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Computer-mediated communication and language learning

Richard Kern, Paige Ware and Mark Warschauer

Introduction

The use of computers for communication between individuals goes back to the 1960s, but it was not until the spread of email and the arrival of the World Wide Web in the 1990s that language educators began to make significant use of computer-mediated communication (CMC) as one dimension of the larger effort to explore computer-assisted language learning (CALL). Initially, most CMC projects took place within a single class and used text-based synchronous (i.e. real-time) platforms such as chat and instant messaging. Early research focused on learners’ attitudes and motivation (Beauvois, 1997), comparisons of interactional dynamics in online versus face-to-face environments (Kern, 1995; Warschauer, 1996) and linguistic descriptions of online discourse (Chun, 1994; Kern, 1995; Warschauer, 1996).

These early studies suggested that use of synchronous CMC environments offered language learners more opportunities to express themselves (in writing) during class sessions – fostering greater overall amounts of language production (Kern, 1995) as well as a wider variety of language forms and functions (Chun, 1994). CMC also promoted more balanced participation than face-to-face discussion (Warschauer, 1996) and reduced anxiety (Satar and Özdener, 2008); however, see Jebali (2014), who found no anxiety effects and better performance in face-to-face discussion than via CMC. Use of synchronous CMC appeared to stimulate motivation, free expression of ideas, the articulation of differences of opinion, the multiplication of perspectives on discussion topics and the levelling of power and status differences between teachers and students (Kern, 1995).

On the other hand, the use of text-based CMC also had some problematic aspects. Teachers were found to have less control over classroom discourse, and the rapid pace of discussions sometimes exceeded students’ ability to keep up. Moreover, since learners’ language contained many non-normative forms, their texts did not model the kind of language most teachers wanted them to read. Even if online participation was more democratic in the sense that shyer students often participated as much as their more outgoing peers, interactions were sometimes anarchic and discussions often lacked coherence (Kern, 1995). Thus, the considerable differences between
electronic and face-to-face discussion led to recommendations that they be used for distinct purposes. Warschauer (1996), for example, recommended that written electronic discussion be used as a prelude to oral discussion to generate ideas that could later be examined and debated orally or incorporated into formal essays. In this way, face-to-face and electronic discussions could be combined in various ways to highlight the advantages of each medium.

In the sections below, we review recent CMC research as it relates to second language acquisition (SLA), with particular focus on two important areas of particular pedagogical interest: feedback on learners’ writing and speaking and telecollaboration in language and intercultural learning. We then discuss three aspects of CMC that merit greater debate: ‘missed’ communication, the neutrality of technological interfaces, and the vexed question of determining the ‘effectiveness’ of CMC for learning. We conclude with a discussion of future directions in the field.

**Critical discussion of main current issues**

**SLA-grounded research**

Research in CALL is informed by a number of perspectives within SLA theory, which is traditionally anchored in a psycholinguistic focus on individual learner use and acquisition of linguistic forms. According to Chapelle (2005), interactionist SLA theory has been the most widely used in CALL research and has underlain a number of studies focused on negotiation of meaning, modified input and learner attention to language form. CMC studies taking an interactionist SLA perspective often rely on quasi-experimental designs and discourse analysis inventories to document learner use and acquisition of particular language forms and, to some extent, learners’ meta-linguistic understandings of the target language. For example, researchers have examined how particular tasks can be purposefully designed to encourage episodes of negotiation of meaning (Blake, 2000; Pellettieri, 2000), how task type affects focus on form (Yilmaz, 2011) and how CMC environments can foster a wider range of learner interactions beyond these anticipated negotiations (Kötter, 2003). A number of researchers have also examined how learners paired with local peers or distant partners can provide the necessary conditions for noticing and uptake of targeted morphological, syntactic and semantic forms. These studies include, for example, examinations of chat-based feedback, which found gains in learners’ metalinguistic awareness of grammatical forms (O’Rourke, 2005); documentation of instant messaging interactions that illustrated how learners took up suggestions within the context of the chat room (Sotillo, 2005); and research that structured chatting around a series of tasks, which confirmed learner uptake on particular lexical items (Smith, 2005).

