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New Technologies and Additional Language Learning

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Introduction

At this point in history, more than a decade beyond the wide-spread diffusion of the world wide web (in the mid 1990s), it has become cliché to engage hyperbole when attempting to describe the magnitude of the Internet's transformative effects on local and global communicative practices, yet recent demographic trends empirically substantiate hyperbolic phenomena. Specifically, as of June 30th, 2006, there are estimated to be well over one billion (1,043,104,886) Internet users globally. Among world regions, it is not surprising that North America retains the greatest percentage of Internet penetration (68.6% of total population), followed by Oceana/Australia (52.6%) and Europe (36.4%). Somewhat surprising may be that the largest absolute number of Internet users currently reside in Asia (380,400,713) (from Internet Use Stats, see *www.internetworldstats.com/stats.htm)*. To revisit the essential message of Internet pioneer Tim Berners-Lee, these massive demographic shifts in Internet growth suggest that the Internet is less a technological fact than a social fact, and one that is mediated in large part by textually mediated language use. These many issues suggest the need for a new alchemy within second language education, one in which linguistic precision and discourse competence continue to play roles, but in the service of cultivating the capacity to make collectively relevant meanings in the inherently intercultural contexts of everyday life.

This review essay will discuss a number of contexts and uses of technologies, generally Internet communication technologies, as they have been and are being used in second and foreign language (hereafter L2) education environments. Three primary areas of research and pedagogical innovation will be addressed, 1) the use of synchronous computer-mediated communication (CMC), generally in intra-class configurations, 2) Internet-mediated intercultural L2 education, where learners engage with one another across language communities and often across nation state borders, and 3) additional language learning as a function of participation in Internet-supported communities such as online fora, fan sites, fan fiction sites, and online gaming. These topics will be followed by a discussion of recent and emerging technologies and a presentation of challenges to technology-mediated language learning. Throughout the essay the iterative theme will be the implications and potentialities of teaching and learning additional languages through activities mediated by Internet communication and information environments. The discussion begins, however, with a retrospective visit to the unrestrained optimism characterizing early reports on technology use in education.

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Preamble: Early Perspectives on Technology Use in Education

Within the academy at large, early pedagogical rationales for uses of computer-mediated communication often involved bringing students' thinking and writing into the classroom as legitimate knowledge (Bruce, Peyton, & Batson, 1993). The "electronic writing space" (Bolter, 1991) provided by computers in composition courses, and later networked writing environments, were eagerly greeted as convention and genre shattering tools that would transform the nature of communication and the production of and audience for student produced texts. To take a few examples of the early enthusiasm for a computer-mediated paradigm for learning, Landow argued that "we must abandon the conceptual systems founded upon ideas of center, margin, hierarchy, and linearity and replace them with ones of multilinearity, nodes, links, and networks" (1992: 2). In a similar vein, Lanham predicted that "[s]ooner or later, … electronic texts will redefine the writing, reading, and professing of literature …" (Lanham, 1993: 1), and later, suggested that "[e]lectronic technology is full of promising avenues for language instruction; it will be lunacy if we do not construct a sophisticated comparative-literature pedagogy upon it" (1993: 23). Both Landow and Lanham were emphasizing the substantive aesthetic and material shifts that digital and networked technologies seemed capable of producing, such as the polyvalent structure of 'texts' as they are produced and consumed in digital and hypertext environments and a reduction of the time and space constraints that characterized pre-digital and pre-internet communication and information practices. These resources were widely acknowledged to catalyze a potential new age of community building through communication (e.g., Reingold, 1993) and to support committed, radical reform to educational practice (Lankshear, Peters, & Knobel, 1996).

Throughout the 1990s, direct personal experience with network technologies initiated a viscerally motivated pedagogical shift that moved many language educators from cognitivist assumptions about knowledge and learning as brain-local phenomena to contextual, collaborative, and social-interactional approaches to language development and activity (e.g., Cummins & Sayers, 1995; Hawisher, 1994; Hilz & Turoff, 1993; Noblitt, 1995; Warschauer & Kern, 2000). Particularly in the context of synchronous CMC, or real-time "chat" style communication, the novelty and defamiliarization of communication within these spaces was provocative. An illustration of this occurred in the summer of 1993 during a workshop on the use of networked environments presented to foreign language and composition instructors. All participants were new to real-time computer mediated communication. At the end of the workshop, the group was asked to use the chat tool one last time to reflect on the day's activities. An instructor from the English department wrote the following:

> I'm a bit fractured. Is this what those in the know call a post-modern moment? I'm situated on the margins of assorted discourse communities, not sure how to construct myself for (or how I'll be constructed by) each audience. Help me. … (Summer 1993; excerpted from Thorne, 1999: 4)

For this participant, the chat experience confounded conventional genres such as conversation and information exchange and perhaps, to borrow from Faigley, more involved a "reconfiguring of discursive relations" (1992: 180). Of course, even a few years later, in the mid and late 1990s, a wide array of Internet-mediated practices were common to the point of complete transparency for habituated late modern communicators.

Review of Research

Networked communication tools in language education

The ability to link students by networked computers has opened up a variety of opportunities for language based social interaction in L2 education. The pedagogical impetus behind educational uses of CMC (both Internet-mediated and earlier, within local area networks) has been, and continues to be, language development through textually mediated, generally peer focused communication.

Reports of L2 uses of Internet and local area network communication technologies began emerging in the early 1990s. These accounts suggested a number of pedagogical benefits from CMC use, many of were seen to be not readily available in conventional L2 language (Cononelos & Oliva, 1993) or composition (Colomb & Simutis, 1996) classrooms. Reported findings included the opportunity for expression of ideas than in face-to-face discussions and more time for reflection in the production of messages (Kern, 1995), more linguistic production overall (Kelm, 1992; Beauvois, 1992), and increased participation by students who do not participate as frequently in face-to-face classroom discussion (Sullivan & Pratt, 1996). The conventional subject positions of teachers and students were also argued to have shifted dramatically through the intervention of technology. Speaking to this issue, Kelm (1996: 27) stated that "technology allows language instructors to function in new roles: designer, coach, guide, mentor, facilitator. At the same time the students are able to be more engaged in the learning process as active learners, team builders, collaborators, and discoverers." While such shifts may have occurred in some cases, the early euphoria surrounding technology use as the panacea assuaging the challenges of education and language learning is striking (for a critical treatment of this issue, see Knobel et al., 1998).

Synchronous CMC Use in L2 Education

The use of synchronous CMC (SCMC), commonly referred to as *chat*, has formed the basis for a large number of second language acquisition (SLA) studies. Throughout the early 1990s, Kern (1995) used a SCMC tool called Daedalus Interchange, a local area network application, with sections of University second semester French foreign language students. Based on his observations of in-class SCMC use, Kern attempted to quantitatively assess the impression that foreign language students were producing more language output in SCMC environments than was the case in large group face-to-face classroom settings. Using a quasi-experimental methodology, Kern analyzed a 50-minute French foreign language SCMC session and compared it to an oral in-class discussion by the same language students on the same topic. The SCMC treatment produced between two and three times more turns per student and a higher total number of sentences and words compared to the large-group oral discussion (see also Abrams, 2003). Kern also examined the linguistic quality of the discussions and found that students' SCMC language output was more sophisticated in terms of the range of morphosyntactic features and variety of discourse functions expressed (1995: 470). These findings are supported by Chun's (1994) study of fourth-semester German students in which SCMC use promoted increased morphological complexity and a greater ratio of complex sentences in non-SCMC written coursework over the course of one semester. More recent research has also suggested that SCMC language use is more accurate than that of face-to-face interaction (Salaberry, 2000).

