Featured Essay

Electronic feedback on second language writing: A retrospective and prospective essay on multimodality

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Abstract

As technology has made a range of modes of communication available and created new ways to integrate these modes, feedback has become increasingly electronic and multimodal. From written to audio, video, and screencast feedback, the multimodal options for electronic feedback (e-feedback) have expanded in such a way that we might speak of a 'multimodal turn' in feedback on foreign and second language writing. However, feedback studies on second language writing are just beginning to explore these complex areas. This essay offers a multimodal perspective on e-feedback by illustrating the scope of current research and highlights future research directions. The retrospective underscores the scarcity of research in the area with a specific focus on multimodality and identifies needs for speciality feedback systems that consider practical and contextualized perspectives. We argue that

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future research should strive for a context-rich description of e-feedback activities, gathering thick data about feedback provision, learner engagement with feedback and uptake through screencasting, eye-tracking, and keystroke logging technologies. These data should be triangulated with information about all factors impacting the feedback activity outcome, ranging from participant variables over modal affordances of the platforms used to environmental factors like institutional support.

Introduction

Multimodal options in recent learning technology trigger a transformation of writing and feedback on writing. Language learners of today make meaning multimodally, often using emoticons, images and videos (e.g., Hafner, 2014), and receive timely feedback from their social circle through 'likes', short comments, and emoji's. Language teachers also have a variety of new ways of providing feedback to learners electronically using, for example, word processing with commenting and editing features, such as Microsoft Word and Google Docs, online platforms that enable audio comments, such as Turnitin,[1] Canvas[2] speed grader and Google Docs plugins, and even software options that enable them to produce video feedback. This essay aims to take stock of how new ways of reading, writing and learning using new media influences electronic feedback (e-feedback) practices in second language writing, and to identify the 'distinct possibilities and constraints' (Jewitt, Bezemer, and O'Halloran, 2016: 3) of the modes that these new technologies entail.

E-feedback is increasingly seen as a key area in the teaching of second language writing. It was featured prominently in Hyland and Hyland's (2006) State of the Art article, 'Feedback on second language students' writing', and was also the focus of Ware and Warschauer's (2006) chapter, 'Electronic feedback and second language writing'. However, these two key reviews do not focus sufficiently on the *multimodal* nature of electronic feedback. While increasing attention is devoted to multimodality in many areas of learning and teaching, including literacy studies (e.g., Jewitt, 2008), classroom-based language learning and teaching (e.g., Sert, 2017) and online language teaching (e.g., Hampel and Stickler, 2012), there is a dearth of studies that focus on the role of multimodality in e-feedback on second language writing. A few attempts have been made to broadly capture segments of second language writing e-feedback research (e.g., T. Chen, 2016; Pennington, 2013), and meta-analyses and research syntheses do exist on the impact of the multimodal nature of computer-mediated communication on writing performance (e.g., Lin, Huang and Liou, 2013; Sauro, 2011;

Ziegler, 2016). Yet, a discussion of the role of multimodality in e-feedback on the teaching of second language writing is still lacking.

In this essay, we will offer a 'narrative literature review' which 'selects relevant past research and synthesizes it into a coherent discussion' (Feak and Swales, 2009: 2) in order to describe the state of research on the role of multimodality in electronic feedback on writing. We define the terms *multimodality*, *mode*, and *affordance* within a social semiotic perspective. *Multimodality* is 'the use of several semiotic modes in the design of a semiotic product or event, together with the particular way in which these modes are combined' (Kress and van Leeuwen, 2001: 20). *Modes* are understood as 'semiotic resources' (Kress and van Leeuwen, 2001: 21), and different modes offer varying 'means of making meaning' (Jewitt, Bezemer, and O'Halloran, 2016: 2) with a range of distinct meaning potentials. The meaning potential of each mode is thus referred to as *modal affordance*, which is 'what is possible to express and represent easily with a mode' (Jewitt, 2017: 26).[3]

At the same time, it is also essential to define what we do *not* mean by *mode*. First, in our review we do not address utilization of *grammatical mood* (modal verbs). Second, we treat feedback provided via synchronous and asynchronous computer-mediated communication as *forms* of communication, and not as distinct modes, in line with the editorial of the special issue. In the same vein, we would like to state that a comparison of electronic and non-electronic feedback is beyond the scope of the present essay, and thus we focus primarily on multimodality in e-feedback and do not cover technology vs face-to-face or non-technologically mediated options. Furthermore, as explained above, we do not intend to provide a systematic overview of research in the area, but offer a 'narrative review', which is necessarily selective and meant to advance a particular line of argument. Finally, although we will argue that multiple modes of e-feedback provision might open up new potentials for meaning-making, we acknowledge that even when e-feedback is provided through multiple modes, as Furnborough and Truman (2009) have shown, some learners may still take little account of it. Thereby, we present multimodality as one of many variables in e-feedback and do not seek to make claims regarding the *effectiveness* of particular modes or ensembles of modes.

This featured essay is subdivided into two major sections: a look to the recent past and directions for the future. First, we provide a retrospective of selected studies published after 2006 that highlight key areas of current research related to multimodality in second language writing feedback. This overview is structured according to prevalent modes of feedback (written and audio-visual) provided by instructors and peers on second language writing and the forms of communication (synchronous and

asynchronous) through which such feedback is delivered. The second part of this essay takes a prospective perspective, suggesting future paths to be explored, both in terms of research opportunities and in terms of designing better technological tools for multimodal feedback. We end the section with a word of caution, indicating practical issues to consider for a broader implementation of multimodal feedback in instructional practice.

Looking back: Main topics in recent research on multimodal e-feedback in second language writing

This section is organized broadly by mode and synchronicity. We begin the section with synchronous and asynchronous forms of written e-feedback and close with synchronous and asynchronous forms of audio-visual e-feedback. We acknowledge the limitation of this organization in line with Bezemer and Kress's (2016: 142) warning that 'several modes are always in operation, in ensembles', and so 'a priori selection of just one or two of those modes for further analysis' is always problematic. Yet this organization is adopted simply for clarity, and to follow a line of evolution from the more 'traditional' (written) to the more recent (audio-visual) modes.

E-feedback via written language

Perhaps surprising given the rapid evolution of new audiovisual technologies, written language still prevails in research about feedback on second language writing. Below we identify some of the themes that emerge in relation to asynchronous and synchronous e-feedback provided via written language. Prevalent research topics include uptake and retention, feedback focus, and learner variables that might impact the feedback process, especially in peer e-feedback studies.

