rankings.

## FRAMEWORK DEVELOPMENT

The WA current competencies were first mapped out and reviewed to get a further understanding of some of the issues that have already be mentioned in the introduction. There are 11 WA's each that have an overarching differentiating characteristic. These differentiating characteristics have a title and a short explanation, these then align to the specific WA. The full table can be seen below in Table 1.

Table 1: Washington Accord Engineer Graduate Attributes

Characteristic Title	Characteristic Overview	Engineer Graduate (WA)
Engineering Knowledge	Breadth, depth and type of knowledge, both theoretical and practical	WA1: Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialization as specified in WK1 to WK4 respectively to develop solutions to complex engineering problems
Problem Analysis	Complexity of analysis	WA2: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences with holistic considerations for sustainable development.
Design & development of solutions	Breadth and uniqueness of engineering problems i.e., the extent to which problems are original and to which solutions have not previously been identified or codified	WA3: Design creative solutions for complex engineering problems and design systems, components or processes to meet identified needs with appropriate consideration for public health and safety, whole-life cost, net zero carbon as well as resource, cultural, societal, and environmental considerations as required.

Investigation	Breadth and depth of investigation and experimentation	WA4: Conduct investigations of complex engineering problems using research methods including research-based knowledge, design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.
Tool Usage	Level of understanding of the appropriateness of technologies and tools	WA5: Create, select and apply, and recognize limitations of appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems.
The Engineer and the World	Level of knowledge and responsibility for sustainable development	WA6: When solving complex engineering problems, analyze and evaluate sustainable development impacts* to: society, the economy, sustainability, health and safety, legal frameworks, and the environment.
Ethics	Understanding and level of practice	WA7: Apply ethical principles and commit to professional ethics and norms of engineering practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion.
Individual and Collaborative Team work	Role in and diversity of team	WA8: Function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multi-disciplinary, face-to-face, remote and distributed settings.
Communication	Level of communication according to type of activities performed	WA9: Communicate effectively and inclusively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, taking into account cultural, language, and learning differences.
Project Management and Finance	Level of management required for differing types of activity	WA10: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
Lifelong learning	Duration and manner	WA11: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change.

Each of the WA have multiple aspects that can be quite multidisciplinary and broad in nature. An example of this is seen below in Table 2.

Table 2: Example Washington Accord Attribute Displaying Difficulty in Understanding

Differentiating Characteristic	Engineer Graduate
<b>Project Management and Finance</b> Level of management required for differing types of activity	Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

Breaking down this characteristic and WA, shows that both knowledge and understating of management principles, economic decisions and application in individual, leader of team and management of multidisciplinary environments. When investigating what a graduate may be required to undertake, management and leading may not be directly applicable when first entering the workforce, as such this interpretation may lead to an incorrect prioritisation of various stakeholders. This is but one interpretation with one example, demonstrating the difficulty in applying and interpreting the competencies. There were all but one of the 11 WA's that were not classified as a "professional engineering skills" which was engineering knowledge. Whilst the overarching characteristic could be seen as a professional engineering skill, the WA explicitly states that it is the foundational mathematics and science knowledge. This does not align with the studies work and is thus omitted from the remainder of the study. The expansion and simplification of the WA's was undertaken by critically reviewing the detailed attributes or indicators of required skill. Each of these were first extracted from the WA's explicitly to generate a large table of skills that were found within the framework but may have required simplification in characteristics. We classified 35 skill sub-descriptors that was determined to be the most direct and explicit explanation of the skill. An example of this expansion is seen in the below table (3).

Table 3: Example of Development of Framework from the Washington Accord

Attribute: Lifelong learning	Sub skill descriptors
WA11: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change (WK8)	Undertake independent and lifelong learning to grow professionally.
	Adapt to emerging technologies in the engineering field.
	Develop critical thinking to navigate technological change.