While Kern and Chun's research on L2 uses of large-group SCMC have demonstrable strengths, Ortega (1997) has noted limitations to comparing computer-mediated classroom and whole-class oral discussions. Ortega posited that the variables of group size and communicative task were not accounted for in the early SCMC research (e.g., Beauvois, 1992; Chun, 1994; Kelm, 1992; Kern, 1995). She argued that

> it is justified to hypothesize that group size and equality of participation are negatively related in traditional oral interactions and positively related in computer-assisted interactions, and that the benefits of electronic over non-electronic interactions will increase with the size of groups ... In other words, the positive equalizing effect of the electronic mode will be accentuated when comparing larger groups, as in the comparisons of teacher-fronted, whole-class discussion with whole-class electronic discussion. (p. 86)

This observation in no way obviates early SCMC research efforts, but it constructively suggested attention to key pedagogical and group size variables and also set the stage for future work that examines the possibility of cross-modality transfer between SCMC use and oral language production.

Cross-modality Transfer

A growing number of L2 SCMC investigations explore cross-modality transfer between spontaneous SCMC and oral L2 language production (e.g., Abrams, 2003). Indeed, one of the alluring characteristics of SCMC for L2 teachers and learners has been its perceived resemblance to oral conversational language (e.g., Chun, 1994; for an argument against this claim, see Johanyek, 1997; see also Yates, 1996). Since a major goal of foreign language instruction is the development of oral conversational ability, the possible connection between spontaneous L2 language production via text and speech has been a long-stranding focus of L2 SCMC research (Beauvois, 1997; Payne & Whitney, 2002; Abrams, 2003; Kost, 2004; Payne & Ross, 2005). Payne and Whitney (2002) applied psycholinguistic models of language production and working memory to cross-modality transfer and found a significant difference in the oral proficiency gains between experimental (+SCMC) and control (-SCMC) groups. In a follow up study, Payne and Ross (2005) augmented this psycholinguistic approach with discourse and corpus analytic techniques to explore how individual differences in working memory capacity may affect language use in SCMC. A principle finding was that learners testing at lower levels of measured phonological working memory were able to utilize the scrolling on-screen messages from other students as they generated their own contributions. Payne and Ross hypothesizd that SCMC creates a "bootstrapping effect" that reduces the cognitive demand of L2 language production and may enable students with measured low-span working memory to produce more complex language than would otherwise be the case. New possibilities in cross-modality research include emerging CMC tools that support bimodal chat (i.e., a combination of both text and voice communication, see Blake, 2005) that may prove promising as environments to support a variety of learning styles and media preferences.

Interactionist SLA Research

A large number of SCMC studies have adopted the interactionist or "negotiation of meaning" framework, an approach to SLA initially designed for analysis of negotiation of meaning in oral interaction (e.g., Varonis & Gass, 1985) and subsequently has been applied to SCMC learner data and task configurations. Briefly described, the interactionist hypothesis suggests that nonnative speakers benefit from negotiation processes, such as modifications to linguistic input, that subsequently increase comprehension and promote interlanguage development (e.g., Long, 1985; Pica, 1987; Varonis & Gass, 1985; for a critique of the interactionist SLA paradigm, see Block, 2003). Pellettieri's (2000) interactionist research on Spanish L2 learners using SCMC found that dyadic groupings promoted an increase in corrective feedback and negotiation at all levels of discourse, a condition that prompted learners to produce form-focused modifications to their turns. Additionally, task type, specifically goal-oriented closed tasks, was positively correlated to the quantity and type of negotiations produced.

In a similar study from the same period, Blake (2000) assessed the SCMC interactions of 50 intermediate learners of Spanish. Participants were arranged in dyads and asked to carry out three task types: decision making, information gap, and jigsaw. Like Pellettieri (see also Smith, 2003), Blake found that jigsaw tasks produced the greatest number of negotiations, but nearly all negotiations were lexical in focus with very few addressing problems in syntax or larger units of discourse. In a 2005 study, Sotillo examined the use of Yahoo! Instant Messenger to assess the nature of negative feedback (e.g., error correction) occurring in native speaker (NS) – non-native speaker (NNS) and NNS-NNS interaction. This study indicated the availability of negative feedback within SCMC, particularly among the NNS-NNS dyads, with some evidence of learner uptake catalyzed by these direct and indirect (e.g., recasts) corrective feedback moves.

Building on earlier negotiation of meaning research in both CMC and face-to-face settings, Smith (2003) expanded the Varonis and Gass (1985) four-part model of face-to-face negotiated interaction—1) trigger > 2) indicator > 3) response > 4) optional reaction to response— by explicitly incorporating two additional phases to represent delayed reactions to response turns that are so frequent in SCMC discourse. Smith terms these *confirmation* and *reconfirmation* phases, elements that explicitly conclude a given negotiation routine and which act as discourse markers suggesting the possibility of resuming non-negotiation interaction (2003). Smith's augmentation of the interactionist model provides a more modality-relevant framework for research on computer-mediated negotiated interaction.

While the interactionist SLA framework constitutes a significant or even majority market share of CMC L2 research and has produced interesting findings, the assumption that negotiation of meaning results in increased comprehensibility, which then is posited to promote language learning, has been strongly contested (Block, 2003; related to CMC, see Reinhardt, forthcoming). Swain, an early proponent of and contributor to the interactionist paradigm, has recently contested these correlations, stating that "virtually no research has demonstrated that the greater comprehensibility achieved through negotiation leads to second language learning" (2000: 98). Interactionist researchers are aware of this problem and subsequently often make only descriptive claims confirming the presence of negotiation in SCMC discourse. For example, in a recent NNS-NS SCMC study, Lee concluded that while her study supported the interactionist hypothesis, it "did not address whether responses to implicit feedback led to L2 development", rather it "simply identified feedback features used by both NSs and NNSs to negotiate meaning and form in the immediacy of ongoing [SCMC] dialogue" (2006: 171). Another challenge to the interactionist paradigm is its traditionally exclusive focus on linguistic elements and encapsulated discoursal moves with little attention to, or provision for, the goal-directed pragmatic and cultural dimensions of communicative activity as they may relate to language learning (Kern, 2006). Researchers committed to the interactionist hypothesis, however, are addressing these limitations, for example by focusing on cognitive processes such as noticing and attention to form that more robustly correlate negotiation of meaning to measurable gains in linguistic and communicative competence (e.g., Ellis, Basturkmen, & Loewen, 2001). Within CMC L2 research, an inspiring research article by O'Rourke frontally addresses the constraints of interactionist CMC research by contrapuntally contrasting it to Vygotsky inspired sociocultural theory (the latter discussed below). O'Rourke utilizes interactionist methodologies as an aid in uncovering language phenomena associated with metalinguistic awareness. At the same time he openly acknowledges interactionism's tendency toward determinisms – both that technology can be seen to determine linguistic functions and that negotiation of meaning can be, somewhat ironically, presented as a set of pre-defined categories of non-negotiable discoursal moves. He also problematizes sociocultural theory as overstating the plasticity of social relations, interpretation of tasks, contexts (and by extension, subjectivities), and cultural significances associated with particular technologies. For research on technology-mediated L2 language use,

O'Rourke suggests careful attention to the "features of artifacts and environments [that] can be graded according to the strength of their tendency to promote attention to form" (2005: 435). This approach could allow interactionist methodology greater responsivity to the flexibility and local cultural qualities of the activity and artifacts at hand while also accepting the "relatively identifiable contours" of historically stable contexts, language practices, and technologies.