Asynchronous e-feedback via written language

Asynchronous written e-feedback is perhaps the most common and familiar form of e-feedback. It usually involves the use of online and offline text editors, often with review features (e.g., MS Word and Google Docs track changes and comment bubbles) and may also include the use of email, discussion boards, course management systems and blogs. These forms of written e-feedback have been seen to lead to positive student perceptions and writing improvement, as described below.

First, written e-feedback research has highlighted practical aspects of the mode. These have primarily concerned positive student perceptions of convenience, such as ease of email submission (Ho and Savignon, 2007), cloud-based document access (Kim, 2010) and blog-based revision (Ciftci

and Kocoglu, 2012). Beyond this, specific elements, such as the review features in MS Word, have been shown to contribute to student preference for written e-feedback over handwritten comments (Ho, 2015). The potential for anonymity in peer feedback offered by some written e-feedback platforms (e.g., discussion boards) has been received positively by learners, as it can lead to more direct, honest, and critical feedback (Guardado and Shi, 2007; Razi, 2016).

Second, a few studies have focused on the impact of written e-feedback on writing improvement and have shown evidence of improvement in writing following asynchronous written peer e-feedback (e.g., Kitchakarn, 2013; Yusof, Manan, and Alias, 2012). However, it is also important to consider learner variables and modal affordances. For example, learner proficiency may be a possible moderating factor in effectiveness, as Ge (2011) found that low-proficiency learners benefited more from written e-feedback than high-proficiency learners. Use of affordances of a mode may be a further factor in peer e-feedback effectiveness. For instance, AbuSeileek and Abualsha'r (2014) found that learners who received feedback via track changes gained significantly higher writing post-test scores than those receiving feedback in the form of recast or metalinguistic explanation. Speculating on the key affordances of the mode (written feedback using MS Word review features), the authors maintained that, as track changes preserved the 'original ill-form produced by the learner', it enabled the writer to 'make a cognitive comparison and notice the difference between the error and the suggested correct form' (AbuSeileek and Abualsha'r, 2014: 88).

Stretching the boundaries of written mode to written error codes, an interesting trend are cloud-based speciality e-feedback systems such as Markin[4] and Emended.[5] In terms of affordances for teachers, these systems allow insertion of preset feedback text-based codes or comments on writing. Moreover, instructors can integrate links to other websites or course management systems. Speciality e-feedback systems streamline the feedback process because time-consuming downloading, converting, and uploading between systems can be avoided. (Byrne, 2007; Buyse, 2012; Godwin-Jones, 2008). A possible problem with these systems is a lack of flexibility to enable the feedback provider to choose and adapt available modes. For example, Byrne (2007) reported that the default settings in the Markin version she used (marking surface-level errors in red without default options for praise) was perceived by learners as aggressive and demotivating.

Synchronous e-feedback via written language

Studies of synchronous written e-feedback tend to combine it with and/or compare it to asynchronous e-feedback. While most of this research has occurred with text chat in peer feedback, new synchronous options that allow for the insertion of comments while a student is writing have opened innovative possibilities for synchronous instructor written e-feedback.

One example of a platform that offers this collaborative potential is Google Docs, which allows multiple users to write and comment on a document simultaneously. Using Google Docs, Shintani (2016) and Shintani and Aubrey (2016) compared synchronous and asynchronous instructor direct (inserted comments with the correct form) written e-feedback on hypothetical conditionals in timed, in-class, writing in English as a foreign language (EFL) at a Japanese university. The findings suggest that synchronous feedback facilitated more successful self-correction than asynchronous feedback, and allowed for a contiguous focus on form and meaning (Shintani, 2016). Additionally, Shintani and Aubrey (2016) identified a significant difference in delayed writing post-test scores in favour of the learners who received synchronous written feedback as opposed to those who received asynchronous feedback. They concluded that synchronous written feedback was found 'more effective in improving learners' accuracy' (Shintani and Aubrey, 2016: 296) because it led to better grammar learning and fewer fossilized constructions.

Other studies on synchronous written e-feedback have explored the use of text chat during peer review, with many using it as just one of several tools in the peer review process (e.g., Ho, 2015; So and Lee; 2012). Some of these have sought to identify the effect of synchronicity on the global or local focus of the feedback but have yielded inconclusive results. To illustrate, C.-F. Chang (2009) reported that synchronous feedback (via text chat on MSN Messenger) was found to be more focused on local problems than asynchronous written peer-feedback (via MS Word), but a follow up study (C.-F. Chang, 2012) produced contrasting results. Other peer feedback studies utilizing text chat have identified benefits of the synchronous form of communication. For instance, in a study that investigated a combination of synchronous and asynchronous e-feedback, Cha (2008) explored peer e-feedback practices of 52 English education majors in a freshman writing course in Korea. One group was assigned to provide feedback asynchronously on a bulletin board, while the other used the bulletin board followed by synchronous text chat. The results indicated that the addition of text chat provided learners with an opportunity to share ideas and negotiate issues that came up in the asynchronous feedback, and thus led to a better understanding.

However, synchronous written e-feedback through text chat comes with a few key limitations. First, it has been found that adequate keyboarding and typing speed are critical for successful participation of learners (C.-F. Chang, 2009; Jin and Zhu, 2010). Jin and Zhu's (2010) case study demonstrated that an inexperienced participant's slow typing skills and insufficient chat experience can frustrate both parties in peer e-feedback. Second, because text chat tools are typically separate from the writing tool, the visual disconnect between the chat and the draft may add difficulty to referencing and matching comments provided on text chat to the draft (Cha and Park, 2010). Third, the synchronous nature of online chats has at times led to social conversations and task management episodes that can outnumber on-task activities (Cha, 2014; Cha and Park, 2010; C.-F. Chang, 2009, 2012; Liang, 2010). C.-F. Chang (2009, 2012) reported that on-task episodes were more frequent in asynchronous peer e-feedback because socialization was absent without live interaction. This final consideration points perhaps to a greater focus on interpersonal aspects of communication in synchronous interactions.

In sum, we have seen that the bulk of studies on written e-feedback are concerned with different *forms* of feedback communication and how to combine them rather than with a deep exploration of the affordances of the mode. This might be one of the reasons we still see so many inconclusive results in this area.

Audio and video in e-feedback

Non-written modes, such as audio and video, also show promise for e-feedback on second language writing. These include asynchronous forms, such as recorded audio or screencast comments, as well as synchronous forms, such as audio-visual feedback via audio and video chat platforms. While not yet as ubiquitous as written forms of e-feedback, one of the main features of audio-visual feedback is the greater perceived proximity among the participants thanks to the presence of intonation and facial expressions.

