Tracing EFL writers' digital literacy practices in asynchronous communication: A multiple-case study

1. Introduction

As learners' personal, social, and academic lives are heavily mediated by technologies, writing instructors are increasingly called upon to rethink our curricula and pedagogies in light of learners' digital literacy practices and needs (Elola & Oskoz, 2017; Hafner, Chik, & Jones, 2013, 2015; Kern, 2014). To enable learners to learn, work, and communicate in digital environments, the goal and scope of EFL writing pedagogies need to be broadened to include digital literacies—"reading and writing on electronic devices and the Internet" (Ware, Kern, & Warschauer, 2016, p. 307). Research has shown that inclusion of digital practices in a language classroom can prepare students for their digitally mediated world, connect with their out-of-class literacy practices, and empower and engage them in formal instruction (Selfe, 2007). Hafner (2019) summarizes four ways of incorporating digital literacies into formal language education: (1) "structured participation in online affinity spaces," (2) "embedding digital literacies within the curriculum," (3) "digital multimodal composing projects" and (4) telecollaboration projects (i.e. engaging geographically dispersed learners in online interaction and collaboration) (p. 12). Of these four types of pedagogical endeavors, learners' digital literacies in telecollaboration projects are relatively under-researched, as existing telecollaboration studies have tended to focus on learners' acquisition of language forms and intercultural communication skills (Guth & Helm, 2012; Wu, 2018a). To address this gap, this study traces Chinese EFL writers' on-screen and behind-the-scenes digital literacy practices in a Sino-US telecollaborative forum. The forum is chosen as a research site for three reasons. First, asynchronous communication allows sufficient time for EFL learners to read a post, consult resources, and design a reply (Helm, 2015). They can mobilize a wealth of resources for reading, thinking, writing, and communicating, thereby providing rich accounts of "the *process* of meaning making and learning with the technology" (Chun, Kern, & Smith, 2016, p. 77, original emphasis). Second, as text production and reception are typically separated in an asynchronous forum, EFL learners are presented with opportunities and challenges to become "writerly readers" (Hirvela, 2004). That is, learners not only read for key messages, but also attend to rhetorical choices that writers have made vis-à-vis other options (Cheng, 2008). Third, the forum creates rhetorical exigence for learners to make "writerly choices" (Lunsford & Ede, 2009) based on their imagination and interpretation of interactional dynamics (Wu, 2018b) and meaning-making resources available to them. With these learning potentials, the asynchronous forum is an interesting site to understand how EFL writers leverage, modify, and extend their repertoires of digital literacies in response to learning and communication needs in virtual exchange.

2. Conceptualizing digital literacies

2.1 An ecological metaphor

Literacy was once defined as the ability to read and write print texts. This view saw literacy as cognitive skills residing in people's heads, while disregarding sociocultural factors that might shape reading and writing practices (Barton, 2007; Gee, 2015). Therefore, researchers have suggested using the plural form "literacies" to highlight the multiplicity of literacy practices that cannot be reduced to a monolithic cognitive quality (Gee, 2015). The plural form shifts the focus from the denotative meaning of "reading and writing" as autonomous, cognitive skills to the connotative meaning of "reading and writing" as sense-making and meaning-making practices that "take many different forms" in response to local demands emergent from "different social contexts" (Ware et al., 2016, p. 307). This is particularly true for digital literacies when reading and writing practices are mediated by a variety of technologies (e.g. email, Twitter, and wikis). Given the diversity of (digital) literacies, researchers have used an ecological metaphor to conceptualize the relations between and within literacy practices (Barton, 2007; Kern, 2014; 2015). It posits that literacy practices are undergirded by a web of relations between and among individuals, material/symbolic resources, and contexts (Kern, 2015; van Lier, 2004). The ecological metaphor is relevant in this study, as it takes relations as the focus of analysis (Kern, 2015), allowing us to discern and disentangle the complex relations embedded in EFL writers' digital literacy practices. Two types of relations are of particular interest in this study: contextual and mediational.

2.2 Contextual relations

From an ecological perspective, researchers have explored contextual relations of literacy practices by tracing various connections among practices enacted in different contexts (Wardle & Roozen, 2012). For instance, Yi (2010) traced a Korean student's writing practices across in-school and out-of-school contexts and found that these practices were interconnected and mutually informing. The student's personal diary writing provided resources for the content and the design of her course assignments, while in-school writing shaped the topics of her personal writing. In a recent study, Rothoni (2018) followed Greek adolescents' English literacy practices in and out of school and described the fuzzy boundaries between these practices. Vernacular literacies (e.g. Greeklish and lyrics of English songs) seeped into the school context as resources for the adolescents to express boredom during lessons, share their interests in pop culture, and construct their youthful identities. Reciprocally, school-valued practices (e.g. looking up unknown words in dictionaries) found their way into the adolescents' personal life.

Collectively, these and other similar studies have demonstrated the fluidity and hybridity of literacy practices that cannot be strictly tied to a particular context (Barton & Lee, 2013). When we use the labels of home/school literacies, vernacular/standard literacies, and online/offline literacies, we may perpetuate the presumed distinctions between various forms of literacies that are not necessarily separated by learners in the same way (Lammers, 2016). Therefore, it is important for us to see from learners' perspectives and trace how literacy practices in the context of use are intricately linked to practices in various contexts. To understand these contextual relations, the notion of "adaptive transfer" is useful. Adaptive transfer refers to a writer's "conscious or intuitive process of applying or reshaping [literacy practices] in order to … negotiate new and

potentially unfamiliar writing situations" (DePalma & Ringer, 2011, p. 135). Previous studies have traced how English L1 writers reused and reshaped genre knowledge, rhetorical awareness, visual practices, and self-sponsored writing practices in the processes of print-based and digital composition (DePalma, 2015; Reiff & Bawarshi, 2011; Roozen, 2010). These adaptive transfers demonstrated that English L1 writers were resourceful and agentive in mobilizing literacy practices that cut across different contexts. Recent studies discovered that EFL students were also able to link literacies and reshape practices to fit their writing tasks (Rinnert et al., 2015; Wilson & Soblo, 2020). While enlightening, these studies centered on EFL writers' print-based composition. It would be interesting to understand how practices are taken up, relocated, and appropriated by EFL writers in a digital environment. As such, this study examines the actual meaning-making process whereby students reuse and reshape prior and/or concurrent practices in a telecollaboration project, an important site of developing students' digital literacies (Hafner, 2019; Wu, 2018a).