Sociocultural Theory and CMC L2 Research

L2 technology researchers have found sociocultural theory (hereafter SCT) to be a useful theoretical framework due in large part to its serious attention to the symbolic and material mediators of human activity (e.g., Belz, 2002; Darhower, 2002; Oskoz, 2005; Thorne, 2004; Warschauer, 1997, 2005). The vast majority of technology related SCT oriented L2 studies, however, address the specific context of Internet-mediated intercultural L2 education, an area of pedagogical innovation that has become so vibrant as to warrant separate attention and thus will be addressed in the following section. To briefly describe the essential elements of theory, SCT -- also referred to as cultural-historical activity theory (see Thorne, 2005, for discussion of this terminological difference), is rooted in the writings of the Russian psychologist L. S. Vygotsky and colleagues (e.g., Leont'ev, 1981; Luria, 1976; Vygotsky, 1997; Volosinov, 1973). SCT argues that human mental functioning is fundamentally a mediated process that is organized by cultural artifacts, activities, and concepts (Ratner, 2002). Humans are understood to utilize historically developed repositories of existing, as well as to create new, semiotic and conceptual artifacts that allow them to regulate their biological and behavioral activity. In this sense, individual and communal practices are on the one hand articulations of historical continuance; on the other hand, they possess revolutionary potential for individual and collective change (see Sawchuk, Duarte, & Elhammoumi, 2006). Language use, as well as language organization and conceptual structure, are the primary of these social-semiotic mediational tools (for an SCT-informed linguistic model of communicative activity, see Thorne & Lantolf, 2006). While human neurobiology is an obvious and necessary condition for higher order thinking, human cognitive activity develops and is qualitatively transformed through interaction with, and contributions to, social and material environments (see Lantolf & Thorne, 2006a, 2006b; Stetsenko & Arievich, 2004; Tomasello, 1999).

SCT has been used to frame a number of areas of L2 CMC inquiry. Darhower (2002) has examined the use of SCMC in two fourth semester university level Spanish courses. His analysis illustrated that students were able to appropriate the chat environment to produce a personally meaningful, highly intersubjective discourse community that included the performance of non-student identities, theatrical role play, sarcasm and recurrent forms of humor, and strategic uses of the L1 to support more sophisticated dialogue, all of which extended the discourse possibilities substantially beyond those available in the face-to-face classroom setting. In a multisite research project that resulted in the text Electronic Literacies, Warschauer (1999) examined technology use in linguistically and ethnically diverse college level ESL, Hawaiian language, and English writing courses. His emphasis was to assess the impact of technology mediated learning activities across divergent contexts, with a focus on understanding the limits and possibilities of computer-mediation as a potentially transformative force in the development of computer literacy, L2 communicative competence, and L1 writing. Warschauer's analysis showed that the processes and outcomes of technology use differed greatly across the various contexts, suggesting constitutive ecological relationships (e.g., Bateson, 1972) between institutional mission and culture, teacher beliefs about the processes and expected outcomes associated with learning, and student-participants as subjects with agency and independent life goals. To take two of the cases, the undergraduate ESL course emphasized discrete point surface level grammatical accuracy and subsequently, computer-mediated activities involved primarily grammar drills and attention to

linguistic form. The Hawaiian language course, by contrast, was ideologically committed to writing as a form of collective empowerment, with computer-mediated activities involving linkages to the community and the production of applied research that could support Hawaiian language revitalization and maintenance. In terms of technology integration into formal educational contexts, Warschauer's (1999; see also 2005) work has suggested that socially and/or professionally relevant "strong purpose activities" are more productive, but equally, that the uses of various technologies should include modality specific and rhetorically appropriate opportunities for expression.

Engeström and Miettenin have pointed out the problem that "[a]ctivity-theoretical studies of work and communication have thus far mainly dealt with development and learning within well-bounded activity systems" (1999: 32). Yet demonstrably, life and learning are not composed of isolated or strictly isolatable moments and spaces (e.g., Leander & Lovvorn, 2006; Roth et al., 2005). Addressing this issue, Thorne (1999; 2000a) has focused on the interpenetrations occurring between micro-interactional activity and macro-social and cultural structures through an examination of social and formal educational uses of Internet communication technologies. Based on log file transcripts and ethnographic interviews with participants, Thorne presented evidence that for a number of students, the discursive framing of L2 educational activity is differentially configured when mediated by synchronous Internet communication tools. The question posed was—why is this the case? Although prior research on CMC use in L2 contexts (for example, Beauvois 1998; Chun 1994; Warschauer, 1997) had provided important descriptive analyses of uses of CMC for educational purposes, this work was limited by its lack of attention to macro-cultural processes also at work (though see Warschauer, 1999, discussed above). Addressing this problem, Thorne (1999; 2000a) has proposed a two-level theoretical framework for the study of CMC that draws upon and expands theoretical treatments of mediation and interactivity system analysis. This approach to human activity mediated by artifacts distinguishes the "genotype" of an artifact's essential features and functional from its "phenotype", or observable characteristics as it is used within goal-directed activity. While artifacts always possess a discrete functional materiality – their brute observable genotypic existence, in practice, artifacts are meaningfully and differentially defined by their historical patterns of use. Within the context of CMC L2 use, a phenotypic approach frames in-class digital interaction within the larger context of participants' prior and everyday use of Internet communication tools. Through a focus on divergent communities mediated by common mediational artifacts—in this case Internet communication tools—the relevance and importance of interactivity system analysis becomes both obvious and necessary. Extensions of this line of research will be further discussed below.

