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4. NEW TRENDS IN USING TECHNOLOGY IN THE LANGUAGE CURRICULUM

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Language teachers actively seek to provide their students with classroom opportunities to engage in collaborative interactions. Similar opportunities for such interactions can also be created within the context of computer-assisted language learning (CALL) and, in particular, in the area of computer-mediated communication (CMC)—whether in real time (synchronous, SCMC) or deferred time (asynchronous, ACMC)—working together with other nonnative- (NNS) or native-speaker (NS) partners. Recent advances in intelligent *CALL* (*iCALL*) are also beginning to empower students to engage in online activities with computer applications that provide at least limited levels of feedback, if not some palpable degree of interactivity. This article will review the reported benefits of online language study with particular emphasis on the importance of providing a sound pedagogical framework for the tasks and activities that students are asked to accomplish. In pursuit of effective CALL, researchers have previously stressed the role of online negotiations of meaning via CMC, intercultural communicative competence, and electronic literacy and identity. Although these topics continue to be of great interest for the CALL field, other areas are attracting attention as well: iCALL, distance learning, and teacher training. CALL researchers are increasingly finding that teachers' lack of experience with using technology—that is, their inability to take into account its affordances as well as its engrained cultures of use—can often present the most serious barrier to its successful integration into the language curriculum.

The field of computer-assisted language learning (CALL) has greatly diversified its scope in the last decade. Previous research stressed topics such as online chatting from an interactionist framework, intercultural communicative competence from a sociocultural footing, and electronic literacy from the perspective of identity construction (Kern, Ware, & Warschauer, 2004; also see Arnold & Ducate, 2006; Chun, 2007; Levy & Stockwell, 2006; Zhao, 2003). Although these themes continue to be of interest to the field, researchers are increasingly concerned with other issues such as the delivery of language instruction via a distance-learning environment, the use of feedback and iCALL, and teacher training.

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CMC in Relation to Interactionism, Intercultural Competence, and Literacy/Identity

Much of the previous CALL research on CMC has been carried out from an interactionist perspective (e.g., Abrams, 2006; Blake, 2005, 2006; Doughty & Long, 2003; Meskill, 2005; Smith, 2003) that strives to document how synchronous CMC (SCMC) stimulates negotiations of meaning with similar benefits to those documented in face-to-face exchanges. Abrams (2006) has christened this task-based learner/learner CMC with the name of intracultural communication and attests to its wide use in college-level L2 classrooms. Increasingly, researchers have turned to conversational analysis as a framework to examine student interactions using bimodal chatting (i.e., discourse with both text and audio channels; see Blake, 2005). Doughty and Long (2003) have suggested 10 methodological principles (MPs) that instructors should follow when implementing SCMC tasks with an eye to stimulating negotiations and L2 language development. Blake and Zyzik (2003) and Lee (2004) have examined L2 Spanish learners (NNSs) chatting synchronously with U.S. Spanish speakers. Although Lee's study focused more on the communicative benefits and difficulties from the NNS's point of view, Blake and Zyzik explored the subtleties between the notions of heritage speakers (HS) versus native speaker (NS) and, more specifically, what benefits heritage learners might accrue from participating in these CMC exchanges.

Researchers have made it clear that any benefits from engaging in CMC are not automatically or deterministically derived from the tools themselves (Zhao, Alvarez-Torres, Smith, & Tan, 2005; Thorne, 2003), but rather from how CMC is used in service of promoting meaningful interactions and real intercultural reflections. Breakdowns can be frequent, but they also provide golden opportunities for students and teachers alike to focus attention on the emerging L2 system as well as new ways of conceiving of students' new bilingual identity. This heightens rather than diminishes the teacher's role in designing appropriate tasks and raising the students' cross-cultural awareness (O'Rourke & Schwienhorst, 2003).

Another group of sociocultural researchers (Belz 2002, 2003; Belz & Thorne, 2006; Byram, 1997; Darhower, 2007; Kern et al., 2004; Lomicka, 2006; O'Dowd, 2003, 2005, 2006; Thorne, 2003; Ware & Kramsch, 2005; Warschauer, 2004; Wildner-Bassett, 2005) disfavors the purely interactionist SCMC paradigm because it portrays communication within a narrowly conceived tradition of information processing. Sociocultural researchers reject any model that separates the environment from its users, thereby reducing the classroom activities to a series of supposedly culture-free transactions and self-referenced learning events (Byrnes 2006; Magnan 2007). Sociocultural researchers contrast *intra*cultural CMC with *inter*cultural CMC or intercultural communication for foreign language (FL) learning (ICFLL; see Thorne & Payne, 2005), so as to "draw attention to the complex nature of humans as sociocultural actors and technological settings as artifacts and as mediators, rather than determiners of action and interaction" (O'Rourke, 2005, pp. 435). These ideas draw heavily on Byram's (1997) notions of intercultural competence defined as "an ability to evaluate, critically and on the basis of explicit

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criteria, perspectives, practices, and products in one's own and other cultures and countries" (Byram, Gribkova, & Starkey, 2002, p. 9).

