

Engineering Management: A Forgotten Discipline or the Re-emergence of a Phoenix?

The data from the Australian Council of Engineering Deans (ACED) shows that there were 34 Master programs in Engineering Management (EM) in 2020 [1]. While EM is a well-known discipline defined by ABET in the US [2], scholars in Australia pay relatively little attention to EM education with notably no papers published on EM education in the last 10 years [3]. Is it a forgotten discipline or the re-emergence of a phoenix in our country?

Despite Australia's strong education ranking and rising MEM enrolment, its Master of Engineering Management programs struggle to gain global popularity and prestige. This motivates me to contribute to teaching and research in the field of Master of Engineering Management (MEM) as an education-focused lecturer at Macquarie University.

During my three years as a lecturer in the MEM program, I've observed the students' strong need for employability skills in teaching delivery due to their maturity. In light of this distinctive demand, my teaching philosophy revolves around focusing on integrating employability factors into the curriculum and teaching activities. Furthermore, given the dominance of international students in our Master's program, I have taken the time to understand their characteristics. Research shows that one of their barriers to employment is the unawareness of available support and advice services [4,5]. This understanding has shaped my teaching philosophy of being an effective and motivational source for students by creating an active sharing culture between academics and students.

CRITERION 1 - APPROACHES TO TEACHING AND THE SUPPORT OF LEARNING THAT INFLUENCE, MOTIVATE AND INSPIRE ENGINEERING STUDENTS TO LEARN

Recognizing the significant impact of the teacher-student relationship on students' performance [6], I assist students to participate and achieve success in their learning. The positive outcomes of my teaching in ABC, DEF, and XYZ can be demonstrated through students' feedback in the Learner Experience of Unit (LEU) surveys and emails. It is worth noting that the LEU criteria undergo yearly changes.

Sub 1: Fostering student development by stimulating curiosity and independence in learning.

To foster student development by stimulating curiosity in learning, I create an open and supportive environment where students feel comfortable asking questions. This encourages them to explore more about their interested topics and motivates them to seek answers beyond the regular curriculum.

Evidence: "June was very willing to hear student feedbacks in classes and was always encouraging us to ask doubts and would happily solve them" (XYZ – LEU 2023)

"The lecturer creates an approachable & friendly environment, that takes away the intimidation of asking questions and answering with uncertainties." (XYZ - LEU 2021)

To foster student development by stimulating independence in learning, by understanding the students' circumstances, I allow and support flexible learning paths by providing additional support and assistance. These activities effectively address individual learning needs and greatly contribute to their academic success.

Evidence: "Dr June who I have Professional Practice with, after explaining my situation, has been kind enough to accommodate me (and a few other students who work full time) by providing a zoom link and turning the class from F2F to hybrid so we can attend the class." (Student name, ABC unit, 2023)

Through my assistance in promoting students' participation and success in their learning, they are able to grasp the knowledge of the field and enjoy a high-quality educational experience. This is evident in the high scores received in the LEU surveys.

Criteria	/	Units	XYZ	ABC
Knowledge of field(s) I am studying.			4.8/5	4.8/5
How would you rate the quality of your educational experience			5/5	4.4/5

Sub 2: Assisting students from equity and other demographic subgroups to participate and achieve success in their courses.

In addition to the challenges of cultural adjustment, international students also encounter difficulties in adapting to new learning and teaching styles. I actively provide support and encouragement to ensure equal opportunities for success. I always promote student voice and identify struggling students early on and provide timely interventions to address their challenges.

Evidence: “Dr June Ho was very compassionate and considerate towards us. She helped all of us in every way possible to better understanding of this subject. She made sure we all get every opportunity equally.” (XYZ - LEU 2021)

“The lecturers are aware of the situation of the students”. (ABC - LEU 2022)

I have also gained a reputation among our colleagues for being supportive and empathetic towards students. Acknowledgment from Dr. (Name) (Senior Lecturer at MEM, School of Engineering) has given me the motivation to improve my teaching activities: “June is very approachable to students and she is one of the student’s favorite lecturers”.

Students' high satisfaction with my teaching and support activities is evident, as they enthusiastically recommend my units to their friends. This word-of-mouth promotion has resulted in a significant increase in the number of enrolments, highlighting the positive impact of our educational offerings.

Units / Criteria	I would recommend this unit to other students.	
XYZ – DEF	4.9/5 – 4.6/5 (2022)	4.7/5 – N/A (2023)

Sub 3: Inspiring and motivating students through effective educational design and delivery.

