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Over the last decade, Canada has witnessed a significant increase in the number of international students choosing to study at Canadian colleges and universities. According to the Canadian Bureau for International Education (2018), since 2010, there has been a 119 percent increase in the numbers of international students, with a 20 percent increase in 2017 alone. Currently, almost 500,000 international students attend Canadian colleges and universities, comprising approximately 11 percent of the total student population. A large number of international students come to academic institutions speaking first languages other than English. Faced with the challenges of now having to write in a language that is not their mother tongue, they are showing up on the doorsteps of writing centres (WCs) across the higher education landscape, seeking help with grammar, vocabulary, and academic register (Thonus, 1993,2014), thus compelling WCs to reevaluate how they provide service to this population (Williams, 2002).

With a recent call to consider WC tutors as³ E R W K V H F R Q G O D Q J X D J H Z U L W L V H F R Q G O D Q J X D J H W X W R U V ´ 6 there is a growing need to examine how written corrective feedback (WCF) is provided in the WC, particularly considering that corrective feedback has often been thoug 1 169.08 239.33 Tm 0 g 0 G [(ha)7(s)-6(oft)-13(e)7(n be)7(e)

on L2 OHDUQHUV¶ DELOLW\ WR XVH WKLV GDWD IRU WKH ODQJXDJH OHDUQLQJ SURFHVV

the practice, the consensus from more recent research is that written corrective feedback does have a significant effect on accuracy improvement in L2 writing (Russell and Spada, 2006; Storch, 2010; VanBeuningen, 2010; Bitchener & Ferris, 2011; Kang & Han, 2015). These positive findings have led to a growth in research into the role that computer-mediated communication (CMC) tools play in providing WCF (Lin, 2014, 2015; Sauro, 2011). At the same time, in order to meet ever increasing demands for access to service, WCs are turning to online tutoring services as a supplement to face-to-face sessions (Severino, Swenson, & Zhu, 2009). However, empirical investigation into the effect of online corrective feedback supplied by tutors within an WC context is almost non-existent.

The purpose of this literature review is to provide an overview of WCF research in relation to the provision of CMC feedback on L2 writing, from which I draw implications for the provision of WCF within an online WC context. I conclude by suggesting opportunities for future research.

Written Corrective Feedback

WCF refers to instances where L2 writers receive information indicating that their language production within a piece of text is ungrammatical (Bitchener & Ferris, 2012). Correction of a WHUW¶V FRQWHQW RU JUDPPDWLFDO]DWLRQ YRFDEXODU\

research. One of the key dimensions in this typology distinguishes between focused and unfocused feedback. Focused feedback targets specific language structures for correction, whereas, unfocused feedback addresses a comprehensive range of error categories. A second dimension differentiates between direct, or explicit, feedback and indirect, or implicit, corrective

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(Lin, 2014), however, attention directed towards the use of CMC tools to provide WCF has only recently begun. Defined as [3]

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Behaviour Abstracts (LLBA), Linguistics Abstracts Online, Scholars Portal, Education Resources Information Center (ERIC), Education Source, and JSTOR.

As I wanted to focus on current CMC technologies, I limited the literature search to a date range of the year 2000 to the present. The key words used to perform the search included various combinations of the following: second language (L2) writing, corrective/negative feedback/evidence, error correction, computer-mediated communication (CMC), online/asynchronous/synchronous, electronic or e-feedback, ESL/EFL, and writing centre/center. Search results returned previous meta-analyses in computer-mediated communication and second language acquisition (Ng & Han, 2015; Lin, Huang, & Liou, 2013; Lin, 2014, 2015; Sauro, 2011). I analyzed the references from these meta-analyses to identify additional sources of potential studies.

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Because of the breadth of research in the area of language learning and technology, I chose to narrowly focus this review on experimental studies that addressed CMC and WCF on L2 writing in a post-secondary setting. Participants in the studies needed to be either ESL or EFL students. Although case studies face limitations due to their lack of representation and generalizability, I chose to include the case studies in this review because of their complex and rich portrait of L2 writing development and the impact of CMC feedback on that development (Shintani, 2016), and

contributions to WCF research, and introduces concerns of publication bias, a comprehensi
analysis of the literature was out of scope for this review. Studies investigating the use of CMC
to provide error correction in collaborative writing and interactional studies were excluded,
primarily because they tend to focus on peer feedback or on conversations between teacher and
student in a face-to-face environment. Studies, such as Shang (2017), which examined students
conducting self-error editing using a synchronous interface providing corrections in the were
not included due to the similarity with computer-mediated language correction tools and
automated writing evaluation software. We also chose to exclude studies on computer-assisted
language learning courses, CMC oral feedback, and class-based online language exchanges and
telecollaborations. Other studies were excluded because the primary research focus was on
student/teacher perceptions of and attitudes toward CMC.