With respect to a working definition of ICC, Lomicka (2006, p. 213) very astutely recognized the commonality among (1) Kramsch's (1993, 2000) notion of the L2 learner locating himself in a third place, somewhere between native-like competence in L1 and the L2 target language, (2) Byrams' call for critical cultural awareness, and (3) Freinet (1994) and Cummins and Sayers' (1995) *recul* or distancing that must take place as the L2 learner moves toward any meaningful kind of bilingualism.

The intercultural approach to CMC has also been referred to as telecollaboration. O'Dowd & Ritter (2006, p. 623) described telecollaboration as "online communication used to bring together language learners in different countries in order to carry out collaborative projects or undertake intercultural exchanges." O'Rourke (2005, p. 434) envisaged telecollaboration as a socially and culturally situated activity engaged in by learners as agents who coconstruct not only shared meanings, but also their own roles within a bilingual chat community (also see Darhower, 2007).

One welcome result of the sociocultural paradigm has been a heightened emphasis on intercultural pragmatics, an area previously ignored in the foreign-language curriculum but so often at the root of intercultural communicative breakdowns between learners and native speakers (for CALL lessons on Spanish pragmatics, see Cohen & Sykes, 2006; O'Dowd & Ritter, 2006; Sykes, 2005).

The *Cultura* project (Bauer, deBenedette, Furstenberg, Levet, & Waryn, 2006) continues to stand out as an effective implementation of telecollaborations and intercultural learning (see Kern et al., 2004). Ironically, the role of the teacher is not lessened in the *Cultura* curriculum. Rather, the suggested activities call for more of an expert guide in contrast to the showman commonly found in the teacher-centered classroom (for a detailed discussion, see O'Dowd, 2006). On the micro level, the teacher draws attention to contradictions, irony, humor, and sarcasm in search of charged linguistic expressions that are the product of deeply ingrained values. This process does not necessarily lead either teachers or students to closure, but rather opens up to a persistent interrogatory approach concerning the L2 culture. Accordingly, the teacher must insist that students provide evidence for their observations by quoting pertinent language or examples gleaned from the questionnaires, films, articles, or supplementary materials.

Both interactionist and sociocultural perspectives have also guided CALL research on literacy and identity construction. Hegelheimer and Fisher (2006) and Hegelheimer (2006) represented the interactionist perspective or instrumental approach to the development of L2 literacy where intervention by the teacher and CALL software via programs such as *iWrite* can yield demonstrable improvements in students' writing quality.

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Studies such as Darhower (2007), Meskill (2006), Warschauer and De Florio-Hansen (2003), Kramsch, A'Ness, and Lam (2000), and Wildner-Bassett (2005) provide a good example of a sociocultural approach to literacy by focusing on how individuals construct their bilingual identity in response to interacting with an electronic community, usually through asynchronous chatting via e-bulletin boards (forums), blogs, or wikis. Wildner-Bassett (2005, p. 638) described the focus of her German language courses as "an exploration of narratives that construct the Other, the foreigner, and the outsider in German-speaking societies"—which she describes as a quasi out-of-body experience. In essence, there exists a process of cocreation or coconstruction of identity in these chat communities, classrooms, and written assignments.

New or Renewed Directions in CALL

CALL Feedback and iCall

Multimedia glossing has been the focus of much CALL research (for an excellent overview, see Chun, 2006; Lafford, Lafford, & Sykes, 2007). According to Chun (2006, p. 78), L2 vocabulary is best remembered when learners look up picture or video glosses in addition to receiving translations of unfamiliar words. But if given the choice, L2 learners tend to choose only simple definitions or translations in a fashion like what *WordChamp* provides along with audio recordings in an amazing number of languages (for a review, see LeLoup & Ponterio, 2005). Chun's (2006, p. 82) study shows that lexical knowledge, rather than grammatical knowledge, is significantly related to both reading and listening comprehension. Following Grabe's (2004) work, Chun (2006) correctly pointed out two separate aspects of lexical knowledge that impact reading comprehension: the learning of vocabulary and the fluency (i.e., automaticity) of word recognition. The research shows that explicit instruction, including tutorial CALL (see Lafford et al., 2007), has a significant impact on vocabulary acquisition, but reading comprehension is more complicated and is affected by a number of factors, especially prior or background knowledge of the material to be read. Chun (2006, p. 92) counsels teachers to include a large battery of prereading activities to prime students for what they will encounter. Fukkink, Hulstijn, & Simis (2005) have demonstrated that L2 students retrieve faster and with less variation the unfamiliar words on which they have trained in contrast to those on which they have not trained. Research of this kind indicates obvious areas where tutorial CALL and explicit instruction can make a difference in second language development.

