What Students Tell Us: Preferences for Learning Trigonometry Through Pen-and-Paper and Online Practice

Chris Wright
St Ignatius College, Riverview
cwright@riverview.nsw.edu.au

The integration of digital platforms has prompted debate about how students engage with mathematics practice environments. While technology-supported instruction enhances learning outcomes (Hillmayr et al., 2020), traditional handwriting practices remain essential for conceptual understanding (Dündar, 2015). This study addressed: What are Year 10 students' preferences for completing trigonometry practice in pen-and-paper and online environments, and what factors do they identify as supporting their learning?

This action research was conducted with a Year 10 mathematics class (n = 24) at an independent boys' school in New South Wales. As the classroom teacher and researcher, I designed a three-week trigonometry unit using both pen-and-paper textbook practice and online Mathspace practice. To mitigate bias, I prioritised student voice through anonymous surveys and class discussions. Inductive thematic analysis (Braun & Clarke, 2006) was employed, with codes emerging directly from student data.

Six themes emerged. *Immediate feedback* (31.2%) was dominant, with students valuing Mathspace's instant feedback. *Error identification* (23.4%) reflected appreciation for correcting mistakes in real time. *Blended approach* (20.8%) was most significant: 64.3% preferred combining both environments. One student noted, "Mathspace when we're learning initially, textbook for study when closer to assessment." *Distraction concerns* (14.3%) revealed some preferred pen-and-paper focus. *Memory and retention* (10.4%) reflected writing's value for consolidation. *Technical frustration* (3.9%) involved minor platform issues.

These findings reveal that students develop sophisticated metacognition when given experience with multiple practice environments. Rather than expressing universal preferences, students articulated context-dependent reasoning: digital environments for new concepts and traditional environments for consolidation. This suggests intentional pedagogical orchestration of both environments may better support student learning than reliance on either approach alone.

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References

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