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COMMENTARY

Introduction to the Special Issue on Automated Writing Evaluation

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Introduction

Technologies that allow the automated evaluation of machine-readable text—a process which has become known as Automated Writing Evaluation (AWE)—have been around since the 1960s, and for almost as long, there has been interest in the ways such technologies can support the work of second-language (L2) learners, teachers, and practitioners in the field of computer-assisted language learning (CALL). The mainframe computers and punch cards used in those early forays into AWE have long given way to much more accessible, affordable, and user-friendly systems, such that most learners writing today on computers with internet access will be able to avail themselves of some form of AWE. The speed of this development means users' understanding of these technologies and their broader implications for L2 writing and learning has always lagged behind. While it has only been six years since our involvement in the production of a previous special issue on AWE (Hegelheimer et al., 2016), the abundance of more recent research seemed to require an updated consideration of the field. In addition, the global COVID-19 pandemic temporarily shifted much L2 language and writing instruction online, necessitating more dependence on written forms of communication and thus pushing AWE presumably even further into L2 writers' common experience. These were the motivations for this special issue on AWE.

Given the need for an updated perspective on AWE as described above, we were surprised by the rather lackluster response to our call for papers. We received 38 abstracts, and of these, we selected 13 from which to invite submissions of a full article. Following peer review, we ended up with the four empirical articles presented here, all of which were based on research conducted in East Asia in tertiary-level Chinese L1 contexts in which the language of the focal AWE system was English. Despite our appreciation for the fine work of our contributors, we could not help but be somewhat disappointed at the lack of range of research that this special issue represents, given the emphasis in our original call for papers for work based in non-tertiary contexts and AWE tools addressing languages other than English. On the positive side, we were pleased to see a variety of AWE systems represented, including those that are commercially produced (e.g., Pigai) versus those developed by the study's authors (CyWrite and its engineering abstracts module). There were also a variety of target features for the AWE systems in question, such as grammatical forms (Write & Improve with Cambridge), content/argumentation (Virtual Writing Tutor), and genre conventions (again, CyWrite and its specialist engineering-discourse module). There is no doubt that the pandemic, which began a few short months before our call for papers went out, has had an inhibiting effect on the conduct and dissemination of research.

In This Issue

In the article by Liu and Yu, "L2 learners' engagement with automated feedback: An eye-tracking study," the authors contribute to the growing literature on L2 student engagement with AWE feedback. Their study is distinguished from previous work in this area by the fact that it involves, first, a conceptual framework derived from interactionist second-language acquisition theory, and second, the use of eye-tracking to

quantitatively measure noticing. As such, it frames engagement largely in terms of the potential for AWE to contribute to L2 development. In addition to eye-tracking, the researchers also used stimulated recalls based on eyetracking data along with reflective journals to investigate the influence of feedback explicitness and accuracy on engagement. The AWE system in question, Write & Improve with Cambridge, is unique in the way it varies in terms of explicitness; unlike most other commercial systems, it indicates the presence of some forms of error only by colored highlighting without any indication of the specific nature of the error, making it akin to the type of indirect feedback featured in many studies of teacher-provided written corrective feedback. Perhaps not surprisingly, the participants were found to spend more time engaging with indirect feedback than direct feedback (in which the error was defined by the system) and to expend more cognitive effort in their engagement with such feedback, while also using less of it in their revisions. The results corroborate previous research showing explicitness to be a key factor influencing engagement. Liu and Yu conclude with calls for AWE developers to continually improve the accuracy of AWE tools and for teachers to help learners better distinguish between accurate and inaccurate feedback.

In "Genre-based AWE system for engineering graduate writing: Development and evaluation," Feng and Chukharev-Hudilainen document an evaluation of an AWE system and accompanying analysis module that they have developed to support genre-specific writing in the domain of English for Specific Purposes (ESP). In particular, their tool was designed to evaluate the writing of research abstracts by graduate students of engineering in a Taiwanese university. The custom-developed tool, a module for the CyWrite system developed at Iowa State University, provides feedback on lexical bundles and verb forms (tense, aspect, and voice) in line with the findings of previous research into functional moves and steps in this specific sub-genre. In addition to its specialized focus, the system is also unique insofar as the authors employed a co-construction approach to facilitate interaction between it and the target users. Feng and Chukharev-Hudilainen based their evaluation on the framework proposed by Chapelle (2001) for evaluating tasks in CALL, prioritizing the criterion of language learning potential. The results showed a positive effect in drawing users' attention to and enhancing their use of two linguistics features employed to achieve communicative purposes in line with the rhetorical moves of their abstracts.