2.3 Mediational relations

In the 21st century, literacy practices are increasingly mediated by technologies. Research has shown that technologies, like languages, are not neutral but "carry with them historical traces of usage, preferred and dispreferred uses, and expectations of genre-specific communicative activity" (Thorne, 2013, p. 199). For instance, in Thorne's (2003) telecollaboration project, the focal American and French students held different beliefs about a communication medium (i.e. email). The American students used email in their daily life to maintain social relationships, while the French students limited their use of email to educational purposes. As their perceived affordances of emails varied, their language styles in email communication also varied (emotional versus informational). While this study and similar others (e.g. Thorne & Black, 2007) have offered valuable insights into cultural differences and preferences of using communication tools, they have tended to downplay (if not disregard) the importance of individual agency and creativity when learners use these tools (Kern, 2015). By contrast, an ecological view of mediation underlies the human-environment relation, whereby a resource (material or symbolic) is not perceived "as it is" but "as it is to me" (van Lier, 2004, p. 91). To be literate entails one's ability to perceive and actualize the affordances (or action possibilities) of resources at one's disposal. An ecological view further contends that how the mediation plays out is co-determined by an interplay of material, social, and individual factors (Kern, 2015). In other words, the materiality of resources, social conventions of using the resources, and individual interpretation of the context of use all feed into the mediation process. An emergent but still small body of research (e.g. Li & Kim, 2016; Smith, Pacheco, & de Almeida, 2017; Wu, 2018b) has begun to trace EFL writers' digital composing processes. However, relatively little is known about individual differences, perceptions, and decision making in EFL writers' appropriation of resources as the meaning-making processes unfold. More research is needed to understand how individual EFL writers perceive and act upon affordances emerging from the clash or convergence of material, social, and individual factors in digital environments.

In sum, this study extends previous research on learners' digital literacies (Elola & Oskoz, 2017; Hafner, 2015, 2019; Smith et al., 2017) by examining the contextual and

mediational relations of EFL writers' sense-making and meaning-making practices in an asynchronous telecollaboration project. Specifically, this study was guided by three research questions:

1. To what extent and how did EFL writers reuse and reshape literacy practices in asynchronous communication?
2. What mediational resources were taken up by EFL writers and how did these resources mediate their digital literacy practices?
3. What were possible factors that shaped EFL writers' digital literacy practices?

3. The study

3.1 Context and participants

The present study was part of a larger project that traced Chinese EFL learners' digital literacy practices in a Sino-US telecollaborative forum. The Chinese participants were enrolled in an *English Writing* course in their first-year undergraduate program in China. They worked with American students (enrolled in a *Rhetoric: East Meets West* course) from a partner university in the United States. The 7-week telecollaboration project was carried out in three stages (see Table 1). In the first stage (Preparation), all the students watched one Chinese movie (*And the Spring Comes*) and one American movie (*Mona Lisa Smile*). Both movies featured the growth of a female teacher, but differed in the sociocultural constraints imposed on the protagonists (e.g. household registration system in the Chinese movie vs. rigid female roles in the American movie). As such, the movies provided topical commonalities and sociocultural particularities as points of discussion. The students were required to individually draft one 500-word English essay comparing the two movies. In the second stage (Exchange), each student was randomly assigned two intercultural partners. Working in intercultural groups, they posted their essays in an asynchronous forum (built by a technician from the U.S. using phpBB) and exchanged essay comments in English. They were also encouraged to discuss sociocultural issues of their choice (e.g. women's roles in families and societies). They were instructed to write at least four posts for each intercultural partner, but no minimum word count was required. The Chinese participants were also asked to keep learning diaries throughout the interaction (more on this in Section 3.2). In the third stage (Reflection), all the students revised their movie essays and posted their final drafts on the forum. The Chinese participants also took process-tracing interviews to reflect on their performance (more on this in Section 3.2). After the virtual exchange, a colleague (with 10 years' experience in the telecollaboration project) and I graded the Chinese participants' on-screen engagement based on four criteria (adapted from Nandi et al. [2012])—interaction flow, asking specific questions, offering specific answers, and justifying claims with evidence. We then met and discussed the grading results until consensuses were reached.

Table 1
Procedure of the telecollaboration project

Stages	Items	Remarks
1. Preparation (Week 1)	Movie comparison essay	About 500 English words
2. Exchange (Weeks 2-4)	Forum posts	Minimum four posts for each intercultural partner; no word limit
	Learning diaries	For the Chinese participants only
3. Reflection (Weeks 5-7)	Revised movie essay	About 500 English words
	Process-tracing interview	For the Chinese participants only

This article focuses on three cases of Lee, Tam, and Wong (all pseudonyms). They were selected because they displayed varying levels of on-screen engagement on both quantitative and qualitative measures (see the second, third, and fourth columns in Table 2), although they had a similar level of English proficiency (B2 of CEFR). It would be interesting to know what happened behind the scenes/screens and how the participants differed in their enactment of practices and deployment of mediational resources. Thus, the multiple cases provide strong, meaningful contrasts in terms of the participants' processes, products, and perceptions relative to their digital literacy practices during the virtual exchange.

Table 2
Profile of the participants

Participant	Number of posts	Number of words	Level of on-screen engagement	Diary	Interview
Lee	11	3,132	Exceeding expectation	4,845 words	1 hour and 59 minutes
Tam	9	2,314	Meeting expectation	6,675 words	1 hour and 58 minutes
Wong	9	1,401	Below expectation	5,545 words	2 hours and 24 minutes

3.2 Data collection

The data sources included the participants' postings, learning diaries, and process-tracing interviews (see Table 2). During the telecollaboration, the participants were asked to keep learning diaries, using a three-part template. In the first part (Observation), the participants described the actions they took and resources they used when reading and writing a post. In the second part (Reflection), they critically analyzed the efficacy of the actions and resources leading up to their asynchronous interaction. In the third part (Implication), they summarized what they had learned thus far and formulated strategies for the ensuing digital practices. They were asked to write as frequently as possible but no specific number of diary entries was required. They could write in Chinese, English, or a combination of both.

At the end of the project, process-tracing interviews (Prior, 2004; Roozen, 2010) were conducted to gain a richer understanding of the participants' digital practices. Before the interview, I recursively read all the posts and diaries to familiarize myself with

the participants' process accounts of reading and writing forum posts. I marked up their posts and diaries and prepared probing questions about their purposes, processes, and perceptions of engaging with mediational resources. I printed out all the documents and brought them to the interviews. The first part of the interviews consisted of follow-up questions derived from my reading of the participants' diaries (see Appendix for an example). In the second part of the interviews, inspired by Prior (2004), and Clark et al. (2009), I worked with the participants and visualized the resource landscape in a time-sequenced grid (see Figure 1). The first column of the grid chronologically listed each participant's forum posts. Next to each post, the participants were asked to fill in the grid with (a) the mediational resources they had drawn upon and (b) the context of origin of the resources. In the meantime, they retrospectively verbalized how they deployed these resources for sense-making and meaning-making. The interviews were conducted in Chinese and transcribed verbatim. The extracts cited in this paper were translated by me and checked by the aforementioned colleague.

