Computer-Assisted Language Learning Trends and Issues Revisited: Integrating Innovation

NINA GARRETT
Yale University
4 Seaview Avenue
Old Saybrook, CT 06475
Email: nina.garrett@aya.yale.edu

This update to Garrett (1991), "Technology in the Service of Language Learning: Trends and Issues," explores current uses of technology to facilitate the teaching and assessment of second languages. In this article, I discuss the changes that have taken place over the last 18 years regarding selected topics from the 1991 article, including the relationship between pedagogy, theory, and technology, physical infrastructure, efficacy, copyright concerns, categories of software (e.g., tutorial, authentic materials engagement, communication uses of technology), and evaluation. I then explore the most challenging issues facing computer-assisted language learning (CALL) scholarship and practice today, that is, new demands in language education (based on the conclusions of the 2007 report of the Modern Language Association and Jackson & Malone, 2009), the need to rethink grammar instruction, online learning, social computing, teacher training and professional development, and CALL research. Like the original 1991 article, this work contains an appendix with links to information resources for CALL research and practice. I conclude by saying that new initiatives are needed to promote the use of technology for research on CALL and for facilitating second language acquisition, such as support for institutional language centers, streamlining of the work of professional organizations dedicated to CALL, and the establishment of a national CALL center.

EIGHTEEN YEARS AGO IT WAS POSSIBLE—just barely—for one person to write in just 22 pages "an overview . . . of the kinds of technological resources currently available to support language learning and of various approaches to making use of them" (Garrett, 1991a, p. 74). Today we have not only computers of almost incomprehensibly greater power and sophistication but also a far greater range of consumer technologies that can be harnessed for language teaching and learning. An update to my 1991 overview now takes up this entire volume, with contributions from 18 experts in language technology pedagogy, theory, and research. Their contributions explore topics in computer-assisted language learning (CALL), some of which had not yet been imagined in 1991, and the rest of which have changed out of all recognition.[1]

The 1991 overview was aimed mostly at teachers with little or no experience with CALL. Nowadays, there are perhaps not many postsecondary language teachers who make no use of technology, but there are still many—especially those whose teaching preparation did not include mention of technology—who use it only to a limited extent. They may use email, word processing, and digital audio; they may find authentic materials on the Web to use in class or to make available to students, and they may use their institutions' course management systems to post syllabi and assignments and to manage their grading. I would argue, though, that these uses of technology do not constitute CALL proper, that is, the full integration of technology into language learning. We need constantly to remind ourselves and those outside the field that "CALL" is not shorthand for

The Modern Language Journal, 93, Focus Issue, (2009)
0026-7902/09/719–740 $1.50/0

"the use of technology" but designates a dynamic complex in which technology, theory, and pedagogy are inseparably interwoven.

1991 ISSUES RECONSIDERED

The Relationship of Pedagogy, Theory, and Technology

My 1991 title stressed the primacy of pedagogy over technology; today, by contrast, I want to emphasize that none of the three major components of CALL—pedagogy, theory, or technology—should dominate the others. Early enthusiasm for each technological advance in the capacities of those first limited microcomputers sometimes allowed gadgetry to drive pedagogy; then, reacting against experimentation with technology for its own sake, teachers insisted that it should be exploited only to carry out activities that were already pedagogically accepted. This stance, however, implies that current pedagogical practice represents everything we need to know about instructed second language acquisition (SLA) so that we need only "computerize" what we already do, an implication refuted by SLA research.

At every step in the development of CALL, technological innovations have encouraged us to engage learners in ways never before available, and research on that experimentation has changed our understanding of language learning. We used to consider "the four skills" as requiring four different kinds of lesson plan, but even the earliest multimedia allowed us to represent language holistically by integrating textual, aural, and visual input and by adding hitherto undreamt-of dimensions of cultural content. We used to feel that student "conversations" typed on the computer—even in real-time interactions with others—were "inauthentic" by contrast with face-to-face spoken conversation, but we now understand that composing a conversational utterance demands similar mental processing whether it is expressed in typing or in speech (see Payne & Whitney, 2002) and that texting and chat are indeed authentic and frequently used modes of communication.

It is clear, therefore, that accepted pedagogical practice should not be the primary determiner of technology use. Nor can SLA theory be privileged in shaping CALL, although it undeniably plays a huge role in motivating and justifying it. SLA theory was developed first in the domain of English as a Second Language (ESL), and not all the SLA research on ESL is applicable to the acquisition of other languages. To the extent that SLA theorists and researchers have explored the acquisition of other languages, the focus has been to a great extent on Spanish and French; this is understandable, given that a huge proportion of language learners in the United States are enrolled in those languages. However, Spanish and French are closely related to English, with many cognates, basically similar syntax, and inflectional morphology systems almost as reduced as that of English. SLA theory has to a much smaller extent considered the acquisition of languages that are very different from English, especially those that are highly inflected, and the development of CALL for such languages, especially those that use a non-Roman script, has lagged far behind.

Moreover, SLA theory has for several decades now focused heavily on sociolinguistics, pragmatics, and discourse analysis, that is, the "communicative" aspects of SLA, and during this period we have seen less research, in comparison, on the acquisition of grammar forms and grammar concepts except as these have been examined in the context of communicative theory and pedagogy. Today, therefore, we cannot assume that CALL development should ideally be driven either by current pedagogy, by already-developed SLA theory, or by technology. Each of these evolves and changes in its relationships with the others.

Physical Infrastructure

A fourth component must today be factored into the relationship of pedagogy, theory, and technology, namely *infrastructure*—the contexts or environments that strongly affect the way the other three components work. In fact, it is useful to recognize three levels of infrastructure. One is the physical/technological setup of our teaching and learning spaces, such as classrooms, computer labs, faculty development spaces, and so on. A second is the institutional professional development support structure for technology use, and a third is the national structure of language education and the national support structure for it.

The growth of consumer technologies has encouraged a great deal of CALL development, especially in communication activities and in student-generated projects. However, it has also had a negative impact: Administrators tend not to realize that technology use for the purpose of language learning is radically different from general consumer use and even from that of teachers of other disciplines. On many campuses the "language media/technology/resource centers" have been taken over by information technology (IT) services and turned into general-purpose computer labs, with support staff who may know

little about the specific ways in which language teachers use technology. In many such labs, students do not have access to earphones and are not allowed to speak aloud, with the result that they cannot carry out audio or video assignments, and Web access to foreign countries or to various interactive tools like chat may be severely restricted.

In addition, increasing emphasis on assessment and accountability in language education creates a demand for facilities allowing efficient testing of all proficiencies at multiple levels for placement, for fulfillment of a language requirement, for oral proficiency adequate to certify a major, and for applications for fellowships and internships abroad. In fact, computer centers designed for language testing can be used by other disciplines as well, although the converse is usually not true; that is, spaces designed for other-discipline purposes may not be usable for language learning or testing. With the proliferation of new designs for learning spaces, teachers need to think carefully about the kinds of technology-based activities in which they want students to participate (a) in the everyday "smart" classroom, (b) in a computer lab during class time, and (c) outside class hours in other settings or with their own technologies. Most campuses are equipping more smart classrooms every year with Internet connections and projectors, sometimes with SMART Boards and so on, but these are not always well designed for language teaching. For example, not infrequently the remote control for the projector can be used only from the front of the classroom, perhaps only from a fixed station, whereas language teachers typically roam their classrooms and interact with students (and with the projector) from all sides. Lack of adequate window treatments to allow clear video projection is a common problem, as is lack of adequate sound systems for audio and video.