Internet-mediated Intercultural L2 Education

The use of Internet technologies to encourage dialogue between distributed individuals and partner classes proposes a compelling shift in L2 education, one that moves learners away from simulated classroom-based contexts and toward actual interaction with expert speakers of the language they are studying. The conceptualization of L2 learning and use as foremost a process of intercultural communication, in both online and offline contexts, has received significant attention in recent years (e.g., Belz & Thorne, 2006a; Belz & Reinhardt, 2004; Brammerts, 1996; Byram, 1997; Furstenberg, 2003; Furstenberg et al., 2001; Kinginger, 1998, 2004; Kramsch, 1998; O'Dowd, 2003; Sercu, 2004; Tella, 1991; Thorne, 2003, 2006). Indeed, with greater Internet access across more of the world, there has been the suggestion that Internet-mediated intercultural communication constitutes a "second wave" of computer-mediated L2 pedagogy

(Kern, Ware, & Warschauer, 2004: 243). To refer to the wide diversity of approaches in this area, the umbrella term Internet-mediated intercultural L2 education will be used (hereafter ICL2E; note that "Internet-mediated" is assumed, and thus ellipted from the acronym). While intercultural approaches to language education constitute a vibrant but minority position in North America, Europe has begun to attune its educational systems to acknowledge growing diaspora populations and multilingualism as core characteristics of the modern nation state (*Council of Europe*, 2001). Displacing the long-standing goal of L2 communicative competence, the "objective of foreign language teaching is now … 'intercultural competence'" (Sercu, 2004: 115). Elaborating on this shift, Sercu argues: "[s]een from the intercultural perspective, it can be said that what a foreign language learner needs to learn in order to attain communicative competence is not how to adapt to any one of the foreign cultures present, and forget about his/her own cultural identity. Rather, the task of the participants in such an intercultural situation will be to negotiate, by means of implicit or explicit cues, a situationally adequate system of (inter)cultural standards and linguistic and pragmatic rules of interaction" (2004: 116). In reference to the larger goals of L2 education, Byram and Zarate (1997) describe intercultural competence as the capacity to mediate multiple cultural identities and situations, a perspective that includes, but extends far beyond, the mechanics of surface level grammatical accuracy.

Many ICL2E researchers and educators have benefited from the work of linguistic anthropologist Michael Agar, who brings together language and culture into a dialectical unity through the construct "languaculture" (1994: 60). Agar emphasizes that utterances are always produced and interpreted in relation to historically formed cultural practices and speech situations, thus the "langua" in "languaculture" is to be understood as the local inscription of more holistic frames of reference, examples of which include discourse grammar and language use as discursive practice (see also Carter, 1998; Gee, 1992, 1996; McCarthy & Carter, 1994; Scollon & Scollon, 2001). For L2 learners, perhaps especially those at more advanced levels, the growing realization of the subtle and obvious differences between their own and others' languacultures produces what Agar (1994) terms "rich points," the opportunities to collaboratively forge a heightened awareness of self and other that is fueled by the contestations and confusions that arise during communication (explicitly "intercultural" and otherwise). Agar conceptually shifts culture from the status of object to that of a process: "[c]ulture happens when a problem in language has to do with who you are" (1994: 48). A "problem" in the sense meant by Agar (see also Belz & Müller-Hartmann, 2003) is not something to avoid or ignore; it is a catalyst for development. As has been suggested by practitioners of cultural-historical activity theory (Engeström, 1987, 1999; Leont'ev, 1981; for L2 research, see Lantolf & Thorne, 2006a, 2006b; Thorne, 2000a, 2000b, 2003, 2004, 2005), development itself emerges from the resolution of contradictions, which in turn create conditions for future, perhaps more complex contradictions. As the research described below will suggest, differing languacultures and the rich points made visible through their contact have the potential to create potent if also challenging conditions for developing intercultural communicative competence.

Pedagogical Approaches to ICL2E

There exist numerous models of Internet-mediated intercultural L2 education (for a review, see Thorne, 2006). One approach, termed telecollaboration (Warschauer, 1996; Belz, 2003; Kinginger, 2004), describes international class-to-class partnerships within institutionalized settings. Telecollaboration practitioners tend to formally align their courses and often utilize parallel texts (e.g., translations of written material and remakes of films) to structure dialogue, form the basis of cross-cultural analyses, and encourage critical reflection on language-culture relations. Telecollaboration models are administratively intensive to initiate and maintain due the high level of coordination between partner classes (e.g., Belz & Müller-Hartmann, 2003). However, class-to-class partnerships arguably provide the strongest support for developing sophisticated

understandings of intercultural communication through careful design of student-initiated investigations and the explicitly designated role of the instructor as critical mediator and resource. A variant of the telecollaboration model involves connecting language students with heritage speakers on the same campus. Blake and Zyzik's (2002) research suggests that this format holds significant promise. While many institutions and regions include populations possessing heterogeneous linguistic and cultural backgrounds, intra-community linguistic resources remain largely untapped in instructed L2 education. Tandem learning, used extensively in Europe, involves the pairing of individuals in complementary dyads where each is interested in learning the other's language (Kötter, 2002; O'Rourke, 2005; Schwienhorst, 2003). Tandem learning is most associated with non-institutional learning configurations and typically requires partners to negotiate discussion topics and the balance between overt pedagogical and informal conversational activity.

A Review of Select ICL2E Research

More than a decade ago and still prophetic today, Kramsch suggested that L2 teaching should be built on a philosophy of conflict, one that affirmed fault lines, engendered a tolerance for ambiguity, and where "understanding and shared meaning, when it occurs, is a small miracle" (1993: 2). While ICL2E holds tremendous potential, a great deal, perhaps even the majority, of research in this area suggests that cultural miscommunication and open conflict should be expected (e.g., Kramsch & Thorne, 2002; Schneider & von der Emde, 2003, 2006; Thorne, 2003; Ware, 2005; Ware & Kramsch, 2005). The discussion to follow describes two telecollaboration case studies that focus on disjuncture between discourse systems and is followed by broader implications for the role of the instructor in ICL2E projects (this review of ICL2E is drawn largely from Thorne, 2006).

Motivated by the awareness that intercultural communication is certainly made more rapid and convenient by global communication networks, Kramsch and Thorne (2002) have argued that characterizations of face-to-face communicative competence (e.g., Breen and Candlin 1980; Savignon 1983) may require substantial revision in the context of Internet-mediation. In a study that analyzed the email interaction occurring in a French-American telecollaoboration project, Kramsch and Thorne (2002; see also Kern, 2000) illustrated that the French and North American students were operating within, and expecting from the other, differing genres of communication. The French students employed a largely factual, impersonal, and dispassionate genre of writing that included supporting their positions with examples and frequently employing argument building logical connectors ("for example," "however," "moreover"). By contrast, the North American students expected the telecollaborative interactions to result in peer solidarity and mutual trust building. Especially in early phases of the project, the phatic style of the American postings, full of questions and exclamation marks (and other message elements seeking to build relations rather than exchange information), suggested a high degree of affective involvement and personal-emotional investment that, in the end, did not convert well to contentious academic argumentation. In a post-telecollaboration interview, one of the American students explained his experiences in the partnership in the following way:

> Interviewer: It seemed like you all would ask questions, right? Didn't you get responses?
> Eric: Sometimes we'd get long .... but it's true we didn't get, *it seems true that they weren't doing the same thing we were.* It seemed like, you know, we had a task. And they, it seemed like, *I didn't know what they were doing* [laughs]. … When we [Americans] were talking to each other, it was debate and agreement and process. But with the French, we'd ask a question and receive a statement... (Kramsch & Thorne, 2002: 97)

As this participant describes it, the two partner classes were operating on the different and orthogonal axes of communication as information exchange versus communication for personal engagement, forming what Bernstein (1996: 44) has termed a "potential discursive gap" that marks both misalignment as well as an opportunity for alternative possibilities and understandings. In a related article describing "missed communication" in a German-American telecollaborative partnership, Ware (2005) emphasized that intercultural L2 research should address not only the processes through which participants jointly construct online discourse, but also how participants construe the larger context of their participation.