Post	What	When	What	When	What	When	What	When	What	When
#1	Corpora	Last sem	Youdao	High School	Bing	Last Sem				
#2	Corpora	Last sem			Bing	Last sem				
#3	Corpora	Last sem	Youdao	High school	Bing	Last sem				
#4	Corpora	Last sem	Youdao	High school			Baidu	High school	Online Dictionary	Last Sem
#5	Corpora	Last sem	Youdao	High school						
#6	Corpora	Last sem	Youdao	High school						
#7	Corpora	Last sem	Youdao	High school						
#8	Corpora	Last sem	Youdao	High school						
#9	Corpora	Last sem	Youdao	High school	Bing	Last sem				

Figure 1. Wong's grid (partial) in the process-tracing interview

3.3 Data analysis

This research followed a multiple-case study approach and sought to provide "thick description and grounded interpretation" (Prior, 1995, p. 321) of the participants' digital literacy practices. Data analysis was conducted in three stages. In the first stage, I marked up the diaries and interview transcripts in terms of types, purposes, and contexts of origin of the mediational resources reported by the participants. In the second stage, I grouped the marked-up texts into coherent categories and developed codes to represent these categories. Table 3 summarizes the resultant codes, descriptors, and examples. Using the coding protocol, I deductively coded the learning diaries and interview transcripts. Inspired by Clark et al. (2009), I also mapped the codes onto the resource grids filled out by the participants in the interviews. The integrated resource grids (see Figures 2, 5, and

7 below) were able to visualize the contextual and mediational relations of the digital literacy practices. In the final stage, I conducted within-case analysis (Merriam, 2009) and cross-case analysis (Yin, 2009). For the within-case analysis, I triangulated the data (i.e. diaries, interviews, and resource grids) and composed narratives for each participant. The narratives focused on the connections between the products, processes, and perceptions of the participants' digital practices. Member-checking was conducted to ensure the validity of my interpretative accounts. For the cross-case analysis, I compared the narratives to generate thematic discussions relative to the three research questions (contextual relations, mediational relations, and shaping factors). Some important points of comparison included the range of mediational resources deployed, motivations of using certain resources, and perceptions of the asynchronous forum.

Table 3
Coding protocol for mediational resources

Codes	Descriptors	Example extracts from the diaries and interviews
Types		
Digital	Digital tools used by the participants	I looked up unknown words in an online dictionary portal.
Discursive	"Bits" of language picked up and deployed by the participants	The phrase *leftover women* was discussed in the English Reading course…I used it in my posts to talk about gender equality.
Purposes		
Receptive	Mediational resources deployed when reading posts	I was confused by the phrase *cards stacked against you* in the American student's post, so looked it up in the online dictionary portal.
Productive	Mediational resources deployed when writing posts	I drafted my posts in Microsoft Word to check my grammar and spelling.
Contexts of origin		
High school	Literacy practices acquired in high school	I learned the phrase "*Looking forward to your reply*" in high school.
Previous semester	Literacy practices acquired in the previous semester	An English teacher in the previous semester showed us how to use COCA.
Current semester	Literacy practices acquired in the current semester	I attempted to use a new expression from the English Reading course: a(n) + author's name = the works of the author
Telecollaboration	Literacy practices acquired in the telecollaborative forum	I reused a sign-off from the American students' posts: *I am interested to hear more*.

4. Results

In the following case analyses, I first chart out the resource landscape that emerged from the participants' practices of reading and writing forum posts. I then recount the participants' narratives of adaptive transfer and resource mobilization. The case narratives are organized by the purposes of using resources, first dealing with resources for reading/receptive purposes and then for writing/productive purposes. Cross-case comparisons are offered within the case presentations and more in-depth discussion is presented in Section 5.

4.1 Lee

As shown in Figure 2, Lee deployed various digital and discursive resources originating in high school, the previous semester, and the current semester, for both receptive and productive purposes.

Post	Digital resources								Discursive resources	
	Digital dictionary (ICIBA)	Bing	Online dictionary portal	WeChat (asking a teacher)	MS Word	Non-use of emoji	Wiki	Baidu	*leftover women/men*	*enjoy a Pavarotti*
1	R	RP	R	P	P	P	P	P	P	
2	R	R	R		P	P				
3	R				P	P				
4	R	RP		R	P	P	P	P	P	
5	R	R	R		P	P			P	
6	R	R			P	P				
7	R		R		P	P				
8	RP	R		R	P	P	P	P		P
9	R	R	R		P	P				
10	R	R			P	P				
11	R	R			P	P				

practices originating in the current semester
practices originating in the previous semester
practices originating in high school

R: Receptive
P: Productive
RP: Both receptive and productive

Figure 2. Lee's resource grid.

When reading American peers' posts, she used a digital bilingual dictionary (ICIBA) to look up words as her "instinctive response."[1] Interestingly, she used a smartphone version of the dictionary and "switched between the computer and the smartphone screens." She did not find this troublesome because she "was quite used to working with several screens." If the lookup did not provide an instant solution, she "went to Bing and tried a few online dictionaries…for more explanations." If the issue remained unsolved, she turned to her "English Reading teacher for help via WeChat [a Chinese social networking app]...but it might take a while before the teacher could respond." This sequential consultation method corresponds to the decreasing frequencies of using digital resources for receptive purposes in Figure 2. In her Diary #4, Lee documented an episode

[1] Unless otherwise stated, quotes are cited from the participants' process-tracing interviews.

that illustrated her consultation procedure. She had difficulty understanding the sentence *it really stuck out to me*. She looked up the phrase in various combinations in ICIBA (see Figure 3) and noted that

> all the explanations provided by ICIBA made little sense…I then Binged the phrase but the results were similar as those in ICIBA…I had to consult my [English Reading] teacher. He pointed out that "something sticks out to somebody" means "something is noticeable."

English glosses:

a) The three phrases in this line respectively mean "Commonly used dictionary," "Oxford dictionary," and "Collins advanced."
b) This part provides the British and American pronunciations of the queried item.
c) This part provides the Chinese glosses of the queried item.
d) This is an advertisement of "tricks you wish you knew for memorizing words."
e) The two phrases in this line mean "Report an issue" and "Add more."
f) This part lists "bilingual example sentences."

Figure 3. Lee looked up *stick out to* in the smartphone-based dictionary.