Asynchronous audio and audio-visual e-feedback

Asynchronous modes of audio and audio-visual e-feedback in second language writing have been more prevalent than synchronous modes. Studies in this field have tended to focus on instructor feedback with a particular emphasis on screencasting, while the use of recorded audio feedback seems to be in decline.

Recorded audio feedback research has focused on pre-electronic tools such as audio tape recordings (e.g., McAlpine, 1989; Morra and Asis, 2009), despite current technology allowing for more streamlined distribution

of audio comments through built-in features of grading platforms, like Turnitin and Canvas's speed grader, and options for inserted audio comments in text editors. Although writing instruction in general has embraced audio e-feedback (see Killoran, 2013 for a review), relatively fewer studies have utilized similar tools for feedback on second language writing. For instance, Kotska and Maliborska (2016) who evaluated recorded audio comments in Turnitin on second language writing suggested that audio comments were convenient for comments too long to explain in writing. The potential for expanded explanation in audio feedback has been championed even in studies of older forms of technology, suggesting a key affordance of the audio mode.

Capitalizing on the benefits of audio feedback while augmenting it with a recording of student work on the screen, screencast feedback (also known as screen recording or screen capture) provides an asynchronous multimodal audio-visual mode of e-feedback. Screencasts contain the learner text, sometimes with additional written comments (Ali, 2016; Harper, Green, and Fernandez-Toro, 2015) or codes (Ducate and Arnold, 2012) on the text, accompanied by audio or audio-visual comments given in the student's L1 (Ducate and Arnold, 2012; Harper *et al.*, 2015) or in the target L2 (Elola and Oskoz, 2016; Harper *et al.*, 2015). In this sense, it presents a unique modal ensemble for feedback provision on second language writing. This use of multimodality in feedback gives students an opportunity to practise listening skills alongside writing (Ali, 2016; Harper *et al.*, 2015) and may be of particular benefit for auditory and visual learners (Ali, 2016) or students with dyslexia (Harper *et al.*, 2015).

Studies have shown that screencast feedback provides clear (Ali, 2016; Elola and Oskoz, 2016; Harper *et al.*, 2015) and memorable explanations (Harper *et al.*, 2015). It tends to capture the feedback provider´s cognitive engagement with the student's work and thus can encourage emotional bonding between the two parties. As such, it offers enhanced tutor presence (Harper *et al.*, 2015) and affective benefits (Ducate and Arnold, 2012) for the students. Additionally, teachers have perceived screencast feedback to be useful especially in addressing higher level writing issues, such as organization (Ali, 2016; Ducate and Arnold, 2012), and less overwhelming for students with a large number of grammar issues (Harper *et al.*, 2015). In terms of linguistic gains, students have been seen to successfully revise at the same or better rates with screencast than with written MS Word feedback (Ducate and Arnold, 2012; Elola and Oskoz, 2016). Likewise, Ali (2016) reported that in follow-up writing exams, learners' overall writing as well as content, organization and structure improved more following screencast feedback than following written feedback.

Perhaps the earliest study of the past decade on screencast feedback was reported in Li and Akahori (2008), in which feedback was provided via a tablet based software that allowed learners to play back a video of the teacher's handwritten corrections and audio recorded explanations on students' use of letter honorifics at a Japanese language school in China. Li and Akahori (2008) ascertained that the audio mode increased the perception of the teacher's social presence for all learners. However, when accompanied by written comments, explanations in the audio only aided the intermediate students and were found to be redundant for the advanced students, if not even disadvantageous, given the reversal effect of cognitive load. In a more recent study, Ducate and Arnold (2012) investigated success in revision following feedback via screencast and MS Word comments. They observed their students of German L2 to be more successful revising case and word choice issues following screencast feedback, but more successful revising verb agreement and verb errors following feedback as MS Word comments. The authors speculated that extra explanations in the audio on easily referenced errors, in this case verb agreement and verb errors, might have caused students to overthink the corrections rather than simply consult a reference, resulting in inaccuracies.

These studies suggest that, despite its promise, screencast feedback is not without its drawbacks. Students may not prefer screencasts because they make skimming and quick error correction more difficult (Elola and Oskoz, 2016). Students have also reported technical issues such as the drawback of needing to be online to access feedback (Harper *et al.*, 2015), being unable to download videos (Ali, 2016), and a need for better sound quality (Ali, 2016). Moreover, screencast feedback may cause some initial uncertainty for students. However, once they overcome this initial anxiety, students respond very positively to screencast feedback and its multimodal nature (Ali, 2016; Elola and Oskoz, 2016).

Future studies and developers should seek to learn from these insights, offer students access options and ensure better sound quality. At the same time, research needs to focus on the interrelationships between modal choices and options in screencast feedback, learner variables (e.g., proficiency), and feedback focus (e.g., error type).

Synchronous audio and audio-visual e-feedback

Studies on synchronous modes of second language writing e-feedback incorporating audio and video are scarce. By way of example, we will highlight one study for each mode in synchronous communication. These studies specifically mark the interactive, collaborative, and dialogic nature of synchronous audio and video e-feedback, while hinting at potential modal

overload on the side of the learners who have to divide their attention between the tutor's voice, facial expressions and their written output.

As regards synchronous audio e-feedback, Cho (2017) compared text chat and voice chat as supporting technologies in two consecutive collaborative summary writing tasks in Google Docs. Findings suggest that the mode of communication played an important mediating role in peer interaction. Voice-based chat appeared to promote more collaborative behaviour than text chat both in terms of amount of individual contributions and of communicative strategies. Using voice chat, students initiated a greater amount of decision-making episodes and took turns reading their work aloud during revision and editing. Students also preferred the voice chat mode for its interactive and instantaneous aspects.

Synchronous video-mediated e-feedback was the scope of a qualitative case study by Odo and Yi (2014) at a US university. They studied instructor-student Skype video conferences of three graduate students from Asia following written MS Word feedback. Skype feedback sessions involved video-conferencing, text messaging and screen sharing. The researchers noted that despite glitchy connections and some lag time, the synchronous medium allowed for dialogic feedback where students were able to clarify and negotiate feedback with the reviewer. This collaborative, immediate negotiation process helped learners feel more engaged and more personally attached to the work while maintaining a sense of agency. Learners commented positively on the ability to see the reviewers´ face, hear their voice, and interact with them while at the same time looking at their own paper. While the authors interpret these comments as an advantage of the tool in relation to its potential for multitasking, future research is need to further our understanding of learner perceptions of different modes in feedback via Skype calls.

