Article

Synthesizing Research on Learner Perceptions of CMC Use in EFL/ESL Writing

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Abstract

This study presents a synthesis of empirical research reporting on learners' perceptions about the effectiveness of CMC in EFL/ESL writing classes. Conducting a multi-stage systematic review, we analyzed 52 scholarly research articles published between 2000 and 2016. Our findings indicate that while learners perceive linguistic benefits from interacting with different interlocutors in mainly blog- and wiki-mediated writing activities, they also report challenges with respect to task demands and the quality of feedback. Learners perceive CMC-integrated writing to be authentic and interactive, thereby developing their motivation, autonomy, and identity as writers. Finally, the implications of this review and the directions for future research in the domain of CMC and EFL/ESL writing are discussed.

1. Introduction

Along with the increasing impact of computer-mediated communication (CMC) on how we communicate, second language (L2) learning and teaching is now mediated by various participatory technologies (H. Lin, 2015; Thorne, Sauro, & Smith, 2015; S. Wang & Vásquez, 2012). No longer confined to the classroom setting consisting mainly of created materials or teacher-moderated

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interactions (Brandl, 2002), L2 learners now interact with various audiences on a wide range of CMC platforms. In addition, they collaborate on pedagogical tasks using various CMC tools while being exposed to multimodal content (Chun, Kern, & Smith, 2016; Golonka, Bowles, Frank, Richardson, & Freynik, 2014; Rassaei, 2017).

Evolving from the "revising" era of word processing in the 1980s into the era of Web 1.0 of creating and retrieving information in the 1990s (T. Chen, 2016; Warschauer, 2010), the current Web 2.0 era of CMC not only enables learners to share information, but it also creates numerous opportunities for interaction. In addition to the asynchronous or time-delayed communication via blogs, wikis, email, and discussion forums, learners also communicate in synchronous or real-time environments, such as chat rooms and videoconferencing (e.g. Skype). In these participatory environments, L2 learners not only develop and practice their linguistic skills, but they also acquire various digital literacy skills, such as making connections between various texts, images, sounds, and links (Godwin-Jones, 2016; Hafner, Chik, & Jones, 2015).

In this state of affairs, understanding how learners perceive language learning mediated by technology-enhanced participatory environments is important for language educators. Even though there is extensive research on learner perceptions about the integration of CMC into language learning and teaching (e.g., Chao & Lo, 2011; Gleason & Suvorov, 2012), there is no synthesis of the published research reporting on learner perceptions about such integration. In light of Wesely's (2012) two-dimensional conceptualization of learner perceptions—i.e. (1) how learners see themselves and make sense of their own learning and (2) how they perceive the learning situation involving classroom variables, such teachers and peers—our review aims to explore what benefits learners perceive of the integration of different CMC tools into EFL/ESL writing, and what issues or challenges they report. Our focus on the perceptions of EFL/ESL learners is motivated by the increasing impact of CMC on English for Academic Purposes (EAP) contexts, particularly the role of CMC in creating new academic writing genres, tasks, and interactions (Kuteeva, 2011). The following questions guided our review:

1. What CMC technologies have been investigated in relation to learners' perceptions about the integration of these technologies into EFL/ESL writing?
2. What are the learners' profiles in research focusing on CMC and EFL/ESL writing? What are the findings of research reporting on learners' perceptions of the integration of CMC in EFL/ESL writing?

2. CMC and L2 Writing

A number of studies focusing on the overall effectiveness of CMC with respect to L2 performance or development reported findings relevant to L2 writing. In their systematic review of technology use in primary and secondary ESL contexts, Macaro, Handley and Walter (2012) found wikis to be the most commonly used technology in L2 writing. Rather than learners' attitudes towards the integration of technology into writing, they reported on the facilitative role of computer-assisted language learning (CALL) in writing with respect to critical thinking, stance expressing, and process writing. Focusing on the process of writing from an interaction perspective, T. Chen (2016) reported learner perceptions pertaining to comfort in providing comments in CMC interactions, flexibility in discourse and language use in electronic feedback, less dominance from teachers during interactions. She also reported that synchronous online communication was not conducive to detailed corrections and clarifications, but useful in getting immediate response from peers. Similarly, S. Wang and Vásquez (2012) found that blogging led to more comfort and confidence in writing in Spanish and improved performance in German with respect to grammar and vocabulary.