In the article by Chen, Chen, Jia, and Le, "Exploring AWE-supported writing process: An activity theory perspective," the authors report on an innovative effort to investigate AWE-supported writing through a sociocultural lens, specifically the lens of Activity Theory (AT). This analysis focuses on how tertiary students of English in a Chinese university incorporated feedback from the well-known AWE tool Pigai into their revisions in English. Drawing on the key AT concepts of object or goal-orientedness, tool mediation, and constant development, the authors analyze data that include interviews with the students and their submissions to the system. They then demonstrate, among other things, that the scoring and ranking functions of Pigai introduced an element of competition that enhanced the participants' writing motivation for and engagement in writing. Their analysis also reveals evidence of conflicts in the activity system, particularly tensions caused by the students' inability to leverage Pigai's feedback into useful revisions because of their limited language proficiency. Other findings regarding the participants' mobilization of resources within their AT community raise questions about previous research suggesting AWE fails to address the social nature of writing. The study shows AT to be a valuable tool for process-oriented investigations of the ways individual and contextual factors influence L2 students' use of AWE.

The article by Shi, Liu, Lai, and Jin, titled "Enhancing the use of evidence in argumentative writing through collaborative processing of content-based automated writing evaluation feedback," is innovative in its focus, first, on an AWE system that gives content-oriented feedback on students' argumentative writing, and second, on students' collaborative use of such feedback. The AWE system used in the study, Virtual Writing Tutor, provides feedback on students' use of evidence in argumentative writing by detecting language related to categories such as topic sentence, evidence, cited sources, and support. Its use in the study was embedded in a groupwork task requiring students to collaborate in groups of four or five to make sense of the feedback and incorporate it into their revisions of one group member's essay that had been selected for revising. This task design feature was implemented in response to challenges in learners' sense-making of AWE feedback that had been identified in a review of previous work. Data sources included

transcriptions of each group's in-class discussions about the feedback as well as the AWE feedback itself and the groups' written revision plans. The researchers also coded and analyzed the first and revised drafts of the groups' argumentative essays to assess improvements in the participants' use of evidence. Findings showed three phases of collaborative processing of AWE feedback emerging from the analyses: a trustful phase, followed by a skeptical phase, and finally a critical phase. Use of evidence was found to improve over time. Generalizing beyond the genre of argumentative essays, the authors claim that collaborative processing of AWE feedback might enhance use of AWE feedback for writing development more generally.

Finally, in a special installment of his Emerging Technologies column, Godwin-Jones provides an expansive, up-to-date look at tools for intelligent writing assistance in instructed language learning. AWE tools are considered within a wider perspective that also encompasses machine translation and automatic text generation. This contribution will advance many readers' understanding of intelligent tools for writing support by highlighting the increasingly important role played by large language models based on artificial intelligence and mathematical modeling of language data, as opposed to the grammatical formalisms that were the basis for earlier systems. The author argues the need for an ecological perspective on classroom integration, noting that such technologies are not used in a vacuum but are influenced by, and in turn influence, myriad factors, such as teacher attitudes, individual students' case histories, and institutional decisions. Godwin-Jones closes by discussing the implications of these new technologies for classroom integration and calling for this integration to be guided by "situated practice, established goals, and desired outcomes."

Conclusion

Despite the somewhat narrow cross-section represented in this special issue, we believe these contributions advance the field by illustrating the range of AWE systems and focuses for automated feedback currently available, the variety of factors influencing how L2 students use them, and the diversity of ways such tools and their feedback are being incorporated into classrooms and education more generally. These studies highlight the extent to which such tools have become a familiar and even commonplace feature of the L2 writing landscape, one that is increasingly difficult for writing instructors and L2 teachers to ignore (whether or not they may be inclined to do so). Looking to the future, it is our hope that this special issue with spur interest in future AWE research involving non-tertiary (particular sub-tertiary and professional) contexts, systems that analyze writing in languages besides English, as well as a wider diversity of theoretical, methodological, and research-design choices.

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