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Source of Feedback

The current body of research on WCF using CMC tools in a tutoring environment is limited. Within the date range limiting this review, only four studies on electronically-provided tutor feedback were found in the literature: one empirical study, two case studies, and one data analysis study. Discussion of these four studies follows.

Sauro (2009) investigated the immediate and sustained effects of two different types of direct feedback: metalinguistic feedback and recasts. The focus was limited to the English zero article with abstract noncount nouns. 23 first year undergraduate Swedish students took part in the study, completing two writing tasks while receiving SCMC feedback from English L1 graduate student tutors using the Virtual Classroom chat system on the learning management system, Blackboard. The metalinguistic condition was provided direct feedback and incorporated meta-language into the description of what was to be corrected. The recast condition was provided with a correctly formulated version of the erroneous statement, without explicit error identification. The control condition was given content statements only. Participants in the metalinguistic condition demonstrated a mean gain in accuracy scores in the immediate post-test, although scores dipped slightly on the delayed post-test. Participants in the recast condition showed an increase in scores from the immediate post-test to the delayed post-test. There was a lack of improvement for the control group. Both recasts and metalinguistic feedback delivered through SCMC were found to be helpful in noticing and recalling previously known items, although neither type was significantly more effective than the other, either immediately or over time.

services in the WC. 6HHNLQJ WR XQGHUVWDQG WKH H[WHQW WR ZKL
short- and long-term L2 writing development, draft-to-revision analyses were performed on texts
provided to the WC over the course of two years. ACMC tutor-provided marginal and in-text
comments were analyzed to determine error type: direct correction, which also included
questions, suggestions, or options; indirect correction, involving an indication that an error
existed; and metalinguistic, in which an explanation was provided. An unfocused approach was
taken, with comments coded as Rhetoric, Syntax, Expression, Lexis, Grammar, or Mechani
The researchers found that 88 percent of marginal comments reflected linguistic errors.
$OWKRXJK VXFFHVVIXO UHYLVLRQ RI HUURUV GRHV QRW SU
overwhelmingly successful uptake of 76 percent of tutor feedback is indicative of at least some
short-term learning. Issues at the discourse level of Grammar were responsive to direct
correction, whereas direct error correction was less likely to have an influence on problems of
Syntax or Rhetoric.

Type of Corrective Feedback

As evident from the previous four studies, DQJ + DQ¶V -analysis method that
far more studies of error correction investigate direct, as compared to indirect, feedback.
Advocates of direct correction argue that this type of corrective feedback leads to a minimization
of risk for L2 learners unable to accurately correct their own errors (Bitchener & Knoch, 2009;
Chandler, 2003). They suggest that direct error correction is particularly applicable for lower-
proficiency level students who do not yet have sufficient linguistic knowledge to self-correct
(Bitchener & Ferris, 2012). The following five studies describe some aspect of direct corrective
feedback.

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Two studies opted to compare unfocused, direct corrective feedback on grammatical errors with ACMC, using Microsoft Word, against feedback provided using a conventional red pen and paper approach. Yoke

provided through a free punctuation and spell checker software program called Ginger, or a metalinguistic correction group in which feedback was provided through a Windows program called Markin4, which allowed researchers to insert corrective comments. Findings indicated

idea formation and content, and so, students find this type of feedback more challenging to implement. Analysis of feedback revealed that, while indirect feedback was provided, there was a considerable preference by the teachers for direct feedback, including metalinguistic explanations of rules and suggestions for correct usage, aimed at content and organizational concerns, with less focus on grammatical errors. The highest rate of successful uptake, at 75 percent, however, was in response to direct feedback on grammar.

Synchronous and Asynchronous CMC

While the nine other studies in this review used either SCMC or ACMC, the following three studies chose to compare the different CMC tools in the provision of CMC feedback in order to shed light on whether SCMC or ACMC was more effective. These researchers measured the effectiveness of feedback as indicated by uptake scores, and the impact of timing of feedback on accuracy.

In (QH 8SWRQ¶V 64 participants were selected from 12 students enrolled in either a basic/developmental level course, or a university required first year composition course. Participants in both courses completed three essays each. For the ACMC condition, SDUWLFLSDQWV VXEPLWWHG GUDIWV via Writing Course Management System. Three teachers with advanced TESOL degrees downloaded the drafts in Microsoft Word, used Track Changes to provide primarily direct corrective feedback, and then returned the corrections to the participants for inclusion in the fin 0 g 0 Os 35 Tm 0 g 0 Gcones in ic1FMCID 1/Lang

uptake. A limitation of their study, however, is that the SCMC was not truly synchronous; participants had completed their writing and engaged in the chat only as a revision activity invalidating the distinction between SCMC and ACMC feedback. As a result, participants in the Ene and Upton (2018) study did not accrue the same benefits of consolidation and of scaffolding of writing development towards self-correction as did the L2 writers receiving SCMC in Shintani and Aubrey (2016) and Shintani (2016). On the other hand, these latter researchers narrowly focused their studies on a single linguistic category, and so the amount of feedback was relatively limited. Also, this narrow focus raises the question of the ability to extend the findings to other linguistic structures. The results of these three studies, however, do yield consensus that both computer-mediated feedback conditions lead to successful uptake of corrections, and both conditions provide opportunities for noticing linguistic forms that L2 writers can use to begin to self-correct.