When writing posts, she drew on a variety of resources to maximize the quality of communication. She always drafted her posts in Microsoft Word "for spelling and grammar checks before posting them on the forum." She also synthesized multiple sources to design the content of her posts. In a telling example (Post 1 in Figure 2), she negotiated the information from Bing, Wikipedia, and her English Reading teacher to explain a Chinese cultural term *leftover women*:

> In the [English Reading] course, we talked about *leftover women* in China…I double-checked with my teacher before using this term in my movie essay. But my American peer was still confused…I performed a series of searches in Bing and confirmed the validity of the term. I figured that it might not be the issue of translation, but lacking such a concept in the American culture…I initially wanted to provide a Wikipedia link about *leftover women* in my post. Simple and correct! On second thought, this might not be a sincere act of communication. So, I combined the description in the Wikipedia and my personal understanding of the Chinese and American cultures, and offered my own version of

translation/explanation. (Diary #1, see also Figure 4 reproducing Lee's resultant post)

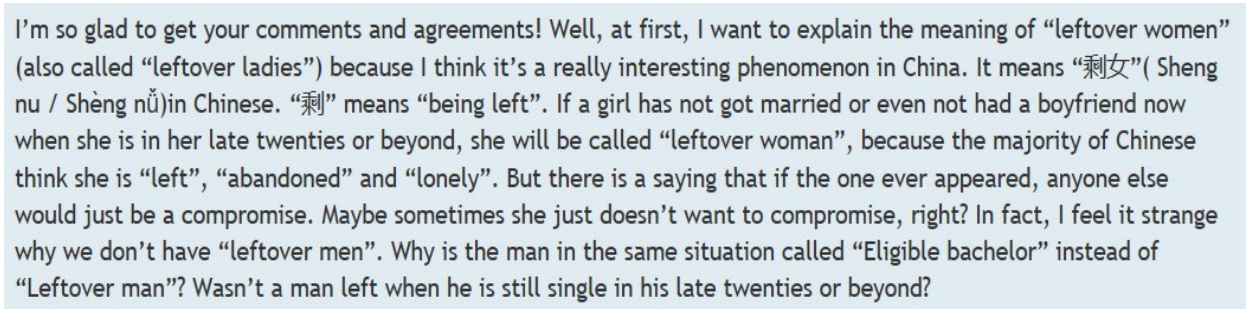

I'm so glad to get your comments and agreements! Well, at first, I want to explain the meaning of "leftover women" (also called "leftover ladies") because I think it's a really interesting phenomenon in China. It means "剩女"(Sheng nu / Shèng nǚ)in Chinese. "剩" means "being left". If a girl has not got married or even not had a boyfriend now when she is in her late twenties or beyond, she will be called "leftover woman", because the majority of Chinese think she is "left", "abandoned" and "lonely". But there is a saying that if the one ever appeared, anyone else would just be a compromise. Maybe sometimes she just doesn't want to compromise, right? In fact, I feel it strange why we don't have "leftover men". Why is the man in the same situation called "Eligible bachelor" instead of "Leftover man"? Wasn't a man left when he is still single in his late twenties or beyond?

Figure 4. Lee's post about *leftover women*.

This episode shows that Lee was reflective in deploying and negotiating discursive and digital resources to meet her communicative needs. She brought the Chinese concept *leftover women* to the asynchronous communication from her English Reading course. The term, however, was confusing to the American peer, who was unfamiliar with the Chinese cultural connotation. Instead of providing a Wikipedia link to quick-fix the miscommunication, Lee synthesized information from online sources and her knowledge about American culture (e.g. *eligible bachelor* in Figure 4) to re-present the term in service of her communicative intent to engage the American peer.

In another episode (Post 8 in Figure 2), Lee's attention to communication quality again influenced how she used the digital dictionary for productive purposes:

> My American peer recommended me to listen to Pavarotti's operas. When I composed my reply, I attempted to use a new expression from the English Reading course: a(n) + author's name = the works of the author. I wanted to say "enjoy a Pavarotti". I looked it up in ICIBA and the Chinese translation was *xiangshou pawaluodi* [enjoy Pavarotti]. This sounds strange! I did not want to upset my American peer because she adored Pavarotti. So, in my post, I used a much safer expression "enjoy Pavarotti's operas". (Diary #4)

This extract shows that unlike her sophisticated use of tools for receptive purposes, Lee used only one digital resource to check her attempt of the new language structure. She attributed the discrepancy to her beliefs about language learning:

> Communication quality is the first priority for me, because communication is language learning. I must completely understand the American peers, so I consult various sources when I come across unfamiliar words. However, when I compose my posts, it is not necessary to use new structures. I can use simpler and safer expressions to avoid communication issues.

Clearly, Lee refrained from using the new language expression because the strange translation provided by the digital dictionary made her worry about the potential miscommunication. In a similar vein, Lee's desire to preempt communication issues resulted in yet another avoidance strategy. Lee was the only participant who did not use any emoji in her posts. Her non-use of the digital resource was intentional:

> The default emojis on the forum are oval-shaped, not cute at all…You know, on Chinese social media, we have round-shaped emojis, with chubby faces. They are

cute and expressive. I purposefully did not use the default oval-shaped emojis because I feared they would alienate my American peers.

Lee's narratives suggest that her belief (i.e. communication is language learning) motivated her use and non-use of mediational resources during the virtual exchange. She actively navigated an array of digital tools to understand her peers' posts. For productive purposes, she used Microsoft Word to ensure accuracy. She also negotiated multiple resources to explain *leftover women* because it was an important concept for the communication. By contrast, she minimally used a digital dictionary to check her attempt of a new language expression because she preferred to use a safer version to avoid miscommunication. Her non-use of the default emojis was also motivated by her fear of causing communication problems.

4.2 Tam

As shown in Figure 5, Tam reused and reshaped digital and discursive resources for both receptive and productive purposes. Like the other two participants, she re-enacted practices originating in high school and the previous semester. However, she was the only participant who recycled discursive resources from the telecollaborative forum.

Post	Digital resources								Discursive resources		
	Digital dictionary (ICIBA)	Online dictionary portal	Bing	MS Word	WeChat (asking classmates)	Baidu	Wiki	COCA	*Looking forward to your reply.*	*Looking forward to hearing back from you.*	*I am interested to hear more!*
1	R	R	RP	P	P				P		
2	R			P					P		
3	R	R	RP	P	P	P		P		P	
4	R	R	R	P							P
5	RP	R	RP	P				P	P		P
6	R	R	R	P						P	
7	R	R	RP	P	P	RP				P	
8	R	R	R	P		P	P			P	
9	R	R		P			P				

practices originating in the telecollaboration activity
practices originating in the previous semester
practices originating in high school

R: Receptive
P: Productive
RP: Both receptive and productive

Figure 5. Tam's resource grid.

When reading the American peers' posts, Tam consulted a PC-based version of the digital dictionary (ICIBA) and an online dictionary portal that aggregated several dictionary databases. She was "used to switching between windows when looking up words." An interesting episode showed that she reshaped a search-in-page technique for receptive purposes. She was "confused by the word *take* as in *I would like to hear your take on this*" and consulted an online dictionary portal:

> When I typed *take*, an overwhelming amount of information from seven dictionaries was displayed. Obviously, it was not possible to read from top to bottom. So, I used the Find shortcut (Ctrl + F) I learned in the previous semester to search *your take* within the webpage. Immediately, I located a bilingual sentence, which helped me understand that *your take* means *your idea or interpretation*.