Other more interactive programs that provide feedback to L2 student responses are represented by programs known as *chatterbots*. Fryer and Carpenter (2006) described how chatterbot programs can give the appearance of being a sympathetic listener to students by prodding them with follow-up questions such as: "How are you feeling?" "Why are you feeling tired? "Tell me more of last night." In actual fact, chatterbot programs identify key phrases, nouns, adjectives, verbs, and adverbs recognized only as character strings (i.e., not as parsed linguistic structures) and then match these strings with clichéd responses that give the impression of a

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normal, give-and-take conversation. Payne (2007) has been experimenting with another type of bot program called *BodoBot* that provides L2 German learners with an instant messenger (IM) interface that coordinates access to many different online language-learning resources. BodoBot simultaneously tracks students' learning behavior in order to provide reading recommendations and quizzes tailored to the learner's skill level. Students send messages in either English or German to request translations to or from German, additional examples of German words in context, related links to authentic German texts at the same level of difficulty, a German word-of-the-day, and vocabulary quizzes. Programs such as BodoBot will also provide researchers with new sources of student behavior data because they keep track of all requests and actions.

In the earlier days of CALL, feedback focused more on the grammatical or sentence level. CALL feedback was limited to spellcheckers, grammar checkers, and discrete string or keyword matching. Unfortunately, most spellcheckers assume that the users are already competent speakers of that language. Few programs are designed with L2 learners in mind (see Burston's (1998) review of a French spellchecker). Spellcheckers do well at catching single-letter violations, but often fail to analyze learner's more competence-based errors (Heift & Schulze, 2007, p. 166–167).

Although string-matching routines, such as what is available from *Hot Potatoes* (http://hotpot.uvic.ca/), are far better than simple right/wrong responses, this approach still falls short of providing students with CALL materials that can truly be labeled as interactive. As the CALL field has moved away from the model of drill-and-kill tutorials (but see also Hubbard & Bradin Siskin, 2004), the field has demanded CALL applications that react to student input in ways that appeared to be more context sensitive. As early as the 1980s, Underwood (1989) described what the ideal intelligent tutoring system (ITS) should be able to do: Act as a real tutor or guardian for L2 students, leading them by the hand to discover more and more about the target language with each response and prescribing the appropriate exercises and metalinguistic explanations about the language that are needed to advance. An ITS, then, involves an expert (usually, some type of grammatical parser, a program capable of separating utterances into phrases, words, parts of speech, and limited semantic interpretations), a student, and a teacher module, frequently circumscribed in a highly defined semantic microworld or domain to minimize potential ambiguities and confusions. At the time, artificial intelligence (AI), a subfield of computer science, held great promise that something like Underwood's forward-looking description of an expert tutor could actually come to pass.

Gradually, the term ITS or expert system has been supplanted by a more modest notion of iCALL, but as Schulze (2001) explained, a more accurate name would be parser-based CALL. This later term makes it clear that natural language parsers are used to evaluate students' syntactic and sometimes semantic input. Although Schulze (2001, p. 117) openly acknowledged that a parser-based CALL cannot account for the full complexity of natural human languages, "it does not mean that interesting fragments or aspects of a given language cannot be captured by a formal linguistic theory and hence implemented in a CALL application." Obviously, a

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parser-based approach places an inordinate emphasis on morpho-syntactic errors—not a bad thing seeing that these types of errors appear to constitute the most frequently occurring mistakes that students make in freely produced texts (Schulze, 2001, p. 121). However, the parser approach also produces its share of false acceptances and false alarms. Once again, the more constrained the semantic domain is, the more successful the parser will be at diagnosing errors.

A much more serious problem for the iCALL field has been the fact that despite a great deal of work in artificial intelligence over the years, there still only exist two operational Web-based iCALL programs: *E-Tutor* for German (Heift, 2002; Heift & Schulze, 2007; http://www.e-tutor.org) and *Robo-Sensei* for Japanese (formerly called *Banzai,* Nagata 1996, 2002; http://www.usfca.edu/japanese/RSdemo/preRSfiles/demoTOC.htm; for a review, see Ushida, 2007). A third system, *Tagarela* for Portuguese (http://tagarela.osu.edu), is promised for spring 2007. The goal of all these programs is to provide error-specific feedback and flexibility in handling student textual input.

In the case of the *E-Tutor,* a natural language parser for German is combined with a student module that tracks each student's errors and proficiency level, controlling the type of feedback that will be delivered: Namely, for beginners and intermediates, rich metalinguistic feedback messages and remedial exercises (e.g., dictation, build a phrase, which word is different, word order practice, build a sentence), but something much less explicit for the advanced students who need only light guidance.

Heift (2001) acknowledged that building this type of parser-based CALL is very labor and time intensive and requires close cooperation among computer programmers, linguists, and pedagogues. However, error analysis of this ilk can also be very accurate in providing the type of feedback and interactivity that is helpful to the learner, even if it does not meet the lofty ideals that Underwood (1989) originally imagined. And students really pay attention to well-crafted feedback! Heift (2002) discovered that most students (85%) using E-Tutor revised their sentences without peeking at the answers, with the weaker performers tending to also be the more frequent peekers. Heift (2004) also showed that the more explicit and metalinguistic in nature the feedback is, the more it helps the L2 learners successful complete their L2 tasks.

