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A Novel Approach to Examine the Impact of Web-based Peer Review on the Revisions of L2 Writers

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Abstract

The use of peer feedback to support student writing is increasingly popular among second language writing teachers. However, the effect peer feedback has on the revision and the writing process remains unclear. Technological advances have made the application of peer feedback in the L2 writing context more accessible. As a result, there is a growing body of research investigating web-based peer review and L2 writing. This study aims to better understand how L2 writers conduct peer feedback activities, by looking at the types and traits of the feedback and how they influence revisions made in subsequent drafts using a web-based peer review system. A new methodology for studying web-based peer review comments is introduced. The results suggest that a specific type of feedback, *alteration*, and specific type of feedback, *recurring*, are important predictors for revision.

Keywords: peer feedback; revision; L2 writers; web-based peer-review systems; machine learning

1. Introduction

The use of peer feedback to support the development of student writing is now becoming increasingly popular in a wide range of educational contexts around the world. Certain aspects of peer feedback remain controversial. In the context of second language (L2) writing in particular, it remains unclear how peer feedback supports the L2 writing process and does peer feedback support the L2 writing process, and it remains unclear what the immediate and long term effects are on revision and the writing production (Gielen, Peeters, Dochy, Onghena, & Struyven, 2010; Hyland & Hyland, 2006; Lundstrom & Baker, 2009; Min, 2006; Zhang, 1999). Research on peer feedback has generated conflicting reports either confirming or refuting its usefulness and effectiveness. This notwithstanding, peer feedback on L2 writing has generally been viewed positively in higher education (Hyland & Hyland, 2006; Liu & Hansen, 2002; Topping, 2003), as it supports the process approach to writing, encourages collaborative learning, and learning through dialogue with peers (Hirvela, 1999), and is generally more consistent with current popular pedagogic concepts such as Vygotsky's zone of proximal development (Vygotsky, 1978).

This study aims to contribute to the growing body of knowledge regarding the use of web-based technology, peer feedback, and supporting L2 writers and writing instructors. L2 writers in the context of this study are all writers who are writing in a language (English) other than their mother tongue. Technological advances, specifically web-based

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technology, have made the application of peer feedback in the L2 writing context more accessible. Web-based tools such as blogs, wikis, and more recently web-based peer review systems are readily used in classrooms for the purpose of teaching writing and engaging students in peer review activities. As a result, there is a growing body of research investigating web-based peer review and L2 writing. The results of these studies are as multiple as the settings in which peer feedback and writing is found (Goldin, Ashley, & Schunn, 2012). Consequently, as the amount of data and different settings grow, so is there a need for new research methods able to investigate these differences systematically. This study applies machine learning as a novel method on a large set of web-based generated data of L2 writers using peer feedback using a web-based peer review system (SWoRD) to support the development of their text over a number of drafts. Machine learning is as statistical method that essentially represents patterns in large set of empirical data in order to make predictions about this data when applied in different settings. These predictions help explain how these patterns perform in a new situation (Leijen, 2014; Conway & White, 2012). Previous studies have indicated that machine learning is both a powerful statistical method to study larger sets of authentic data (Leijen, 2014), and shown to offer new perspectives in writing research studies (Leijen & Leontjeva, 2012; Crossley, 2013; Xiong, Litman, & Schunn, 2012). In addition, as Scott A. Crossley (2013) points out, current advances in both computational linguistics as well as methodological advances in L2 writing research allow for more replication studies, which can, for example, be carried out using machine learning techniques. For example, once specific patterns have been found, these can be tested again by improving the model or changing the setting. As a result, these replication studies on writing tasks can provide a richer understanding of the processes, variation in, and development of writing by generalizing from real examples.

Consequently, the main aim of this paper is to better understand how L2 writers conduct peer feedback activities by looking at the types and the traits of the feedback they provide and how these may influence revisions made in subsequent drafts. Additionally, in response to Crossley's (2013) suggestion for replication studies focusing on second language writing using novel techniques, this paper introduces a new methodology for studying web-based peer review comments and their effectiveness on the revision on subsequent drafts. Finally, the paper extents the discussion to include how the results are beneficial to academic writers and writing instructors in general.

2. Web-based Peer Review Systems

Web-based peer review systems are specifically designed to support the reviewing and revision process of writing. For example, SWoRD^{TM} (Cho & Schunn, 2004), Calibrated Peer Review^{TM} (Russell, 2004), MyReviewers (Moxley, 2012), and ELI (Hart-Davidson, McLeod, Klerkx, & Wojcik, 2010) were all developed at north American higher educational establishments. Research on the use of these systems and the effect these systems have amongst L2 writers has so far remained unexplored.

Although different tools, such as wikis, blogs, *Google Docs,* and the traditional Review tool in *Microsoft Word* are readily available to educators and researchers, the development of web-based peer review systems has gained momentum. Although these systems share some communal features with the systems mentioned above, they are fundamentally different. First, most of the systems such as wikis, forums, and blogs are structured around discussion (feedback and commenting) on a specific text (blog), or collaborative text creation (wiki). *Google Docs* and *Microsoft Word* are centered on text creation and offers tools to allow for comments and tracking revisions (Track Changes tool). The disadvantage of these systems is how they collect data. Researchers need to develop a system for collecting individual pieces of work from students, which, when attempted on a large scale, can fast become a daunting task. This is where web-based peer review systems come into their own as a research resource: By virtue of their very design, they provide the researcher with the means to collect large well-structured sets of student-generated data in a corpus for the purpose of analysis. An added advantage of web-based peer review systems is that the writing itself is often supported with additional features such as changeable rubrics and personal peer feedback prompts. Finally, web-based peer review systems are developed and structured around the educational practice of peer feedback on writing and are flexible to fit most of the writing tasks students are already likely to be engaged in.

The basic principles behind the development of web-based peer review systems are to support the development of content knowledge through writing, to assist in organizing writing assignments for instructors to reduce the workload, to provide students an authentic audience for the giving and receiving of feedback, and to enable students to practice writing through constant revision for the purpose of learning how to write (Cho & Schunn, 2004). In practice, additional aspects have been shown to be useful and effective for both students and instructors; in particular, a number of studies