When Tam composed her posts, she navigated a wide array of resources. Like Lee, Tam drafted her posts in Microsoft Word. She used the grammar and spell checkers to

ensure accuracy and then copied and pasted the posts on the forum. Different from the other participants, however, Tam "did not use Bing until this activity." She had been using Baidu (a Chinese counterpart of Google) "as the default search engine," but in this activity, she did not find much information about the English movie via Baidu. She turned to "[her] classmates, who recommended [her] to try Bing."[2] Remarkably, she developed a sophisticated understanding about the two search engines through multiple comparisons:

> Whenever I Binged the Chinese movie, the search results led me to Baidu…I did an experiment and looked for information about the Chinese director on both search engines. The Bing results were unimpressive…However, when I tried to find something about the English movie, Bing offered more results… Additionally, if I wanted to translate some expressions from Chinese to English, Bing offered more reliable example sentences.

Based on these trials and errors, Tam formulated a search strategy: "If I want to search something about China, I go to Baidu. If I want to look for full-length English articles, look up English words, and translate Chinese to English, I go to Bing."

Tam's adaptability was not limited to using digital resources but also reflected in her "writerly" engagement with language forms (Cheng, 2008). For instance, she "had learned a formulaic expression *looking forward to your reply* in high school and always used it in [her] emails." She also "reused the expression in the first few posts." Later on, she wanted to vary the sentence pattern and "sound like I really mean it," "so [she] asked [her] Chinese peers for some ideas." Her classmates suggested her to read the American peers' posts and she took the advice:

> I read through the posts and focused on how the American peers signed off their replies. I found two common phrases: *Looking forward to hearing back from you* and another one with stronger emotions *I am interested to hear more*.

She was happy with her findings and recycled these sign-offs in her replies. Figure 6 reproduces how Tam signed off her posts during the interaction. As can be seen, in the first two posts, she reused the formulaic expression she had acquired in high school. From the third posts onwards, she adapted the two sign-offs from the American peers' posts and added her personal touches to vary the tones.

[2] Since 2010, Google has been unavailable in the Chinese mainland, making Bing a popular alternative to Baidu.

Post #1

I also want to ask you whether you think Cailing and Katherine live a peaceful and happy life in the end? Why or Why not? Any disagreement is welcomed. Looking forward to your reply.

Post #2

In the end, the two lead characters don't achieve their dreams, but Katherine goes to explore Europe and Wang lives a peaceful life. I want to ask you whether you think they have happy endings, why or why not? Looking forward to your reply.

Post #3

I guess you deeply understand the central ideas of the two movies. Therefore, I wonder whether there is any scene that impressed you most. Why? Could you tell me something about it?
Any disagreement is welcomed. Looking forward to hearing back from you.

Post #4

Any disagreement is welcomed. Looking forward to your comments on my paper and more ideas of the movies from you.

Post #5

So I couldn't say whether they really were forced into the right decision since they might found something more valuable than dreams. However, they did try to make the best with what they given. Do you have any other opinions? I am interested to hear more from you.

Any disagreement is welcomed. Looking forward to your reply.

Post #6

I noticed some members in other groups think Wang and Katherine are feminists. Do you have same ideas? Why or why not?

Looking forward to hearing from you soon.

Post #7

In addition, I wonder which movie you like better. Could you please tell me reasons? And I would be glad if you would like to share any other unconventional movies with me.

Looking forward to hearing back from you soon!

Post #8

I checked on Wikipedia and found some people compared the movie Dead Poets Society and Mona Lisa Smile because of they have similar themes. Have you seen Dead Poets Society? If you have watched it, I would like to know what you think of the two movies?

Looking forward to hearing from you soon.

Figure 6. Extracts of Tam's sign-offs.

The next episode is representative of Tam's use of digital resources for productive purposes. She noted that her "American peer misquoted one Chinese poem in a post." In order to provide the correct version, she "translated the poem on [her] own and came up with this draft: *Seeing mountains again and again, rivers seem to be endless, I wonder whether there is a way*" (Diary #4). She was unsure of the grammatical accuracy so she "consulted COCA to check whether *seeing* can be placed in the sentence-initial position." Although she found many confirmative instances, she was not satisfied with her translation and continued to search for alternatives:

> I performed multiple searches and located a simpler version on an English learning website: *Mountains multiply, streams double back—I doubt there's even*

> *a road*. I also found that Hillary [Clinton] quoted the poem during her visit to China in 2010: *After endless mountains and rivers that leave doubt whether there is a path out* … Comparing these versions, I decided to use the one on the English learning website, because it was more concise and faithful to the original text, preserving the artistic mood. (Diary #4)

As evident in the extract, Tam's composing process involved three steps. She first drafted her own English version and checked potential grammatical issues by consulting dictionaries or COCA. Then, she "would search for alternative versions via Bing or Baidu." Finally, she "compared these versions in terms of grammar and contextual fit." Tam made great efforts to mobilize a wide range of resources because she believed that both communication with American students and attention to language forms improved her writing skills:

> When I explained Chinese cultures/concepts in English, I acted as a cultural tour guide…I must consult different sources to ensure that my posts were understandable and accurate to the American peers...In the meantime, I picked up many words and expressions through checking, searching, and comparing alternative language expressions…These efforts helped me become a better writer.

Taken together, Tam assigned equal importance to communication quality and language forms. Such beliefs motivated her to adopt a new tool (Bing) and new expressions (sign-offs) to enhance and ensure the communication effect. She was also agentive and reflective in her engagement with digital resources (e.g. formulating search strategies for Baidu and Bing) and discursive resources (e.g. observing, comparing, and trying language forms) to advance her learning purposes.

4.3 Wong

As Figure 7 shows, Wong mobilized a smaller range of resources during the telecollaboration. Different from Lee and Tam, Wong's "resourcescape" was primarily limited to the receptive use of digital resources. His adaptive transfers were also limited to the practices originating in high school and the previous semester.

Post	Digital resources					
	Corpora	Digital dictionary (Youdao)	Bing	Baidu	Online dictionary portal	Visual design
1	R	R	R			P
2	R		R			P
3	RP	R	R			P
4	R	R		R	R	P
5	R	R				P
6	R	R				P
7	R	R				P
8	R	R				P
9	R	R	R			P

practices originating in the previous semester
practices originating in high school

R: Receptive
P: Productive
RP: Both receptive and productive

Figure 7. Wong's resource grid.

Interestingly, Wong used an embedded glossing function of a digital bilingual dictionary (Youdao) for smooth reading: "when I place the cursor on a word, the Chinese explanation will pop up. This function allows me to read through the posts without switching between windows or screens." He consulted an online dictionary portal only when the simple glosses did not make sense to him:

> I was confused by the word *agency* as in (1) "I use metaphor sun to depict the persona of high *agency*…" and (2) "all the vignettes mentioned above reveal that Katherine has strong *agency* over what she is doing." The pop-up explanation offered two meanings: *a government organization* or *a business*. Neither of them made sense, so I turned to the online dictionary portal. I found a third meaning: *a cause*. It made sense in Sentence (2), but not in Sentence (1). So I had to guess that *agency* meant *motivation*. (Diary #2)

Although Wong deployed a limited range of resources, he was heavily mediated by corpora (see Figure 7). He became obsessed with COCA when an English teacher introduced the tool in the previous semester:

> I was so pleased to know our university subscribed COCA, so I had unlimited and free access. It felt like I was given an annual pass to an amusement park, and I went there every day to have fun with words.