Another perspective on CMC, involving qualitative rather than experimental methods, is conversation analysis (González-Lloret, 2011). Conversation analysis can be applied not only to teacher-controlled CMC projects but also to learners’ use of CMC outside of school settings to study how language is acquired through interaction. Tudini (2010) studied learners of Italian interacting with Italian peers as well as adults of diverse professional backgrounds, focusing largely on repair sequences. She recommended that learners become reflective analysts of their own acquisition by being introduced to conversational repair broadly, so as to become aware of forms of repair other than correction. Jenks (2014) studied multiparty voice-chat by speakers of English as an additional language, using conversation analysis as his primary method of analysis. He showed how vocal cues, such as intonation, are used during voice chat and explored differences in turn-taking practices between text and voice chat, showing that interactional competencies vary according to the particular medium used. Jepson (2005) also compared chat
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mediums and found that repair moves were significantly higher in voice chat than in text chat (and were frequently motivated by pronunciation difficulties).

In experimental studies, researchers have begun to target specific practices within the context of asynchronous text-based chat. For example, Sauro (2009) assessed the benefits of two different types of corrective feedback for learners of English: feedback that recast learners’ errors or metalinguistic feedback that informed learners of the nature of their errors. With respect to the language feature of interest (article omission with abstract nouns such as ‘work’, ‘love’, ‘culture’), Sauro found no differences between the two treatment groups, though the metalinguistic group outperformed the control group. Sauro and Smith (2010) adopted a different approach and assigned students to one of two groups: those who were given additional time to self-correct their writing prior to sending it and those who were not. They found that learners who self-corrected showed greater lexical variety and linguistic complexity.

The focus on corrective feedback in the above studies reflects interests common to interactionist SLA research. However, in recent years, researchers have begun to explore two other domains for peer feedback: idea development, which emphasises meaning generation across the multiple phases of writing, and genre awareness, which emphasises an awareness of register, rhetoric, audience and context. We will treat these areas in the following section.

**Feedback on writing and speaking**

Feedback provided by classroom peers, teachers or distant partners can be delivered through a number of technological means, including word processing software, commercially developed programmes and instructors’ creative uses of Moodle, Google Docs, blogging and wiki interfaces (i.e. platforms that allow learners to create and share content online). Ware and Kessler (2013) categorised feedback studies according to the focus of the feedback (form, idea development or genre awareness) as well as the strategies used to deliver feedback. Strategies for delivering feedback include using transcripts of interactions for guiding learners’ meta-reflection; analyzing models for effective strategies; and offering guidance in expanding writing range across different genres.

Several recent studies add insights about peer feedback. In analyzing synchronous chat logs of learners in Japan and Australia, Bower and Kawaguchi (2011) found that learners typically focused on communicating ideas unless they were instructed to offer explicit corrective feedback. Darhower (2008) came to a similar conclusion in his study of learners in the US and Puerto Rico. Ware and O’Dowd (2008) conducted a quasi-experimental study in which US and Chilean students were not given instructions to offer error corrections or comments on language form. Students in a US-Spain partnership, however, were given explicit instructions to provide feedback on form. Ware and O’Dowd found that both groups rarely provided corrections. They concluded that learners’ tentative engagement with error correction reflected their desire not to be overly didactic and their insecurity about their own language expertise.