In a study that imparts a complementary perspective on the issue of divergent communication styles, Belz (2003) carried out a linguistic analysis of telecollaborative exchanges between one American and two German participants. Belz utilized a variety of Hallidayian systemic functional analysis called appraisal theory, a specialized approach used to analyze the linguistic elements at play in the development, negotiation, and maintenance of social relationships. Appraisal theory provides tools to examine epistemic modality and other linguistic resources that communicators use to display and negotiate feelings, judgments, and valuations (see Martin & White, 2005). This study involved a quantitative analysis of linguistic features in the asynchronous CMC interactions which illustrated that while overall rates of appraisal were similar for the three participants, there were marked differences in the distribution of positive and negative appraisals between the Germans and the American. To summarize, Belz demonstrated in fine-grained linguistic detail that Anke and Catharina, the German partners, showed a tendency toward "negative appraisal, categorical assertions, and intensification [that] may be reflective of broader German interactional patterns of directness, explicitness, and an orientation toward the self" (2003: 91). In contrast, Eric, the American, exhibited "patterns of self-deprecating judgments, positive appreciation, and the upscaling of positive evaluations [that] may index broader [American] communicative patterns of indirectness and implicitness" (Belz, 2003: 91). Belz clearly states that these differences dialectically interrelate with cultural and institutional communicative patterns but that languacultural norms do not determine discourse in any absolute fashion. Rather, historically established languacultural systems represent social semiotic resources that inform interactional preferences. Building on Byrnes (1986), the pedagogical implication to be drawn is not that students need necessarily change their discourse preferences. Rather, intercultural communicators would benefit from greater awareness of their own interactional style(s) and the development of heightened attunement to the communicative preferences of their interlocutors. The instructor would have multiple roles in this process, such as acting as a critical mediating resource and sounding board to facilitate consciousness raising and modeling what Kramsch has described as an intercultural stance (1999; Ware & Kramsch, 2005). Belz provides the following description of the role of the ICL2E educator: "the teacher in telecollaboration must be educated to discern, identify, explain, and model culturally-contingent patterns of interaction in the absence of paralinguistic meaning signals, otherwise it may be the case that civilizations ultimately do clash – in the empirical details of their computer-mediated talk" (2003: 92-3). Put another way, the role of the L2 teacher in ICL2E setting is "to prepare students to deal with global communicative practices that require far more than local communicative competence" (Kramsch & Thorne, 2002: 100).

ICL2E research has also addressed issues of pragmatic and linguistic development that have been argued to be consequences of participation in significant, meaningful, typically age-peer personal relationships. In a case of language learning fostered by interpersonal mediation, Thorne (2003) described a student in a University level fourth semester French grammar course participating in an ICL2E exchange with University students in France. In a post-semester interview, the student described a transition that began with frustration over the slow start to her keypal relationship but which culminated with a one-week period of prolific dialogue. The exchange began with an e-mail message but quickly moved to another Internet communication tool, America Online

Instant Messenger (IM). The student reported that the first IM interaction went on for nearly six hours and included the use of both English and French. Subsequent to this, the interactions continued in twenty to thirty-minute sessions, often twice or three times per day. Two issues are highly salient -- the shift to IM, which is the clear communication tool of choice for peer interaction among University aged youth in the United States, and the subordination of French language study as an educational activity to the use of French (and English) for the building of a personally meaningful relationship. Not discounting the importance of the flirtatious nature of this relationship, the American student reported that her linguistic and pragmatic performance in French showed significant shifts. Through interaction with and goading from her French key pal, the American student eventually gained command of appropriate tu-vous (T/V) pronoun use, a facility that had eluded her throughout years of French study. More dramatically, the American student had always thought of herself as "horrible" at French grammar and had little confidence in her capacity to carry out meaningful communication in the language. When asked about the specific linguistic gains arising from her interactions with her French interlocutor, she made the following remarks:

> Interviewer: What else beside the tu/vous stuff did he help you with?
> Kirsten: Usage of "au" versus "en" versus "dans" versus "à" versus, you know, that kinda stuff. A more in-depth vocabulary, for sure. … it's kind of nice to have a human dictionary on the other end too ... I was like "how am I supposed to say?" like for example .... So the "de" and "à" thing, "de la campagne," "à le cité," whatever, stuff like that. I was like "wow," you know, eeeeeee [vocalization of glee; laughs]. Because I couldn't get that from a dictionary.
> Interviewer: That's something you have to have a little help with, yeah?
> Kirsten: Yeah, yeah, and how am I supposed to learn it? That's not in the grammar books, you know [laughing], expressions like that, and other things. It was fun. (Thorne, 2003: 50-51)

In these excerpts, the American student describes the interaction that allowed her access to the French prepositional system that she allegedly "couldn't get … from a dictionary" and that is "not in the grammar books." Many French language students have successfully developed the ability to use French prepositions of location from grammar texts or instructor-provided grammar explanations. This student, however, seemingly required interpersonal mediation, specifically from a desirable age-peer who was willing to provide immediate corrective feedback as part of an ongoing social relationship. During her initial IM conversation with her French partner, she crossed a threshold that marked the first time she was consciously aware of her capacity to communicate meaningfully in French, stating "that was the first time that I was like, 'I made a connection in French.' I was so proud. It was like, 'wow, that's me, in French, and he understood me!'" (Thorne, 2003: 53) This brief case study suggests that interpersonal dynamics construct differing capacities to act, which in turn are associated with a range of possible developmental trajectories.

The power of social relationships also has a hand to play in one of the strongest examples of pragmalinguistic learning outcomes reported in ICL2E research. In a series of SCT-informed studies on telecollaboration, Belz and Kinginger (2002, 2003) and Kinginger and Belz (2005) described the development of address forms used in French and German (tu/vous and du/Sie, hereafter T/V). Current sociolinguistic research indicates that T/V usage has become destabilized in the French and German languages (Morford, 1997). Additionally, the specialized contexts of foreign language textbooks and classroom discourse tend to radically simplify the sociopragmatic ambiguity around T/V usage. Perhaps for this reason, nearly all of the American student participants in these trans-atlantic interactions exhibited free variation of T/V at the start of the intercultural communication process. Employing the Vygotskian methodology of microgenetic analysis, Belz and Kinginger tracked usage over time in both email and synchronous CMC ses-

sions and found that after critical moments within exchanges with expert speaker age-peers, the American participants began to systemically modify their usage. These critical moments included explicit feedback and rationales for T form usage from German and French peers. Additionally, the American students had myriad opportunities to observe appropriate pronoun use by native speakers across synchronous and asynchronous CMC modalities. In this way, pragmatic awareness of T/V as an issue (i.e., "noticing", see Schmidt, 1993) led to the approximation of expert speaker norms in most cases. Belz and Kinginger argued that the American students' desire to maintain positive face (in essence, wanting to be liked) with age-peers helped to focus their attention on the role of linguistic form in the performance of pragmatically appropriate communication. In further research, the importance of the social relationships built in these transatlantic partnerships have been linked to positive development of other grammatical and morphological features, namely da-compounds in German (Belz, 2004, 2006), modal particles in German (Belz & Vyatkina, 2005), and lexical and morphological development in Spanish (Dussias, 2006).