Based on numerous practices of consulting COCA, he had developed sophisticated knowledge about using corpora for "checking grammatical accuracy and collocations." Interestingly, the virtual exchange prompted him to use corpora for receptive purposes for the very first time. He built a corpus to understand the Chinese and English writing styles: "the first thing I did when I logged into the forum was to collect all the movie essays by the American students. I put them into a Word file like a corpus…and planned to read them" (Diary #1). Later, he reported that he "read seven essays" (Diary #4), although the task required the participants to read only two. He continued to build his corpus: "When the activity ended, I immediately collected all the postings by the American students. 18,000 words and 44 pages in total!" (Diary #5). Working as a "writerly reader" (Hirvela, 2004), he carefully read these materials and grouped the language forms based on the communicative functions they served. Figure 8 reproduces an excerpt from his Diary #4.

1. 如何描述王彩玲的最后一幕？——1）the last scene of the movie, when she imagines herself in front of an orchestra, with a **warm**, primarily wooden opera hall **serving as her backdrop**.
2. 如何描述王彩玲的平凡生活？——1）**blandness** and **uniformity**；2）the **mundane** life
3. 如何描述立春里的艺术家？——1）gifted；2）frustrated；3）would-be；4）hopeless struggle
4. 如何描述立春的色调？——1）full of gray**s** and soft green**s**, **reminiscent of** late-90s and early-00s American movies；2）**represents** Wang's dreary outlook；3）oppressed
5. 如何描述 Katherine？——1） a **progressive**, **liberated** 30-year old art history teacher
6. 如何描述 *Mona Lisa Smile* 的色调？——1）has **a wider spectrum of color**, but those colors seem to **serve the setting more that mood**；2）important and honest conversations still take place in **dimly lit** rooms or hallways, but brighter color in backgrounds and outfits are used to **establish the pace and energy of a university**；3）brisk

English glosses of the six functions summarized by Wong:

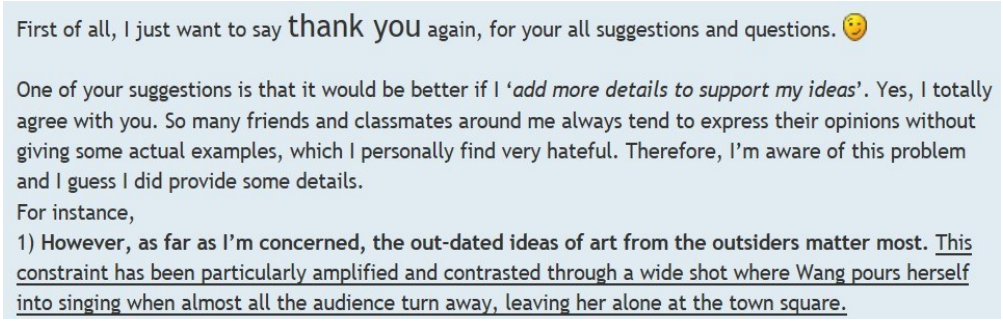
1. How to describe Wang Cailing's last scene
2. How to describe Wang Cailing's plain life
3. How to describe the artist in *And the Spring Comes*
4. How to describe the color tones in *And the Spring Comes*
5. How to describe Katherine
6. How to describe the color tones in *Mona Lisa Smile*

Figure 8. Wong's diary excerpt summarizing form-function patterns (original emphasis).

His expansive reading of the essays and posts also led him to reflect on the cross-cultural differences in writing styles: "American students' writing is more factual and straightforward, while Chinese students' writing is more emotional and mysterious…but this might be overgeneralized, because I think the corpus size is not large enough." This corpus thinking—collecting data, observing patterns, and formulating hypotheses—was fascinating for an EFL writer. When asked whether he tried to discuss his perceived stylistic differences with his American peers, he said "no" because

> Reading and analyzing the forum posts are my ways of learning. Online participation is secondary because you only interact with a limited number of American students…By reading lots of essays and posts, I get more language exposure. I prefer to be an observer.

When writing posts, Wong always deployed a variety of visual resources, including font sizes, bolded, italicized, underlined texts, and emojis (see Figure 9 for an example). He explained that this visual enhancement practice originated in high school: "Back then, I was caught up in several projects…To organize my hectic schedule, I began to use colors to highlight tasks in my to-do list." This visual practice was reinforced in a compulsory course (*Practical Computer Skills*) in the previous semester, leading to his mastery of a number of textual designs. After the course, he would use visual-textual enhancement techniques as his "default mode of communication."


First of all, I just want to say thank you again, for your all suggestions and questions.

One of your suggestions is that it would be better if I '*add more details to support my ideas*'. Yes, I totally agree with you. So many friends and classmates around me always tend to express their opinions without giving some actual examples, which I personally find very hateful. Therefore, I'm aware of this problem and I guess I did provide some details.
For instance,
1) **However, as far as I'm concerned, the out-dated ideas of art from the outsiders matter most.** This constraint has been particularly amplified and contrasted through a wide shot where Wang pours herself into singing when almost all the audience turn away, leaving her alone at the town square.

Figure 9. An example of Wong's post.

One final note about Wong's writing process is his non-use of Microsoft Word. Unlike Lee and Tam, he directly wrote his posts in the forum's Reply Box. This practice and the ones described previously suggest that Wong did not regard online participation as a prioritized approach to developing his writing skills. As such, he mobilized few digital resources when writing his posts. By contrast, he treated the virtual exchange as a source of language materials to be collected, read, and studied. He actively built a corpus of forum posts and used it as a thinking tool to understand the cross-cultural stylistic differences. He had in-depth engagement with digital resources for receptive purposes, which aligned with his self-position as a keen language observer.

5. Discussion

5.1 Contextual relations: laminated, emergent, and adaptive

The first research question concerns the contextual relations of the participants' literacy practices evinced in the asynchronous communication. The virtual exchange did not take place in a bounded context but was intricately linked to the participants' literacy practices from a number of contexts: distant (high school), recent (the previous semester), and immediate (the concurrent course and the telecollaboration project). Remarkably, practices from these contexts were "laminated (layered, fused, and blended)" (Prior & Hengst, 2010, p. 7) in the participants' processes of reading and writing posts. For instance, when Lee composed a post about *leftover women*, she reused the term from a concurrent course, checked the expression with her teacher via WeChat (an app she had started to use in high school), confirmed the validity of the term via Bing (a tool she had acquired in the previous semester), and finally used some materials from Wikipedia (a tool introduced to her in the previous semester). These literacy practices, albeit originating in contexts with different temporal proximities, were simultaneously assembled and laminated in the composing process. These contextual relations were unpredictable, emergent, and on-demand (Rothoni, 2018). They were unpredictable because the contextual traversals were not planned by the participants but rather emerged from the participants' interaction with and within the asynchronous forum to fulfil their communicative or learning demands. In Tam's case, the communicative demand prompted her to reuse a formulaic expression (*looking forward to your reply*) acquired in high school to sign off her posts. Later on, she intended to vary the pattern and project her sincerity. This new rhetorical exigence prompted her to read the American peers' posts and incorporate their sign-offs into her own posts.

