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## **Paper and computer-based text composing in the early years: The unique role of transcription skills**

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*Learning and Instructional Technology*

*developmental aspects of writing ability, fluency, handwriting, on-line writing and digital media*

Digital tools are an integral part of most writing communities across the globe, enhancing the criticality of gaining a comprehensive understanding about both paper and computer-based writing acquisition and development. In Australia, where the current study took place, keyboarding has been replacing handwriting in national exams, with children's literacy skills being assessed online, via keyboarding, in the first semester of Year 3. The relationships between transcription skills and children's paper-based writing performance are well documented. Much less research, however, has investigated whether and how keyboarding and spelling skills impact computer-based text composing. In this study, we examined the unique contributions of transcription skills (i.e., handwriting automaticity, keyboarding automaticity and spelling) in predicting Year 2 students (N = 544) paper-based and computer-based writing performance (i.e., compositional quality and fluency) after accounting for other student-level (i.e., gender, word reading, reading comprehension, and attitudes towards writing) and classroom-level factors (i.e., amount of time teaching handwriting, keyboarding, and spelling). Multilevel modelling results showed that handwriting automaticity and spelling accounted for a 7.1 % combined variance in students' paper-based compositional quality and 3.8% of variance in paper-based compositional fluency, above and beyond all the student and classroom variables examined in this study. Results further revealed a combined contribution of 6.7% of spelling and keyboarding automaticity in explaining students' computer-based compositional quality and an 11% combined contribution in explaining students' computer-based compositional fluency. Compared to handwriting automaticity, spelling skills accounted for a larger percentage of unique variance in predicting paper-based compositional quality; handwriting automaticity accounted for a larger percentage of unique variance in explaining paper-based compositional fluency. Findings further showed that keyboarding automaticity, when compared to spelling, accounted for a larger percentage of unique variance in students' keyboard-based compositional quality and fluency. Gender and word reading skills were also found to be uniquely related to students' writing performance across modalities. These findings underscore the need for educators to address and nurture the automaticity of inscription and spelling skills to enhance students' compositional quality and fluency, whether in traditional paper-based or computer-based text composing.