This process was undertaken by all three authors where there was consensus and agreement based on both the wording and descriptor. This generated a list of 10 attributes that directly aligned with the 10 WA's however there were 35 individual sub-skills descriptors created. The EA stage 1 was consulted as well as current literature (Cajander et al., 2011; Litchfield et al., 2016; Quince et al., 2024) to derive the language and the descriptors. The research team also included missing indicators or skills which were added to the relevant skill level. There were several that were originally flagged for inclusion however the majority ended up being assumed or included within sub-skill descriptors. There were three skills that were covered but either not explicitly or the team felt that they were not emphasised enough. They were the use of GenAI, self-agency and feedback literacy, these will be discussed in the following section. The framework which is described as Competency in Professional and Authentic Skills for Success (COMPASS) can be seen in Table 4.

Table 4: Professional Engineering Skills Framework Based on the Washington Accord

Skill Descriptor	Code	Skill Sub-Descriptor
Ability to Define and Analyse Engineering Problems	1.1	Identify, analyse, and solve complex engineering problems supported by evidence.
	1.2	Solve engineering problems with sustainability and holistic perspectives in mind.
Ability to Design and Develop Engineering Solutions	2.1	Design innovative engineering solutions to meet project needs.
	2.2	Develop solutions considering public health and safety.
	2.3	Develop solutions considering project lifecycle, costs, and societal impacts.
Ability to Methodologically Investigate Engineering Problems	3.1	Design experiments, analyse and interpret data, and synthesise information for valid conclusions.
	3.2	Use research methods to investigate complex engineering problems.

Ability to Use Engineering and Digital Tools	4.1	Identify suitable modern tools and techniques, understanding their strengths and limitations
	4.2	Select suitable modern tools and techniques, understanding their strengths and limitations
Ability to Solve Complex Engineering Problems with a Focus on Responsible and Sustainable Outcomes	5.1	Evaluate the sustainability of engineering solutions.
	5.2	Assess the socioeconomic impacts of engineering practices, decisions, and solutions.
	5.3	Analyse health and safety concerns in engineering practices.
	5.4	Consider environmental impacts in engineering decisions.
	5.5	Understand relevant legal frameworks in engineering.
Ability to Apply Ethical Practices	6.1	Adhere to relevant national and international laws and regulations.
	6.2	Demonstrate an understanding of diversity and inclusion.
	6.3	Uphold ethical standards and professional norms in engineering.
Ability to Work Independently and Collaboratively	7.1	Receive feedback, evaluate its relevance, and take necessary action.
	7.2	Provide constructive feedback.
	7.3	Contribute effectively as a team member.
	7.4	Lead teams effectively.
	7.5	Perform self-directed tasks.
	7.6	Collaborate in diverse and multidisciplinary environments.
Ability to Communicate Through Various Mediums	8.1	Communicate effectively within the engineering community.
	8.2	Communicate effectively with society.
	8.3	Develop reports and presentations that respect cultural and linguistic diversity.
Ability to Apply Project Management Skills	9.1	Apply financial decision-making to individual engineering projects.
	9.2	Apply management principles in individual engineering tasks.
	9.3	Contribute to team projects with financial decision-making skills.
	9.4	Apply management principles to teamwork in multidisciplinary settings.
	9.5	Lead projects with sound economic decision-making.
	9.6	Manage multidisciplinary projects effectively as a leader.
Ability to Engage in Ongoing Learning and Professional Development	10.1	Undertake independent and lifelong learning to grow professionally.
	10.2	Adapt to emerging technologies in the engineering field.
	10.3	Develop critical thinking to navigate technological change.

## DISCUSSION

To ensure that the 35 descriptors aligned with all the EA stage 1 competencies and indicators of attainment, the newly derived framework was compared. All indicators of attainment were mapped at least once, with some mapping to multiple. This demonstrates that this framework would allow for the EA competencies to be covered by this framework. This was the first validation method. The CDIO knowledge library was the second professional framework that was used to validate the mapping process. Both the CDIO syllabus 3.0 and CDIO standards 3.0 were assessed for alignment with the new framework. This syllabus allows for the ABET criteria to be assessed for alignment as the CDIO syllabus complements and expands on it. Syllabus 3.0 was developed with direct updates to reflect the professional sustainability, digital literacy skills, contemporary societal changes and lifelong learning. These cross the professional skills framework developed within four out of five of the building blocks of the CDIO framework. The CDIO standards also aligns with the newly developed framework by comparing the rationale and the 35 sub-skill descriptors. All 35 sub-skills descriptors we aligned to the 12 CDIO standards.

