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Integrating mathematics and the arts in secondary mathematics teacher education

Most students I teach in the preservice secondary math teacher education program at the University of British Columbia are new graduates from highly disciplinary, specialized undergraduate degrees in mathematics. Yet as secondary teachers, they are expected to represent both disciplinary and transdisciplinary approaches, aiming to reach all learners in their secondary school classes through integration of mathematics with the arts and humanities as well as with the sciences. This curricular imperative connects with a growing international movement to integrate mathematics with the visual and performing arts, particularly through the Bridges Math and Art organization (bridgesmathart.org) and the affiliated Journal of Mathematics and the Arts (JMA).

Over my fourteen years as a mathematics teacher educator, I have worked to introduce my teacher candidate students (and their future secondary students) to the idea of transdisciplinary identities for themselves and their own students – in other words, the idea that one does not have to view oneself as either 'a math person' or 'an arts person', but can bring mathematics and the arts together to create deeper mathematical understandings and aesthetically-interesting mathematical representations.

In this session, I will explore several successful design experiments supporting UBC teacher candidates in integrating mathematics and the fine and performing arts, including mathematics and dance, poetry, design and the plastic arts. I will describe the pedagogical design experiments, and use two short films and student responses to document the effects of introducing mathematics via the arts early on in our secondary mathematics teacher education program.