Administrators at institutions who claim to take internationalization seriously would do well to consider the special needs of language programs that integrate innovative CALL; the Computer Assisted Language Instruction Consortium (CALICO*) and the International Association for Language Learning Technology (IALLT*) maintain lists of consultants to advise on such matters (see Neville, 2009).[2]

Efficacy

In 1991, the efficacy of computer use for enhancing language learning constituted an issue of major importance. I argued then that studies attempting to answer the question were generally misconceived because the use of the computer is not of itself a language teaching method; its efficacy depends overwhelmingly on how it is used—that is, what language learning activities it supports—and how well its use is integrated into the syllabus. After the 1991 paper was written, several excellent metalevel surveys of efficacy studies appeared in Dunkel (1990). The need to explore the "interrelated and complex research variables" (p. 75) that I posited then is equally urgent now: *What kind of software [I would now substitute "technology-based learning activities"], integrated how, into what kind of syllabus, at what level of language learning, for what kind of language learners, is likely to be effective for what specific learning purposes?* Each part of that question still deserves to be explored in depth in research on SLA and, as several other contributors to this volume point out (see especially Egbert, Huff, McNeil, Preuss, & Sellen, this issue), not enough attention has been devoted to these variables (see also Allum, 2002; Felix, 2005).

Efficacy concerns are often motivated by underlying anxiety about cost. It could be argued that in the United States we no longer need to do efficacy research to justify CALL because computers are taken for granted in teaching virtually every discipline, while in developing countries efficacy studies are still seen as necessary to persuade administrators that the cost is worthwhile. Here, financial anxiety has translated into challenging the costs of maintaining dedicated language technology facilities and especially the costs of hiring CALL specialists to support those facilities and the teachers who use them, that is, maintaining the infrastructure to support the substantive integration of innovation and new productivity in CALL.

Copyright Concerns

In 1991 copyright concerns focused chiefly on the copying, or pirating, of software, but that is less of an issue now; publishers have well-established licensing procedures and password protection is more sophisticated. Much more problematic nowadays is teachers' uncertainty about using selections from texts, audio, images, and video that they find on the Web in creating materials for their students. Students also need to be educated about copyright when they create projects for their classwork. Many institutions offer workshops through their libraries or teaching/learning centers.[3]

Categories of Software

The five-part categorization of pedagogical software that I posited in 1991—tutorials, drills,

games, simulations, and problem solving—is irrelevant today, especially since so much CALL uses general consumer communication tools and applications for which we would no longer use the term "pedagogical software," such as mobile communication devices and tools for texting, audioconferencing, videoconferencing, podcasting, and so on. I would instead see today's CALL in three categories: tutorial, engagement with authentic materials, and communication. Others have proposed different categorizations (see EuroCALL* for the link to Graham Davies's Web site, which summarizes several). Other contributions in this volume discuss communication uses of CALL (Levy; Thorne, Black, & Sykes; Blake, all in this issue), and student portfolios (Cummins & Davesne, this issue), so I shall focus here on the first two of my categories.

Tutorial. In the earliest days of CALL, little software was available except for simple vocabulary games like "Hangman" and drills. Unfortunately, *tutorial CALL* is still often equated with the most mechanical drills. In the past two decades, SLA theory and language pedagogy have so strongly privileged communicative teaching methods and activities that few developers have been interested in innovative drill-and-practice CALL. Because the infrastructure support essential to tutorial CALL design and development is far harder for most institutions to maintain, few teachers can afford to attempt it.

Tutorial CALL is not just for teaching grammar. Dictations, pronunciation work, listening and reading comprehension activities, and writing assignments all make use of tutorial structures. The presentation of sophisticated cultural information often demands tutorial presentation, as does the development of students' strategies for learning from new tools and activities (see Hubbard & Bradin Siskin, 2004).

Traditional grammar CALL generated corrective feedback by checking students' answers against item-specific stored correct answers, or (in more sophisticated tutorials) anticipated wrong answers. Current initiatives to develop error diagnostics and feedback are focused instead on natural language processing (NLP) or intelligent CALL (iCALL), in which the actual grammar rules of language are programmed into the computer and student input is matched against them using a parser.

Efforts along these lines have been brought to bear on language learning since the 1980s (see Holland, Kaplan, & Sams, 1995) and are now coming into new prominence (see Heift & Schulze, 2007). However, the use of NLP/iCALL in language pedagogy still faces two great challenges: First, it is much harder to parse incorrect (i.e., learners') language than correct (i.e., standard) language, and second, it is often not enough to be able to identify a learner's error in linguistic terms. To be useful to learners, a diagnostic must provide some indication of why they made that error. This requires detailed tracking of the contexts for the structure in which the individual learner makes or does not make that particular error (Garrett, 1987). Such diagnostics are probably not worth the trouble for straightforward surface-structure constructions, but where a misunderstanding of the grammar concept is involved, they may be the only way to provide feedback from which students can learn.

Authentic Materials Engagement. The term *authentic* characterizes materials created by and for native speakers, in contrast to those created for pedagogical purposes. For the vast majority of our students—those in elementary/intermediate language classes—authentic materials are difficult by virtue of their grammar, vocabulary, genre-specific style, and cultural references. Teachers prefer to adjust the difficulty of the tasks they assign, rather than the difficulty of the materials themselves: Instead of abridging or editing the texts, video, or audio they assign, they provide annotations and other kinds of support to aid students' comprehension, memory, and use of the materials. Long before the Web, templates like LIBRA (Farris & Fischer, 1994) and GALT (Lyman-Hager & Davis, 1993) allowed teachers to annotate (respectively) audio/video and written texts with, for example, an English gloss, target language synonym, picture/video, audio pronunciation of individual words in a written text or continuous reading of whole passages, transcripts, grammar explanations, cultural explanations, and so on. Today's templates (see Otto & Pusack, this issue) allow for glossing text, audio, and video material on the Web as well, dramatically increasing the use of authentic materials at all pedagogical levels. However, the availability of tools and resources that make possible student use of such aids does not guarantee that students will, in fact, use them in the way or to the extent that developers intend; only carefully structured assignments and follow-up work can effectively promote such use (see Fischer, 2007, for a discussion of research tracking how students use CALL features; see also Abraham, 2008).

The explosion of the Web, and the concomitant increase in power and sophistication of the tools used for finding material on it, has made this kind of CALL increasingly valuable to language teachers—at least to those who have regular access to it in their classroom/lab—but simply providing students with Web links to authentic materials does not of itself constitute CALL. The real challenge is, as it always has been, developing the activities that will integrate the content of authentic materials into the language learning process and engage students.

