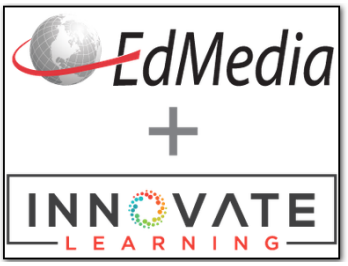


# An exploratory study of student online collaborative writing with teacher metacognitive prompts

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Abstract

Technology has provided increasingly popular ways for teenagers to communicate. However, there are worries that this trend is having a detrimental effect on their writing skills. In fact, many argue that writing quality has deteriorated due to the stunted writing style of social media, which plays havoc with spelling and grammar and weakens the ability to write more formal texts. In this perspective, we tested an innovative, student-centered learning program that combines technology, writing, collaboration, and feedback. The aim was to explore the extent to which a teacher's feedback (metacognitive prompts) during collaborative writing tasks acts on students' overall writing quality, use of metacognitive strategies, feelings of competence, and motivation to complete writing tasks. The participants were 22 high school students. To better understand the impact of collaborative online writing with teacher's intervention in the student's writing process, we used five data collection instruments (survey questionnaire, individual and group interviews, learning outcomes on formal writing assessments, online analysis of the writing process). The results spotlight the role of collaborative online, with metacognitive prompts from the teacher, on the students' overall writing quality. We highlight how this collaborative use of technology strengthened their use of metacognitive strategies, feelings of competence in the writing task, and motivation to write.

*Keywords:* online collaborative writing, metacognitive prompts, teacher, student

## Introduction

In the past decade, technology has impacted almost every aspect of daily life, and education should be no exception. A growing number of studies highlight that technology can have highly positive impacts on education (e.g., Chauhan, 2017; Zheng et al., 2016). At the same time, some studies point out certain challenges that technology brings to the classroom (e.g., Karsenti, 2016). Even as teachers and students should take advantage of the benefits of technology for education, they need to anticipate certain drawbacks that may prevent students and teachers from realizing its full potential. One of these drawbacks is that technology may negatively impact the writing quality of teenagers. Technology has provided increasingly popular ways for students to communicate. However, there are worries that this could have a detrimental effect on their writing skills. In fact, many argue that writing quality has deteriorated due to the stunted writing style that is pervasive on social media, which takes liberties with spelling and grammar and weakens the ability to write more formal texts (Zheng, Yim, & Warschauer, 2018). It's no secret that many students are lousy writers. According to the Pew Research Center (2008), teens generally don't believe that technology negatively influences the quality of their writing, but they do acknowledge that the informal writing styles that they use to text might occasionally seep into their schoolwork. Accordingly, in this exploratory study, we focused on technology and how it affects students' writing quality. We tested an innovative, student-centered learning program that combines technology, writing, collaboration, and feedback. Why this specific setting? Because many researchers have concluded that technology integration should be part of a precise conception of instruction (Hutchison, Beschorner, & Schmidt-Crawford, 2012), one that emphasizes student-centered learning (Cheung & Slavin, 2012; Wang et al., 2014; Zheng et al., 2016), a collaborative spirit (Cheung & Slavin, 2012), and optimized feedback (Harks, Rakoczy, Hattie, Besser, & Klieme, 2014; Zheng, Lawrence, Warschauer, & Lin, 2015). Collaborative online writing fits well with this conception, in that it enables students to engage in active learning and simultaneously receive feedback from peers and/or teachers (Ware & O'Dowd, 2008), feedback that can encourage them to complete the writing task (Rogers & Graham, 2008). This is hardly a frivolous issue, given that good writing is generally believed to be a critical asset for most careers (Lenhar et al., 2008).

## Objectives

This study aimed to explore the extent to which teacher's feedback during collaborative writing tasks acts on students':

- Overall writing quality
- Use of metacognitive strategies
- Feelings of competence
- Motivation to complete writing tasks.