The two studies described above testify that synchronous audio and video e-feedback can be applied successfully in collaborative and individual writing scenarios. With increasing interest in telecollaborative work, we hope to see more audio and video synchronous e-feedback in the future.

Looking ahead: An agenda for future work on multimodal e-feedback on second language writing

Multimodality and the increasing ubiquity of technology have diversified the possibilities for e-feedback in second language writing. While the potential benefits and suitability of multimodal e-feedback have been acknowledged, how to harness these affordances best for particular goals and learners is yet to be fully understood. Based on the review we presented in the previous section, we identify key areas in need of more research and

explore the potential for the development and design of electronic environments for the provision of multimodal feedback. Finally, we offer a word of caution regarding the practical considerations of putting multimodal e-feedback into practice.

Future research paths for multimodal e-feedback on writing

Our agenda for future research in the field of multimodal electronic feedback includes both suggestions for new topics to be explored and methodological suggestions on how to address these topics.

An agenda for future research topics

Our review revealed an imbalance in the representation of modes in research on e-feedback in second language writing. More specifically, research on synchronous feedback on writing has been inconclusive (in written mode), or scarce (in audio and video mode). Therefore, future research should continue to investigate differences between the amount and manner of feedback across various modes. Apart from this general imbalance, we have identified five key areas which need to be addressed to advance our understanding of multimodal e-feedback. These concern: (1) the impact of feedback providers´ and receivers´ background on the feedback process; (2) the impact of synchronous multimodal e-feedback in peer collaboration as part of a process-oriented approach to writing; (3) the impact of tool affordances on the feedback process; (4) affective contributions of multimodal e-feedback; and (5) the interaction of several modes in e-feedback.

Concerning the impact of feedback receivers´ background on the process, Li and Akahori (2008) highlighted the need to carefully consider learners' proficiency levels. However, there are many other learner variables that have been underrepresented or even overlooked thus far, such as learners' prior conceptions of and experiences with language learning and technology, making use of the technology-acceptance model that hitherto has informed mainly studies on automated scaffolding and feedback (see e.g., Roscoe, Wilson, Johnson, and Mayra, 2017). Moreover, learners often seek out multiple alternative sources of feedback beyond their instructors and classmates (F. Hyland, 2010; Séror, 2011). However, studies in second language writing are only just beginning to look at how technology offers learners a multitude of sources and modalities of feedback beyond the classroom, such as social question and answer portals that allow for quick interchanges about language related questions between non-native-speakers and non-expert (in terms of background in language instruction) native speakers.[6] This is an important area for exploration

because it might have implications for learner attitudes towards these sources and modes when utilized within the educational context. With students increasingly connected through technology, researchers could explore what sources of feedback students reach out to on their own. Likewise, since teacher beliefs and classroom practices influence student actions in peer feedback and attitudes towards technology (e.g., Chen and Cheng, 2008), multimodal e-feedback studies will also need to account for instructor variables, such as instructor experiences with and attitudes towards not only the specific tools but also technology in general, multimodal communication, and the modes of communication these technologies require users to engage with.

As the process-oriented approach to writing has gained momentum since the beginning of the 2000s, and along with it, peer reviewing and collaboration, it would be interesting to devote research to the role that multimodal e-feedback can play in it. On a general level, there is a noticeable lack of peer e-feedback studies that employ audio or video modes or non-linguistic visual modalities, such as colour, in combination with more traditional written feedback modes. Future research could, thus, examine how a combination of modes, e.g., review features and (video or audio) chat tools within or across online collaborative writing and communication platforms can be used to provide synchronous peer and instructor feedback. Within such contexts, the parallel use of the review features and text chat can also be exploited in terms of workflow organization. For instance, Strobl (2015) provides evidence for the beneficial effect of using the GoogleDocs comments and chat functions simultaneously for peer feedback in collaborative writing, where the comments function is used for suggestions directly related to the text, and the chat function is used for discussions concerning the workflow (e.g., who adds or deletes what). Research in this area might also inform new approaches to task design, which is another essential component for effective online learning. Although task design has been a focal point of research in online learning environments (e.g., Hampel, 2006), the impact of task design on feedback effectiveness is still an uncharted territory.

With regard to the impact of affordances of tools for the feedback process, it is important to identify how systems and interfaces affect the feedback provider´s ability to create effective feedback and feedback receivers to use it in meaningful ways. Practitioners who want to make a well-informed choice between different applications for a specific task or target skill need to know to what degree the design of the application can affect the quality of feedback and its uptake. An example of such a context-rich comparative study of several Web 2.0 applications for e-peer feedback is N. Canham's paper in this special issue.

The affective dimension of multimodal e-feedback is another under-explored area. Although an emerging group of studies (see, for example, C. Maas and K. Cunningham in this issue), and especially research on screencast feedback, have devoted attention to this aspect, studies on the affective impact of different feedback modes on second language writers are still rare. Further research is needed to identify the ways in which technology can be used to make feedback personal, and how writer-reviewer relationships affect the production and use of feedback in context.

Last but not least, we would like to point out the need for studies that disentangle the interaction between writing, speech, visuals, movement and other artefacts in how feedback is constructed and received. As we have shown in our review, studies that explore, compare and contrast multiple modes in e-feedback are still largely limited to how written and spoken language is employed either synchronously or asynchronously. We would like to see studies emerging that explore multimodal e-feedback on writing within a (social) semiotic lens which refuses a hierarchy of modes in meaning-making. Those studies might, for example, try to disassociate how pointing the cursor, audio commentary, images, digital handwriting, drawings, and diagrams, embedded videos, and metalinguistic error correction codes work together to provide meaningful feedback.

Innovative research methods

The recent wealth of empirical studies on electronic peer feedback has yet to fully consider the potential of multimodal e-feedback, instead focusing primarily on written language. On the other hand, studies investigating e-feedback provided by instructors (which has received significantly less attention compared to peer e-feedback within the last decade) have started to explore modal affordances through a growing, yet perhaps insufficient, interest in screencast feedback. This relative scarcity of feedback research with regard to modes other than writing might in part be the result of the ease of collecting written data as opposed to the complexity of collecting and analysing multimodal data. Practical and methodological issues in the collection and analysis of complex multimodal e-feedback will continue to be an area of innovation and learning that comes with challenges and opportunities.

