

Transdisciplinary Pedagogy: An Arts-Integrated Approach to Promote Authentic Science, Technology, Engineering, Arts, and Mathematics Education in Initial Teacher Education

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Abstract : This paper will focus on the design, delivery and assessment of a transdisciplinary STEAM (Science, Technology, Engineering, Arts, and Mathematics) education initiative in a college of education in Ireland. The project explores a transdisciplinary approach to supporting STEAM education where the concepts, methodologies and assessments employed derive from visual art sessions within initial teacher education. The research will demonstrate that the STEAM Education approach is effective when visual art concepts and methods are placed at the core of the teaching and learning experience. Within this study, emphasis is placed on authentic collaboration and transdisciplinary pedagogical approaches with the STEAM subjects. The partners included a combination of teaching expertise in STEM and Visual Arts education, artists, in-service and pre-service teachers and children. The inclusion of all stakeholders mentioned moves towards a more authentic approach where transdisciplinary practice is at the core of the teaching and learning. Qualitative data was collected using a combination of questionnaires (focused and open-ended questions) and focus groups. In addition, the data was collected through video diaries where students reflected on their visual journals and transdisciplinary practice, which gave rich insight into participants' experiences and opinions on their learning. It was found that an effective program of STEAM education integration was informed by co-teaching (continuous professional development), which involved a commitment to adaptable and flexible approaches to teaching, learning, and assessment, as well as the importance of continuous reflection-in-action by all participants. The delivery of a transdisciplinary model of STEAM education was devised to reconceptualize how individual subject areas can develop essential skills and tackle critical issues (such as self-care and climate change) through data visualisation and technology. The success of the project can be attributed to the collaboration, which was inclusive, flexible and a willingness between various stakeholders to be involved in the design and implementation of the project from conception to completion. The case study approach taken is particularistic (focusing on the STEAM-ED project), descriptive (providing in-depth descriptions from varied and multiple perspectives), and heuristic (interpreting the participants' experiences and what meaning they attributed to their experiences).

Keywords : collaboration, transdisciplinary, STEAM, visual arts education

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