Methodological Affordances: Corpus Analysis and CMC as Persistent Conversation

As has been discussed, ICL2E is premised on the notion of language learning through intercultural communication. A significant problem with the teaching of language-as-culture, as well as language form, is that the more obvious manifestations, such as grammatical constructions or formulaic pragmatics, are relatively simple to isolate and may require only modest explication. On the other hand, the historically structured resources (i.e., culture) that inform the subtleties of everyday communication can remain difficult to access or even invisible. Internet mediation provides a number of affordances in this area. In addition to the process-ontology of unfolding activity, the actual moment-by-moment participation in a chat dialogue box or even the first reading of an asynchronous post, most CMC tools also produce a digital record that has been described as "persistent conversation" (Erickson 1999). Erickson provides the following insightful description:

> …digital conversation may be synchronous or asynchronous, and its audience intimate or vast. Its persistence means that it may be far more structured, or far more amorphous, than an oral exchange, and that it may have the formality of published text or the informality of chat. The persistence of such conversations also opens the door to a variety of new uses and practices: persistent conversations may be searched, browsed, replayed, annotated, visualized, restructured, and recontextualized, with what are likely to be profound impacts on personal, social, and institutional practices. (Erickson, 1999: no page number)

The persistence of (relatively) spontaneous language production is useful for L2 learners on at least two levels. The first is the immediate re-representation of a message that has been typed and submitted to a synchronous or asynchronous forum. To take SCMC as one example, messages are first entered into a discrete text window and then, when posted, take their place in the publicly shared window as a turn-at-talk in an ongoing two- or multi-party discussion. This re-presentation of one's message as a unified and emplaced utterance objectifies it in a way that is distinctive from the experience of having producing it. Learners often see gaps, problems, or a need for revision to their own messages when re-reading them just moments after they have been posted (Thorne, 2000a). To take one example, in the excerpt below, a student describes learning from e-mail interactions with a French friend:

> Eric: e-mail is kind of like not a written thing .... when you read e-mail, you get conversation but in a written form so you can go back and look at them. …I've had that experience where conversational constructions appear in an e-mail form from a native speaker of French, which is really neat. Because it doesn't fly by you and kind of "look at that" (Kramsch & Thorne, 2002: 97)

A second use of persistence is that transcripts can be intensively searched and analyzed after the fact. If we understand language use as a form of social action (Heritage 1984), CMC makes these actions visible and durative. This opens up significant opportunities for reflection and analysis that would otherwise not be possible. From a conversation analytic perspective, Brouwer and Wagner describe working with "collections of phenomenological similarity", meaning recurrent patterns of communicative activity that share structural and functional features and that are used as a "resource for constructing intersubjective meanings in social life" (2004: 31). One approach for making visible such "collections of phenomenological similarity" is to utilize computational tools that can search, produce collocations, and variably sort large volumes of real language data that reflect specific genres or communicative contexts of interest. This approach is called corpus linguistics (e.g., Biber et al., 1998; Granger et al., 2002; McCarthy, 1998; Sinclair, 1991, 2004).

Within ICL2E, Belz (2004, 2006) and her collaborators have used corpus analytic techniques to query large volumes of Internet-mediated intercultural language conversations to ascertain the precise differences between expert and learner discourse in difficult to teach (and learn) areas (such as *da* compounds and modal particles for German). Belz uses corpus-informed contrastive analysis, sometimes described as data-driven learning (e.g., Johns, 1991), to ascertain subtle differences in uses of discrete linguistic elements and collocations (i.e., common patterns of lexical affiliation) across learner and expert corpora of language use. Assessing variance in the frequency and distribution of linguistic elements between expert and learner language use is especially relevant for ICL2E projects as issues of pragmatic appropriacy and cultural misalignments are all recorded in persistent textual form. With ecologically aligned corpora of both learner and expert language use, Belz & Thorne have suggested that L2 teachers can better:

> "capitalize on the blended quality of telecollaborative pedagogy in conjunction with the results of contrastive learner corpus analysis to convey an understanding of L2 competence that is rooted in frequency of use as well as grammatical accuracy, to construct quantitative profiles of learners' linguistic development over time, and to design individualized, corpus-based pedagogical interventions for underused or misused features." (Belz & Thorne, 2006b: xv).

This review of ICL2E research has attempted to show that the goals of various projects and interventions are diverse, but often include linguistic and pragmatic development as well as increasing awareness about one's own cultural background, those of one's interlocutors, and the processes involved in carrying out extended, developmentally productive, and ultimately meaningful dialogue with persons who are primary speakers of other languages. While correspondence with expert speakers of the language of study is a pedagogical method with a long history (e.g., Freinet, 1994), the recent surge in pedagogical and research efforts in this area suggest that ICL2E is exerting a significant and broad-based influence on the character, processes, and goals of mainstream L2 language education.

Open Internet Communities and Affiliative Networks

People have interests, passions, hobbies, idols, fetishes, problems, addictions, and aspirations that they want to communicate, share, argue about, and bond over. The Internet has created compelling opportunities to engage in all of the above (and more) that include discussion fora associated with newspapers such as *Le Monde* (Hanna & de Nooy, 2003), fan fiction sites (Black, 2005, 2006), and fan websites (Lam, 2000, 2004; Lam & Kramsch, 2003). To begin with a project that most closely relates to instructed L2 learning, in a finely crafted study, Hanna and de Nooy (2003) reported on four students of French who participated in public Internet discussion fora associated with the Parisian newspaper *Le Monde*. The authors present a strong rationale for opting to use public discussion fora rather than more conventional telecollaboration partnerships. While it is a debatable point, Hanna and de Nooy argue that while telecollaboration has many virtues, students are still "safely

within the classroom, virtual though it might be" (2003: 73) and limited by the fact that they occupy, and predominantly speak from, the institutionally bounded subject position of student or learner. *Le Monde* discussion fora, by contrast, exist to support argumentation and debate about mostly contemporary political and cultural issues. One forum in particular, labeled *Autre sujets* (other topics), included a wide range of participants and topics and was selected as the venue for the study.

The French language learners in Hanna and de Nooy's study were David and Laura, both American, and Eleanor and Fleurie who were English. Each student's opening post to the *Autre sujets* forum was analyzed and followed for the number and content of the responses received. Each of the four students opened with a gambit that positioned them as learners of French, but they differed in their tone and affect. Eleanor and Fleurie opted to create new, stand-alone messages on the forum, with the respective subject lines *Les Anglais* ("The English") and *Une fille anglaise* ("An English girl"). In the content of their posts, Eleanor and Fleurie each made explicit requests for conversational partners to help them improve their French. They received a few cordial as well as abrupt replies, each of which suggested that they actually say something or take a position in the ongoing discussion. Neither did and both disappeared from the forum.