In order to meet these challenges, Kirschner, Martens, and Strijbos (2004: 22) argue that 'mixed methods [research] (...) to trace and interpret the realization (or non-realization) of "designed" and emergent affordances can assist us in enhancing our designs for successful language learning mediated by technology'. Adopting their distinction between *perceived* and *perceptible* affordances to the field of multimodal e-feedback, it is important

to track the uptake of affordances of modes. Some affordances might not be perceived by the feedback giver and/or receiver, due to possible physical, logical or cultural constraints, e.g., learners or teachers being unaware of the synchronous chat function of Google Docs. It is equally possible that certain affordances of a mode emerge only during the interaction without having been consciously engineered by the tool designers or feedback providers, e.g., participants of a video-based e-tandem who resort to screen sharing to jointly resolve a writing problem. Therefore, it is essential to investigate not only the *designed* modal affordances of feedback tools, but also *emergent* affordances that materialize as they are enacted by feedback providers and perceived by feedback receivers.

Many lesser used technologies provide opportunities for the investigation of multimodal feedback such as keystroke logging, screen casting (with or without audio) and eye-tracking technologies. The first allows us to track all typed actions a user takes, while the second captures all on screen and audible actions of a user. These tools might offer insights into the processes of feedback provision or use (for a discussion on the potential of video screen recording for writing research and instruction, see e.g., Hamel and Séror, 2016). The final tool, eye-tracking, frequently used in reading research, is gaining momentum as an instrument to analyse noticing in online communication in language learning, including feedback (for an overview of related studies, see e.g., Michel and Smith, 2017). Future research on modality in feedback should make use of these technologies to deepen our understanding of the contribution of mode to the feedback process.

Another unclaimed potential is feedback tracking. While e-feedback allows for tracking of feedback and revision, this area has only just begun to be examined in research. Drawing on corpus linguistics, records of feedback can be archived and compiled over time to look for trends (e.g., how different feedback issues are addressed and when they tend to arise), uncover student needs and progress, or see feedback development. Perhaps large scale shared e-feedback corpora could allow for broader understandings, especially if multiple modes of feedback could be captured in a single system. Feedback tracking extends easily to time-based multimodal feedback, such as screencasts, where the parts of a video a student might be rewatching can be tracked. Similar to other modes, such tracking could offer insight into clarity of or engagement with feedback.

Future software development paths for multimodal feedback on writing

We see a promising software development path for speciality e-feedback systems. In our review, we pointed out the specific affordances of such tools

that are designed for effective feedback provision, both for instructors and learners. However, only a few studies have assessed specialized cloud-based feedback systems such as Markin and Emended. Future studies might consider how integration and simplicity could be brought to these systems in a way that would make them useful for both instructors and learners. How might such systems provide for fully integrated multimodal options that allow for the seamless combinations of audio, textual, and visual modes of feedback and which default options should be provided?

Moreover, speciality e-feedback systems can incorporate multimodal affordances for the teacher to endorse peer feedback and facilitate its uptake. Students often choose not to incorporate peer suggestions because of a tendency to veto feedback from their peers considering it to be inaccurate (C. Y.-H. Chang, 2016; Cote, 2014). If speciality feedback systems are designed to contain multimodal features, they might help overcome this challenge, as exemplified by Yusof *et al.* (2012). In his study, using Facebook with Malaysian students, the instructor 'liked' potentially useful peer comments before students revised their writing, and unsurprisingly instructor-marked peer feedback was successfully incorporated into students' revisions. In a similar vein, the 'Game of Writing' created at U Alberta,[7] makes use of 'likes' to gamify the feedback environment that targets the improvement of the participants´ academic writing skills through e-peer-feedback. Rooted in the conviction that only a good reader can become a good writer, this gamified application invites students to mutually review their work and gain points for quality and quantity of reviewing. These two examples show that, if such multimodal features are available, instructors can use technology to validate the credibility of peer e-feedback and impact on peer feedback uptake.

Speciality e-feedback systems also contain new affordances to help learners become more autonomous. These include integration of quick links to a familiar bank of student resources (Milton, 2006), built-in vocabulary lists and concordancers (Liou, 2010), and tools that cater for social interactional needs of the learners (Yang, 2010, 2012). Moreover, an intelligent (and cross-modal) amalgamation of human feedback with computer-based lookup (as a kind of semi-automated feedback) could further support learner autonomy and encourage learners to revise their text more successfully.[8] Tono, Satake, and Miura (2014) used instructor feedback on student writing to guide the use of corpus based tools which led to successful revisions. This kind of cross-modal feedback could be facilitated and semi-automatized by speciality systems.

In future work, we are likely to see more multilayered multimodal cross-platform integrated feedback systems. These might include layers of screencast, synchronous and asynchronous text, audio, video, human-generated

and computer-generated feedback that is personal, trackable, exportable, and accessible in a single integrated system. Such systems will allow us not only to create feedback in new ways but research its creation, use, effects and subsequent learning in new ways. We will need to ask how feedback creation and distribution systems can fit seamlessly in the learning space, incorporate what instructors and students need and not become overwhelming. As Killoran (2013) pointed out, in order for instructors to use new technology-mediated feedback tools, there is a need to *reduce* complexity while *increasing* traceability and observability of learner actions upon feedback.

A word of caution: Practical issues of multimodal e-feedback in the second language writing classroom

As a note of caution, we would like to emphasize that we do not intend to promote the universal acceptance and utilization of multimodal e-feedback for the teaching of second language writing. We acknowledge potential issues in relation to: (a) cognitive overload especially for beginner level learners (Stickler and Shi, 2013); (b) lack of competence or interest in technology (Arslan, 2014); (c) the need to be online to access feedback (Harper *et al.*, 2015) and persistent problems of internet connection and speed in some regions of the world; as well as (d) usability and accessibility issues some multimodal feedback options may present, such as the need for better sound quality (Ali, 2016).

Future studies should seek to learn from these insights, be sure to offer students access options and ensure good sound quality. Moving forward, research need not focus on *whether* to use multimodal e-feedback but *where, when*, and *how* to use it best in different contexts. Possible issues to be considered in this context are physical or learning disabilities of feedback providers or receivers, higher technological demands of modes in terms of equipment (such as webcams, noise cancelling microphones, software bandwidth), and device compatibility. The observed predominant reliance on text in peer review studies to date might be related to these practical concerns, as all students then need to be able to create feedback in the same mode. An important question is, how can multimodal feedback be brought into reach for students in different contexts? Therefore, large-scale adoption of multimodal speciality electronic systems will require careful consideration of issues such as slow connection speeds, accessibility, and multi-platform compatibility for use of the system on laptops, tablets, and mobile phones. With the continual expansion of technological access and the growing ubiquity of multimodal electronic communication, it seems likely that such demands will be seen as less of an issue in the future.

Institutionally sponsored multimodal-friendly integrated systems that can account for some of these concerns may be one way forward.