More CMC feedback research has been done on student writing than on speech, though with technological advances that enable video and audio to be better exchanged, this situation is changing rapidly. Most studies on feedback on speech have focused on a number of automated feedback programmes (for a review, see Ware and Kessler, 2013). The primary drawback to these automated systems is their still-limited ability to provide learners with individually tailored feedback, which therefore underlines the need for better systems to enable teachers to give feedback electronically. Delivery mechanisms for providing feedback include a range of web-based tools, many of which use a version of automated speech recognition (ASR). Several popular tools which allow instructors to provide voice- and text-based responses (and students to leave messages and comments) include Wimba voice boards, Voxopop, Moodle Nanogong,
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Google Voice and Portable PoodLL. Recommended areas of research include developing a better understanding of the advantages and disadvantages of human feedback in relation to automated programmes, examining student use of feedback and documenting pedagogical pitfalls (e.g. schools’ inadequate investment in professional development opportunities, students’ inability to use software autonomously, institutional constraints that limit teachers’ use of software and over-reliance on automated software).

While SLA research tends to focus strictly on language acquisition, much pedagogical use of CMC is not targeted on language per se but rather on communicative exchange and intercultural learning. We now turn to that side of CMC.

Telecollaboration and intercultural learning

Telecollaboration involves establishing online educational exchanges between language learners and speakers of the target language. Traditionally, telecollaboration projects have been established between partner classes in schools and universities, but in recent years they have come to transcend institutional boundaries, as in the case of MMOGs, or massively multiplayer online games (Thorne et al., 2009; Thorne, 2010; Rama et al., 2012; Thorne and Fischer, 2012).

A number of books and review articles have surveyed research on telecollaboration (e.g. Kern et al., 2008; Guth and Helm, 2010; Dooley and O’Dowd, 2012; Blake, 2013). Rather than provide a comprehensive review here, we will focus on the intercultural learning dimension of telecollaboration, which is most relevant to many English teachers’ practice.

One of the best known and the most longstanding telecollaborative projects is Cultura, which exemplifies the cultural turn in online pedagogy (Furstenberg and Levet, 2014). Developed at MIT in the late 1990s, Cultura aims to facilitate language learners’ collaborative exploration of the concepts, values, beliefs and attitudes that underlay their respective cultures. Culture is approached dialogically and critically through a series of activities that involve juxtaposing materials from both cultures, analyzing and interpreting those materials, and responding to others’ interpretations. In addition to working with a variety of texts, questionnaires, images and films, students ‘meet’ in an online forum that gives them time to read, think and formulate answers to partners’ questions. Their discussion of these questions (in writing) leads to new questions, feeding an ongoing process of reflection, discussion and further reflection. The idea is not to arrive at definitive conclusions about the other culture but to glimpse aspects of the culture through the very process of discussion.

While a number of studies have found promising results regarding the viability of telecollaboration for providing motivating language practice and developing intercultural awareness (e.g. von der Emde and Schneider, 2003), other studies show that intercultural contact does not necessarily lead to cultural understanding (Belz, 2002, 2003; Thorne, 2003; Ware, 2005; O’Dowd, 2006). Language ability, linguistic style, academic context and institutional culture are all factors that can affect learners’ negotiation of meaning and cultural understanding. Two of the most significant, yet subtle, factors are the medium and genre of interaction.

In her study of telecollaboration between German students of English and American students of German, Ware (2005) found that the nature of the CMC medium, which often favours speed and brevity over sustained attention, can have a negative influence on students’ communicative choices, leading to disengagement and missed opportunities for intercultural learning (see the section later in the chapter on ‘missed communication’). Thorne (2003) added that while a particular medium may influence communicative practices, it does not determine them. Rather, communicative patterns are negotiated dynamically through ‘cultures of use’ (i.e. the norms and attributions that evolve out of everyday use of a medium). The cultures of use relevant to a given
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CMC medium (e.g., email, chat room, instant messaging) can differ across social, generational, institutional and national groups and can affect discourse in various ways, from the choice of an appropriate topic to the level of formality (including non-normative spelling and capitalisation, the use of emoticons and emoji, and so on).

