

## **CRITERION 4 – INNOVATIONS & LEADERSHIP THAT HAS INFLUENCED & ENHANCED ENGINEERING STUDENT EXPERIENCE**

**OVERVIEW** – My work enhanced the experience of Higher Degree by Research (HDR) students in Engineering Education Research through addressing the lack of specific opportunities for networking and professional development. I did this by developing an annual professional development and networking program (The Australasian Association for Engineering Education HDR Symposium) and running additional networking events from 2020 to the present. HDR students reported feeling these opportunities helped connect them to other HDR students and have a greater sense of belonging. HDR students also reported feeling the HDR symposium particularly helped increase the visibility of their research and support them to develop academically in an accessible and engaging way.

**THE ISSUE** – **There was a lack of specific opportunities for networking and professional development for Higher Degree by Research students in Engineering Education research in Australasia.** Higher Degree by Research (HDR) students undertaking engineering education research (EER) projects are spread out and isolated across various institutions in Australasia. Often EER students are the only student in their institution working on an EER project, let alone in their topic area in their faculty. Similarly, often the supervisors of EER students are the only researcher(s) or of a very select few at their institution who research in engineering education. Before this work commenced, the Australasian Association for Engineering Education (AAEE) only offered general networking opportunities for all members where HDR students often suggested they didn't feel confident to engage. Australasian EER HDR students reported they often felt isolated, without a sense of belonging and with few opportunities for professional development and topic specific feedback on their scholarly work [1]. Developing a sense of belonging and inclusion has often been described more broadly as important for student engagement and wellbeing [2], particularly important in a HDR context. Tailored professional development and topic specific feedback is also an important part of developing as an effective engineering education researcher [3].

**THE MAJOR WORK UNDERTAKEN** – **I led the development of a professional development and networking opportunity (The AAEE HDR Symposium) offered from 2020 to now.** In late 2019, together with a colleague we identified the gap described above as a result of said colleague's experience attending a HDR specific professional development opportunity in The U.S. (Frontiers in Education HDR Symposium) and engaging with colleagues in EER programs in The U.S. We proposed addressing this by creating an opportunity for professional development and networking for HDR students in Australasia. Based on feedback provided by 15 HDR student attendees at a scoping session at the 2019 AAEE annual conference, I have subsequently led the design and development of the AAEE HDR Symposium since 2020.

The HDR Symposium is an opportunity for Masters by Research and PhD students to develop their research projects and build their networks. Participants share and discuss their current dissertation work in small groups facilitated by scholars from none of the group's participants' home institutions. Participants are provided with resources to support them, reflect on the feedback provided through discussions, identify how this feedback could be used as well as exploring the broader HDR student experience. In 2021 onwards, participants additionally hear from a diverse panel of early career

researchers on topics submitted by participants in the application process (2021 - building a career after completing a HDR in engineering education research, 2022 – TBC). A key design element of the HDR Symposium is that it is accessible to all HDR students irrespective of their life circumstance, meaning it is currently only offered online, during office hours, with limits on each session length and adequate breaks built into the activity schedule of each session. Participants are also invited to contribute to shaping the final schedule to ensure it is accessible to all and in line with evolving community identified needs.

Yearly, my work involved recruiting two senior members of the AAEE community with experience in STEM education research and graduate student supervision to act as my co-designers (Prof. Les Dawes (Queensland University of Technology) and Prof. Olivera Marjanovic (University of Technology Sydney)). Together we design the activities that the participants undertake and discuss appropriate choices for each group's mentors. I then liaise with the AAEE Executive Committee, gaining appropriate endorsements and advertisements, develop application and marketing materials, recruit applicants and mentors as well as develop the participant hand outs and mentor resources. I led another HDR student in the administration, communications and engagement of participants. I co-chair the mentor briefing session as well as the symposium itself before designing and running surveys to gather participant and mentor feedback.