Second, pursuing multimodality in peer e-feedback is likely to introduce a number of affordance considerations yet to be fully understood. Next to technical issues like audio quality, studies might have to consider learners' listening and speaking skills, their comfort level, and how best to train learners to make good use of the affordances at hand. Yet it is also possible that some aspects of multimodality may come more naturally to students as they transfer skills from other areas of their lives, such as video chats with friends, to this new type of collaborative work. On a different note, the impact of anonymity in peer feedback also merits further attention, as some varieties of multimodal feedback, such as audio and video, can limit the opportunities for anonymous feedback, which has been observed to be more critical than non-anonymous feedback.

To exploit the affordances that new technologies and modes offer for e-feedback, learner-teacher competences and preferences need to be taken into account. Next to intuitive and user-friendly systems, this requires the design and delivery of learner-teacher training in most appropriate ways. The issue of training is therefore not limited to technical competences, but also extends to learner and instructor training in using multimodal e-feedback (e.g., F. Hyland, 2010). Such training can be pivotal, particularly in how students receive and provide multimodal e-feedback. The argument we would like to advance here is that language teachers and learners should have sufficient levels of competence and confidence in being able to select, adapt and utilize several modes for feedback provision as and when they are appropriate.

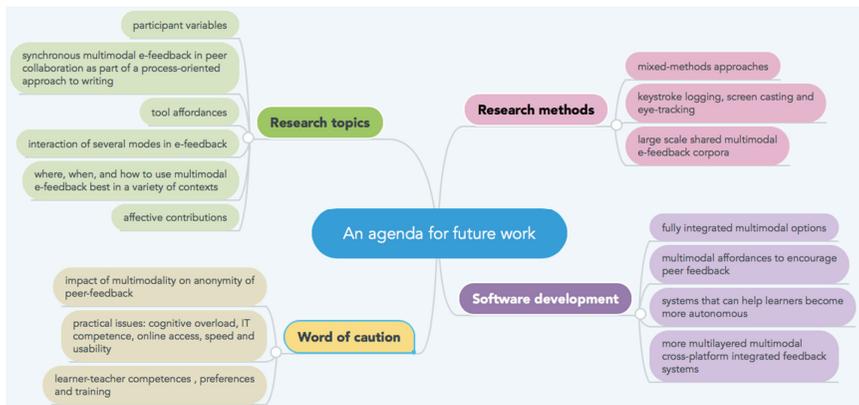We summarize the ideas put forth in this section in Figure 1.

Figure 1: An agenda for future work on multimodal e-feedback on second language writing

Conclusions

The narrative review of research presented in this essay shows that multimodal e-feedback has found its way into second language writing instruction. However, studies on written, asynchronous feedback still abound in comparison with other modes. The main thrust of this essay, therefore, is that the field of second language writing has yet to fully explore multimodality in e-feedback on writing within a (social) semiotic lens which refuses a hierarchy of modes in meaning-making. The current state of knowledge on multimodal e-feedback is still inconclusive with regard to the impact and efficiency of modes and affordances available in e-feedback.

Multimodal e-feedback on second language writing offers many different opportunities for future research. Research has continually shown that the activities and instructional purposes surrounding feedback can be at least as important as any other parameter in understanding how effective feedback can be. The use of a particular mode will have to be embedded in the writing classroom where instructional (e.g., objectives and demand), learner (e.g., learner needs, computer literacy, and comfort level with technology), instructor (e.g., attitudes, goals), and technology (e.g., affordances, access, and cost-effectiveness of the technology) variables are intertwined. Pedagogically and practically, these will influence the selection and use of e-feedback. Concerning research, this implies the need for more rigorous studies to fully understand how learner level, interaction design, feedback mode and technological affordances factor in improvement in second language writing. Studies that contribute to our understanding of multimodal e-feedback should therefore be process oriented, context rich, and ecologically valid.

It is important to recognize that multimodal e-feedback presents new principled approaches to feedback not constrained by or rooted in the affordances of only or mostly written language. As seen with screencast feedback, a different mode may, for instance, be able to offer feedback in a manner that avoids overwhelming students while still addressing a number of concerns. This means that ideas of best practices also need to change along with incorporation of multiple modes and should not rely on traditional feedback standards. However, as mentioned above, adding multiple mode options may add to the complexity of the feedback process and may have a daunting effect on feedback providers and receivers, which sometimes can even trigger lack of engagement. Thus, it is up to practitioners and researchers to identify the best ways to use multimodal e-feedback in their own contexts, stretching its potential in new ways while carefully considering instructional design and training for feedback providers and receivers.

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Notes

1   http://turnitin.com
2   https://canvas.instructure.com/login/canvas
3   Please see the editorial, this issue, for further elaboration of these terms.
4   https://www.cict.co.uk/markin/index.php.

5   http://emended.com/. This is the commercialized version of the tool *KungFu Writing* (Rybickia and Nieminena 2012)
6   See, for example, the forum discussions on the free multilingual dictionary project LEO, initiated at Munich University (TU München): www.leo.org
7   http://wac.ctl.ualberta.ca/en/research/gwrit.aspx
8   The recently released first version of Emended goes some way in this direction by facilitating the inclusion of links to dictionaries and additional grammar explanations.

References

AbuSeileek, A. and Abualsha'r, A. (2014). Using peer computer-mediated corrective feedback to support EFL learners' writing. *Language Learning & Technology* 18 (1): 76–95.

Ali, A. D. (2016). Effectiveness of using screencast feedback on EFL students' writing and perception. *English Language Teaching* 9 (8): 106–121. https://doi.org/10.5539/elt.v9n8p106

Arslan, R. S. (2014). Integrating feedback into prospective English language teachers' writing process via blogs and portfolios. *The Turkish Online Journal of Educational Technology* 13 (1): 121–150.

Aubrey, S. (2014). Students' attitudes towards the use of an online editing program in an EAP course. *University Review* 17: 45–55.

Bezemer, J. J. and Kress, G. R. (2016). *Multimodality, Learning and Communication: A Social Semiotic Frame.* Milton Park: Routledge.

Buyse, K. (2012). Effective writing tasks and feedback for the Internet Generation. *Language Learning in Higher Education* 1 (2): 377–398. https://doi.org/10.1515/cercles-2011-0028

Byrne, T. (2007). Marrying two existing software packages into an efficient online tutoring tool. *Computer Assisted Language Learning* 20 (5): 459–469. doi:10.1080/09588220701746039.

Cha, Y. J. (2008). Effects of online peer feedback using CMC instrument. *English Teaching* 64 (4): 1–24.