Why, then, has iCALL not gained more notice in the CALL field? Perhaps what has distracted the field from the slow but sure advances in parser-based error analysis has been to the meteoric surge of interest in CMC and sociocultural/intercultural research. In short, CALL practitioners are looking at human communication as the true source of interactivity; however, much learning still occurs when individuals are alone, working by themselves in isolation at odd times of the day and in nonacademic settings. In these self-study times, iCALL has proven superior to using static workbooks alone (Nagata 1996). When one considers that classroom teachers infrequently correct phonological and grammatical errors, but rather concentrate on discourse, content, and lexical errors, iCALL could have an

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honored niche in the L2 learner's individual study time. As more parser-based systems become available for a large array of languages, the goals of iCALL still hold considerable promise as a useful tool for L2 learning.

Feedback to textual input is not the only kind of response the computer is capable of; while iCALL has concentrated on syntax and text production, researchers working on automatic speech recognition (ASR) have looked to applying their results to teach pronunciation. As in the case of parsers, ASR applications "perform best when designed to operate in clearly circumscribed linguistic sub-domains" (Ehsani & Knodt 1998, p. 56) in pursuit of executing specific tasks: for example, individual sound practice, word recognition, and short sentence repetition. Although ASR software is good at recognizing short utterances (words, phrases, or short sentences), continuous spoken language input with open responses and multiturn dialogs poses almost insurmountable challenges without access to powerful computers and lots of memory. In addition, the input must be clear and noise-free, which often depends on a good microphone and noise-cancellation baffle.

Despite these obstacles, commercial software does exists that provides specific exercises dealing with mastering linguistic forms at the word or sentence level as opposed to simulating real communicative exchanges. For examples, *Tell Me More Pro* (Auralog, http://www.auralog.com/english.html; for a review of the Spanish version, see Lafford, 2004) tracks and visually displays the waveform and pitch contours from speech input in nine languages and compares them to those patterned after native speakers; the program then scores the learner's efforts on a scale from 1 to 7. The learner can zero in on and practice particular phones in isolation, if so desired. *Tell Me More* also provides a 3-D animation that demonstrates how the lips and tongue should move in the mouth to produce the target sound.

With the *Auralog* sentence exercises, L2 learners choose to speak one of several closed responses with ready-made vocabulary and syntax, which greatly simplifies the speech recognition algorithm, but prohibits learners from actively constructing their own utterances (Eskenazi, 1999). As Eskenazi (p. 64–65) observed, "To our knowledge, current speech-interactive language tutors do not let learners freely create their own utterances because underlying speech recognizers require a high degree of predictability to perform reliably." Eskenazi (1999) reported on some successful research efforts (i.e., the FLUENCY project at Carnegie Mellon University: http://www.lti.cs.cmu.edu/Research/cmt-projects.html) to construct a production task that uses carefully constrained elicitation techniques (patterned after the Modern Language Association's (MLA) audio-lingual method) to guide the L2 learners into speaking only the specifically targeted speech data.

ASR technology, as in the case of parser-based iCALL, may have a significant impact on CALL development in the near future, but what the field needs now is an authoring tool that makes incorporating ASR simple for nonengineers. Undoubtedly, this will be forthcoming soon, but a more serious obstacle to implementing ASR in any given language will be the existence of and access to large corpora of native and nonnative speech data, in both print and conversational formats.

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Distance Learning for Language

Few language teachers would dare to admit that they are not interested in technology, at least as a support for the language curriculum, for fear of being classified as outdated or out of touch with best practices. Not surprisingly, most teachers routinely employ Web pages to distribute syllabi assignments, cultural materials, WebQuest instructions, and even lecture notes. But at the point that the faculty is polled about accepting credit for language courses delivered in a hybrid or completely distance-learning format on an equal footing with classroom instruction, the smiles may fade and the positive attitudes toward technology may evaporate. Some FL teachers still harbor deep-seated doubts as to whether or not a hybrid course, much less a completely virtual learning experience, could ever provide L2 learners with an accepted way to gain linguistic proficiency, especially when oral language skills are in question. It may be the case that a percentage of language instructors secretly worry that these new distance-learning (DL) classes will displace them or perhaps force them to drastically change their more traditional and teacher-centered classrooms into educational environments that are more student-centered.

Despite these fears, national education trends increasingly include DL classes in all disciplines. In 2005, the Sloan Consortium (Allen & Seaman, 2006, pp. 1–2) reported that there were approximately 3.2 million students, or one in six enrolled in higher education, taking at least one course online in the fall of 2006, up from 2.3 million in the previous year, which represents a 40% increase. These online students are overwhelmingly undergraduates and hail almost exclusively from the larger universities (i.e., 15,000 enrollments or more). More than half (51.5%) of the online students are enrolled in 2-year associate institutions (p. 6). In terms of quality, 62% of the chief academic officers at these large universities felt that the online courses are equivalent or even superior to their face-to-face counterparts. Not surprisingly, the most important barriers to the implementation of online courses and programs cited were faculty acceptance, the demands of learning teaching methods, and lack of student discipline in the online learning environment.