Beyond that challenge, though, is a more daunting one: The annotations help students with the task at hand, such as comprehending the particular text, audio, or video, but they do not teach students how to work with the next unannotated materials they encounter, in other words how to read, how to listen, how to interpret visual culture better. To provide them with this ability—surely the basis for lifelong learning—*authentic-materials-engagement CALL* needs to incorporate tutorial CALL, to help students understand and practice how to skim and scan a text; how to recognize the vocabulary choices and discourse style of a certain register; what to listen for in the first and subsequent hearings of an aural passage; what devices of grammar, cadence, and word choice indicate emphasis (real, rhetorical, or ironic); how the clause structure of a complex sentence adds meaning to the content words, (topic–comment, foregrounding of information, the stylistic conventions of genre, authorial intention); how sentence melody indicates pragmatic meaning in spoken language, and why it is as important as vowel or consonant accuracy in making for a good accent; how to take notes and use them in writing summaries, and so on. Teaching these skills through CALL demands sophisticated annotation techniques and the teaching of in-depth translingual/transcultural concepts, and thus requires a combination of tutorial and authentic-materials CALL.

Not every teacher is trained and experienced in teaching this kind of top–down processing, and teaching it takes more class time than can commonly be devoted to it. Web-based materials could be developed to provide not only guidelines but practice in approaching authentic materials in these ways, with feedback to build competence and confidence. Lifelong learning depends absolutely on students' ability to engage with authentic materials in their areas of interest.

Communication Uses of Technology. The development of a panoply of new communication technologies has enabled a third category of CALL that we might call *communication CALL*, to distinguish it from CALL activities that are used within a "communicative" pedagogy (see Warschauer, 1996, for an expanded definition of communicative CALL). Computer-mediated communication (CMC) has been for some years growing in popularity, partly because of the steadily increasing influence of SLA theory focusing on sociolinguistics, discourse analysis, and pragmatics, and partly because of the massive rise in consumer communication technologies. There is a huge body of work on CMC, within which some of the major topics are telecollaboration, Web 2.0, and social networking[4] (see the later *Social Computing* section for more discussion of this topic).

Evaluation

The 1991 section on evaluation of technology-based materials is still valid today, if we substitute "activities" or "Web sites" for "software packages." However, it is even more difficult today than it was then for teachers to keep up with the literature on CALL, and it is hugely time consuming to work through the vast array of potentially useful Web sites to gauge their usefulness in a particular course. Fortunately, teachers have more resources now in the form of software reviews than in 1991. The CALICO* Web site includes (under "Publications") a wide selection of software reviews listed by language; the *Languge Learning & Technology* Web site (llt.msu.edu) and MERLOT* constitute other repositories. In addition, all the major language pedagogy journals routinely include both reviews of tools and applications and reports of evaluation studies.

Other contributions to this volume explore in depth concerns that I discussed in 1991, so I will not explore them separately here; see Levy (this issue) on the kinds of materials and types of tools and applications that are available today, Otto and Pusack (this issue) on authoring and materials development, Smith and Lafford (this issue) on professional rewards and incentives (see also Levy & Stockwell, 2006), and Ockey (this issue) and Cummins and Davesne (this issue) on the use of technology for assessment of second language (L2) abilities.

ISSUES FOR CALL

New Demands on Language Education

What is changing most radically in the complex of factors that define CALL is the larger context of language education in today's world within and across academic institutions, the increasingly

urgent national demand that we produce more proficient speakers of many more languages for a wider variety of career purposes. Although too many Americans still think the rest of the world manages well enough in English to spare us the inconvenience of learning other languages, our students increasingly recognize the value of genuinely translingual/transcultural competence: To be successful historians, environmental engineers, social psychologists, or economists in the 21st century they must function comfortably in cultures other than their own. Most of the concerns I explore here are not new to language education but have yet not been addressed from the perspective of CALL's potential role.

The MLA Report. Perhaps the demand for reform that is most widely circulated in the academic world is the report issued in May 2007 by the Modern Language Association (MLA*) called "Foreign Languages and Higher Education: New Structures for a Changed World." (Even before that report, the MLA Language Map revealed with astonishing detail the range of languages spoken in the United States, providing unprecedented data on the importance of translingual and transcultural competence in this country as well as abroad.) The report calls for a radical expansion of language programs, recommending (a) more programs in more less commonly taught languages (LCTLs); (b) new emphasis in language curricula on area studies and culture broadly defined, that is, not only on the study of literature and literary criticism; (c) new courses and programs for heritage learners, students returning from study abroad, and both undergraduate and graduate students in every discipline across the university, such as humanities, social sciences, law, medicine, and so on.

Even when the report was issued in 2007, it was clear that most departments and institutions would find it difficult or impossible to fund the new faculty lines, materials development, and teacher training needed to implement its recommendations. Today, following the financial meltdown of late 2008, both private and public institutions are facing massive cuts, even though the expansion of language education called for in the MLA report is if anything more urgent now than ever before.

A National Language Framework. A more recent white paper, "Building the Foreign Language Capacity We Need: Toward a Comprehensive Strategy for a National Language Framework" (Jackson & Malone, 2009), also makes an urgent case for the need for a larger vision and expanded resources for all segments of language education, including K–12 and government. Jackson and Malone summarize numerous published reports and analyses that have addressed foreign language needs, listing the goals for a national strategy—a set of demands even more comprehensive than those of the MLA report.

How, then, is language education to meet these demands? I suggest that CALL is the answer, but it will have to be a massively expanded and significantly reconceptualized version of CALL—its theory, its pedagogical integration, its technologies, and its infrastructure. The MLA report makes surprisingly little mention of technology, referring to it only trivially as (a) one of the areas in which graduate students need to be trained as part of their preparation for teaching, and (b) the basis for offering television programs, newspapers, and foreign language films for broad campus audiences. It seems not to have occurred to the report's authors that implementation of its recommendations will depend quintessentially on CALL. Jackson and Malone (2009), too, make only the most tangential reference to the potential of CALL to address national needs. Obviously CALL cannot solve all the problems of language education, but without CALL we cannot begin to address them.

Curriculum Expansion. The MLA report's list of the new courses and programs needed to equip language learners for today's world sets out a daunting array of materials development tasks. Many of the MLA report's recommendations are for the addition of cultural content courses at the third- or fourth-year level. However, the report also urges a similar addition of "content and cross-cultural reflection *at every level*" (p. 6, emphasis added). This raises a question that is still debated among language teachers: Is it appropriate and efficient for language programs to offer courses or tracks in language for special/specific purposes from the beginning of language study, or should such courses be offered only after a semester or two of general-purpose elementary/intermediate language study? General-purpose language courses at this level are usually designed to be attractive to students taking them only to fulfill a requirement, but ambitious and professionally committed students may be frustrated by the typical focus on popular culture and teenage interests. The vocabulary, idioms, and cultural explanations presented in elementary

language courses could also focus on the specific content of international/global issues such as public health, economic development, or environmental concerns. Web-based modules of such content could be created and made widely available independently of grammar explanations (see *Rethinking Grammar Instruction*, below) for teachers to incorporate into elementary-/intermediate-level courses.

Language for Special/Specific Purposes and Language across the Curriculum. Courses focused on the history, geography, anthropology, environmental concerns, art, film, and so on of a specific language area tend to be offered in English so as to attract students whose language proficiency is not adequate to deal with such content; these courses are more typically offered in area studies programs (national resource centers, NRCs*) than in literature departments. The MLA report, however, emphasizes the value of studying such content through the medium of the language, combining advanced-level language teaching and disciplinary content. The term Language for Special/Specific Purposes (LSP; i.e., for any purpose other than the study of literature) is often used for such upper level language department courses, which are typically taught by the language faculty, since senior research faculty are for the most part neither trained nor inclined to teach these courses.