Kramsch and Thorne (2002) proposed that intercultural CMC exchanges sometimes go awry not just because of linguistic misunderstandings but also because of clashes in cultural frames and the stylistic conventions of particular genres. Hanna and de Nooy (2009) underscored the importance of communicative genres in their case study of two British and two American learners of French who participated in an online forum sponsored by the newspaper Le Monde. They showed that the ease with which the learners entered the online discussion with native speakers of French was deceptive because the genre called ‘discussion’ is not universal but varies across cultures. In the context of this French online forum discussion, politeness and linguistic accuracy were much less important than a willingness to be socialised into and to follow the online community’s discourse rules. In other contexts, however, attention to politeness and linguistic accuracy might be far more important. Therefore, genre and culture interact to shape the conditions and constraints of communicative contexts and, by extension, communicative competence. Taken as a whole, then, intercultural CMC studies underline the fact that online contact does not automatically produce intercultural understanding, which requires sustained negotiations of differences in genres, interaction styles, local institutional cultures and culture more broadly.

As mentioned earlier, online collaboration is not always academic in nature, and, as digital devices are routinely used for everyday communication, the boundaries between in-school and out-of-school language learning contexts are becoming increasingly blurred – a point we take up in the next section.

In and out of school

The growing prevalence of social media has meant that students often communicate online outside of school. In some cases, their CMC use directly overlaps with school-based activities. In many more cases, it does not, but may contribute to students’ language learning nonetheless.

Black (2008) carried out a study of adolescent English learners using fan fiction websites. These sites involve tens of thousands of people posting their own stories related to the characters or settings of novels, movies, television shows, manga or other fictional media. Readers offer praise, suggestions and feedback on writing, and authors follow up with discussion and dialogue. Black presents case studies of English learners who honed their writing, communication and media skills, while developing their identity and self-confidence, through fan fiction communities. Other new media genres, such as video games and virtual worlds, also provide opportunities for language and literacy development through computer-mediated interaction. Zheng et al. (2009), for example, document the English language communication that takes place when middle-school students in China and the U.S. interact in the Quest Atlantis virtual world. Similarly, Rama et al. (2012) study the affordances for language learning offered when college students play World of Warcraft in a language they are learning. Both studies conclude that the intermingling of native and non-native speakers and non-threatening communication tasks facilitate the kinds of risk-taking (by learners) and feedback (by native speakers) that can accelerate learners’ language development.

Key areas of debate

Pedagogical uses of CMC are not without some controversy, and we will deal with three debates tied to the following assumptions: that affording learners the opportunity to engage online with
native speakers will be productive, that technologies are neutral and that assessing effectiveness is unproblematic.

**Missed communication**

When social interaction is theorised as being jointly constructed among participants, online communication requires a mutual commitment for individuals to converse through multiple layers of context: linguistic, situational, cultural and virtual. Successful communication online might therefore be viewed as a joint commitment among participants to develop and sustain interaction even in the face of potential contextual ambiguity. For example, in Ware (2005: 66), students construed the context in a variety of ways: as a chance to develop an informal online friendship, as a formal task to be completed for their course grade and as an opportunity to receive feedback on their linguistic output. When linguistic, situational or cultural misunderstandings developed, in part because of these differences in perceived context, participants would often retreat by ignoring the problem, redirecting the conversation or withdrawing from the conversation entirely. Such avoidance of engagement is what Ware described as “missed” communication, or “missed opportunities for approximating the kind of rich, meaningful intercultural learning that instructors often intend with telecollaborative projects”. Communication in telecollaboration “fails”, as O’Dowd and Ritter (2006: 624) have argued, when projects end in “low levels of participation, indifference, tension between participants, or negative evaluation of the partner group or their culture”.