The term *distance learning* has been loosely applied to many different types of learning environments including formats that can be referred to with descriptors such as teleconference, hybrid, blended, or virtual (for a recent overview of DL education, see Fleming & Hiple, 2004; Holmberg, Shelley, & White, 2005; Stickler & Hauck, 2006). Teaching languages through teleconferencing (two-way interactive closed circuit TV) has the longest track record in the field, although this medium does not relieve either students or instructors of the burden of showing up at some specific time and place (i.e., the campus TV studio or satellite campus studio), not unlike the demands imposed by the classroom. Teleconferencing allows a teacher, usually of less commonly taught languages (LCTLs), to reach students who might otherwise have no access to instruction.

O'Dowd (2006, p. 189) separated videoconferencing into three types: teacher-to-class, student-to-student, and class-to-class. All three types of videoconferencing potentially suffer from sound delays and gaps in fluidity in

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handovers that make the medium critically different from face-to-face interactions, sometimes leading students into a pattern of passive viewing (O'Dowd, 2006, pp. 191–193). Practical difficulties can become formidable obstacles to carrying out successful videoconference projects when implemented among institutions that do not share the same calendar, (i.e., semesters vs. quarters) or do not have adequate mechanisms for sharing credit and financial resources.

Ironically, teleconferencing language courses are more readily accepted by faculty curricular committees as being equivalent to the classroom experience despite whatever difficulties might exist in duplicating the same learning experience found in communicative language classroom, the gold standard for best practice in the United States. (Magnan, 2007). This is, no doubt, due to the privileged status of the teacher-driven classroom and the physical presence of the instructor, even if only represented by a video image projected by teleconferencing in real time, which leads the profession to validate the learning experience on a par with what happens in standard classrooms.

Unfortunately, with respect to the question of evaluation, there are only a handful of completely online DL language courses being offered for credit in our universities and even fewer evaluation studies available that could be used to establish a strong track record with which to assess their impact or to argue in favor of offering students this alternative (Zhao, 2003; for an online database of comparative studies for all uses of technology in language classrooms, also see Grgurovic & Chapelle, 2007).

Critics of learning language at a distance routinely tend to couch the debate in terms of all or nothing—all distance-learning curriculum versus a traditional classroom one—whereas the real issue is how to obtain the smooth articulation of distance-learning offerings into the overall language curriculum in ways that accommodate the needs of an institution's learners without compromising quality. In other words, DL language courses should be conceived as part of a diversified path, including study abroad opportunities, that FL departments employ to meet different needs of their students.

No language professional, not even the most technologically enamored instructor or CALL researcher, would dispute the notion that in order to reach advanced proficiency levels (Interagency Language Roundtable (ILR) level 3 or higher), L2 students need to interact face-to-face with native speakers, preferably in a country where the language is spoken. How else could an L2 student develop an appropriate sense of pragmatic or sociolinguistic competence, let alone advanced linguistic competence? Davidson's (2007) study of a database spanning 30 years of students studying Russian abroad ($n = 3{,}500$) established without any doubt that the gains toward advanced proficiency are due to study abroad—especially, when carried out in full-year study programs as opposed to just one semester. Unfortunately, of the 45% of entering U.S. freshmen who profess the intent to study abroad, fewer than 3% actually undertake it (Davidson, 2007). This explains why both administrators and the FL profession obviously need to bring more pressure on the university curriculum to

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include study abroad as a requirement for graduation (see *Lincoln Commission Report*: http://www.lincolncommission.org/).

The central research question with respect to DL language delivery asks whether a hybrid or a completely virtual format can engender linguistic results comparable to those fostered within a traditional L2 classroom environment that meets 5 days a week, especially with respect to oral proficiency. Rephrased in a broader educational context, do DL classes have a role to play in the FL language curriculum? The answer is "yes," because DL courses represent one way to begin the journey down the long road to advanced proficiency, a feat that will require a minimum of 700 to 1,320 hours of instruction depending on the target language's complexity (Bialystok & Hakuta, 1994).

Chenoweth and Murday (2003) examined the outcomes of an elementary hybrid French course, *Elementary French Online* (2000), developed at Carnegie Mellon University, and delivered primarily online along with an hour-long, face-to-face class meeting once per week as well as weekly 20-minute individual or small-group meetings with a native speaker tutor. Chenoweth, Jones, and Tucker (2006) and Chenoweth, Ushida, and Murday (2006) provided a project update on the project that includes a Spanish counterpart, *Spanish Online,* to that of the *French Online* course. The progress of French and Spanish L2 students in the online group was compared to that of others who attended a traditional class 4 hours per week on tests of oral production, listening comprehension, reading comprehension, grammar knowledge, and written production. The results showed that the scores for the treatment and control groups were not significantly different for oral production and only slightly different in the case of the writing samples, with essays by students in the online group being judged superior to those of the control group on a variety of measures, including grammatical accuracy and syntactic complexity (Chenoweth, Jones, & Tucker, 2006, pp. 158–159). Blake and Delforge (2007) also reported no significant differences in student outcomes for discrete grammatical knowledge from both a hybrid and completely virtual Spanish online as compared to traditional classroom learners.