Teaching activities at MEM are in high demand for practical applications and employability skills due to the mature nature of the students. As such, I design lessons that demonstrate the practical applications and relevance of the subject matter in real life. Indeed, the effectiveness of this educational design and delivery is evident in students' positive outcomes and performance.

Evidence: “June teaching methods are excellent, interactive and she designed the course quite well! I really enjoyed her class and found it very helpful!” (XYZ - LEU 2023)

As a result of these factors, students find the units to be highly engaging, which is proven through the LEU results.

Unit / Criteria	Overall, I found the learning activities in this unit engaging.	
XYZ	4.7/5 (2022)	4.6/5 (2023)

I establish a strong connection between lecture content and industry demand by referencing job descriptions and requirements. This enables students to understand the practical relevance of the material and its application in real-world scenarios. Consequently, students find these lectures to be highly valuable and engaging, greatly aiding them in their preparation for professional employment.

Evidence: “This unit was really helpful for my future career. I could relate to a lot of those topics because of my previous work experience. I liked it that June always incorporated job opportunities and career advise based on the topics covered.” (XYZ4 – LEU 2023)

“All topics discussed in the unit was relevant to the course objective and useful for future professional employment”. (ABC - LEU 2022)

As a result, students consistently give high scores for the LEU criteria of "Work-related/professional knowledge and skills" in all my units. Students also express their strong interest in my units, citing their significant value for their future employment.

Units / Criteria	Work-related/professional knowledge and skills	
XYZ - ABC - DEF	4.8/5 - 4.7/5 - 4.6/5 (2022)	4.8/5 - 4.5/5 – N/A (2023)

Evidence: “The subject is very practical. It addresses all that we need to expect when we graduate and help us out on how to prepare for it”. (ABC - LEU 2023)

“This unit helped me to understand the market needs and what i should improve in my personal level to achieve my goals.”(XYZ – LEU 2023)

“June always guided me not only in educational perspective also in my future career pathways.” (XYZ - LEU 2022)

Sub 4: Enabling others to enhance their approaches to learning and teaching.

Recognizing the overlooked discipline in Australia, I took the initiative to promote learning and teaching activities within the MEM program. This involved publishing learning and teaching activities, and sharing resources for discipline growth and development.

Evidence: I have published 3 conference and 1 accepted journal papers about EM education in Australia in the past 3 years. To the best of my knowledge, I have taken the lead in publishing work on recent practices in EM education in Australia, including curriculum development to ensure alignment with global standards and especially accredited EM programs and global certifications for master's programs in Australia.

In addition to my efforts in MEM, I actively engage in interdisciplinary collaborative research projects. One is a project focused on developing an assessment strategy for engineering students at Macquarie University (presenting at the International Education conference in July 2023).

Moreover, I actively share best practices of MEM teaching strategies and innovative approaches through various projects and workshops at my university. These endeavours aim to foster a culture of excellence in teaching and enhance the learning experience for MEM students.

Evidence: I participated in the project "Critically Evaluating the Quality and Effectiveness of Educational Innovations and Proposals for Innovations" by the Senate Learning and Teaching Committee. Additionally, I joined a Pitch Session focusing on innovative assessment practices at the Faculty of Science and Engineering, Macquarie University.

Sub 5: Developing and/or integrating assessment strategies to enhance student learning

I designed assessment strategies to develop skills required by Engineers Australia and employers [7], such as communication, teamwork, and self-management in a project-based environment. I use diverse assessment methods to facilitate skill practice in the learning environment. For example, to mirror real-world tasks and challenges, including teamwork and communication, I use group project in all of my units. Incorporating SPARKPLUS software, I implement peer assessment to promote constructive evaluation among students. Additionally, I encourage self-assessment and reflection to empower students in taking charge of their learning journey. I also provide timely feedback which enables students to identify areas for improvement.

Assessments	Group project			Individual assessment		
	Report	Presentation	Peer- evaluation	Reflection	Case study	Exam
ABC	x	x	x	x		
XYZ	x		x	x	x	x
DEF	x	x	x	x	x	

Evidence: Students highly rated the assessment tasks for their positive impact on learning. They also expressed satisfaction with the effectiveness of the prompt feedback provided.

LEU Criteria (2022)	Units	XYZ	DEF	ABC
Assessment tasks in the unit assisted my learning.	/	4.7/5	4.4/5	4.4/5
I received assessment feedback in time to guide my subsequent study/ assessment work.		4.7/5	4.7/5	4.4/5

Reference

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