In most institutions, only the Spanish department has enough third- and fourth-year enrollments to offer such courses regularly. The Spanish department at Yale, for example, lists LSP courses on law, medicine, politics and international relations in Latin America, journalism and media, and the sociolinguistics of the Spanish-speaking world.[5] These do not count toward the Spanish major, but they are popular with students majoring in the related departments. Other possibilities would be history, history of art, opera, a major city, philosophy, environmental issues, social issues, gastronomy, and so on. However, the availability of departmental faculty with the requisite background in any of these fields is a matter of serendipity. Such professionally focused courses are rare in LCTLs.

Language departments sometimes resist pressures from students to develop LSP courses because of a perception that such language study is "Berlitzy," that is, motivated by "instrumental" purposes that are less intellectually valid than the "constitutive" orientation of literature and culture courses that traditionally define the major. The MLA report disappointingly perpetuates this dichotomy.[6] To refute it one need only consider a course in "Spanish for Legal Purposes," for example, which will give students an in-depth understanding of differences between a Hispanic legal system and an Anglo one: The study of topics such as the rights of the individual versus those of the community, privacy, kinship, the purposes of punishment, and the relation of church and state are fully as constitutive as the study of literature. Since universities offer doctoral and other postgraduate degrees in economics, business, law, medicine, engineering, and the environment, we can hardly accept literature professors' assertion that the study of these disciplines in other cultures is not intellectually valid.

By contrast, programs under the rubric Language across the Curriculum (LxC, LAC, or FLAC) typically offer courses in nonlanguage departments that focus on a particular world area, for example Chinese philosophy, economic development of postwar Germany, or environmental issues of the Amazon, where the lectures are given in English but one discussion section is designated for students with enough language proficiency to read some of the materials in the original (while the students in the other section[s] read them in translation) and to discuss them in the target language with a departmental graduate student who is a native speaker of the language (Straight, 1998). LxC courses tend to be available in commonly taught languages and common majors; even large institutions can make available only a small fraction of the hypothetically possible combinations of Language X plus Discipline Y. Offering these sections on a regular basis is likely to be difficult, especially given today's budgets.

The most efficient way to establish LSP and LxC courses would be to use templates to develop intensive and extensive online support for them, both tutorial and authentic-materials CALL. (See Otto & Pusack, this issue, on the potential of such templates; see COMET* for a description of one suite of templates that could be used in this way.) Tools for annotating course materials are essential, but students must also learn how to work independently with unannotated materials in their disciplines.

One of the COMET templates, CRAFT (Companion for Reading Authentic Foreign Texts), allows teachers to create Web pages with content-specific vocabulary, idioms, cultural references, and prereading activities available to students while working with newspapers, documentaries, or government archives on the particular content domain, without having to annotate specific texts. Summer funding for the teacher or teaching

assistant (TA) preparing an LSP or LxC course would suffice to build a CRAFT site on virtually any topic in any language, and such sites can easily be updated for future iterations of the course. Without archives of such materials there can be no continuity over time of LSP/LxC courses, and no way to share them across institutions. These materials might then also be made available to students who want to undertake independent reading even in semesters when the particular LSP or LxC course is not offered, or at institutions where no such offerings are ever available.

I will often suggest that Web-based modules are needed not only to support new language curricula but also to provide online learning opportunities for independent learners; therefore, I should state explicitly that it will always be better for students to learn language in courses led by well-trained language teachers than to attempt to do so independently, no matter how good the materials. However, since the availability of the specialized courses and the teachers needed is extremely limited at any given institution—and especially limited nationally in LCTLs and in an adequate range of disciplines—it is clear that the development of collections of Web-based materials will be of enormous benefit to students.

Less Commonly Taught Languages. A second kind of expansion essential to language curricula is the addition of LCTLs, although what counts as such varies widely across institutions from those that are relatively common (such as Italian, Russian, and more recently Chinese and Arabic), through others offered at larger institutions (such as Korean, Portuguese, Hindi, or Swahili), to almost never-taught languages such as Indonesian, Dari, Quechua, or Sango. (See LCTL–List* for a database of languages taught in the United States.) Whether a new language is added to the program of an existing department or offered through an area studies program, it is rare that a sequence of courses of more than two or three semesters can be regularly offered. Staffing is always a problem for LCTLs, which seldom have enrollments that justify hiring a full-time teacher or creating a continuing appointment even for a part-time teacher.

LCTLs can be made available to students through a directed or semi-independent language program, such as Directed Independent Language Study (DILS*) at Yale, the Autonomous Language Learning Network (ALLNet*) at the University of Iowa, or other such programs organized through the National Association for Self-Instructional Language Programs (NASILP*). In such programs students work independently but on a schedule (i.e., these are not at-your-own-pace programs) using a recommended textbook with audio, and they meet twice weekly with a native-speaker language partner (not a teacher); they are tested by an outside examiner who teaches the language at another institution. These programs are highly valued by area studies centers, whose students often need LCTLs for research or field work.

Most of the National Foreign Language Resource Centers (NFLRCs*) already commit major resources to initiatives supporting LCTLs, offering workshops for teachers and grants for them to work on the development of materials and testing instruments, almost always technology-based. The University of Wisconsin–Madison Language Institute* has established a National Online Less Commonly Taught Languages Teacher Training Initiative, creating a series of online courses on methods, best practices, readings, research, and more. The LCTL Project at CARLA (the University of Minnesota's NFLRC*) maintains a Web site with information about LCTL programs across the country and listservs for LCTL teachers; it also offers workshops and small materials development grants. The Computer Assisted Language Instruction Group (CALI*) at the University of Arizona specializes in CALL materials for LCTLs. The Center for World Languages (CWL*) at the University of California at Los Angeles (UCLA) includes a wide array of initiatives, including online courses and the Language Materials Project (LMP*). Several NFLRCs* focus on a single world area and its language(s), for which they provide workshops, materials, and other resources. (See Jackson & Malone, 2009, Part II, for more details on the National Security Language Initiative, NSLI*, and the National Security Education Program, NSEP*.)

Because few language textbook publishers can afford to publish print materials for languages with small enrollments, most LCTL resources are digital. That CALL is essential to the teaching of LCTLs no one doubts, but we do not as yet have nearly enough funding for comprehensive projects of materials development in an adequate number of LCTLs, especially at advanced levels and for specific career purposes. The mandate is well within the purview of CALL, had we but funding enough and time.

Gateway Language Programs. Language departments sometimes add LCTLs to their curricula

that are closely related to their principal language(s)—Portuguese for speakers of Spanish, Polish for speakers of Russian, Dutch for speakers of German, and so on—and can, therefore, be linguistically sophisticated, encouraging students to use both their proficiency in and their linguistic knowledge about the gateway language as a basis for rapid development of proficiency in the LCTL. CALL materials could be developed to support these initiatives, with pedagogically sound metalinguistic comparisons of grammar, usage, phonological changes and contrasts, and lists/explanations of common false cognates. The juxtaposition of digitized texts from related languages, with accompanying audio, highlighting similarities and contrasts, could make for rapid assimilation of the LCTL.