O’Dowd and Ritter (2006) propose four types of causes of missed communication: individual, classroom, socio-institutional and interactional. Individual differences in motivation, expectations, background knowledge and time investment can lead to tensions in how involved and aware participants are likely to be during the exchange (Ware, 2005). At the classroom level, the quality of learner interaction can be affected by the relationship between the organising teachers (Belz and Müller-Hartmann, 2003), the strategic task design and sequencing (O’Dowd and Ware, 2009) and the instructional time available for learners to process and reflect on their online interactions (O’Dowd and Ritter, 2006). Additionally, socio-institutional factors can impose formidable logistic and pedagogical challenges. Differences in semester schedules and time zones make it difficult to align calendars and develop a smooth rhythm for steady interaction (Belz, 2002). Course expectations and assessment norms at different institutions might differ considerably, with more or less emphasis placed on basic participation, formal linguistic accuracy or critical analysis (O’Dowd, 2010). Finally, at the interactional level, language norms can differ considerably, not only across classrooms but also within individual participant groups. Turn-by-turn analyses along sociolinguistic, pragmatic and discursive lines have illustrated the many points at which communication can break down (Belz, 2003; Ware and Kramsch, 2005).

Many pedagogical recommendations have emerged from this body of work focused on missed communication. O’Dowd and Ritter (2006), for example, argue for a three-pronged approach that emphasises engaging students in discussions of examples of failed exchanges, ensuring that instructors are communicating consistently and encouraging participants to adopt an action research perspective. Ware and Kramsch (2005) suggest that instructors cultivate an intercultural stance in which learners seek a “decentered perspective” (p. 202) from which they can learn to make sense of their partners’ words by interpreting them, not only by using their own individual interpretive lens but also by taking on perspectives that are informed by other possible interactional styles, situational contexts or historical understandings beyond those that are most familiar to them. For example, if one international partner in telecollaboration uses a formal form of personal pronoun to address the other partner, such word choice could be interpreted
in a variety of ways, including as an attempt to create interactional distance, to signal respect or to invite formality. Such a dialogic approach is growing among researchers interested in CMC for intercultural understanding. Belz (2002), for example, advocates exploring the linguacultural faultlines that emerge in online interaction, and Guth and Helm (2010) suggest that working through conflicts is an important skill for any intercultural encounter.

Dialogic approaches to intercultural understanding map well onto other types of international partnerships that promote similar goals of global dialogue and intercultural understanding. Helm et al. (2012) documented a new type of pedagogical structuring in which language instructors offered students the opportunity to satisfy part of their course requirements by participating in a non-governmental organisation (NGO) project focused on intercultural interactions. In this case study, Italian and Palestinian students learning English participated in the SoliyaConnect Programme, an NGO project whose goal is to increase dialogue among individuals from different cultures. This novel approach positions the language instructor as a co-facilitator within a larger infrastructure built around developing intercultural understanding. These pedagogical recommendations share a rigorous and creative rethinking of the goals of telecollaboration and its role in the language curriculum. (See also Kramsch and Zhu, this volume, for discussion of language, culture and online cultures in ELT.)

Technology as ‘neutral conduit’ versus ‘social actor’

When people communicate via technology, their language is mediated materially by some kind of device and its interface. Some consider these devices and interfaces to be neutral conduits (Rheingold, 1993; Negroponte, 1995). Others, however, point out that both hardware and software influence how we use language and, in the case of videoconferencing, how we express ourselves visually (Kappas and Krämer, 2011). For example, Parkinson and Lea (2011) found that when people videoconference with people they do not know well, they tend to compensate for relatively intimate visual contact by talking about less personal topics in order to increase social distance. “Paradoxically,” they write, “one consequence may be that [videoconferencing] produces less intimacy than text-based or audio-only communication, because, in the latter cases, interactants may seek to increase rather than decrease the emotional relevance of the conversation itself when fewer alternative cues are available” (p. 103). Each medium has its own particular human–material interface and corresponding conventions that must be mastered. How well one knows the workings of these interfaces makes a difference in how communication unfolds (with inexperienced users being at a disadvantage), and the technologies themselves impose their own constraints that can produce misunderstandings (for example, when a transmission delay occurs, interlocutors sometimes wonder whether the desynchronised smiles, gestures or facial expressions they see onscreen are responses to what they are saying right now or whether they correspond to what they said a moment earlier).