David and Laura, in contrast, both opened with a response to another message, *de facto* entering into a turn exchange system as their messages were marked by the subject line header of the message they had responded to (e.g., *Réf: Combattre le modèle américain* – "Fight the American model"). They also each began by apologizing for the limitations of their French language ability. Hanna and de Nooy interpret this as a clever strategy that "reinstates certain cultural borders" and that provided them with "a particular speaking position" (2003: 78) that may have yielded advantages in the debate culture of the forum. It is also salient that immediately following their language apology gambits, they each contributed position statements on the themes of racism and cultural imperialism. David, in fact, primarily used English in his posts, but with coaching and support from forum participants, he maintained an accepted a significant presence on the forum, suggesting that "neither politeness nor linguistic accuracy is the measure of intercultural competence here" (2003: 78). Rather, in the circumstances of *Le Monde* discussion fora, participation in the genre of debate is the minimum threshold for membership. The critically important message from this study, framed in the vernacular, is that if you want to communicate with real people, you need to self-present as a real person yourself. From an instructional perspective, encouraging (or requiring) students to participate in non-educationally oriented online communities would involve teaching students toward how to recognize genres, and subsequently, how to engage in discussion that does not ultimately revolve around "the self … as the exotic little foreigner/the other" (Hanna & de Nooy, 2003, 73).

Hanna & de Nooy's study illustrated that participation in open and thematically oriented Internet communities supports the very processes L2 education ostensibly seeks to provide, such as the use of language as a resource for ongoing identity formation and personally meaningful communication in the service of goals that extend beyond 'practice' or 'learning' in the restrictive senses associated with institutional settings. In related research investigating diaspora and immigrant youth engaged in non-academically structured uses of the Internet, Lam (2000, 2004) has ethnographically documented a number of developmental trajectories. One individual, an immigrant from Hong Kong, had struggled with English, been tracked as a low achieving student, and expressed significant trepidation about English, the language of his new home in the U.S. In high school, however, he began to explore the Internet, developed a web site devoted to the Japanese pop (J-pop) singer Ryoko, and started to converse over email and SCMC with a number of other J-pop fans. This process was mediated largely in English but also included trans-cultural expressive features such as emoticons, web page design, and elements from other languages (e.g., Chinese). Participation in a vibrant online community elevated Almon's confidence and enhanced his capacity to use a genre of English appropriate to online communication. As Almon's semiotic repertoire

expanded, he developed the ability to construct a complex online identity and to build and sustain meaningful relationships. Commenting on the differences between Almon's developmental progress in English in school and in the Internet peer group, Lam and Kramsch (2003) argue that while Almon's textual identity on the Internet was a positive and empowering discursive formation, his position in the U.S. high school "is also symbolically constructed, this time as a low-pride 'low-acheiver'" (p. 155). In other words, note Lam and Kramsch, the sophisticated genre of English language use Almon demonstrated online may not meet the selection criteria necessary to pass the high school exit composition test. This case presents a number of challenges to the conventional goals and processes of language education, such as the rigidity of the gate keeping mechanisms of high stakes testing, the disconnect between and the prescriptivist epistemology of schooling and language use that is appropriate in other contexts (Internet-mediated and otherwise), and what should or could be done to leverage, and perhaps formally acknowledge, a plurality of communicative practices that are currently considered stigmatized linguistic varieties. In an age marked by trans-cultural and hybrid genres of communication, these issues will increase in intensity and complexity and will necessarily have to inform the L2 educational frameworks of the future.

New(er) Technologies and L2 Education

A number of recent techonologies, namely wikis, blogs, and gaming, are rapidly being appropriated into L2 educational contexts. There is currently very little research on the use of these tools for L2 learning, presenting an obvious opportunity for future work.

Blogs and Wikis

Blogs and wikis are considered second generation web applications and represent relatively modest technological advancements over their static webpage predecessor (for a review of these technologies, see Thorne & Payne, 2005). Wiki (from the Hawai'ian wiki wiki meaning 'quick') describes a web-based environment that supports collaborative writing. Wikis are designed to be intensely collaborative and allow multiple users to edit content and contribute to the production of continually evolving texts and informational resources. The radical dimension to wiki use is its challenge of the notion of authorship. In the archetypal wiki, there is no distinction between "author" and "audience" per se since readers of a wiki page can spontaneously opt to become a collaborating author. Individual wiki pages can be password limited to one or a group of users using an access control list, but wiki technology is premised on the idea of universal write/access. Within the context of group and educational uses, wikis obviate the need to laboriously merge individual contributions in order to avoid deleting one another's work. Most wiki engines track each addition, deletion, and modification so that changes can be assessed against earlier versions of the text. Furthermore, determining the amount of individual participation in a group project for assessment purposes need not rely exclusively on self- and peer-assessments by group members or observational hunches by the teacher. Like an archaeological tell, a wiki's current content is but the top layer of temporally stratified laminations of text that record the history of the writing process (Thorne & Payne, 2005).

Blogs and blogging are terms describing use of a web application that displays serial entries with date and time stamps. Most blogs include a comments feature that allows visitors to post responses. In its short history—the first use of the term blog (from 'web log') is variably reported to have occurred in either 1996 or 1997 and blogging as a populist movement dates only from the turn of the millennium—the rise of blogging as a form of communicative and informational expression has been mercurial. To take one example, LiveJournal (http://livejournal.com) reports over 7 million blogs created, approximately 5 million of which have been updated at least once. LiveJournal reports that female-presenting bloggers outnumber users presenting as males by approximately two to one (67.3% vs. 32.7%, respectively). The ages of LiveJournal

users span from 13 (35,856 blogs created by this age group) to 55 (1,229). The 15-20 year age group produces the majority of the blogs on this site which suggests that the everyday digital literacy practices of current high school and college students differ significantly from those of earlier generations. Within L2 education contexts, blogging provides an alternative to writing assignments that would normally be presented only to the instructor. The chronological ordering of blog entries creates for each student an archive of their personal work that they can revisit and reflect upon. In addition to its intraclass use as a journaling tool, blogging is also being used to link together study abroad students and those still at their home universities. While still in the exploratory phase, such uses of blogs serve a number of functions, such as providing predeparture cultural exposure for students still at their home university, helping students currently abroad to synthesize and put into narrative form their cultural and linguistic experiences, and for creating predeparture orientation materials that represent student specific experiences and points of view.

While a large number of additional mediated social networks exist, such as facebook (*www.facebook.com*), myspace (*www.myspace.com*), and friendster (*www.friendster.com*), to date, their potential as sites for affiliative interaction and L2 learning has gone entirely unexplored.