Cha, Y. J. (2014). Effects of blended peer feedback modes on learners' writing performance and perspectives. *Multimedia-Assisted Language Learning* 17 (2): 11–42.

Cha, Y. J. and Park, L. E. (2010). An analysis of synchronous interaction and its influence on EFL writers' revisions. *Multimedia-Assisted Language Learning* 13 (2): 9–36.

Chang, C.-F. (2009). Peer review through synchronous and asynchronous CMC modes: A case study in a Taiwanese college English writing course. *The JALTCALL Journal* 5 (1): 45–64.

Chang, C.-F. (2012). Peer review via three modes in an EFL writing course. *Computers and Composition* 29: 63–78. https://doi.org/10.1016/j.compcom.2012.01.001

Chang, C. Y.-H. (2016). Two decades of research in L2 peer review. *Journal of Writing Research* 8 (1): 81–117. https://doi.org/10.17239/jowr-2016.08.03.01

Chen, C.-F. and Cheng, W.-Y. E. (2008). Beyond the design of automated writing evaluation: Pedagogical practices and perceived learning effectiveness in EFL writing classes. *Language Learning & Technology* 12 (2): 94–112.

Chen, T. (2016). Technology-supported peer feedback in ESL/EFL writing classes: A research synthesis. *Computer Assisted Language Learning* 29: 365–97. https://doi.org/10.1080/09588221.2014.960942

Cho, H. (2017). Synchronous web-based collaborative writing: Factors mediating interaction among second-language writers. *Journal of Second Language Writing* 36: 37–51. https://doi.org/10.1016/j.jslw.2017.05.013

Ciftci, H. and Kocoglu, Z. (2012). Effects of peer e-feedback on Turkish EFL students' writing performance. *Journal of Educational Computing Research* 46: 61–84.

Cope, B. and Kalantzis, M. (2009). 'Multiliteracies': New literacies, new learning. *Pedagogies: An International Journal* 4 (3): 164–195.

Cote, R. A. (2014). Peer feedback in anonymous peer review in an EFL writing class in Spain. *Gist Education and Learning Research Journal* 9: 67–87.

Ducate, L. and Arnold, N. (2012). Computer-mediated feedback: Effectiveness and student perceptions of screen-casting software versus the comment function. In G. Kessler, A. Oskoz, and I. Elola (Eds) *Technology Across Writing Contexts and Tasks* (Vol. 10), 31–56. San Marcos, TX: CALICO.

Elola, I. and Oskoz, A. (2016). Supporting second language writing using multimodal feedback. *Foreign Language Annals* 49 (1): 58–74. https://doi.org/10.1111/flan.12183

Feak, C. B. and Swales, J. M. (2009). *Telling a Research Story: Writing a Literature Review*. Ann Arbor, MI: The University of Michigan Press.

Furnborough, C. and Truman, M. (2009). Adult beginner distance language learner perceptions and use of assignment feedback. *Distance Education* 30 (3): 399–418. https://doi.org/10.1080/01587910903236544

Ge, Z. (2011). Exploring e-learners' perceptions of net-based peer-reviewed English writing. *Computer-Supported Collaborative Learning* 6: 75–91. https://doi.org/10.1007/s11412-010-9103-7

Godwin-Jones, R. (2008). Web-writing 2.0: Enabling, documenting, and assessing writing online. *Language Learning & Technology* 12 (2): 7–13.

Guardado, M. and Shi, L. (2007). EFL students' experiences of online peer feedback. *Computers and Composition* 24: 443–461. https://doi.org/10.1016/j.compcom.2007.03.002

Hafner, C. A. (2014). Embedding digital literacies in English language teaching: Students' digital video projects as multimodal ensembles. *TESOL Quarterly* 48 (4): 655–685.

Hamel, M. J. and Séror, J. (2016) Video screen capture to document and scaffold the L2 writing process. In C. Caws and M. J. Hamel (Eds) *Language-Learner Computer Interactions: Theory, Methodology, and Applications,* 137–162. Amsterdam/Philadelphia: John Benjamins.

Hampel, R. and Stickler, U. (2012). The use of videoconferencing to support multimodal interaction in an online language classroom. *ReCALL*, 24: 116–137.

Harper, F., Green, H. and Fernandez-Toro, M. (2015). Using screencasts in the teaching of modern languages: Investigating the use of Jing® in feedback on written assignments. *The Language Learning Journal* 18 August: 1–18. https://doi.org/10.1080/09571736.2015.1061586

Ho, M.-C. (2015) The effects of face-to-face and computer-mediated peer review on EFL writers' comments and revisions. *Australian Journal of Educational Technology* 31 (1): 1–15.

Ho, M.-C. and Savignon, S. J. (2007). Face-to-face and computer mediated peer review in EFL writing. *CALICO Journal* 24: 269–290.

Hyland, F. (2010). Future directions in feedback on second language writing: Overview and research agenda. *International Journal of English Studies* 10 (2): 171–182.

Hyland, K. and Hyland, F. (2006). Feedback on second language students' writing. *Language Teaching* 39: 77–95. https://doi.org/10.1017/S0261444806003399

Jewitt, C. (2008). Multimodality and literacy in school classrooms. *Review of Research in Education* 31 (1): 241–267.

Jewitt, C. (2017). An introduction to multimodality. In C. Jewitt (Ed.) *The Routledge Handbook of Multimodal Analysis* (2nd ed.),14–27. London: Routledge.

Jewitt, C., Bezemer, J., and O'Halloran, K. (2016). *Introducing Multimodality.* Abingdon: Routledge.

Jin, L. and Zhu, W. (2010). Dynamic motives in ESL computer-mediated peer response. *Computers and Composition* 27 (4): 284–303. https://doi.org/10.1016/j.compcom.2010.09.001

Killoran, J. B. (2013). Reel-to-reel tapes, cassettes, and digital audio media: Reverberations from a half-century of recorded-audio response to student writing. *Computers and Composition* 30 (1): 37–49. https://doi.org/10.1016/j.compcom.2013.01.001

Kim, S. H. (2010). Revising the revision process with Google Docs: A classroom-based study of second language writing. In S. Kasten (Ed.) *Effective Second Language Writing.* Alexandria, VA: TESOL.

Kirschner, P. A., Martens, R. L. and Strijbos, J.-W. (2004). CSCL in higher education? A framework for designing multiple collaborative environments. In J.-W. Strijbos, P. Kirschner and R. L. Martens (Eds) *What We Know About CSCL: And Implementing it in Higher Education,* 3–30. Dordrecht, Kluwer Academic Publishers Group.