Related to the issue of technology neutrality is the question of cultural bias of computer technology. For example, even though computers allow writing in all Unicode-encoded scripts via software workarounds, they come standard with ASCII keyboards that lend themselves most easily to Roman alphabetic writing. Computers also come standard with one keyboard and one monitor, implying that they are intended to be used by single individuals. But in some non-Western contexts, the ‘computer user’ is often a collective, involving the household and extended family (Bell et al., 2005). In one study, Japanese engineers reported that they rarely if ever wrote texts in isolation and avoided using computers set up for just one user (Haas, 1996: 228).
While such issues may not seem directly relevant to pedagogical uses of CMC, a similar, perhaps subtler form of culture bias is evoked in Thorne’s (2003) work on *cultures of use* (mentioned previously in the telecollaboration section). Popular email clients like Gmail or Yahoo, social networking sites like Facebook or Orkut, text and video-chat clients like Skype or Google Hangouts can be used in different ways, for different purposes, and with different expectations by different people in different settings. Consequently, decisions made by teachers (for example, choosing email as a platform to encourage friendly, personal communication among students) may backfire if students do not associate email with that kind of activity in their day-to-day lives.

People may not ordinarily think of technology as being a social actor, yet psychological studies have shown that people tend to relate to computers and television like they do to people and places in the real world (Reeves and Nass, 1996). This body of research, which Reeves and Nass refer to variously as “media equation”, “social responses to communication technologies” or “computers as social actors”, shows, for example, that people treat computers with female voices differently than those with male ones; they feel encroached upon by large faces on a screen; and they can have the same physical responses to on-screen motions as to real-life motions. Bolter and Grusin (2000) also argue that media and reality are inseparable, though less from a psychological and sociological perspective and more from a cultural and historical perspective.

In today’s media saturated world, it is difficult to factor out the technological from the social and the social from the technological. To date, CMC research in the context of language education has not paid much attention to techno-social relationships, but it seems that the focus of future research should be not unidirectional, as in ‘how technology affects language’, but rather interactive, as in how people deal creatively with the resources that new technologies offer them to do traditional activities in new ways, or to invent whole new social practices.

**Measuring effectiveness**

The seemingly simple question, ‘Does CMC improve language learning?’ turns out to be not so simple to answer, because many intervening variables come into play. We have seen that CMC can be used in myriad ways in myriad contexts. Consequently, the judgment of effectiveness cannot be separated from the specificities of the learners, the setting, the task(s), the form of assessment and so on. Furthermore, the researcher’s theoretical stance on what ‘counts’ as acquisition makes a difference. For example, Blake (2000) found that CMC provided a good environment for negotiating meaning. However, his data showed a predominance of lexical negotiations and relatively few syntactic negotiations, leaving open questions about the extent to which CMC fosters grammatical development. On the other hand, if we view language learning from a broad semiotic perspective, we will be less interested in whether learners successfully acquire a particular linguistic structure and more interested in how they use their available linguistic, cognitive, social and material resources to deal with specific communicative situations. The variability in contexts and uses of CMC is such that teachers and researchers need to understand effectiveness in terms of the specifics of what particular learners do with computers, how they do it and what it means to them. As a consequence, the effectiveness question cannot be answered in any generic or absolute sense but only in a highly context-specific sense.

**Future developments**

Future CMC projects will inevitably incorporate an increasing variety of platforms, will involve both in-school and out-of-school contexts, and will be designed for varied purposes. Two
current areas that will most likely grow in sophistication and significance are multimodal CMC and automated conversation.