Gaming and Virtual Environments

A genre of digital environment that will likely emerge as the premier L2 educational technology in the immediate future is virtual environment games (Gee, 2003), which provide the opportunity for temporary immersion in linguistic, cultural, and task-based settings. One variety of gaming involves interaction within pre-programmed (but sometimes customizable) environments, the best selling example of which is The Sims. A game that simulates the activities and responsibilities of everyday life, The Sims is now produced in a number of languages. In an informal assessment of The Sims as a foreign language learning tool, Purushotma (2005) found that the vocabulary and tasks comprising the game were highly aligned with the content of conventional foreign language course content. The difference between instructed foreign language learning and a game like The Sims, suggests Purushotma, is that exposure to the target language is always linked to carrying out tasks and social actions, which concomitantly embeds vocabulary and constructions in rich associative contexts. A second variety of virtual immersion is massive multiplayer online videogames (or MMOGs, see Steinkeuhler, 2006). These Internet-mediated environments are immensely popular, especially among adolescents and younger adults, and are already educational in the sense gamers must learn to negotiate complex scenarios, be socialized into culturally specific discursive formations, and be capable of negotiating play in real-time with environment driven elements as well as other co-present gamers. MMOGs log a gamer's activity such that there is an ontogenetic developmental component for the online . In essence, a gamer's character becomes more capable, and more powerful based on experience. In addition, gamers can accumulate (virtual) property, commodities with set exchange values within a given MMOG, and in some instances, properties and commodities with exchange value recognized by non-gaming global capital (e.g., in-game resources such as weapons, currency, property, and even completely developed advanced characters can be bought and sold on ebay). Many MMOGs are multilingual and involve thousands of gamers from around the world (e.g., World of Warcraft). For the growing number of individuals participating in MMOG-based cultures, the international, multilingual, and task-based qualities of these social spaces, where language use is literally social action, may one day make them de rigueur sites for language learning (see Thorne, forthcoming). Or perhaps, somewhat ironically, students will study foreign languages to enhance their gaming skills and interactional capacity in these largely language organized action-scapes.

Technology as Cultural Artifact and Challenges to L2 Education

This section addresses two final issues relating to technology use in L2 education. The first is (hopefully) a reminder that the Internet does not exist as a neutral medium. The second issue is the widening gap between real world communication and the anachronistic epistemological prescriptivism that remains dominant in educational institutions. The Internet has enabled multiple new opportunities for information gathering, enhanced possibilities for producing and disseminating information to others, and has provoked changes in the granularity of information sharing between spatially dispersed co-workers, friends, and family members. By definition, such communicative practices are made possible through technological mediation. As the research of Jones (2004), Miller and Slater (2000), and Scollon and Scollon (2004) make clear, a dichotomized view of face-to-face and Internet-mediated life, and certainly a rigid dichotomization between "real" and "virtual," completely dissolves under close examination of lived communicative practice. Especially among the digital native generation (Presky, 2001), a descriptor for individuals who quite literally grew up with (and through) the use of Internet information and communication tools, it is apparent that social as well as academic communication increasingly involves participation in community networks mediated by facebook, myspace, blogs, vlogs (video blogs), instant messaging, MMOGs, and voice and text messaging over cell phones (see Thorne & Payne, 2005; Thorne, 2006, for discussions). The rise in mediated communication in the service of community building and maintenance suggests that for many students across the world, performing competent identities in second and additional language(s) may now involve Internet-mediation as or more often than face-to-face and non-digital forms of communication. However, for an obstinate majority of L2 CMC researchers, the variable meanings and significances of the Internet are masked by the *doxa*, or taken-for-grantedness, of its use in routine, everyday cultural practice (e.g., Bourdieu & Eagleton, 1992). Internet communication tools are, like all human creations, cultural tools (e.g., Cole 1996; Nardi, 1996; Wartofsky, 1979) that carry interactional and relational associations, preferred uses (and correspondingly, dispreferred uses), and expectations of genre-specific communicative activity. Kramsch and Anderson note that information and communication "has become more mediated than ever, with a mediation that ever more diffuses and conceals its authority. The role of education, and FL education in particular, is precisely to make this mediation process visible" (1999:39). Cultures-of-use of Internet communication tools build up over time in relationship to use in particular discursive settings and to mediate specific social functions. The suggestion is that technologies, *as culture*, will have variable meanings and uses for different communities. While Internet communication tools carry the historical residua of their use across time, patterns of past use do not determine present and future activity, just as gender, mother tongue, or social class do not determine present and future activity. Rather, the cultures-of-use framework provides another axis along which to perceive and address cultural conflict, variation and similarity (Thorne 2000a, 2003, 2006). A telling example of the malleability of Internet communication and information tools involves wiki technology (described above). Emigh and Herring (2005) found that despite the potential of wiki environments to transform notions of authorship and processes of writing, wiki use does not necessarily promote the production of heterogeneous, creative, or non-standard genres of text. Based on a corpus analysis of Wikipedia and Everything2 (another wiki-based encyclopedia), Emigh and Herring found that structures of postproduction and editorial control resulted in homogeneous, formal, and standardized text types despite the expectation that multiple authors would produce a diversity of text genres. As with all technologies described in this chapter, task design and procedural processes, in interface with exogenously developed cultures-of-use and expectations of appropriate Internet communication tool use, are critical elements that contribute to the ways that mediated language learning activity plays out.

The second aforementioned challenge precipitated by the Internet is that there now exists an amplification of the conventional generation gap between top-down processes and pedagogies that operate in formal learning environments and the bottom-up life experiences of students in secondary and university environments (e.g., Lankshear & Knobel, 2003). This gap has been confirmed in recent research by the Pew Internet and American Life Project (Levin & Arafeh, 2002) based on focus groups (136 students in gender-balanced and racially diverse clusters) and voluntary participation data (200 students who submitted online essays describing their use of the Internet for school). The 2002 Pew report revealed that while nearly all students used the Internet as a regular part of their educational activities, little is known about how the Internet is actually used for schoolwork nor has there been adequate consideration of Internet use as it might substantively inform school policies, practices, and pedagogies. As Internet users expand numerically and geographically, and as Internet information and communication tools continue to evolve, research and pedagogical innovation in the area of CMC and language education will need to continually adapt in response to new populations, communication tools, and emerging communicative needs.

Final Points

While in the 1990s the use of the Internet was often treated as a proxy or heuristic environment to assist with the development of 'real' communicative performance (i.e., face-to-face communication, aural comprehension, and non-digital epistolary conventions such as essay writing), textual Internet-mediated communication now presents its own set of high-stakes contexts and modalities. Commercial activity is conducted via asynchronous and synchronous channels, job interviews take place over instant messaging, University courses are now mediated by course management systems, and chat, blogs, wikis, and podcasting, among other technologies, are increasingly being incorporated into general education and L2 course activities. Furthermore, with the proliferation of digital multimedia technologies (e.g., digital video cameras and video editing software, web publishing technologies that support audio and video, and cell phones that record still images and video), mediated communication now includes a large number of small footprint devices that have little to do with what has been conventionally referred to as a computer. Education generally, and language education particularly, will need to accommodate emerging communication tools and their attendant communicative genres that are, and have been for some years, everyday dimensions of competent social and professional activity.

While there exists a large volume of research on CMC in foreign and second language education, this field is something of a shape-shifter, a research area that is polymorphous both across time and within and between bounded areas of inquiry. The population of Internet users has expanded geographically and numerically, Internet information and communication technologies continue to evolve at increasing rates, and for many individuals around the world, daily social and professional activity is mediated by ubiquitous computing. This observation is not meant to hype these transformations as universally positive or superior to earlier patterns of communicative and informational activity. On the contrary, the point is that with the increasing opportunity to choose and engineer Internet mediation for educational purposes, the responsibility to make informed decisions – at the levels of classroom use, curricular innovation, institutional policy, and even region or nation state agenda setting – is more critical now than ever before.

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