In addition to the process of writing and interaction in CMC, a few studies noted positive effects of CMC on L2 learners' writing competence. S. Wang and Vásquez (2012) found that wiki-based writing improved learners' editing and revising abilities. Similarly, Felix (2008) noted that CMC improved learners' revision strategies and increased their awareness of the degrees of formality in written language. Improved quality in writing through the use of blogs was also noted in Golonka et al.'s (2014) review, which also included learner perceptions about the benefits of using blogs. These were preferences for blogging over traditional journal or weekly essay writing, motivation associated with publishing writing online, and increased confidence in writing thanks to reading and commenting on blogs written by native speakers. Similar to S. Wang and Vásquez's (2012) findings, the use of wikis was found to increase students' motivation to edit and revise their in-class individual compositions.

Even though the above-mentioned studies provide useful insights about the process features of L2 writing in CMC environments, they encompass various language learning and teaching situations without a clear focus on specific learner groups or languages. In addition, most research on the effectiveness of CMC in language learning focused on performance outcomes relying on statistical effect sizes without a comprehensive account of what learners experience and perceive as gains or benefits as result of their engagement in CMC activities (e.g., Felix, 2005; 2008; Grgurović, Chapelle, & Shelley, 2013; Plonsky & Ziegler, 2016; Zhao, 2003). Given the growing importance of the

teaching of EAP in EFL/ESL contexts (Lee & Subtirelu, 2015), more focused reviews of research are needed to enhance our understanding of learner perceptions about developing an academic writing competence and L2 writer identity. Therefore, in this study we aim to make learner voices heard by synthesizing research focusing on learners' own perceptions of CMC use in EFL/ESL writing.

3. Method

This review focuses on empirical studies[1] reporting on EFL/ESL learner perceptions of CMC use in writing classes. The studies were retrieved from eight databases, namely Academic Search Premier, Education Full Text (EBSCO), Google Scholar, Web of Science, ERIC, JSTOR, PsychINFO, and Science Direct. The keywords used during the search were *CMC & EFL/ESL writing*, *technology & EFL/ESL writing*, *computer & EFL/ESL writing*, *blogs & EFL/ESL writing*, *wikis & EFL/ESL writing*, *chat & EFL/ESL writing*, *synchronous EFL/ESL writing*, *social networking sites & EFL/ESL writing*, *Facebook/Twitter & EFL/ESL writing*, *virtual learning environments & ESL/EFL writing*, *email & EFL/ESL writing* and *discussion boards & EFL/ESL writing*. For a study to be included in the review, it had to:

1. be published between 2000 and 2016[2] in a peer-reviewed journal;
2. be an empirical study;
3. focus on CMC and EFL/ESL writing;
4. report on learner perceptions about CMC use in EFL/ESL writing through self-report methodology[3].

Our search resulted in 52 empirical studies that met the above criteria. Table 1 displays the distribution of studies by the journals in which they were published. The analysis of the 52 studies involved a multi-stage process. Stage 1 involved the coding of the studies in light of our research questions. Specifically, we coded the studies based on the CMC technologies explored, the context of the studies (i.e., EFL or ESL), and the learner characteristics (i.e., nationality, academic background, and instructional contexts). Stage 2 involved the careful reading and summarizing of the main findings of the studies with respect to the self-report perceptions of learners about CMC use in EFL/ESL writing. In Stage 3, we conducted a content analysis on the summarized findings and identified the emerging themes. Finally, in Stage 4, to ensure the reliability and consistency of our coding, we compared and contrasted our findings and resolved the differences through careful deliberation. Below we report our findings and interpretations in response to our research questions.

