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Context and Implications Document for: Improving writing skills through technology-based instruction: a meta-analysis

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Author's Introduction

Students with poor writing skills face difficulty in both primary and secondary schooling that may potentially impact future life success. Bearing in mind the importance of writing skills, technology-based instruction offers the promise of improving writing skills for struggling students. Schools are increasingly implementing technology in the classroom; however, results have been equivocal, with some technology-based interventions reporting large, positive effects (Englert et al., 2007), and others reporting small or negative effects (e.g. Rowley & Meyer, 2003; Goldenberg et al., 2011). The present study examined the effect of technology-based writing instruction on writing outcomes and whether characteristics of study, sample, and outcome moderated the effect of technology-based writing instruction using meta-analytic methods. Improved understanding of the effectiveness of technology-based writing instruction on writing ability can inform best practices for development and implementation in K-12 educational settings.

Implications for Practice

This article highlights three potential avenues through which technology-based writing instruction may influence instructional practice:

(1) The results of the current study suggest a positive impact of technology-based writing instruction on student's writing outcomes. Technology may supplement teachers' efforts to deliver instruction and practice time to students, which can allow students extra opportunities to engage with writing both in and out of the

classroom versus that supplied in a traditional instructional setting. Further research into technology-based writing instruction could inform ways to improve best practices for writing instruction.

(2) Several of the included intervention studies described scaffolded and individualised feedback for students, suggesting technology as an effective means of providing student-centred and personalised instruction (e.g. Rowley & Meyer, 2003; Franzke et al., 2005; Warren et al., 2008). Based on these results, future innovators and developers of technology-based writing instruction may wish to further examine the role of scaffolding and other types of student-centred instruction on writing outcomes.

(3) The results of this meta-analysis suggested students with learning disability may receive greater benefit from technology-based writing instruction than typically achieving students. Educators and administrators may consider prioritising technology-based writing resources in special education settings. If students with learning disability do benefit from extra time, scaffolding, and one–one–one instruction provided by technology, then special education professionals may see greater gains in writing outcomes when technology-based writing instruction is included as part of the standard curricula.

Focus questions

(1) Which are the best methods to include technology in traditional classroom settings?
(2) What elements seem to act as barriers to the adoption of technology-based instruction?
(3) How can researchers work with educators to improve the design of technology-based instruction for writing skills?
(4) How can researchers and practitioners further examine the potential benefit of technology-based writing instruction for students with learning disability?
(5) What is the right balance between teacher-led writing instruction and technology-based writing instruction for optimal writing gains?

Seminar/project idea

Best practices in classroom instruction could benefit greatly from researchers conducting large-scale, randomised controlled trial assessments of the impact of technology-based writing instruction on writing outcomes.

Author Recommends
Theories of writing development

Berninger, V. W., Winn, W., MacArthur, C. A., Graham, S. & Fitzgerald, J. (2006) Implications of advancements in brain research and technology for writing development, writing instruction, and educational evolution, in: C. A. MacArthur, S. Graham & J. Fitzgerald (Eds) *Handbook of writing research* (New York, Guilford Press), 96–114.

Cutler, L. & Graham, S. (2008) Primary grade writing instruction: A national survey, *Journal of Educational Psychology*, 100(4), 907–919.

Graham, S. & Sandmel, K. (2011) The process writing approach: A meta-analysis, *The Journal of Educational Research*, 104(6), 396–407.

Understanding how technology has the potential to augment classroom instruction

Connor, C. M., Goldman, S. R. & Fishman, B. (2014) Technologies that support students' literacy development. In *Handbook of research on educational communications and technology* (New York, Springer). 591–604.

Examples of technology-based writing instruction

Englert, C. S., Zhao, Y., Dunsmore, K., Collings, N. Y. & Wolbers, K. (2007) Scaffolding the writing of students with disabilities through procedural facilitation: Using an Internet-based technology to improve performance, *Learning Disability Quarterly*, 30(1), 9–29.

Franzke, M., Kintsch, E., Caccamise, D., Johnson, N. & Dooley, S. (2005) Summary Street®: Computer support for comprehension and writing, *Journal of Educational Computing Research*, 33(1), 53–80.

Goldenberg, L., Meade, T., Cooperman, N. & Midouhas, E. (2011) Impact of a technology-infused middle school writing program on sixth-grade students' writing ability and engagement, *Middle Grades Research Journal*, 6(2), 75–97.

Rowley, K. & Meyer, N. (2003) The effect of a computer tutor for writers on student writing achievement, *Journal of Educational Computing Research*, 29(2), 169–187.

Warren, S. J., Dondlinger, M. J. & Barab, S. A. (2008) A MUVE towards PBL writing: Effects of a digital learning environment designed to improve elementary student writing, *Journal of Research on Technology in Education*, 41(1), 113–140.

Previous review of technology-based writing instruction

Goldberg, A., Russell, M. & Cook, A. (2003) The effect of computers on student writing: A meta-analysis of studies from 1992 to 2002, *The Journal of Technology, Learning and Assessment*, 2(1), 1–51.