Kitchakarn, O. (2013). Peer feedback through blogs: An effective tool for improving students' writing abilities. *Turkish Online Journal of Distance Education* 14 (3): 152–164.

Kotska, I. and Maliborska, V. (2016). Using Turnitin to Provide Feedback on L2 Writers' Texts. *TESL-EJ: The Electronic Journal for English as a Second Language* 20 (2): 1–22.

Kress, G., and van Leeuwen, T. (2001). *Multimodal Discourse: The Modes and Media of Contemporary Communicatio*n. Oxford: Oxford University Press.

Li, K. and Akahori, K. (2008). Development and evaluation of a feedback support system with audio and playback strokes. *CALICO Journal* 26 (1): 91–107. https://doi.org/10.1558/cj.v26i1.91-107

Liang, M. Y. (2010). Using synchronous online peer response groups in EFL writing: Revision-related discourse. *Language Learning & Technology* 14: 45–64.

Lin, W. C., Huang, H. T., and Liou, H. C. (2013). The effects of text-based SCMC on SLA: A meta analysis. *Language Learning & Technology* 17 (2): 123–142.

Liou, H. C. (2010). A case study of web-based peer review for college English writing. *Curriculum & Instruction Quarterly* 13: 173–208.

McAlpine, L. (1989). Teacher-as-reader: Oral feedback on ESL student writing. *TESL Canada Journal* 7 (1): 62–67.

Michel, M. C. and Smith, B. (2017). Eye-tracking research in computer-mediated language learning. In S. Thorne and S. May (Eds) *Language, Education and Technology,* 1–12. Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-02328-1_34-1

Milton, J. (2006). Resource-rich web-based feedback: Helping learners become independent writers. In K. H. F. Hyland (Ed.) *Feedback in Second Language Writing: Contexts and Issues,* 123–137. New York: Cambridge University Press.

Morra, A. M. and Asis, M. I. (2009). The effect of audio and written teacher responses on EFL student revision. *Journal of College Reading and Learning* 39 (2): 68–82.

Narciss, S., Sosnovsky, S., Schnaubert, L., Andrès, E., Eichelmann, A., Goguadze, G., and Melis, E. (2014). Exploring feedback and student characteristics relevant for personalizing feedback strategies. *Computers & Education* 71: 56–76. https://doi.org/10.1016/j.compedu.2013.09.011

Odo, D. M. and Yi, Y. (2014). Engaging in computer-mediated feedback in academic writing: Voices from L2 doctoral students in TESOL. *English Teaching* 69 (3): 129–150. https://doi.org/10.15858/engtea.69.3.201409.129

Pennington, M. C. (2013). Trends in writing and technology. *Writing & Pedagogy* 5 (2): 155–179. https://doi.org/10.1558/wap.v5i2.155

Razi, S. (2016). Open and anonymous peer review in a digital online environment compared in academic writing context. In C. Goria, O. Speicher, and S. Stollhans (Eds) *Innovative Language Teaching and Learning at University: Enhancing Participation and Collaboration,* 49–56. Dublin: Research publishing.net. Retrieved on 14 December 2017 from https://reference.research-publishing.net/publication/chapters/978-1-908416-32-2/404.pdf

Roscoe, R. D., Wilson, J., Johnson, A. C., and Mayra, C. R. (2017). Presentation, expectations, and experience: Sources of student perceptions of automated writing evaluation. *Computers in Human Behavior* 70, 207–221.

Rybickia, J. M. and Nieminena, J. (2012). KungFu Writing, a new cloud-based feedback tool. In L. Bradley and S. Thouësny (Eds) *CALL: Using, Learning, Knowing,* 254–258. EUROCALL Conference, Gothenburg, Sweden, 22–25 August 2012, Proceedings. Research-publishing.net. https://doi.org/10.14705/rpnet.2012.000062

Sauro, S. (2011). SCMC for SLA: A research synthesis. *CALICO Journal 28* (2): 369–391. https://doi.org/10.11139/cj.28.2.369-391

Séror, J. (2011). Alternative sources of feedback and second language writing development in university content courses. *Canadian Journal of Applied Linguistics* 14 (1): 118–143.

Sert, O. (2017). Creating opportunities for L2 learning in a prediction activity. *System* 70: 14–25.

Shintani, N. (2016). The effects of computer-mediated synchronous and asynchronous direct corrective feedback on writing: A case study. *Computer Assisted Language Learning* 29 (3): 517–538. https://doi.org/10.1080/09588221.2014.993400

Shintani, N. and Aubrey, S. (2016). The effectiveness of synchronous and asynchronous written corrective feedback on grammatical accuracy in a computer-mediated environment. *The Modern Language Journal* 100: 296–319. https://doi.org/10.1111/modl.12317

So, L. and Lee, C. H. (2012). Peer feedback using blended learning in L2 writing at the university level. *English Teaching* 67 (3): 307–337.

Stickler, U. and Shi, L. (2013). Supporting Chinese speaking skills online. *System* 41 (1): 50–69.

Strobl, C. (2015). Learning to think and write together: Collaborative synthesis writing supported by a script and a video-based model. In T. Guasch and M. Deane (Eds) *Learning and Teaching Writing Online: Strategies for Success,* 69–95. Leiden: BRILL. https://doi.org/10.1163/9789004290846_006

Tono, Y.-Satake, Y., and Miura, A. (2014). The effects of using corpora on revision tasks in L2 writing with coded error feedback. *ReCALL* 26 (2), 147–162.

Ware, P. D. and Warschauer, M. (2006). Electronic feedback and second language writing. In K. Hyland and F. Hyland (Eds) *Feedback in Second Language Writing: Contexts and Issues,* 105–22. New York: Cambridge University Press.

Yang, Y.-F. (2010). Students' reflection on online self-correction and peer review to improve writing. *Computers & Education* 35: 1202–1210. https://doi.org/10.1016/j.compedu.2010.05.017

Yang, Y.-F. (2012). English text improvement through online interaction with peers. *Journal of Science and Technology, Humanity and Social Studies* 21 (2): 139–154.

Yusof, J., Manan, N. A. B. and Alias, A. (2012). Guided peer feedback on academic writing tasks using Facebook Notes: An exploratory study. *Procedia: Social and Behavioral Sciences* 67: 216–228. https://doi.org/10.1016/j.sbspro.2012.11.324

Ziegler, N. (2016). Synchronous computer-mediated communication and interaction: A meta-analysis. *Studies in Second Language Acquisition* 38 (3): 553–586. https://doi.org/10.1017/S027226311500025X