Table 1
Distribution of Studies by Journal

Journal title	# of studies
Computer Assisted Language Learning	7
Computers and Composition	4
Australasian Journal of Educational Technology	3
System	2
Journal of Second Language Writing	2
English Language Teaching	2
Turkish Online Journal of Distance Education	3
Turkish Online Journal of Educational Technology	2
Educational Technology and Society	2
Procedia Social and Behavioral Sciences	2
English Language Teaching	5
Journal of Educational Computing Research, Journal of English for Academic Purposes, Computer-Supported Collaborative Learning, Interactive Learning Environments, International Journal of Academic Research, CALICO Journal, English for Specific Purposes, ELT Journal, TESOL Journal, European Journal of Open Distance and E-learning, Journal of Basic Writing, Journal of College Teaching and Learning, Language Learning and Technology, TESL-EJ, JALT CALL Journal, TEFLIN Journal, Language Culture and Curriculum, International Journal of English Linguistics	18*
TOTAL	52

*1 study from each journal

4.   Findings and Discussion

4.1. CMC Technologies Investigated

In order to answer research question 1 (RQ1), we counted the studies based on the type of CMC technology they explored. Of the 52 studies, 17 were blogs, 10 were wikis, 7 were chat, and 18 were other CMC platforms. Table 2[4] shows the distribution of these studies by the specific CMC platforms.

As can be seen, 34% of the studies explored learner perceptions in blogs, followed by wikis (20%). While these findings mirror S. Wang and Vásquez's (2012) study that revealed a more frequent use of blogs followed by wikis, Macaro et al. (2012) found wikis to be the most popular CMC in L2 writing studies.

In addition to blogs and wikis, other asynchronous CMC, such as virtual learning environments (VLEs) (e.g., Blackboard), email or social media (e.g.,

Table 2
Distribution of Studies by CMC Technology

CMC technology	Studies (N=52)	#	%
Blogs (e.g. Moodle, Vox, Weblog, Wordpress)	Aljumah (2012); Author 2 & Co-author (2012); K. T.-Z. Chen (2012); Hashemi & Najafi (2011); Kitchakarn (2012); Lakarnchua & Wasanasomsithi (2013); H. Lin (2015); M. H. Lin et al. (2013); M. H. Lin, Li, Hung, & Huang (2014); Liou & Peng (2009); Miyazoe & Anderson (2010); Nepomuceno (2011); Noytim (2010); Park & Cho (2014); Vurdien (2013); Wu, Petit, & Chen (2015); Zhang, Song, Shen, & Huang (2014).	17	34%
Wikis (e.g. Wikispaces, Weebly, Moodle)	Aydin & Yildiz (2014); Chao & Lo (2011); C. J. Chen et al. (2015); J. C. Chen & Brown (2012); Kuteeva (2011); Miyazoe & Anderson (2010); Y.-C. Wang (2015); Wichadee (2010); Wichadee (2013); Zou, Wang, & Xing (2016).	10	20%
Chat (e.g. MOO, Skype, text chat)	Adams, Alwi, & Newton (2015); Alwi, Adams, & Newton (2012); Chang (2012); Ho (2015); Liu & Sadler (2003); Yeh, Lo, & Huang (2011); Yen, Hou, & Chang (2015).	7	14%
Other CMC (e.g. VLE, email, discussion board, social media)	Bani-Hani, Abu Soph & Abu-Melhim (2014); Barrot (2016); Chang (2012); Cummings (2004); Hirvela (2007); Ho & Savignon (2007); Jose & Abidin (2016); Miyazoe & Anderson (2010); Razak & Saeed (2014); Razak & Saeed, (2015); Razak, Saeed, & Ahmad (2013); Rodliyah (2016); Shang (2007); Wichadee (2013); Yen et al. (2015); Yu (2014); Yunus, Salehi, & Chenzi (2012); Yusof, Ab Manan, & Alias (2012).	18	36%

Facebook) are also among the most commonly investigated CMC tools (36%) revealing learner perceptions. Our findings indicate that the majority of the studies (11 out of 18) focusing on social networking sites specifically explored learners' perceptions about using Facebook in L2 writing.

Even though chat has been widely used in CMC and L2 writing research, research that reports on learners' perceptions about it is limited compared to other CMC tools (14%). As reported in previous research, synchronous CMC research seems to focus more on oral fluency, specifically lexical richness and density, and grammatical knowledge and development (W.-C. Lin, Huang, & Liou, 2013; Ziegler, 2016).