Heritage Language Learning. The term *heritage* in language education refers specifically to learners who have grown up in families in which English was not the primary language, or who have lived and perhaps even done part of their schooling abroad, but who are not native speakers of the target language in the sense of commanding the full range of proficiencies and registers. Heritage learners can be recognized along a continuum of abilities from those who can understand the language as spoken by relatives but do not speak it, to those who speak a nonstandard variety, to those who speak the standard variety but cannot read or write it. The presence of heritage learners in regular elementary language courses is problematic: True beginners in the language tend to be daunted by and resentful of them, and heritage learners may challenge teachers who are themselves not native speakers or who teach an unfamiliar variety of the language. Heritage learners should have their own section or track, at least through the intermediate level, because their learning strategies and goals are quite different from those of nonheritage students; they need different materials as well. The development of heritage courses or tracks, as urged by the MLA, is already taking place at many institutions, at least in Spanish and Chinese. Wherever heritage learners are encouraged and supported they quickly come to realize the value of their linguistic and cultural background in providing an invaluable "extra string to the bow" of any internationally oriented field they choose to major in, with the result that they often become area studies majors or double majors. At high-intermediate or advanced levels, their needs and those of nonheritage LSP students tend to converge.

Meeting heritage needs is an institutional and national challenge for several reasons. Availability of materials is the most obvious one. Except in Spanish and Chinese, few materials are specifically designed for heritage learners; publishers cannot produce textbooks for such small markets. In recent years, however, the challenges of heritage language education have received a great deal of attention; the National Heritage Language Center (NHLC*) at UCLA, the National Council of Less Commonly Taught Languages (NCOLCTL*), an American Council on the Teaching of Foreign Languages (ACTFL*) special interest group, and many conference panels, workshops, and publications are dedicated to heritage language challenges. So far, however, CALL materials have not to my knowledge been designed specifically to support heritage learning.

Some examples of potentially useful materials for heritage learners include: (a) databases of audio samples of the language as spoken by contemporary native speakers, by speakers in longstanding diaspora communities, or by minority groups, with tools for comparing them; (b) explanations and examples of register-specific language that heritage learners typically use without realizing that it reflects only one register; (c) texts in a wide range of content with audio tracks read aloud by native speakers of the standard language, as heritage learners can often comprehend spoken language far better than they can read; (d) banks of online self-correcting dictation work, at all levels, so they can practice writing, spelling, accents, and so on; and (e) modules of grammar explanations based on common conversational speech likely to be familiar to heritage learners. Collaborative work by teachers of heritage language programs could create sizable online resources for use by teachers without the resources for creating these themselves, and such resources would also be of great value to independent heritage learners at institutions without courses in their languages.

Reading Courses. Years ago language programs often included a "reading track" for undergraduate learners who were not interested in, or were afraid of, an emphasis on speaking. Reading courses emphasized the study of grammar, the practice of translation, and the acquisition of extensive vocabulary, but with the hegemony of the communicative approach and the demotion of the grammar translation method such courses have virtually disappeared from the undergraduate curriculum. The MLA report does

not include reading courses among its recommendations, but I think it is time to reconsider their banishment. They accommodate those language students who learn best when they can establish an a priori sense of the overall structure of the material to be learned before being asked to speak, in contrast with learners who prefer to immerse themselves in the learning experience, to start speaking right away, and to build systematic knowledge of it as they go along. Both of these approaches represent valid cognitive styles. When all language learning was structured by the grammar translation approach, learners who preferred a communicative/immersion approach were disadvantaged; nowadays a program heavily privileging the communicative approach disadvantages those who prefer a cognitive foundation-building approach. If we are to attract as many students as possible to learn a language to an advanced level, we need to find ways to offer cognitively compatible learning opportunities.

Research on language acquisition in reading-with-listening programs has been shown to be surprisingly effective for K–12 learners (Lightbown & Spada, 2006), and experimenting with such an approach for postsecondary learners would be eminently worthwhile. A well-designed computer-based reading course can use CALL tools and materials to include both aural work and communicative context to a much greater extent than was possible when LIBRA and GALT were developed. (This approach is less likely to be successful in languages whose writing systems are not closely related to their oral systems.) Templates make it easy to add to reading materials an audio track of the text as well as glosses, synonyms, cultural notes, grammar explanations, pictures, and so on, as GALT did. Computer concordancing tools (see *Translation and Interpretation* section) allow students to explore how words and (some) grammatical forms are used in huge corpora of texts in the language, which helps them generalize their reading skills to unannotated texts (see Johns, 1994).

The reverse technique, listening-with-reading could be equally effective, as LIBRA materials demonstrated. The subtitles commonly provided with foreign language movies often skip words or provide less-than-idiomatic translations, so these should probably be scrutinized with care before being used for language learning purposes, but Google now has a large set of captioned videos, in multiple languages, that teachers and students can search through, at http://video.google.com/videocaptioned. Google Labs has an application that allows searching for words/phrases in selected videos, which provides something like an audio/visual concordancer: http://labs.google.com/gaudi. (It may as yet be available only for English.) These materials also could be made Web-available to learners without access to such courses at their institutions who are willing and able to work through the materials on their own.

Reading-with-listening courses at the elementary/intermediate level might even be more efficient for many learners than conventional ones. Of all the skills that make up language competence, oral proficiency takes the most time and effort to achieve and it is the first one lost. If, in the attempt to reach the highest possible level of oral proficiency in lower level courses, a syllabus skimps on foundation-building in grammar, vocabulary, and reading, students who abandon language study after that sequence—as do, unfortunately, the huge majority of students who start at a first- or second-semester level—will find later not only that they can no longer speak the language but also that they have no foundation for relearning it. Similarly, students whose first two or three semesters of language study focus too heavily on oral proficiency may find if they do go on to upper level courses that they are unable to read or write at the level or in the amounts required; this is a common complaint of faculty teaching upper level courses (Henning, 2009). Reading-with-listening courses might prove effective in giving students a better foundation both for language maintenance and for continued acquisition. If this kind of activity can be shown to support some acquisition of oral proficiency as well, as the Lightbown, Halter, White, and Horst (2002) study suggests, then an emphasis on reading need no longer be seen as taking away time from an emphasis on speaking. (See Chun, 2006, for an overview of CALL technologies for reading.)

Such reading materials would be equally valuable to students who need to learn to read a language but cannot enroll in courses, and for graduate students whose degree programs require foreign language "reading knowledge," usually tested by a routine translation task. However, graduate students in many disciplines no longer expect to use a foreign language only for decoding footnotes in a campus library: Many intend to conduct research abroad. They need not only discipline-specific reading knowledge but also general language proficiency that will enable them to live abroad and to communicate with foreign colleagues about their research. They need to understand the cultural context for their reading in ways that translated texts do not serve.[7] Here

again, Web-accessible archives of well-annotated reading materials would provide an obvious solution.

Translation and Interpretation.[8] The MLA report (2007) lists as one of its "Continuing Priorities" the development of programs in translation and interpretation, asserting that "there is a great unmet demand for education translators and interpreters, and translation is an ideal context for developing translingual and transcultural abilities" (p. 9). Translation in the nonprofessional context tends to be thought of as a fairly straightforward recoding of a text from one language to another. "Real" translation, whether of literary or nonliterary texts, demands a far higher level of language competence and a top–down approach, that is, the ability not only to understand words and grammar but also to recognize textual coherence and cohesion, authorial intention, and so on (Baker, 1992).