In this article, the notion of "adaptive transfer" (DePalma & Ringer, 2011) is used to understand how literacy practices are intricately linked across contexts. Extending previous studies on EFL writers' adaptive transfers in their print-based composition (Rinnert et al., 2015; Wilson & Soblo, 2020), this study found that the participants reused and reshaped a diverse mix of practices during the virtual exchange. Through their prior language learning/using histories, they had developed personally preferred ways of reading, writing, and communicating digitally (Thorne, 2013). These routine practices were carried forward to the asynchronous communication. For instance, since high school, all the participants had developed their preferred use of digital dictionaries. They reused and consulted these dictionaries to understand unknown words in American students' posts. Additionally, Wong redeployed his deeply ingrained practice of visually enhancing texts to highlight messages in his forum posts. Tam and Lee re-enacted the practices of seeking advice from classmates and an English teacher via WeChat. When the participants realized that their preexisting repertoires were not fit for the needs in the telecollaboration project, they reshaped practices to negotiate the new demands (DePalma & Ringer, 2011). For instance, Tam repurposed the search-in-a-page function (Ctrl + F) as a dictionary consultation technique to quickly locate the meaning of *your take* amid overwhelming lexicographical information displayed on an online dictionary portal. In Wong's case, drawing on his practices of consulting COCA for productive purposes, he built a corpus of the forum posts for receptive purposes and transformed corpora as a thinking tool (data collection, pattern observation, and hypothesis formation). He read the corpus entries, took note of the patterns, and hypothesized stylistic differences between Chinese and American students' writing. His practices were thus transformed from

corpus consultation to corpus construction, from using an existing digital tool (COCA) to building one on his own. Collectively, these cases show that the EFL writers were "agents of adaptation" (DePalma & Ringer, 2013, p. 467). They reused, repurposed, and reconfigured practices as "strategic and creative choice[s]" to meet their emergent needs (Canagarajah, 2006, p. 591) during the virtual exchange.

5.2 Mediational relations: affordance-in and affordance-across

The second research question concerns the mediational relations of the participants' digital literacy practices. One strand of research on digital literacies has tended to focus on affordances inherent *in* particular tools. Some studies compare the influences of asynchronous and synchronous tools on participants' performances (e.g. Thorne, 2003), while others demonstrate the learning and communication opportunities created by particular tools, such as chat rooms (Tudini, 2007), wikis (Li & Kim, 2016), and discussion boards (Wu, 2018b). This *affordance-in* perspective only captures a small part of the mediational landscape relative to participants' digital practices. As this study shows, the EFL writers actively engaged with affordances arising from *across* a constellation of mediational resources. Wong used an on-the-fly gloss function of a digital dictionary and an online dictionary portal for receptive purposes. Lee had a sequential consultation strategy to find out word meanings: from a digital dictionary to Bing and to her teacher via WeChat. In Tam's case, her composing processes were mediated (a) by Microsoft Word, Bing, and COCA to ensure accuracy, (b) by Wikipedia, Baidu, and Bing to search for information, (c) by her classmates via WeChat to offer suggestions to her problems, and (d) by the American students' discursive repertoires to style her communication. Scollon (2001) points out the "partial" nature of a mediational resource in that it never exactly fits an actor's needs (p. 121). This explains why the participants did not draw upon on one single resource but a variety of resources in their meaning-making activities.

Additionally, recent studies (e.g. Zhao, Lampe, & Ellison, 2016) have found that people do not only recognize affordances within individual tools but also make overall assessment *across* a mix of tools. As demonstrated in this study, the participants not only focused on what a mediational resource allowed them to do, but also evaluated the affordances of that particular resource against a host of alternative options available to them. To continue with Lee's example, all the three tools (the digital dictionary, Bing, and the teacher-via-WeChat) could potentially enable her to understand unknown words. However, these tools were not used interchangeably or randomly. The digital dictionary was consulted for a quick gloss, as opposed to Bing for more (detailed) explanations. The teacher-via-WeChat was the most trusted resource, but evoked an interpersonal dimension beyond Lee's control (e.g. the teacher might be too busy to reply). As such, the digital dictionary was the first tool she consulted, not simply because it could offer a quick gloss, but perhaps more importantly because it could provide the *quickest* solution to her linguistic problem amongst the three tools at her disposal.

Taken together, the previous examples show that an *affordance-across* perspective sheds important light on the multiplicity of mediational resources deployed by the EFL writers and the dynamic negotiation processes whereby resources were pitted against one another to inform the writers' decisions.

5.3 Shaping factors: material, social, and individual

The third research question asks what possible factors shaped the EFL writers' digital literacy practices in the asynchronous communication. Kern (2015) contends that literacy practices vary as a function of three intertwining factors: material, social, and individual. In this study, the telecollaborative forum came with material affordances typical of asynchronous communication—text production and reception were not synchronized to allow sufficient time for in-depth textual and digital engagements. These affordances were variously perceived and actualized by the EFL writers, because they espoused different beliefs about language learning (Barton & Lee, 2013; Trinder, 2015). For instance, Lee believed that language learning was engendered by communication, so she regarded the forum primarily as a site of communication. She decided against using a newly learned language structure when the digital dictionary provided a "strange" translation of her attempt (*enjoy a Pavarotti*). She used a much safer expression (*enjoy Pavarotti's operas*) to avoid misunderstanding. Tam thought that both online communication and attention to language forms were germane to her writing skills, so she regarded the forum as a site of intercultural communication and language experimentation. As such, she translated a Chinese poem on her own, checked the grammatical accuracy in COCA, searched alternative translated versions, and finally decided on the version for the asynchronous communication. Wong believed that language learning was enabled by deep engagement with language inputs. Thus, he saw the forum primarily as a site to collect input materials. He built a corpus of forum posts and inspected the writing styles of Chinese and American students.

The perceived importance of the telecollaborative communication also led to use and non-use of digital resources. The forum afforded the possibility for the EFL writers to directly write posts in the Reply Box. Wong chose to act upon this material affordance, while Lee and Tam drafted their posts in Microsoft Word and used the built-in grammar and spell checkers before copying and pasting their posts into the Reply Box. Clearly, Lee and Tam valued the communication quality, while Wong attached more importance to reading and analyzing posts, hence sidestepping the accuracy of his posts.

Finally, Lee's non-use of emojis was also motivated by the interaction of material, social and individual factors. The forum came with default oval-shaped emojis (material affordances), which were different from Lee's routine exposure to round-shaped emojis on Chinese social media. She believed that round-shaped emojis carried the social meaning to be "cute," while oval-shaped emojis were alienating. Thus, she made a "writerly choice" (Lunsford & Ede, 2009) to exclude the default emojis from all her posts to preempt miscommunication.