To further validate the framework against graduate frameworks and professional standards, the framework was compared and mapped against the EA code of ethics. This document standardises the minimum required ethical practice of engineers in Australia. This document is typically not taken into consideration when discussing professional skills however, the

authors argue that the limited scope in which most competencies detail ethics is too shallow and does not set students up for success. The EA code of ethics has four governing sections that is further broken down, and then more granulated again. The four main themes are demonstrate integrity, practice competently, exercise leadership and promote sustainability.

The mapping process was conducted through a systematic analysis of each section and sub-part of the EA Code of Ethics. This involved interpreting the ethical principles and aligning them with relevant competencies within the framework, focusing on problem solving, professional, and interpersonal dimensions. This approach provided a comprehensive understanding of the framework's alignment with ethical engineering practices while identifying specific areas for enhancement to ensure a more holistic integration of the EA Code of Ethics. The mapping demonstrates alignment across all four themes, reflecting a focus on integrity, competence, leadership, and sustainability. Nonetheless, several gaps were identified. These include limited emphasis on stakeholder engagement, structured ethical decision-making, and the use of advanced digital tools for sustainability and safety assessments. Areas such as dispute resolution, and conflict management could be further emphasised. As such, stakeholder engagement, dispute and conflict management and resolution will be further added to the framework explicitly.

Feedback literacy is described by Carless and Boud (2018) as “the understanding, capacity and dispositions needed to make sense of feedback and use it to enhance one’s work and learning”. Being feedback literate as an engineer is an important skill to make judgment of information and make improvements. The current framework includes 7.1 “Receiving and providing constructive feedback”, however, it fails to acknowledge the importance of evaluative judgment and actioning feedback. Self-Agency, also known as having personal agency or agentic behaviour, refers to a persons capacity to act proactively and independently, make choices, and drive personal or professional development. Self-agency is particularly important as it promotes individuals to identify and solve problems independently or by engaging others, which significantly contributes to their projects, teams, and/or organisations. Students are required to consistently develop their self-agency to succeed in their coursework, although stakes are much lower than in a professional setting as the tasks often come with detailed description and guidance. Neither feedback literacy or self-agency are competencies that are well represented in the professional engineering skills framework, nor explicitly presented in EA and WA. While not explicitly mentioned in any of the frameworks, the characteristics are somewhat implied within various skill descriptors, however, do not fully paint the picture. Better integration of feedback literacy and self-agency can create a powerful framework for professional skills development. Pairing the two, individuals not only understand and apply feedback but also take proactive steps to drive their own growth. There is an opportunity perform a systematic analysis of the existing competencies and alignment with the principles of self-agency and feedback literacy to identify gaps. This approach would provide a comprehensive understanding of the framework's strengths and areas for enhancement, ensuring that graduates are equipped with the necessary skills to enter the workforce.

One specific sub-skill descriptor that is currently undergoing a revision to determine if it requires more specific wording is the use of engineering tools due to the current landscape of higher education and industry with the uptake of GenAI. Identified in previous work (Quince & Nikolic, 2024; Quince et al., 2024; Quince et al., 2024) noted that students are not aware of some of the ethical factors and use of the technology. They also demonstrated by a systematic literature review that there was little research undertaken about ethical implementation in engineering education and practice. As such, the framework may need to adapt to 1. Specifically list GenAI in the tools competencies, 2. List GenAI in several sections, or 3. Is

there an overarching assumption that GenAI is implied in all the competencies? Given the fast-paced nature of technological advancements, the authors believe that it is critical that stakeholder perspectives are audited at this critical juncture in the implementation.

### ***Future Framework Implementation***

To further validate the framework and ensure that there is alignment with the works aims, the framework was implemented into a survey that will be used in the overarching project. The preliminary survey was distributed to students and academics for validation and feedback using the professional engineering skills described in Table 4 to determine if there were any misunderstandings with the phrasing or if any skills were missing.