4.2. Learner Profiles
The majority of the studies (47) in our review was conducted in EFL settings, whereas only a small sample (5) represents ESL learner perceptions about

CMC and L2 writing. In both EFL and ESL settings, the majority of the learners were non-English majors (e.g., business, engineering), followed by mainly English majors (e.g., translation, language teaching, literature) in the EFL settings (11). The sample predominantly consisted of Asian nationalities (67%), including Taiwanese (14), Thai (5), Japanese (2), Malaysian (4), Philippine (2), South Korean (1), Indonesian (1) and Chinese (1). Middle Eastern learners were the main participants in only 5 studies and they were Turkish, Iranian, Omani, Saudi, Jordanian, Yemeni, Algerian, Syrian, Sudanese, and Egyptian. Finally, with respect to study programs, the majority (77%) of the instructional contexts in both EFL and ESL settings consisted of undergraduate writing courses with mainly freshman and sophomore students, while the rest (33%) was English language programs.

4.3. Thematized Research Findings

We answer RQ3 by presenting the emerging themes from the content analysis of the findings of the 52 studies. The themes are *feelings* about CMC in L2 writing, learners' perceived *linguistic improvement* as a result of their engagement in CMC facilitated L2 writing activities, experiences with respect to various types of *interaction and feedback*, perceptions related to *authorship*, and *multimodality*. Finally, a number of *issues and challenges* that learners reported with respect to different aspects of their CMC experience are described and discussed.

4.3.1. Feelings about CMC

Several studies report that learners find blogs an enjoyable, fun, fresh, and interesting platform where they practice writing skills with increased responsibility, motivation, and confidence (Aljumah, 2012; Ciftci & Kocoglu, 2012; Kitchakarn, 2012; M. H. Lin, Groom, & Lin, 2013; Nepomuceno, 2011; Vurdien, 2013; Zhang et al., 2014). It appears that the interactive and innovative nature of blogs helps alleviate fear, stress, and pressure associated with traditional writing activities in face-to-face classroom contexts (K. T.-Z. Chen, 2012; Nepomuceno, 2011). Similar to the blog findings, learners seem to find wikis fun, interesting, and enjoyable (Anderson, 2010; C. J. Chen et al., 2015; Zou, Wang & Xing, 2016).

With respect to chat tools, learners find them fun and user-friendly (Liu & Sadler, 2003; Yeh et al., 2011), providing them an opportunity to express their opinions in a non-vocal manner (Ho, 2015). The integration of social media seems to make learners feel more comfortable in communicating with one another (Bani-Hani et al., 2014; Yen et al., 2015), less hesitant to give each other feedback (Chang, 2012) and less anxious and stressed in writing (Barrot, 2016). Learners feel that social media increases motivation and confidence in

writing (Yunus et al., 2012) and provides a supportive and friendly environment to communicate with others (Razak & Saeed, 2015). Discussion forums in virtual learning environments are perceived to provide flexibility, giving learners enough time to reflect on and express their ideas at their own pace (Razak & Saeed, 2015; Rodliyah, 2016) and develop relationships with others (Ho & Savignon, 2007; Miyazoe & Anderson, 2010; Razak et al., 2013).

4.3.2. Linguistic improvement

With respect to blogs, vocabulary learning appears to be one of the main perceived linguistic benefits (Aljumah, 2012; Hashemi & Najafi, 2011; M. H. Lin, 2015; Noytim, 2010; Vurdien, 2013). For example, learners report that reading others' blogs helps them pick up useful vocabulary words (M. H. Lin, 2015) and guess the meaning of unknown words (Aljumah, 2012). Areas of perceived writing improvement include understanding of topic, supporting, and concluding sentences (K. T.-Z. Chen, 2012); creative, analytical, and critical thinking skills (Noytim, 2010; Wu et al., 2015); and developing summary writing (Kitchakarn, 2012). In two studies, namely M. H. Lin et al. (2014) and M. H. Lin et al. (2013), the journaling aspect of blogs was highlighted by learners as a perceived benefit.

Learners also report linguistic benefits of using wikis in areas such as summary writing (Wichadee, 2010), process-based writing involving various stages (e.g., planning, drafting, peer-revising, and individual publishing) (Chao & Lo, 2011), individual and joint construction stages (C. J. Chen et al., 2015), translation skills (Miyazoe & Anderson, 2010), language use and content creation (Chao & Lo, 2011), and writing quality and accelerated task accomplishment (C. J. Chen et al., 2015; Wichadee, 2013). Learners also report less concern about using "perfect" English in writing (Chao & Lo, 2011), more desire to collaborate with peers for error corrections (Zou et al., 2016), more learning gains from peer contributions (Aydin & Yildiz, 2014), and increased motivation and confidence in their writing abilities (Wichadee, 2013).

