



Maths in Makerspaces

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This study explored how and whether participating in a makerspace elective at high school changes the way students see themselves in relation to maths and their imagined futures. We compared 76 students enrolled in makerspace electives with 71 students in other creative electives (e.g., creative writing, print making) across four schools, using pre and post surveys and focus groups to capture students' academic self-concept and future career possible selves (i.e., the careers they hope for or fear). Both academic self-concept and future career possible selves have been shown to be linked to motivation and achievement (Marsh & Martin, 2011).

Findings showed that participation in a makerspace did not have a significant impact on the students' maths self-concept (mean change = 0.15) and was not statistically different from the control group (mean change = 0.09). However, at the same time students' future careers responses revealed a promising shift: the number of students who put maths as a feared career reduced from 12 to 4, whereas the control group showed no net reduction. Although numbers were small and the finding is exploratory, the change suggests that participation in makerspaces can reduce the number of students for whom maths is a career blocking subject even when students' maths self-concept does not change.

Students in focus groups described “makerspace maths” as different from “maths maths”. They could more easily do the “makerspace maths” and placed a higher value on it. In the makerspaces, students encounter maths ideas and concepts embedded in design choices and problem solving and expressed in everyday terms rather than formal procedures. Makerspaces seemed to normalise making and learning from mistakes, fostering a sense of academic bravery and enjoyment in maths. The students contrasted this with mistakes in maths, stating mistakes were “not as helpful in maths.”.

For teachers, the implications depend on whether your school has a makerspace. If your school does have a makerspace, deliberately make connections between the makerspace and maths by identifying the maths in the makerspace, and use the makerspace for standard maths classes. If you do not have a makerspace, you can still run authentic, meaningful, and creative maker activities. When doing hands on projects, tell students when they are doing maths so they learn the many ways that doing maths can feel for them, and encourage reflection that names the mathematical thinking in their projects. In these activities, normalise making and learning from mistakes by planning for design iterations.

References

- Marsh, H. W., & Martin, A. J. (2011). Academic self-concept and academic achievement: Relations and causal ordering. *British Journal of Educational Psychology*, 81(1), 59–77. <https://doi.org/10.1348/000709910X503501>

For more information, please refer to the following paper presented at the 48th Annual Conference of MERGA in July 2026.
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