Participants were asked to rate the importance of professional skills using the ten main descriptors first and then rating the sub-descriptors, each set also included an open-ended question where participants were asked to provide a reason for the rating. Descriptor 9. Ability to Apply Project Management Skills was one of the lowest rated professional skills, although averaged to be rated as important. When reviewing the sub-descriptors these were considered to be less important than the generalised overhauling skill descriptor. The open-ended question suggest that most participants considered the sub-descriptors to be related to manager roles, suggest that these may need some further examples to contextualise their meaning before launching the survey for wider response. Alternatively, as in the case of 7.3 Lead teams effectively, which was rated of lower importance, it may be worth considering whether there is a misalignment in the expectations for graduate engineers to take on a leadership role. Instead, it might be more relevant to consider the ability to work as part of a team and self-agency instead. This is something that can be further explored once data has been collected and triangulated across students, academics and industry.

The framework will first be utilised to create a detailed database of the professional engineering skills that are both used and important as a graduate engineer. This will be undertaken by mapping the 86 activities that were used in the first BeLongEng survey. “The BeLongEng Project is tracking the practices and contexts of a cohort (panel) of individual engineers over time, using a prospective longitudinal cohort approach. It is anticipated that this project will provide evidence into how and why engineering practice is changing, leading to a more responsive and productive learning and workplace ecosystem.”. This will allow the authors to generate a list of the important sub-skill descriptions and the most used. By generating these lists, a very detailed snapshot of the current industry use of these skills can be compared to students and academics.

To gather the perspectives of students perceptions to their professional skills development throughout their degree and preparedness to enter the workforce, and both students and academics views on importance a survey will be used. The described framework and survey will be provided to students and academics in the first half of 2025. Four institutions are currently part of the study including a New Zealand university. It is expected that this work, along with the application of the framework to the activities that participants have responded to through the BeLongEng Survey will help inform the current engineering education practice across the country to align and continue the redevelopment of the methods professional engineering skills are taught.

## **CONCLUSIONS**

The proposed COMPASS framework, based on the Washington Accord and tailored to the Australian and New Zealand engineering education landscape, addresses the identified gaps in current curricula. The incorporation of more accessible language and greater granularity in

the description of professional engineering skill is essential to enhance understanding among stakeholders. This study signifies the need for continuous evaluation and adaptation of engineering education to meet evolving industry demands. Future research should focus on validating the framework through empirical studies and exploring its implementation across diverse educational settings.

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## BIOGRAPHICAL INFORMATION

**Dr Zachery Quince** is an early career researcher and educator specialising in engineering education. With a focus on innovative curriculum design, Dr. Quince has made significant contributions to advancing teaching and learning practices in engineering. As an Engineering Practice Leader, he has led the governance and development of new programs, where he created comprehensive and inclusive curricula that bridge academic learning with industry needs. Dr. Quince is at the forefront of integrating generative artificial intelligence (GenAI) into engineering education. He has developed frameworks and assessment models that leverage GenAI to enhance student engagement, foster critical thinking, and align with professional demands. His work includes incorporating GenAI into project-based learning and designing case studies that demonstrate its practical applications in engineering practice.

**Dr Anna Lidfors Lindqvist** is a lecturer in the School of Mechanical and Mechatronic Engineering at University of Technology Sydney (UTS), specialising in mechanical engineering with focus on vehicle dynamics, engineering design and net zero emissions. She is also specialising in engineering education with a focus on feedback literacy and self-agency in studio-based learning. She has led innovative curriculum design, integrating formative sprint-based learning to enhance student engagement and industry readiness. Anna's work has been recognised with awards, and she actively contributes to research on authentic assessment and educational practices in engineering.

**Dr Patcharin Chen** is a Senior Teaching Fellow and early career researcher at Faculty of Engineering, Monash University. Pat has extensive experience in lecturing and coordinating large cohorts of domestic and international students, particularly first-year subjects with ~800 students per semester in both Biomedical Science and Engineering courses. She is currently leading the development and review of the Biomedical Engineering degree at Monash University and developing partnerships with universities from overseas. With her expertise in biomedical engineering education, she also serves as an academic advisor to Monash Young MedTech Innovation Student Team which is the leading medical innovation student team in Australia.

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