In the chat domain, learners view CMC as providing an integrated skills approach to writing, specifically bringing together speaking and writing (Yen et al., 2015). In Adams et al. (2015), learners reported practicing high frequency words thanks to the speed of the text message exchanges. Similarly, Alwi et al. (2012) reported that learners were able to make sense of unknown vocabulary words by scrolling up on the chat screen when there was miscommunication and receive immediate corrective feedback.

Finally, the findings show that learners view virtual learning environments and social networking sites as spaces where they can brainstorm ideas at the pre-writing stage (Bani-Hani et al., 2014; Yunus et al., 2012) and raise their awareness in different opinions (Cummings, 2004). Improved reading

comprehension (Razak et al., 2013; Shang, 2007), editing skills (Yusof et al., 2012), creative thinking skills (Yunus et al., 2012), vocabulary and grammar (Shang, 2007), and increased ability to notice and correct mistakes (Bani-Hani et al., 2014; Ho & Savignon, 2007) are among the other beneficial aspects of these asynchronous tools.

4.3.3. Interaction and Feedback

Learners perceive blogs not only as a convenient tool to give and receive feedback (K. T.-Z. Chen 2012; Lakarnchua & Wasanasomsithi, 2013), but also a learning community in which they feel motivated to read and respond to their peers' writing and build relationships among each other (Liou & Peng, 2009; Noytim, 2010; Zhang et al., 2014).

M. H. Lin (2015) reports that even though learners appreciate getting feedback from native speakers, they were not always sure as to why they were corrected with respect to grammar forms. Additionally, learners seem to care who the feedback comes from. In Wu et al. (2015), learners indicate a preference for expert writers' feedback over novice peer writers and peers usually echo the writing style of experts. Similarly, M. H. Lin et al. (2013) highlight the "online mimicry" effect in blogs, meaning that learners view blog reading as an opportunity to notice and adopt the "good bits" from their peers into their writing. These findings indicate that blogging plays an important role in learners' conceptualization of writing in general and activates multiple skills, such as reading and evaluating, as well as writing.

Learners also perceive benefits from engaging in wiki-mediated collaborative writing as it enhances peer interaction and peer reviewing (Chao & Lo, 2011; Kuteeva, 2011; Zou et al., 2016). Collaboration in the form of providing contributions to writing is also a perceived benefit (C. J. Chen et al., 2015). Contributions to writing in wiki environments are perceived as more useful and authentic when they focus more on the communicative effectiveness of writing rather than the syntactic and lexical aspects (J. C. Chen & Brown, 2012) and when they are in the form of suggestion or advice (Wichadee, 2013). These findings indicate that learners seem to focus less on the formal aspects of writing in using wikis and what they seem to value is the opportunity to interact and collaborate with others.

In other asynchronous CMC environments, such as virtual learning environments, email, and discussion boards, learners perceive interaction and feedback provision to be more convenient. Chang (2012) reports that learners feel less hesitant to give "sharp" comments in asynchronous mode. Some learners believe that giving feedback to peers enhances their ability to self-edit their own work (Yusof et al., 2012) and monitor their own language production by observing and learning from their peers (Rodliyah, 2016; Shang, 2007),

thereby making peer feedback overall a valuable writing resource (Wichadee, 2013). Ho and Savignon (2007) attribute learners' perception of finding asynchronous mode to be less face-threatening to the fact that they do not have to confront their peers' reaction to the given feedback. That being said, the accessibility of asynchronous feedback is perceived to be advantageous by learners (Cummings, 2004; Hirvela, 2007).