Table 2, in the Tables section at the end of this review, summarizes the research aim, source of feedback, the CMC tool, the type of feedback, the focus of feedback and any associated target structures, and main findings for all 12 studies.

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Two themes with implications for WCs arise from the review of these studies: (1) effectiveness of CMC provided corrective feedback, and (2) learner uptake as a result of noticing.

$V 6HYHULQR 'HLIHOO g feedback, Rewer face-to-face or online, is RQH RI WKH SULPDU\ IXQFWLRQV With the exception of one study (Severino & Prim, 2015), which only analyzed the type of feedback provided and did not address the question of uptake, the remaining studies in this review all found at least short-term



review studies are evidence in support of F K P L G W ¶ Noticing Hypothesis, which claims that second language acquisition occurs through a process of becoming consciously aware of, intentionally noticing, and paying close attention to relevant linguistic data. As Spada (2011) notes in her examination of the benefits of form-focused instruction, the best way to help L2 learners ¶ O D Q J X D J H is D F T X L V L W L R Q by first helping them to notice the error, and second, encouraging them to repair the error.

A limitation of many of the studies in this narrative review is that they tended to examine the extent of uptake only as quantified by revisions; researchers did not investigate the use of the target structure in new pieces of writing, a criticism that has been made against previous WCF research (Bitchner & Ferris, 2012). Results would have been more robust had there been an opportunity to study the lasting effect of WCF as provided through ACMC or SCMC using a free-writing activity rather than just a controlled one. Furthermore, the relatively limited amount of WCF provided in some cases makes it difficult to make judgements about long-term consolidation of the corrected form. These two limitations present particular challenges for WCs because the tutor-L2 writer interaction often only involves one instance of writing; the tutor rarely sees revised work, and so, is unable to make determinations about the success of uptake. Tutor confidence in the effectiveness of online WCF resulting in uptake will only develop from robust experimental research that is able to identify affordances for the WC. Finally, within the WC context, more longitudinal case studies, such as that by Severino and Prim (2016) are necessary to determine the sustained effects of CMC feedback on L2 writing, and to examine the conflicts in perspectives between tutors and L2 writers regarding the provision of CMC feedback.

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With technology changing at a rapid pace, new visual tools and cloud data storage are offering support for the affordances provided by CMC feedback. Spor (2012) speaks of his struggles as a writing instructor to realize the potential of providing clear and precise feedback to L2 writers in an efficient and effective manner until he began using the CMC tool, screencasting, to provide feedback. In the area of writing, screencasting involves creating a video that captures

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1. There is much discussion over the binary terminology of native vs. non-native English users (Corcoran, Gagné, & McIntosh, 2017), particularly in light of considering who constitutes a native user. For the sake of brevity, I refer to those for whom English is not their first language as L2 students/learners/writers, although these individuals may have a plurality of languages of which English may perhaps be a third or fourth language. This conceptualization of the English L2 student is somewhat problematic because it does not differentiate between international or immigrant learners from non-English speaking countries, Generation 1.5 learners, and speakers of a World English variety; the assumption is that L2 students are a uniform group, which is not the case (Williams, 2002; Williams & Severino, 2004; Thonus, 2014).

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7 D E O H V

Table 2

Empirical studies examining the effectiveness of CMC in providing written corrective feedback to L2 writers

Author/s	Participants	Research Aim	Source of Feedback	CMC Tool	Feedback Type	Scope and Target Structure	Main Finding
Ene & Upton (2014)	12 undergraduate students - ESL	Types of e-feedback and effect on successful uptake	Teacher	Asynchronous -MS Word	Direct Indirect Meta-linguistic	Unfocused - organization of ideas, grammar, vocabulary, mechanics, writing process	Teacher e-feedback was overwhelmingly direct, with focus primarily on content, organization, and subsequently, on gramm Rate of successful uptake was high, particularly with corrections on grammar.
Ene& Upton (2018)	64 students in basic developmental writing course, and 1st year university composition course -ESL	Use, effectiveness, and perceptions of e					

							neither is superior, but rather, are complementary.
Severino & Prim (2015)	40 Chinese texts submitted to the WC - ESL	Word choice errors and tutor corrective response	Tutor	Asynchronous - MS Word	Direct Indirect Meta-linguistic	Focused - vocabulary	RI WXWRUV¶ FRUUHFWL word choice errors, and the majority of thos errors arose due to difficulties with the semantic features of English; direct corrections were the most common type of error correction
Severino & Prim (2016)	1 (case study) Chinese student (graduated) - ESL	Influence of online tutor feedback on short- and long					