Collectively, these examples show that the EFL writers' digital literacy practices were not only shaped by technical/material affordances, but also by social considerations and varying individual perceptions, motivations, and needs.

6. Implications

It has been suggested that English writing pedagogies in the 21st century should be expanded to address digital literacies (Elola & Oskoz, 2017; Hafner et al., 2013, 2015). The Sino-US telecollaboration project reported in this article was one attempt to create opportunities for EFL writers to experience and participate in technology-mediated communication. The findings have research and pedagogical implications for researchers and educators interested in EFL writers' digital literacies.

6.1 Research implications

This study shows that an ecological perspective provides a useful lens through which to examine EFL writers' digital literacies. This relation-sensitive perspective does not dichotomize literacy practices as online/offline or traditional/non-traditional (Barton & Lee, 2013). Instead, it focuses the analytical gaze on a web of relations that are embedded and laminated in literacy practices (Prior & Hengst, 2010; Wardle & Roozen, 2012). From this perspective, we gained a richer understanding of the participants' composing processes by tracing how a diverse mix of practices and resources were taken up, navigated, and negotiated in asynchronous communication. These process accounts show that digital literacies were not discrete reading/writing skills that were deployed autonomously (Gee, 2015). Rather, they were sense-making and meaning-making practices, emerging from the constant interactions of material, social, and individual factors (Kern, 2015). As such, when we examine EFL writers' digital literacies, we must go beyond the on-screen performance and take account of learners' actions and thoughts behind the scenes/screens. A mere focus on textual products (e.g. forum posts) would render invisible learners' complex processes of building and building from their repertoires. If we had limited our attention to on-screen performance, we would have been blind to the participants' adaptive transfers of prior and concurrent practices, such as Lee's strategic non-use of emojis, Wong's effort to build a corpus as a thinking tool, and Tam's negotiation of digital and discursive resources. These process data enabled us to attend to learners' agency, adaptability, and reflexivity in managing an expansive and expanding web of relations embedded in literacy practices across contexts (Chun et al., 2016; Wardle & Roozen, 2012).

Furthermore, it is important to understand how EFL writers perceive and actualize affordances *in* and *across* mediational resources. Technology is not simply an add-on to print-based composition, but fundamentally transforms the ways texts are produced, distributed, and consumed (Hafner, 2019). EFL writing research has explored new opportunities afforded by various communication tools (e.g. email, forum, and wikis) to improve learners' abilities to write digitally, multimodally, and collaboratively (Belcher, 2017; Li & Kim, 2016; Wu, 2018a). As this study shows, it is not enough to understand EFL writers' engagement with affordances inherent *in* these communication tools. The asynchronous forum in this project did not function as an autonomous or self-sufficient tool. In fact, to read and write posts, the EFL writers mobilized a larger constellation of mediational resources, and wittingly compared the affordances *across* these resources. They co-opted the "best" one(s) to address their learning/communication needs and constantly changed their choices as needs evolved. As such, researchers must take both *affordance-in* and *affordance-across* perspectives to obtain a fuller picture of how

various resources come into play as EFL writers' meaning-making process unfolds moment by moment.

6.2 Pedagogical implications

The research findings suggest that our pedagogical focus should be shifted from teaching EFL writers "*particular* literacy practices" to facilitating them to "reflect on [their] own literacy practices" (Jones & Hafner, 2012, p. 15, original emphasis). In this study, although the participants had a similar English proficiency level, their digital practices were hardly homogeneous, but heavily mediated by individual differences, such as literacy histories, perceptions of language learning, and communication needs. As "facilitators of the writing process" (Belcher, 2017, p. 81), we need to create structured spaces to develop learners' metacognitive awareness of their digital literacy practices. For instance, prior to technology-mediated activities, learners can share their routine practices to de-naturalize their usage preferences and expand the range of action possibilities (such as Tam taking her peer's advice to try Bing). During the activities, learners can keep diaries to document their practices in descriptive and analytical ways that facilitate "reflection-in-action" (Schön, 1983). After the activities, textual products can be used as a "starting" point to "rewind" the meaning-making trajectories whereby prior and concurrent practices are laminated with one another. This retrospective, reflective process-tracing urges learners to critically evaluate how their practices "contribute to or detract from" their learning and communication (DePalma, 2015, p. 637). In doing so, we sensitize student writers to "the emergent-contingent dynamics" of digital practices (Thorne, 2013, p. 210) and empower them to *act otherwise* (Wu, 2018b). For instance, Lee could have used the new language structure in her post and invited the American peers to comment on its appropriateness vis-à-vis the strange translation provided by the digital dictionary. Such agentive participation would create communicative opportunities to enhance metacognitive engagement with and critical awareness of "relations among forms, contexts, meanings, and ideologies" (Kern, 2014, p. 353), thereby maximizing learning potentials.

7. Conclusion

Writing instructors have been urged to integrate digital literacies into their curricula (Elola & Oskoz, 2017; Hafner et al., 2013, 2015). For such integration to work, it is necessary for educators to understand learners' digital practices (Barton & Lee, 2013) and see practices from learners' point of view. This multiple-case study provides insights into the contextual and mediational relations of EFL writers' digital literacy practices in a telecollaboration project. The participants reused, repurposed, and reconfigured literacy practices from distant, recent, and immediate contexts in response to their emergent needs. They also acted upon the affordances inherent *in* and arising from *across* a variety of mediational resources to address their evolving needs. The contextual and mediational relations were co-determined by an interplay of material, social, and individual factors. These findings attest to the importance of understanding learners' digital literacy

practices from an ecological perspective—tracing how learners' practices are intricately linked across contexts and dynamically mediated by a variety of resources.

One potential limitation of this study is that it traced what Reiff and Bawarshi (2011) called *incomes*—how (previous) practices were (re-)deployed in the asynchronous communication. There is also a need to trace *outcomes*—how the repertoire developed/enforced in the telecollaboration project enables and constrains subsequent practices in similar contexts (e.g. other intercultural activities) or dissimilar contexts (e.g. writing assignments in another course). Although potentially limited by its focus on *incomes*, this study demonstrates the descriptive and explanatory power of an ecological perspective. Future research can build on this study and trace learners' literacy trajectories on a longer timescale to generate a fuller understanding of contextual and mediational relations in EFL writers' digital literacy practices.

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Appendix
Interview questions for Lee (Examples)

Part One: Follow-up questions derived from the diaries

1. In Diary #2, you said that you had consulted ICIBA, Bing, and then the English Reading teacher via WeChat. Why did you consult sources in this particular order? How did these sources differ from one another?
2. In Diary #4, you said that you had consulted ICIBA. Why did you consult this dictionary? Was this consultation typical?

Part Two: Visualization
In this grid, the first column chronologically listed your forum posts. Please fill in the grid with (a) tools and "bits" of language you used and (b) their contexts of origin. While filling out the grid, please describe how you deployed these practices and resources when reading and writing posts.

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