## What is online collaborative writing?

Collaborative writing "refers to the joint production or co-authoring of a document where writers share in the ownership of a text" (Storch, 2005, p. 154). Online collaborative writing is computer-assisted writing that allows at least two students to contribute to writing tasks designed for various purposes (Yim, Warschauer, Zheng, & Lawrence, 2014). In terms of logistics, it extends the classroom beyond the physical walls to the digital arena. This means that students don't have to be in the same location to collaborate on a writing task. It has been said to encourage back-and-forth writing, especially for shorter texts (Applebee & Langer, 2011). Online collaboration can also facilitate the learning process by enabling corrective feedback on structure, grammar, and vocabulary (Yim et al., 2014). Moreover, it has positive effects on the development of reader awareness and critical thinking

(Black, 2005). Although online collaborative writing has been bringing writers together for almost 20 years, this form of learning is relatively new in high school classrooms. In fact, before schools adopted one-to-one devices, collaborative online writing at the same time (synchronously) was rarely seen in classrooms. For starters, they didn't have the requisite tools. Moreover, before Cloud-based collaborative writing platforms (such as Google docs) came along, online collaborative writing was usually asynchronous: students took turns writing on a common text, but they didn't all contribute at the same time. One-to-one classrooms and online collaborative writing platforms are two new trends that have created innovative and productive possibilities. Now a class of students can put their heads together and work on the same text at the same time.

## Impacts of online collaborative writing

Studies have explored the many benefits of online collaborative writing. Some of the key impacts are improved overall writing quality (Yarrow & Topping, 2001; Yim et al., 2017), more time spent writing, greater motivation (e.g., Zheng & Warschauer, 2015), improved feelings of self-efficacy (Ortoleva & Bétrancourt, 2015), and the promotion of critical thinking (Black, 2005). Besides encouraging back-and-forth writing, especially for shorter texts (Applebee & Langer, 2011), it has positive effects on the development of reader awareness (Black, 2005; Yim et al., 2014). Some studies also found improved second-language learning (e.g., Bikowski & Vithanage, 2016; Woo et al., 2011).

## Metacognitive prompts and collaborative writing

Metacognition was originally defined as knowledge about and regulation of one's cognitive activities in learning processes (Flavell, 1979, 2004). Training in metacognitive skills helps students apply metacognitive strategies that ultimately result in better writing quality (Graham, Hebert, & Harris, 2015). Metacognitive skills have a built-in feedback mechanism (e.g., Veenman, Van Hout-Wolters, & Afflerbach, 2006, p. 5). Thus, when an error is made, a monitoring process kicks in to notify the meta level of the metacognitive regulation system. This activates control processes, or actions that resolve the problem (ibid, p. 6). Therefore, when the teacher provides metacognitive prompts during online writing (Berthold, Nückles, & Renkl, 2007; Yarrow & Topping, 2001), there would be impacts on the writing process, the use of metacognitive strategies, and the overall writing quality of the written product (e.g., Yarrow & Topping, 2001).

## Method

The objectives of this study were to better understand the role of collaborative online writing with teacher's intervention in the student's writing process on 1) overall writing quality, 2) use of metacognitive skills, 3) feelings of competence in the writing task, and 4) motivation to write. This section presents the methodology used to achieve these objectives. As recommended by the Publication Manual of the American Psychological Association (2013), in this section, the participants are first presented, followed by a description of the exploratory study setting, the data collection instruments, and the analysis methods. This section concludes with a discussion of the study's methodological strengths and limitations.

### *Participants*

The participants were 22 high school students in Montreal (Canada) who were identified by their teacher as having significant problems with their writing quality. Average age was 16 years, and students were in either Grade 10 or 11. There were 20 boys and 2 girls. Active parent consent was obtained for all students participating in the study. Data were collected in 2018.