**Multimodality and videoconferencing**

As sound and video technologies become increasingly integrated into websites and documents, writing will increasingly share the stage with other modes of expression, and people will be faced with more choices than ever about how to communicate. Should a given idea be expressed through speech? In writing? With a photograph? A video? A combination thereof? Should colour or sound be incorporated? How will it be organised spatially? Each choice entails subsequent decisions about the particular mediational tools and techniques to be used and the most appropriate styles and forms of language to employ. These decisions matter, because just as technologies are not neutral conduits, neither are modes of expression or language itself.

Multimodal communication is of course not new, but what is new in digital environments is that verbal, visual and sonic modes are all represented numerically and thus share a common architecture. This means that tools for ‘writing’ may be used to compose in other modes (for example, voice tracks for video animations can be produced by typing on a keyboard). ‘Authoring’, ‘composing’ or ‘designing’ are therefore more apt terms than ‘writing’, even though the biomechanical processes look identical to those involved in writing text. Digital representation also means that anyone who has access to the requisite computer software has the means to create, transform or re-mediate content and to disseminate it widely on the Internet, potentially attracting massive audiences. Whereas the rhetorical decisions involved in technology-mediated communication used to be reserved for specialists, they are now often in the hands of ‘ordinary people’. This creates an important challenge for language educators.

Kress (2010), Kress and van Leeuwen (1996, 2001) and van Leeuwen (2005) have written extensively on multimodality, emphasising the different affordances of different media and how important it is for educators to understand what those affordances are, to help learners develop a conscious understanding of the ‘invisible’ processes that go into their multimodal creations. Multimodality is directly relevant to pedagogical CMC in many ways, but we will focus on just one here: the increasing use of videoconferencing in telecollaborative exchanges.

Videoconferencing has become a widely used platform for pedagogical CMC projects (e.g. Wang, 2006, 2007; Develotte et al., 2008; Jauregi et al., 2011). This immediately raises the question of how the audiovisual medium affects learner interactions. One researcher who explored this is Yanguas (2010), who investigated how learners in video and audio CMC groups negotiated for meaning during task-based interaction, compared to face-to-face communication and traditional text-based CMC interactions. He found differences in the way the audio and video groups negotiated for meaning, and similarities between oral CMC and face-to-face turn-taking patterns (though these were quite different from those found in written synchronous CMC). Develotte et al. (2008) analysed how American learners of French and their French tutors made use of specific video and textual affordances in MSN videoconferences and found that video augmented the tutors’ palette of resources and facilitated their lesson planning, helped them to gauge the comprehension of their students and to give encouraging feedback, and allowed them to introduce a ludic dimension that would have been difficult to replicate in writing alone. Students reported that video supported their learning by providing nonlinguistic cues and it allowed them to see their French partners interact between themselves, which they found particularly enjoyable and helpful. Written chat was used in a variety of ways to complement the voice and video features. Significantly, writing was almost always done simultaneously with listening or speaking, and it served multiple functions. A frequent use of writing by the tutors was to correct
students’ errors or interject encouragements in such a way as not to interrupt the flow of conversa-
tion, with the added benefit of providing a written record of spoken errors that students could save for review.

Research on multimodal CMC is in its early stages, but is starting to take account of students’ awareness of the complexities of learning and expression in hypermediated environments (Malinowski, 2014) and the specific ways the screen interface refracts participants’ interactions and understandings (Malinowski and Kramsch, 2014). A question for future research is whether videoconferencing ameliorates that problem (e.g. enhancing communication by virtue of its visual immediacy, voice transmission and potential to create a greater sense of personal contact) or whether it merely creates other problems. O’Dowd (2006) took a first step in this direction by studying the use of videoconferencing in tandem with e-mail to compare their respective contributions in intercultural exchanges. He found that although e-mail was a more effective platform for providing in-depth background on issues, participants’ differences of opinion tended to be left unexplored in this medium, whereas in face-to-face videoconferencing students were, “in a way, obliged by the nature of the medium to delve further into the topics in question to find out why the other group felt the way it did. It was when they did this that the link between their partners’ behavior and beliefs and the personal, social, and historical factors began to emerge” (p. 104, our emphasis).