Chenoweth, Jones, & Tucker (2006) also looked at writing and found that all students were weakest in the use of transitions and general essay organization. Likewise, other measures for listening comprehension, grammar knowledge, and reading comprehension registered minimal statistical differences. In the first study, it was also found that the online students spent approximately 1 hour less per week studying than did those in the traditional class, suggesting that the online course was more efficient because students achieved results similar to those attained by learners in the conventional class with less time expenditure. But the second study that included Spanish showed that students spent an equal amount of time regardless of learning format (e.g., 8.5 hours per week).

Some hybrid courses confine the use of technology to the context of online workbooks. Scida and Saury (2006), Echávez-Solano (2003), Epps (2004), and

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Walczynski (2002) reported on the progress of students using *Mallard,* a rote drill/quiz exercise and tracking program designed and supported by the University of Illinois at Urbana-Champaign as a way to free up classroom time for more communicative activities as well as increasing the number of sections that each instructor teaches. These three studies show no significant differences in final grades among the experimental (Mallard) group and the control group, with Scida and Saury's (2006) study registering slightly higher final grades for the group using Mallard. These researchers attributed much of the student success with the Mallard program to the ability for students to continue working on the exercises until reaching 100% accuracy. In essence, the availability of the tutorial CALL program appears to have allowed students to dedicate more time to making more automatic their control of the basic language structures.

Hybrid or blended classrooms are not necessarily constrained by this limited vision of technology (i.e., drill-and-kill), as illustrated by Bañados (2006), whose blended approach to English as a second language for Chilean students includes (1) dedicated CALL programs; (2) online monitoring; (3) face-to-face EFL teacher-led classes; and (4) conversation classes with native speakers of English, both face-to-face and online. In Bañados's (2006, p. 539) framework, both teachers and students are challenged by new roles: Teachers are more like guides and collaborators while students must assume a more autonomous participatory status.

With completely virtual language courses, the teachers and students interact exclusively online; there are no face-to-face meetings, which, no doubt, accounts for the negative reactions typically voiced by language faculty with respect to distance-learning language courses, in contrast to the tolerance shown toward the teleconferencing format and the marginal acceptance of hybrid courses. But completely virtual courses come in all shapes and sizes and encompass different combinations of asynchronous and/or synchronous modes. More often than not, virtual language courses take advantage of the authoring features provided by standardized course management Systems: for example, archived lessons, Web links, multimedia libraries, drop boxes, announcements, internal mail, bulletin boards or discussion forums, wikis, chat tools (synchronous textual exchange, sometimes voice exchanges, too), whiteboards, quiz templates, and customized grade books.

With respect to Spanish, Blake (in press) used an automated Spanish oral phone test called *Versant* (http://harcourtassessment.com/haiweb/Cultures/en-US/Harcourt/Community/PostSecondary/Products/Versant/VersantHome.htm) to verify that online first-year Spanish students—both in hybrid and completely virtual courses—achieved a similar level of oral proficiency to that of students learning in a traditional classroom setting. The students of the completely virtual courses outperformed the other groups, most probably because the online course attracted more mature students from the community who paid for each course they took. More data are needed to fully evaluate this question, especially from students of LCTLs, where access to beginning instruction is especially limited as a result of teacher shortages, low enrollments, and the concomitant financial constraints.

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Teacher Training in Using Technology

The last 5 years have ushered in a marked desire in the CALL field to discuss issues of training teachers to use technology in service of the L2 curriculum, as evidenced by the following spate of publications: Beatty (2003); Blake (forthcoming); Colpaert (2006); Davies (2006); Donaldson and Haggstrom (2006); Egbert (2005); Egbert, Paulus, and Nakamichi (2002); Felix (2003); Hubbard and Levy (2006a); Kassen, Lavine, Murphy-Judy, and Peters (2007); Lai and Zhao (2005); Lomicka and Cooke-Plagwitz (2004); Stickler and Hauck (2006). Kassen et al. (2007, p. ix) divided concerns dealing with teaching training and technology into five broadly defined categories: national frameworks (e.g., Standards, European Common Framework of Reference for Languages, No Child Left Behind), specific contexts (e.g., retraining faculty to teach in e-learning environments, graduate student training), e-communities (also for teachers, for example, MERLOT: http://merlot.org/), toolboxes, and critical reflections. Hubbard and Levy (2006b, p. 11) distinguished four possible roles for teachers with respect to CALL: practitioner, developer, researcher, and trainer. Although teachers minimally are asked to perform as practitioners, it is preferable that they be encouraged to assume other roles as well. In what follows, I will offer some pedagogical reflections on teaching training (see Blake, forthcoming, chap. 6) drawing heavily on Laurillard's (2002) insightful book, *Rethinking University Teaching.*

