

## **The contribution of handwriting over typing to text quality and understanding of the writing task: the role of transactional (but not transmissional) writing beliefs**

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Research demonstrates an advantage of handwriting over typing for processes at the interface of writing and reading. Writing mode is also an important variable in comprehension, with some studies showing an advantage in participants' understanding for handwritten over typed writing samples (e.g., Crumb et al., 2022). Research supports a dual process account of writing engagement, with implicit transactional and transmissional writing beliefs playing a role in writing strategy, text quality and understanding (e.g., Baaijen et al., 2014). Transactional beliefs are process-focused, while transmissional beliefs focus on content. The present study investigated the relationship between participants' writing beliefs and quality of handwritten and typed samples, comparing students of STEM and non-STEM disciplines. Participants (N=34) wrote essays and rated their understanding of the topic before and after writing. A number of standard scales were used to measure attitude to, and prior use of technology, including social media, self-efficacy beliefs and writing apprehension. Conditions were counterbalanced and handwritten samples were typed up for analysis to avoid any biasing effect. Two independent raters assessed the writing samples for originality, coherence, and relevance (following Baaijen et al., 2014) and agreed a holistic score of text quality. Results showed that transactional but not transmissional beliefs were related to text quality, for both STEM and non-STEM groups. However, this applied only for the handwritten writing samples, a difference that was not accounted for by word count. Transactional beliefs were also associated with a difference in writers' self-rated understanding for handwritten but not typed samples. There was no association between self-efficacy beliefs or apprehension and quality, but for the typed samples, social media use was positively associated with text quality. Implications for writing instruction are discussed.

Baaijen, V. M., Galbraith, D., & de Gloppe, K. (2014). Effects of writing beliefs and planning on writing performance. *Learning and Instruction, 33*, 81-91.

Canz, T., Hoffmann, L., & Kania, R. (2020). Presentation-mode effects in large-scale writing assessments. *Assessing Writing, 45*, 100470.

Crumb, R. M., Hildebrandt, R., & Sutton, T. M. (2022). The value of handwritten notes: A failure to find state-dependent effects when using a laptop to take notes and complete a quiz. *Teaching of Psychology, 49*(1), 7-13.