The United States may be the only western country that has no full-scale professional institute specifically for training professional translators and interpreters. The Monterey Institute of International Studies (MIIS*) offers a program, as do schools of foreign service at some universities,[9] and these inevitably include highly sophisticated facilities and instruction in using technology. Some university language departments offer an occasional course on literary translation, but to my knowledge none of these have particularly exploited the potential of language technology use for the purpose of teaching translation. CALL materials and tools supporting in-depth reading can be used equally well in teaching translation. Partly because language pedagogy still tends to proscribe using translation in elementary/ intermediate language courses, we seldom teach our students explicitly how to use online translation tools and resources for real-life purposes after they leave the language classroom.

Working with concordancing software is a valuable way to help students understand that translation is not simple word-for-word recoding. Concordancing is routinely used by ESL teachers, and its neglect in other-language pedagogy is puzzling. A concordancing tool allows the search of a potentially huge corpus of text, on a Web site or a CD-ROM, for example, for a specified word or phrase; each instance of the search text in the corpus is displayed on screen, and any instance can be selected and opened out for examination of the sentence or sometimes even the paragraph in which it occurs, so that students can become aware of its use in different contexts.[10] A parallel concordancer allows for a simultaneous search of a text and its translation, so that students can see how a word is translated differently in different contexts (Barlow, 2007).

We need to develop templates and models for translation and interpretation courses to be used by language programs across the country. Anecdotal data strongly suggest that students are eager to take such courses, and if the tools and the capacity for developing materials and courses were easily available, many more programs would be able to respond to the demand. Interpretation demands the learning of quite different skills, which interactive multimedia are ideally suited to support. Given the huge need for competent translators and interpreters both in the United States and abroad (i.e., great career opportunities), it would certainly be to our students' advantage, and that of our language programs, if national offerings at the postsecondary level were massively increased, as both the MLA foreign language report (2007) and the National Language Framework report (Jackson & Malone, 2009) suggest.

Study Abroad. Language education abroad has seen a huge increase in programs and in institutional support, as well as an increased focus on it in the SLA literature.[11] Volunteer work and internships abroad are also increasingly popular. The MLA report recommends that language departments "provide appropriate courses for students returning from abroad" (p. 9) without defining what these might be, but makes no mention of what can and should be made available before and during study abroad as well as after it.

CALL multimedia modules on the city and country of the program, with cultural content well beyond that of travelogues, could be part of students' required preparation. When the program is located where a regional variety of the language is spoken, it is essential that students have intensive listening practice in that variety before they go. The "Listening Options" template in the COMET* suite of templates was developed especially to allow the creation of materials introducing students to varieties of the language other than those they are familiar with. This kind of work is especially important in Arabic because coursework typically focuses on Modern Standard Arabic, which is by no means an oral lingua franca, so that students planning to go abroad have to learn the vernacular of the particular region. Other technology-based materials could include, for example, online interactive samples of every form students will need to fill out when they are abroad, or video

demonstrations of how to buy or use subway tokens, or how to bargain in a market, as well as any special-purpose language needed to fulfill their purpose for studying abroad.

Many students are reluctant to go abroad during term time because they need to fulfill distribution requirements. The possibility of fulfilling perhaps one such requirement online might be all the incentive needed to get such students to take the plunge. Students doing an internationally oriented major should be encouraged to do relevant field work in the language and to post their findings in online portfolios assessed both by language and other-discipline faculty. However, students' use of their communication devices to stay involved with friends or family at home may hinder real immersion in the foreign experience (Kinginger, 2008).

Lifelong Learning. In recent decades, so few of our language students have gone past the foreign language requirement to advanced levels of study that we have relatively little research on what is necessary to be successful, not only in traditional upper level courses, but in attaining skill-specific proficiency ratings of Superior on the ACTFL* scale (3 on the Interagency Language Roundtable [ILR*] scale) and in actual ability to function competently in any field of study or career, whether as a teacher of language or literature, a political scientist, a public health professional, or any other profession. Bringing students to these levels is not simply a matter of extending the curriculum vertically, that is, by adding on more course options at the top end of the course sequence. The nature of advanced-level competence, and the use of the tools and strategies required to attain these goals, must be taught explicitly from the beginning of the language curriculum.

"Lifelong learning" is a popular phrase, and it resonates with language teachers because all of us know that language learning is never "complete"—it continues throughout one's life of engagement with the target language and culture. Yet for the most part we have not yet integrated into language programs explicit teaching of the tools and techniques students need to be serious lifelong learners. Students must come away from school able to keyboard fluently in the appropriate fonts, to use email, text messaging, chat, and blogs as native speakers do (including observing the target culture's politeness conventions, icons, abbreviations, etc.), to print, to search and evaluate Web sites, reference materials, and archives—in other words, to use technology the way native speakers in their field do, both to find information and to participate in a professional community. Such a course has been developed in Spanish at Marist College (Gaugler, 2008; see also Winke & Goertler, 2008).

Being familiar with digital tools is not enough; students need guidelines on how to use them specifically for the purpose of acquiring greater language proficiency. For example, students typically use their print bilingual dictionaries very badly—they look up a word, seize on the first translation equivalent given, and forget it as soon as they have used it. They use online dictionaries just as badly, only faster, and because looking up words online is so fast and easy they have even less motivation to remember what they find. They have no idea how to check between English and the target language to work out whether the translation they have chosen fits the context, or how to use the idioms in which the word appears, or how to make use of the grammatical information included with the definition. They should know for what purposes a handheld translation gadget can and cannot be used. We need Web-based tutorials on these topics, which could be created for specific languages by knowledgeable native speakers and widely disseminated.

Rethinking Grammar Instruction

The new demands on language education constitute a powerful set of reasons to rethink grammar CALL. This is not the place to recapitulate the debate on whether or how to teach grammar explicitly when the primary goal of language learning is communicative competence,[12] but SLA work in the past decade has refocused attention on the importance of "focus on form" (Doughty & Long, 2003; VanPatten, Williams, Rott, & Overstreet, 2004). Some programs strongly oriented toward the communicative approach still relegate practically all student work on grammar to outside-of-class activities, referring learners to textbook explanations and assigning form-based drill and practice. Textbook explanations tend to be offered from a structural perspective rather than offering a semantic, communicative, and conceptual basis for understanding the form in question (Garrett, 1986), and workbooks, whether paper or online, still offer mechanical drills. Although SLA theorists and teachers have developed new ways to approach the teaching of form, these have not been implemented in CALL.

The first reason to rethink the teaching of grammar is the widespread recognition, already mentioned in the *Reading Courses* section, that many students from lower level language courses that

devote most of the classwork on oral communication skills tend to have an inadequate foundation in grammar, reading, and writing to support the work required of them if they move on to upper level literature or LSP courses. Cummins (2008) coined the terms BICS (Basic Interpersonal Communication Skills) and CALP (Cognitive Academic Language Proficiency) to capture the different skills acquired by immigrant children learning ESL, but the distinction is useful in foreign language teaching, as well. The grammar translation method pursued only CALP, while communicative methods prioritize BICS; early tutorial CALL was limited to CALP, while today's technology, theory, and pedagogy privilege BICS.

