

Understanding the Skill Requirements in Transdisciplinary Engineering Projects.

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Abstract. Increasingly complex engineering practice involves disciplines within and beyond engineering. Approaches that enable the integration of different knowledge and perspectives and drive innovative responses to complex engineering challenges are required. As a result, the transdisciplinary approach to working gained increased attention. To date, literature seeks to characterise transdisciplinary projects or individuals; it has yet to characterise who might employ transdisciplinary skills in industry or the extent such skills are displayed. This paper captures personal reports of the skills most important for such projects and considers those skills most pervasive or critical. Posing the question; Is there a requirement for only transdisciplinary individuals rather than whole transdisciplinary teams? In this paper, we utilise a transdisciplinary competency framework to map disciplinary skills identified by 30 participants in six transdisciplinary engineering projects. Results show only a small subset of skills are critical to its success where (33%) are transdisciplinary and (59%) are interdisciplinary. This suggests solving transdisciplinary problems requires in addition to disciplinary expertise, competency profiles that include TD and ID skills relating to collaboration and communication, knowledge sharing and willingness to collaborate. We find evidence for the presence of 'brokers' or key individuals that can enable the integration of others effectively, have technical understanding, and have the ability to communicate and translate between experts and non-experts. These brokers act as the key enablers of collaborations across disciplinary boundaries, demonstrating the characteristics of a TD personnel and should be the targetted user of the disciplinary tools in projects.

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