4.2.4. Sense of authorship

Even though the impact of CMC on motivating learners to create an author identity has been previously noted (e.g., Pennington, 2003; Thorne et al., 2015), the present review unpacks how authorship is perceived by learners. Observed mainly in blog environments, the sense of authorship was mainly associated by learners with free writing and expression of self (Aljumah, 2012; K. T.-Z. Chen, 2012; M. H. Lin, 2015; Miyazoe & Anderson, 2010; Noytim, 2010). Another indicator of authorship is the audience awareness, which is strengthened by the existence of both peers and audience outside of the instructional setting. One example of this awareness is the development of network etiquette (netiquette), meaning that learners felt the need to assess or edit content before posting on their blogs (Nepomuceno, 2011; Aljumah, 2012). Another example is connecting to a wider audience (Lakarnchua & Wasanasomsithi, 2013; Nepomuceno, 2011) beyond the instructional context (Noytim, 2010; Park & Cho, 2014; Vurdien, 2013). This awareness was reflected in learners' self-reported attempts to adjust their writing process based on the needs and interests of the audience they thought they were writing for (J. C. Chen & Brown, 2012). Publishing essays as a "real" writer, as reported in Ciftci and Kocoglu (2012), further reinforces the authorship identity learners seem to develop in CMC environments. Finally, genre awareness as indicated by learners' identification of the differences between the format of traditional essays written in the classroom and the blog entries (Aljumah, 2012) further supports the idea that learners develop their agency as writers.

4.3.5. Multimodality

Learners' perceptions about CMC writing demonstrate different aspects of multimodality. For instance, for learners, using blogs involves not only writing essay entries but also making them look attractive with different choices of fonts, colors, graphics, templates, and video/audio files (Noytim, 2010). In this sense, learners seem to take into account the visual component of their writing that is likely motivated by their audience awareness. Learners view blogs as a 'toy' with amusing colors, convenience, freshness, and novelty on the outside (M. H. Lin et al., 2013). This suggests that writing on blogs incorporates

two modes of text, namely the actual writing and the artifacts that accompany writing, such as hyperlinks to external articles, photos, clips, and films (Aljumah, 2012), thereby revealing learners' creativity in using multimodal affordances to convey meaning. In wiki environments, learners seem to appreciate the affordance of being able to store various types of digital information (C. J. Chen et al., 2015) such as document files or images. Finally, juxtaposition of various types of texts, such as electronic drafts via chat, document sharing side by side, and synchronous feedback are among the advantages that learners perceive in terms of multimodality (Ho, 2015).

4.3.6. Issues and challenges

The findings of the reviewed studies revealed a number of issues that learners reported with respect to CMC use in writing. These issues pertain to feedback, technicalities, time commitment, and linguistic challenges.

With respect to feedback, some learners reported that not all feedback was useful for improving their writing skills (Aljumah, 2012; K. T.-Z. Chen, 2012; Wichadee, 2013, Yu, 2014). In Facebook groups, learners reported experiencing difficulties soliciting feedback from peers (Barrot, 2016). In Shang's (2007) study, learners felt that peers were not qualified enough to point out errors and suggest corrections. A few studies (M. H. Lin et al., 2014; M. H. Lin et al., 2013) reported that learners experienced linguistic difficulties with respect to grammar, vocabulary, and style of expression. Therefore, they may have expected more form-focused feedback from peers. Lack of regular updates on blog pages or Facebook groups and delay in responding to posts were among the other issues reported (Aljumah, 2012; Barrot, 2016; Ho & Savignon, 2007; Noytim, 2010; Shang, 2007; Zou et al., 2016). Even though this appears to be an issue at first, learners' desire to be read and receive feedback from other users in a timely manner indicates their full engagement in writing activities. Another concern was the lack of outside audience feedback (Lakarnchua & Wasanasomsithi, 2013). Some learners felt that they were only being read by their peers and not receiving attention from a wider audience, which they perceived as a limitation on this platform. As much as learners wanted feedback, they also reported their discomfort with derogatory comments and feedback from intolerable bloggers. They attributed this to the lack of a 'physical mentor' or moderator (K. T.-Z. Chen, 2012; Nepomuceno, 2011). In addition, some learners reported lack of confidence to post comments for peers fearing that they may be judged or criticized (Barrot, 2016). In the chat domain, one issue regarding feedback pertained to chat comments being superficial rather than substantial (Liu & Sadler, 2003), indicating that learners were not satisfied with the breadth and depth of the feedback they received during chat interactions.