Laurillard (2002, p. 23) conceived of teaching as being fundamentally a rhetorical activity: "seeking to persuade students to change the way they experience the world through an understanding of the insights of others." Although Laurillard is an engineer, her description of teaching goals would easily match the stated ideals for CALL researchers of either the interactionist or sociocultural school. Teachers need to help guide their students during this process of change so that they can successfully find their own third place as an incipient bilingual. Classroom L2 language learning is the result of indirect experiences or formal learning language—what Laurillard (p. 20) dubbed precepts rather than percepts, as had been the case when acquiring a first language (L1). The challenge that teachers face every day in the classroom is how to impart decontextualized knowledge and precepts about L2 language and culture, given that most students will not experience either in a direct way by living in the target society, but rather only by acting in an academic setting. Laurillard (p. 93) disfavored the lecture or teacher-centered format because it is inherently flawed: How many brilliant lectures can a teacher give in a day? In a week? In a month?

Her solution is to propose using an iterative conversational framework that first reveals and then takes into account what teachers and students alike bring to the learning environment (e.g., their respective theories, ideas, conceptions, observations; Laurillard (2002, p. 87). In processing the variation that exists between them, teachers must also imagine themselves as the learner, which will determine the focus of further dialogue and classroom activities (p. 71). As a consequence of this iterative process, there can never to be said to exist one way of teaching something—the formulation of specific lesson plans must be based on this dialogic process, which, in turn, depends on the variation of student responses (i.e., student reception).

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Laurillard's (2002) approach requires that lesson plans be constantly reviewed, reworked, and adapted based on student reception—which may account for some of the resistance to technology and any change in traditional teaching methods. Teaching in the fashion advocated by Laurillard, with or without technology, becomes a discovery process, not a deductive exercise in hypothesis testing. Laurillard (p. 69, pp. 86–87) called this discovery process a *phenomenographic* teaching strategy because it asks teachers to qualitatively assess and then incorporate the variation in students' conceptions into the learning environment, using the basic pathway given in the following list. Be aware that not all technological tools support all of the 12 steps; her list should be viewed as an ideal set of criteria by which to evaluate CALL.

1. Teacher can describe conception.
2. Student can describe conception.
3. Teacher can redescribe in light of student's conception or action.
4. Student can redescribe in light of teacher's conception or action.
5. Teacher can adapt task goal in light student's description or action.
6. Teacher can set task goal.
7. Student can act to achieve task goal.
8. Teacher can set up world to give intrinsic feedback on actions.
9. Student can modify action in light of feedback given.
10. Student can adapt actions in light of teacher's description or student's redescription.
11. Student can reflect on interaction so as to modify redescription.
12. Teacher can reflect on student's action to modify redescription.

Notice that the conversational framework heightens, rather than lessens, the active intervention of teachers, although not necessarily in the role of doing all of the talking. Educational media, depending on their respective affordances, contribute to at least some of the 12 steps of the conversational framework. Print, TV, video, podcasts, and DVDs provide students with narratives; DVDs and Web resources offer students an interactive space; CMC tools (e.g., chat, wikis, blogs) assist communications; simulations and iCALL make available an adaptive environment; and, finally, modeling allows students to become productive agents in their own right. An intelligent language curriculum uses a variety of educational media in ways that enable as many steps from the iterative conversational pedagogy as possible.

Conclusions

Recent years have witnessed a rapid growth in CALL research in terms of quantity, quality, and increasingly diversified lines of inquiry. Chapelle (2005) rightly noted that the CALL field has come of age with both the privileges as well as the disciplinary responsibilities to oversee sound research. Exemplars from the last 5 years, cited but only minimally reviewed in this article, bode well for the field and give young researchers excellent methods, models, and research directions. More importantly, as Chapelle (2005) observed, the topic of language and technology is now an established strand in the yearly American Association for Applied Linguistics

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(AAAL) convention. Judging from the research production of the last 5 years, this strand is well justified and will continue to flourish, a felicitous outcome for the second language acquisition (SLA) field as a whole.

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Arnold, N., & Ducate, L. (Eds.). (2006). *Calling on CALL: From theory and research to new directions in foreign language teaching* (CALICO Monograph Series, Vol. 5). San Marcos, TX: CALICO.

This collection of 13 articles on CALL gives the reader a broad overview of the field with particular attention to pedagogical concerns. The topics include sociocultural approaches to using technology, L2 reading research (see Chun's [2006] excellent article, pp. 69–98, reviewed separately later) listening comprehension, pronunciation training, guidelines on using technology to teach writing, teaching culture through CALL (see Dubreil's [2006] thoughtful article, pp. 237–268), CMC projects, intercultural telecollaborations, computer-based testing, and CALL software evaluation. The last article on CALL evaluation by Hubbard (pp. 313–338) provides a helpful scheme for evaluation CALL programs and activities.