The second reason is the relatively new demand that more students attain far higher levels of proficiency than is now common. Most elementary/intermediate courses are designed for students who are taking them only to fulfill an institutional or departmental language requirement; programs may not see much need for these courses to prepare them to do well at higher level work. (In many research universities and strong liberal arts colleges, most students who intend to major in the commonly taught languages come from secondary school with Advanced Placement preparation or other advanced-level coursework and thus enroll directly in upper level courses.) A solid grounding in how grammar shapes meaning at every level is seldom found in conventional textbooks, which puts the onus on CALL materials.

New programs in LCTLs and heritage languages form the third imperative. Teachers commonly complain that it is difficult to teach another language when students are ignorant of the structure of their own and of the crucial role of grammar in communicative competence, and that problem is exacerbated by the greater typological distance of most LCTLs from the learners' native language. Furthermore, we can no longer take it for granted that the native language of all our students is English: In many parts of the country with sizable immigrant, heritage, or diaspora communities, language classes may include learners whose dominant language is Spanish or Vietnamese, for example. Yet almost all textbooks in the commonly taught languages are written as though English were the common reference point, and many textbooks of LCTLs are written entirely in the target language with no reference to any native language. Even a language as closely related to English as German presents more than enough grammatical differences to call for explanations, making it clear to students that learning grammar is not just a matter of memorizing new endings to encode grammar structures with which they are vaguely, intuitively, familiar, any more than the vocabulary of another language is a simple recoding of labels. For LCTLs, especially for non-Indo-European languages, the need for explicit grammar teaching is obviously still much greater.

Finally, we need to rethink the way grammar is taught at advanced levels. A functional, meaningful treatment designed specifically to be useful to advanced-level learners has to capture the nonlinear nonhierarchical nature of grammar, the network of relationships among subsystems, and the complex connections between grammar and vocabulary. (See Neguerela & Lantolf, 2006, on the teaching of concept-based instruction, based on ideas of Vygotsky, 1978, Gal'perin, 1989, and Davydov, 1988.)

Conventional drills are inadequate for our new purposes. We need new models for explanations of grammar concepts and rich examples of how they work both in the native and the target language; these should be organized not only by grammatical terms but also by function, with clearly indicated cross-references to examples, followed by self-assessment for comprehension. Animated computer graphics could provide dynamic illustrations of grammatical relations that would be far more comprehensible and useful than conventional explanations. We also need meaningful links between those explanations and examples of grammar concepts in many languages, so that learners with facility in any language can link explanations from it to a new target language, that is, a cross-referenced grammar database possible only in CALL. Practice materials ranged along a continuum of communicative open-endedness, with appropriate feedback, could conceivably be created on paper, but virtually all workbook activity is now in a digital format. Sophisticated diagnostics of the underlying conceptual basis for individual learners' errors (Garrett, 1987) are essential in building advanced-level capacity to use grammar for meaning.

Online Learning

Other contributions in this volume, especially Blake's, explore the technologies used in distance learning and the issues it raises, so I will mention here only one concern about the materials made available to students in courses with little or no regular contact with teachers. (It is now common to refer to "online" learning rather than "distance" learning because the distance has

become irrelevant: An online course offered at a given campus may be taken by students at that campus as well as by students far away.) With the expansion of online learning initiatives along a continuum of teacher involvement, it is increasingly important that online materials include and highlight explicit support for student use of the unfamiliar learning environment. Materials must include detailed help with learning strategies, clear learning objectives for each activity, and suggestions for self-assessment. Materials published and advertised for online courses must clearly indicate the extent to which they assume any teacher involvement.

Social Computing

The advent of the Internet as a major forum for human communication has recently brought about an explosion of interest in social computing, the use of computer-mediated communication to interact with individuals from all over the world in virtual spaces and environments. Language students today routinely communicate with their friends, family, and people who share their interests using Facebook and MySpace. In addition, many of these students may participate in task-oriented activities in virtual environments such as Second Life or World of Warcraft with players from all parts of the globe. To engage students in meaningful communicative practice that reflects what they do in the natural world, language professionals must leverage this interest in social computing and consider incorporating some of those activities into the L2 curriculum. In addition, projects such as Cultura (Bauer, deBenedette, Furstenberg, Levet, & Waryn, 2005) have been created by language researchers and instructors to utilize telecollaboration with native speakers of the target language to foster intercultural competence. As the Thorne et al. article in this issue goes into detail describing the use of social computing and virtual environments for L2 study, I will not go into further detail on this subject here.

Teacher Training and Professional Development

The specifics of my 1991 discussion of teacher training in CALL are no longer useful, but the comments on the complexity of such training still hold. The conferences of all language teaching organizations nowadays routinely include sessions on technology use and the development of materials and tests, and many of them also include preconference workshops on those topics. The NFLRCs* host summer institutes, including workshops on technology that range in length from a day to several weeks, and CALICO*, IALLT*, and IALLT regional groups all offer workshops, including some that are designed specifically for newcomers to CALL. However, my 1991 warning that CALL is too complex and strenuous a topic to be mastered in such workshops is even more on target today than it was then. Even those teachers who are already familiar with routine or consumer uses of technology will find that it is extremely difficult to follow up on conference or summer institute workshops on CALL development unless they have substantive support from a language center director or CALL specialist back at their home institution.

I assume that most preservice language teaching methods courses for graduate student TAs or undergraduate students working toward language teaching certification now include some introduction to CALL, but when they are taught by language program directors who have not themselves been trained in CALL or worked intensively in this area, such courses are not likely to deal with more than the tip of the iceberg. I am aware of only a few graduate programs in the country that provide substantive training in CALL.[13] We are still, therefore, in the very early stages of building the necessary cadre of language teachers who are well-trained CALL professionals. A number of good overviews of the issues are available: See *Teacher Education in CALL* (Hubbard & Levy, 2006); a special issue of the online journal *Language Learning & Technology* (LLT*; http://llt.msu.edu/vol6num3/default.html); and Kassen, Lavine, Murphy-Judy, and Peter (2007). CALICO* has had a Teacher Education special interest group for several years, and EuroCALL* has just formed one.

Language teacher training is problematic without the help of a trained CALL specialist as language center director (see section below, *Institutional Language Centers*). Workshops put on by general IT support units that are designed to help neophyte teachers of any discipline learn to use materials development tools or course management systems, for example, are often not very useful to language teachers, especially those who are not native speakers of English. As a consequence, many language teachers have little support for developing their use of CALL for any purposes that cannot be carried out with widely consumer-available technologies such as communication tools and popular video-editing programs (C. Evans, Director of the Foreign Language Resource Center, Skidmore College,

personal communication, November 8, 2007). Certainly, activities using communication technologies are firmly grounded in SLA theory and communicative language teaching practice, but we cannot allow budget-driven constraints on infrastructure to make it impossible for teachers to use anything else.

If CALL is to play the expanded roles suggested in this article, teacher training is obviously a major factor. To reiterate the governing argument of this article: Teacher training needs to be not in "technology use" but in CALL proper. Without substantive grounding in SLA theory and in the pedagogical context and rationale for technology use, familiarity with the technology will allow only superficial application and no real integration.