The technical issues learners generally reported were related to internet access, connection, and speed (Barrot, 2016; Razak et al., 2013), format and readability issues on social media sites (Barrot, 2016), and immediate visibility of comments on blogs (Ciftci & Kocoglu, 2012; Lakarnchua & Wasanasomsithi, 2013; Noytim, 2010). Some learners resented not having enough time to finish projects and needed more class time (Aljumah, 2012; Hashemi & Najafi, 2011; M. H. Lin et al., 2013; Razak et al., 2013). Others felt burnout due to their hectic schedules and other commitments (Nepomuceno, 2011) and activities requiring a lot of time to complete (Chao & Lo, 2011; J. C. Chen & Brown, 2012).

5. Conclusions and Future Directions

In this paper we aimed to provide an overview of studies reporting on learner perceptions about the use of CMC technologies in EFL/ESL writing between 2000 and 2016. Consistent with previous research (Macaro et al., 2012; S. Wang & Vásquez, 2012), our findings indicate that blogs and wikis are the most popular CMC tools in the domain of EFL/ESL writing. Learners believe that asynchronous CMC facilitates a less face-threatening writing experience without spatial and temporal constraints. We believe that future research is needed to explore the affordances and constraints of different CMC tools focusing more on different language skills (e.g. writing, speaking).

Our review reveals important shifts in EFL/ESL in the changing dynamics of language learning and teaching in traditional and CMC environments. One shift pertains to learners' ability to differentiate between "real writing" as opposed to the traditional "in-class" writing practices, generally perceived as "display writing" (Brown & Lee, 2015; Golonka et al., 2014). In a similar vein, learners seem to move away from form-focused feedback in writing towards more process-oriented feedback, meaning that they value interacting and building relationships with peers and communicative effectiveness rather than linguistic accuracy (J. C. Chen & Brown, 2012). This transition also implies that CMC enables a shift in L2 writing instruction from teacher-centered approaches to more learner-centered writing practices (T. Chen, 2016).

Our findings encourage future research seeking answers to questions such as, "Do learners' favorable/unfavorable perceptions of achievement and individual differences such as motivation and anxiety impact their actual linguistic gains?" "If yes, how and to what extent?" In fact, Chuo (2007) showed that students' favorable attitudes towards web-based language learning does not guarantee improved language performance results. Therefore, as Golonka et al. (2014) point out, future research needs to establish clear links between learner (dis)satisfaction and enjoyment with technology and actual learning outcomes.

One major limitation in published research focusing on CMC in EFL/ESL writing pertains to learner samples in research designs. As described previously, most L2 writing studies in this review were conducted in EFL settings, representing mainly Asian learners of English. Therefore, the findings in our review should be interpreted with caution as they do not encompass a wide range of learner groups in different contexts. Therefore, future research should include a wide range of learner profiles from different educational settings to allow us to reach more inclusive and conclusive insights about learner perceptions.

Our review also has important implications for EAP instructors and learners. In light of the learner perceptions reported in this review, it appears that CMC provides numerous pedagogical opportunities for teachers to foster learners' critical thinking skills through interaction and collaboration, synthesizing skills through multimodal online content, and genre awareness as a result of exposure to various types written discourse. In addition, CMC helps learners develop new digital literacy skills and gain more autonomy (Chun, 2016). We hope that our findings will stimulate future research in the domain of L2 writing and CMC, specifically exploring the effects of multimodality and digital literacy skills on writing performance and assessing writing performance in light of peer interactions and contributions on various CMC platforms.

Notes

1.   Due to the empirical focus of this review, we did not include literature reviews, position papers, and conceptual review papers in this study.

2.   The search was completed in June 2016. Any studies published thereafter are not included in this review.

3.   Our review was not exclusive to studies reporting only on learner perceptions. Though some studies only reported learner perceptions about CMC use in EFL/ESL writing (e.g., K. T.-Z. Chen, 2012), the review also included other studies that reported the perceptions of learners as a result of an intervention focusing on either the process or performance outcomes of CMC integration into writing activities (e.g., Nepomuceno, 2011).

4.   Some studies appear in multiple rows as they utilized more than one CMC tool. For instance, Miyazoe and Anderson (2010) appear both in blogs and wikis as they studied the effectiveness of both tools.

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