Bauer, B., deBenedette, L., Furstenberg, G., Levet, S., & Waryn, S. (2006). The *Cultura* Project, (pp. 31–62). In J. A. Belz & S. L. Thorne (Eds.), *Internet-mediated intercultural foreign language education.* Boston: Heinle.

The *Cultura* project represents one of the most thoughtful integrations of intercultural collaborations into the foreign-language curriculum, especially with respect to the teaching L2 culture. This more recent report (2006) concerning Cultura's original purpose, design, and methods for implementation is a welcome addition for those contemplating how to go about organizing intercultural electronic exchanges between U.S. learners and those from other countries taking advantage of both the L1 and L2 of each group, respectively.

Belz, J. A., & Thorne, S. L. (Eds.). (2006). *Internet-mediated intercultural foreign language education*. Boston: Heinle.

This edited volume examines eight telecollaboration efforts entirely from a sociocultural theoretical framework. The individual authors explain the theoretical underpinnings of telecollaborations, offer advice on how to implement it, analyze what can go right or wrong, and point out the importance of pragmatics. Of particular noteworthiness is the updated report on the Cultura project (see review of Bauer, deBenedette, Furstenberg, Levet, & Waryn, (2006), pp. 31–62). The volume ends with a thought epilogue on technology, the ideologies of standardization, the construct of the native speaker (Train, pp. 247–284).

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Chun, D. (2006). CALL technologies for L2 reading. In L. Ducate & N. Arnold (Eds.), *Calling on CALL: From theory and research to new directions in foreign language teaching* (CALICO Monograph Series, Vol. 5, pp. 69–98). San Marcos, TX: CALICO.

Chun's (2006) article on CALL and L2 reading should be required reading for anyone studying the affects of multimedia glosses or CALL vocabulary research in general. She had the advantage of being able to compare results from several of her own studies that took place over a 10-year span, as well as including insights from other researchers of L2 vocabulary acquisition. Chun reported that when students are given the option, they prefer to just receive a simple definition or translation rather than a series of flashy multimedia glosses. In general, students benefit from all types of lookups, which result in deeper processing of the reading at hand and better vocabulary retention. Multimedia glosses proved to be of great advantage for students with low phonological working memory. In her overview, Chun distinguished carefully between vocabulary acquisition and reading comprehension—with glosses having a significant effect on the former but not necessarily on the latter. To enhance reading comprehension, previous training with the reading via advance organizers or prereading strategies are critical for learner success.

Heift, T., & Schulze, M. (2007). *Parsers and pedagogues: Errors and intelligence in computer assisted language learning*. London: Routledge.

Heift and Schulze have jointly produced a book that defines the field of intelligent CALL (iCALL) or what Schulze (2001) described in more accurate terms as parser-based CALL. This later term makes it clear that natural language parsers are used to evaluate students' syntactic and sometimes semantic input. The authors have performed a great service by offering a thorough and imminently readable review of natural language processing (NLP) in CALL, error analysis, feedback, student modeling, and glimpse of future iCALL developments.

Hubbard P., & Levy M. (Eds.) (2006a). *Teacher education in CALL*. Philadelphia: Benjamins.

This edited volume includes 20 articles on CALL education predominantly drawn from researchers working in the ESL field with examples—both successes and failures—drawn from many countries, not just the U.S. scene. The articles are organized around five themes: general CALL interests, CALL degree programs, preservice training, in-service training, and alternative methods of CALL training outside of formal settings. In their introductory article, the editors (pp. 3–20) noted that language teachers can use technology in their role as practitioners, developers, researchers, or trainers. Furthermore, they exhorted professionals in the field to actively seek to fulfill more than one of these functions. This is

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a noble effort to begin to make CALL education a more serious topic of research within the larger CALL field. Hegelheimer's (pp. 117–133) article on "When the Technology Course Is Required" is particularly insightful, as is Chen's (pp. 221–234) step-by-step guide of how to do WebQuests.

Stickler, U., & Hauck, M. (Eds.). (2006). Special Issue: What does it take to teach online? Towards a pedagogy for online language teaching and learning. *CALICO Journal, 23*(3), 463–642.

Guest editors Stickler & Hauck (2006) brought together 10 articles dealing with online language learning to form this special issue of the *CALICO Journal* that covers tutorial CALL, virtual learning, asynchronous and synchronous CMC, and online teacher training. This volume examines the different roles an online teacher must play (teacher, administrator, technician, co-learner), the different teaching styles, and the new e-teaching skills necessary for successful online learning with examples from projects in Chile, England, France, Germany, Spain, Switzerland, and the United States. After the introductory article by the editors, Colpaert (pp. 477–498) provided a comprehensive examination of a pedagogy-based approach to CALL that first takes stock of the specific local context and needs and then examines what technological requirements might make it all work. O'Dowd & Ritter (2006, pp. 623–642) offered an insightful analysis of the factors that can cause the failure of any intercultural telecollaboration project: differences in proficiency level (i.e., inability to respond being interpreted as rudeness in this environment), differences in societal norms and cultures of Internet use, prior experience with online writing, and task design.

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