*Exploratory study setting and originality of the study setting*

The pedagogical setting for our exploratory study is innovative. The participants (three groups: 6, 8, and 8 students) took part in eight online collaborative writing sessions, each lasting one hour. Before each session, the students were asked to plan an argumentative text on a predetermined controversial issue. It is noteworthy that, in this case, they did not collaborate with each other, but instead with the teacher, who interacted with up to eight students at a time. The unique aspect of this setting is that, in each session and with each group, the teacher made comments and asked questions (metacognitive prompts) to help the students improve the quality of their text, and the students then responded. The intention was to encourage them to view the writing task as a recursive process (Flower & Hayes, 1981; Elbow, 1998; Sanders-Reio, 2014). Furthermore, most studies of peer writing situations have focused mainly on the development of writing skills and motivation to write (e.g. Zheng, B., Warschauer, M., Lin, C.-H. & Chang, C.).

*Data collection instruments*

To better understand the impact of collaborative online writing with teacher's intervention in the student's writing process, we used five data collection instruments:

- One survey questionnaire for all students (n = 17)
- Individual student interviews (n = 17)
- Group interviews with students (3 group interviews with groups of 6 to 8 participants)
- Comparison of learning outcomes (n = 17) on formal writing assessments before and after participation in the experiment
- Online analysis during the writing process (using one-to-one tablet teaching in the classroom and a screen capture application).

The overall writing quality was measured using standard government assessments before and after the experimental program.

*Data treatment and analysis*

The questionnaire data included both Likert and open responses. Therefore, we used a mixed analysis. Given the small number of participants, we used SPSS 23 to quantitatively analyze the descriptive statistics. These results were supplemented and supported by qualitative analyses of the open questionnaire responses and the individual and group interviews using an approach inspired by L'Écuyer (1990) and Miles and Huberman (2003). First, we applied a content analysis that included semi-open coding of the responses in relation to the main study objectives. For the qualitative analysis, we used QDA Miner, which is widely used in qualitative research (Karsenti et al., 2011). We also used digital trace analysis, inspired by Jaillet's (2009) method, to capture the students' writing process.

*Methodological strengths and limitations*

The data collection instruments used in this study are similar to those used in other studies on online collaborative writing (e.g. Zheng, Niiya, & Warschauer, 2015). One of the main strengths of this exploratory study lies in the research methodology. The combination of a survey questionnaire, individual and group interviews, formal academic outcomes, and digital tracking acts to enrich and triangulate the findings. However, this study includes some methodological limitations. First, the results are based on participants' perceptions and self-reports. We attempted to offset this limitation by using a variety of data collection instruments. Second, the number of participants was rather small. To

reduce this methodological bias, we systematically compared the responses across responders to identify discrepancies. A further limitation is that the sampling was not random.

## Results

The results spotlight the role of collaborative online, with metacognitive prompts from the teacher, on the students' overall writing quality. We highlight how this collaborative use of technology strengthened their use of metacognitive strategies, feelings of competence in the writing task, and motivation to write. In addition, the analysis of the academic outcomes and the digital trace analysis provide a deeper understanding of how collaborative online writing can positively impact students with writing problems.

## Conclusion

Although it is not a one-size-fits-all solution, this experiment indicates how feedback by an expert teacher in the form of digital comments on ongoing collaborative writing tasks can have positive impacts on students' writing skills. Of note, one of the key factors in this project appears to be the role of metacognitive skills and how these skills were encouraged. More specifically, a teacher provided metacognitive prompts (Berthold, Nückles, & Renkl, 2007) during synchronous collaborative online writing tasks. The results indicate that the students improved in their overall writing quality, use of metacognitive strategies, feelings of competence in writing, and motivation to complete the writing task. These results could be explained in part by the fact that, in order to complete properly written assignments of good overall quality, writers need higher-order writing strategies. And it seems that the metacognitive prompts helped these students engage cognitively (Greene et al., 2004), view the task as a recursive process (Flower & Hayes, 1981; Elbow, 1998; Sanders-Reio et al., 2014), and draw on metacognitive skills (Veenman, Van Hout-Wolters, & Afflerbach, 2006). Future studies could verify and extend these findings by testing different collaborative online writing settings in larger samples of students and teachers.

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