



Examining the Impact of Tutorial Activity Engagement on Undergraduate Students' Collaborative Preferences

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Collaboration is a central component of mathematics learning, yet students differ in their preferences for working with others. In earlier work, we developed and validated a new construct, *Collaborative Preferences for Learning Mathematics* (CPLM), which captures the underlying cognitive, social, and motivational needs and dispositions that influence how students engage with mathematical tasks, particularly in settings with their peers (Kim & Evans, 2025). Although existing research highlights both the benefits and challenges of collaborative learning, little is known about how participation in problem-solving tutorials — a key site of small-group mathematical work — shapes these preferences over time.

This study used a two-way mixed ANOVA to track changes in students' collaborative preferences over the semester. The study involved undergraduate students ($n = 201$) who completed surveys of their CPLM at three points during the semester, where in the final survey, they reported how they typically engaged in tutorials (individually, collaboratively, or mixed).

We observed a statistically significant main effect of collaborative tutorial engagement. There were clear differences in collaborative preferences depending on how students engaged in tutorials. Students who worked mostly with others demonstrated the highest mean scores at each time point, reflecting a strengthening preference for collaborative learning over time. Those who mostly worked individually reported the lowest preference for collaboration, and their scores declined slightly across the semester. Students who used a mixture of individual and group approaches also became more positive about collaboration as the semester progressed.

Our results suggest that students' preferences were reinforced by the ways they most often engaged in tutorials. Regular exposure to peer interactions may have fostered a sense of comfort, confidence, and perceived efficacy in collaborative settings for students who participated in groups. Conversely, individual learners may have increasingly relied on solitary learning strategies, thereby reinforcing their preferences for independent study. These findings align with the familiarity principle (Zajonc, 1968), which suggests that individuals develop preferences for contexts and experiences they encounter frequently. This underscores the need to recognise how repeated exposure to instructional settings shapes learning preferences.

References

- Kim, S.H. & Evans. (2025). Collaborative Preferences for Learning Mathematics: A Scale Validation Study. In S. Cook, B.P. Katz, & K. Melhuish (Eds.), *Proceedings of the 27th Annual Conference on Research in Undergraduate Mathematics Education* (pp. 833–840). SIGMAA on RUME.
- Zajonc, R. B. (1968). Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology*, 9(2), 1-27. <https://doi.org/10.1037/h0025848>

For more information, please refer to the following paper presented at the 47th Annual Conference of MERGA in July 2025.
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