**THE MINOR WORK UNDERTAKEN** – I built a community and provided additional networking opportunities to further support the Australasian EER HDR students (**HDR writing circle 2021-current and HDR networking opportunities 2020**). In 2020 I ran monthly Zoom catch ups with the Australasian EER HDR community to support the development of community, particularly as many transitioned to remote working due to the COVID-19 pandemic. I supported this by developing a Microsoft Teams site to collectivize students around. Additionally, I proposed and co-ran 2 networking opportunities with the American Society for Engineering Education Virginia Tech Chapter. One was for Australasian and Virginia Tech students only, and another was open globally to any HDR student undertaking a project in EER. In early 2021 the monthly Zoom catch ups for Australasian engineering education HDR students continued. By mid-2021 these transitioned to weekly online working circles where HDR students in Australasian would gather weekly for 2-hours to work on their dissertations remotely using the pomodoro method. This was shaped by the needs identified by those who regularly attended the Zoom catch ups. The weekly working circle is still running at the point of application.

**OUTCOMES and IMPACT** – The outcome of my work is a well-received professional development opportunity that benefited participants and multiple networking opportunities that has created a sustained community. The *AAEE HDR Symposium* was attended by 17 participants in 2020 and 13 participants in 2021. Participants have come from Masters by Research and PhD programs at 10 institutions in Australia, Aotearoa New Zealand, The United States and Belgium. All participants that responded to feedback surveys stated that they would attend another iteration of the HDR symposium and would recommend it to other students, which is reflected in the high return participation rate. Similarly, all participants rated the HDR symposium highly, with some participants noting that the HDR Symposium was as one participant put it, “*supportive, accessible and so engaging*”. While this inadvertently demonstrates the perceived value of the HDR symposium, when approached for comment a former participant stated that the value of such event was that,

*“Through the HDR Symposium, I received growth-oriented feedback from academics who can engage with my research critically, and **connected with other HDR students** with similar research interests. These feedback sessions **increased the visibility of my research**, and the shared challenges that were identified provided much needed assurance. Sustained interactions with academics and other HDR students also helped in **expanding my network of support**, which resulted in a **greater sense of belonging** within the research community, especially when attending conferences and events.”*

While another former participant commented that: *“The AAEE HDR Symposiums that were held in 2020 and 2021 were **key events in my PhD journey**. There were many factors that contributed to these symposiums being a valuable experience for me as a PhD researcher with a non-local background doing Engineering Education (EE) research in Australia. These events **helped me progress academically**. I learnt a lot through discussions with mentors and the presentations and questions posed by other participants - especially on topics such as scoping of research, managing supervisors, enhancing research skills and planning for a career beyond PhD. The event was a social experience, as I was able to interact with other researchers in the EE space, **make valuable connections, expand my network and make myself visible as a researcher**. Overall, this was a great experience for me as an individual. I also see it as a much-needed step towards enabling EE in Australasian region reach new heights.”*

A mentor and former EER HDR student in Australasia commented that the HDR Symposium was a “*great initiative*” and that it was “*so important for Eng Ed HDR students to have a bit of extra support and guidance, because.... the networks within individual universities can be quite tenuous*”. Mentors who were involved in the HDR Symposium one year, also frequently sent their own students the following year, again reflecting that as one mentor put it, the HDR Symposium was “*well designed, a really great experience overall*”.

Additionally, the **HDR networking opportunities** led to an ongoing active community that still meets regularly to support each other writing up their dissertations. Even those who do not attend the regular working sessions have commented that they draw on the networks established in other ways, with one frequent attendee of 2020 networking events noting on a panel at their home institution in 2022 that despite not being as active in the AAEE HDR community, they feel they could turn to the said community for support if they needed it. I hypothesize that this is as a core group of HDR students regularly attended the events on offer in 2020 and 2021 forming a close group. The number of attendees of the monthly Zoom catch ups ranged from 3 to 12 participants with 11 (5 Australasian from 5 institutions) and 27 (11 Australasian from 6 institutions) attending the collaborative networking events with Virginia Tech.

#### Reference List

- [1] Personal correspondence from AAEE HDR scoping dinner in 2019 at AAEE Annual Conference.
- [2] Brown, N.J., Pearson, A., Rosenqvist, T. 2020. Understanding what integrated inclusion looks like in a mega first year team-based engineering course. In Proceedings of the 31st Annual International Conference of the Australasian Association of Engineering Education, AAEE2020, Sydney, NSW: University of Sydney and University of Technology Sydney.
- [3] Deters, J.R., Holloman, T.K., Pearson, A., Knight, D.B. 2021. Understanding Australian and United States Engineering Education Research (EER) contexts through the eyes of early-career EER researchers. In Proceedings of 32nd Annual International Conference of the Australian Association of Engineering Education, AAEE2021, Perth, WA: University of Western Australia