Finally, an important question raised by multimodality is whether communicative abilities learned via CMC can transfer to other, non-CMC contexts or modalities, such as face-to-face speech. Abrams (2003) found that students who engaged in synchronous CMC the day before an in-class oral discussion produced more discourse during that discussion than students who had not used CMC or had used asynchronous CMC. Mendelson (2014) presented case studies of individual students who displayed transfer between chatting and speaking, but in very different ways.

**Automated conversation**

Automated conversation involving chatbots or agents is another promising area for CMC in language learning. Chatbots have existed since at least the mid-1960s, when an MIT professor introduced ELIZA (Weizebaum, 1966). Today, automated ‘bots’ are widely used in the commercial world to solicit information from customers. In a review of bots for language learning, Fryer and Carpenter (2006) suggested a number of possible advantages they might offer: for example, students feel more relaxed when communicating with bots than with human beings; bots can repeat material endlessly without getting tired or impatient; bots can communicate in both text and synthesised speech; and bots can be designed to provide a variety of specific feedback on either grammar or spelling. In the future, bots could be designed for very specific purposes; for example, they could be combined with automated writing evaluation programmes to converse with students about how they plan to revise their papers.

Newer and more complex than bots, but also of great potential interest for language learning, are automated conversation agents. Such agents do not communicate one-to-one with students. Rather, they ‘listen in’ to small group online discussions, monitor the conversations and intercede according to what has already been said to stimulate more advanced conversation. For example, a team of researchers at Carnegie Mellon University has developed automated agents that ask students to revoice (e.g. ‘So are you saying that the two people are equally at fault?’), to agree or disagree (‘Do you agree or disagree with what she said, and why?’) and to explain others’ perspectives (‘Why do you think he thinks that way?’ e.g. Adamson et al., 2014). To date, these bots have been used to support more critical thinking in general classrooms rather than being targeted at language learners specifically. However, it is easy to imagine the special benefit for language learning if such bots were incorporated into small group online discussions.
Conclusion

For many students, online environments represent far more than a place to learn or practice language. Rather, they are sites where much of learners’ real-world language use takes place. CMC is thus becoming not only more varied and complex, but also increasingly important in language education. The global growth of the Internet, the proliferation of mobile devices, and the development of new capabilities for automated and multimodal interaction make it likely that the role of CMC in second language teaching and research will continue to expand in the future.

Discussion questions

• In what ways might CMC differ from face-to-face interaction? Consider interactional differences as well as how language is used in different forms of CMC. Given that interaction has a central place in the creation of learning opportunities, what might these differences mean for the language that might be learned?
• To what extent do learners in your professional context engage in CMC in English in the classroom and beyond the classroom? What kinds of interactions do they engage in, and what might they learn as a result?
• To what extent do you think that developments in CMC might help autonomous language learning?
• To what extent do you think that the lack of control over language forms in CMC might lead learners to use non-standard English? To what extent is this a problem?
• What opportunities are there for the development of CMC for language learning in your context, both for learners within school settings and also for learners beyond the classroom (e.g. through online game-playing)? What are the barriers to such developments?

Related topics

Cognitive perspectives on classroom language learning; Error, corrective feedback and repair; Language and culture in ELT; New technologies, blended learning and the ‘flipped classroom’; Sociocultural theory and the language classroom.

Further reading


Jones, R. H., Chik, A. and Hafner, C. A. (eds) (2015) Discourse and digital practices: Doing discourse analysis in the digital age. London: Routledge. (This draws on contributions from leading scholars to explore ways that digital literacy practices such as text-based online communication, video gaming and social networking can be analysed using discourse analytic approaches and tools.)


References


Kern, Ware and Warschauer


Ware, P. (2005) ‘“Missed” communication in online communication: Tensions in a German–American telecollaboration’. Language Learning & Technology, 9. 64–89.