The logistical difficulty of integrating CALL is especially acute in elementary/ intermediate courses with multiple sections that are commonly taught by "apprentice" graduate student TAs as part of their degree requirements. CALL use in such courses requires all the TAs to integrate it in exactly the same way because the language students in every section take the same exams and must be prepared identically for the next-level course. The language program director thus has to train all the TAs in the same uses of technology, regardless of individual preferences, and must also create a syllabus for the entire course with the same CALL plan across the board. If CALL is used within the classroom (i.e., not just for homework), the logistical problem will be acute because every section of the course will have to be taught in a classroom capable of supporting CALL work (B. Guthrie, Language Program Director in French, UC Irvine, personal communication, April 16, 2007). Even wealthy institutions seldom have this capacity, and in competing for well-equipped "smart" classrooms TAs have low priority, as do non-tenure-track faculty. As a result, many graduate programs have to leave technology out of TA preparation.

Research

Chapelle's contribution to this volume on the relationship between SLA theory and CALL not only updates and expands on the theoretical concerns I raised in 1991 but also provides an expert, in-depth exploration of the issues. In addition, Egbert et al. (this issue) provide a critical review of many CALL research studies that clearly demonstrates the importance of complex models of data collection. Nonetheless, a few points about theory-motivated CALL research might still be made here.[14]

Because so much language education research now uses technological instruments for the elicitation, collection, or analysis of language learner data, even when the research hypothesis is not a CALL question, it is sometimes difficult to distinguish "true" CALL research, meaning research that considers theory and pedagogy as the essential context for technology use. In 1999, CALICO*, EuroCALL*, and IALLT* developed a joint policy statement or white paper called "Scholarly Activities in Computer-Assisted Language Learning: Development, Pedagogical Innovations, and Research," which is still an extremely helpful description but is also now in the process of being updated (see CALICO* for the link).

Some teachers and researchers now take technology use so much for granted that they do not use technological terminology in their titles, publish in language technology journals, or consider themselves to be CALL specialists. This is one consequence of the "normalization" that Levy (this issue) discusses, which makes it difficult for those trying to get a comprehensive overview of the different kinds of research going on in CALL (see Egbert & Petrie, 2005).

The rapidity with which technologies change also poses a real problem to the research track record of the field. Research on chat, for example, tends to ignore work done in the 1980s on a program called Daedalus, an Intranet program that allowed students to type conversations very much as chat does (see Beauvois, 1998; Kern, 1995). We need to develop a research track record that allows younger researchers to find relevant research of the past, so that insights coming out of studies done on technologies now obsolete are not lost.

The curriculum expansion suggested by new demands on language education will push research in new directions. If we want to bring more students to much higher levels of translingual/transcultural competence, we will need protocols for compiling and evaluating learner histories in a variety of instructional contexts. Institutions eager to add new courses in LCTLs but without the funding to establish full-scale programs with regular faculty appointments will urgently need guidelines for high-quality programs designed along the lines developed in DILS*, ALLNet*, or the Drake University Language Acquisition Program (DULAP*), and those guidelines must be based on substantive research on such programs.

We need not only research that evaluates current CALL practice as a basis for expanding on it, but also research that opens up radically new approaches to language teaching and learning as

a basis for justifying the new curricula, establishing both their theoretical basis and existing precedents for their success, to persuade administrators and funders that a massive expansion of CALL is essential to meeting national needs. However, getting grants for research on significant innovation is always problematic; the review panels for funding agencies are typically made up of well-established language faculty members who may not have had the opportunity themselves to explore the underlying issues of the proposals, and who may have arrived at their opinions on SLA or CALL research only in the context of currently accepted methodologies or curricula. Moreover, the objections to studies representing major innovations are likely to be circular; research on the effectiveness of a new approach or curriculum depends on the availability of materials for it, but funding for radically new materials is not likely to be available without some well-founded promise of their effectiveness.

Two approaches to CALL research are relatively under-explored in our literature. One is the use of the computer to track the psycholinguistic processing of classroom SLA, in contrast to the much greater body of work on sociolinguistics, pragmatics, and discourse aspects of CALL. However, a range of CALL approaches to investigating psycholinguistic processing can be found in the work of Hulstijn (2000), Chun and Payne (2004), and Plass, Chun, Mayer, and Leutner (2003).

The second is the use of the computer to conduct in-depth case studies on individual learners' technology-based activities, which collect a broad array of individual data, and to correlate these across multiple learners. Case study research conducted by a teacher-researcher can usually be carried out only on a very small sample of learners, from which one cannot make significant generalizations. Creating a computer case study instrument requires a nontrivial time investment up front, but once it is in place large numbers of students can use it so that the data can be mined for patterns otherwise impossible to extrapolate. I refer here not only to data collection on how students use the features of a given CALL application but also to computer-based studies of the learning process regardless of whether the learning task focuses on CALL.

INFORMATION RESOURCES

I am amused to note that in the 1991 appendix (available online on the Wiley-Blackwell site) on resources I included street addresses for organizations and journals; nowadays even the less technology savvy among us take it for granted that a Web address (URL) is the starting point for professional information searches. The appendix to this article gives URLs for the most commonly used general resources in CALL and language education; the other contributions in this volume provide specific references and links to materials on their particular topics.

The two major professional organizations in the United States that focus specifically on CALL are CALICO* and IALLT*, and their publications and conferences are probably the most productive starting point for most teachers. Information on CALL tools, software, Web sites, and research is also available in the publications of virtually every organization that serves language education at any level, and nowadays every language education conference includes presentations about the use of technology. So many books on CALL are published every year that it is not practicable to list them here. The best ways to find the ones most likely to be relevant to an individual teacher's interests are to read the book reviews in journals and to go to the conferences of the organizations listed in the appendix and browse the exhibitors' tables. Sometimes SLA research and pedagogical discussions of language learning that make no mention of technology can be read by CALL-oriented teachers as suggesting possible CALL development; conversely, reports of technological innovation in other disciplines can suggest possibilities for language pedagogy. The reading matter of potential importance to CALL is of daunting proportions. The extraordinary amount and range of CALL information is itself one of the major problems in the field; both neophytes and experienced users have trouble finding and/or organizing the information that they seek.

CONCLUSIONS

The explosion of information about CALL, the new demands on language education, and our current dangerous funding situation all combine to force us to develop and implement new initiatives. All the contributors to this volume will have perspectives on the needs of their enterprises; I offer here some suggestions that are independent of specific CALL activities.

Institutional Language Centers

The second level of infrastructure that I mentioned above refers to the institutional language

center, whether this is conceived of as a "language technology/media/resource center" or a "center for language study," whose mandate extends beyond the provision of technology support services and technological training to include participation in institutional language policy and a wider range of professional development activities (see Garrett, 2001). Dedicated language centers are needed not only to provide the physical infrastructure discussed above, but also to provide a place where language faculty from all departments, as well as area studies faculty from other disciplines, can explore professional issues together.

A serious hindrance to the development of a significant research agenda exploring the expansion of language curricula, as recommended by the MLA report, is the fact that most language teachers are not tenure-track (LCTL teachers may not even have any departmental affiliation) and are therefore not eligible to be principal investigators on grant-funded materials development or research projects. A well-established institutional center for language study or an international studies center can function as the principal investigator institutional grounding for language projects carried out by non-tenure-track teachers. The *Language Center Management Manual*, published by IALLT* (Lahaie, 2003), provides an overview[15] of the many responsibilities that a language center can fulfill, and it behooves all those who believe in the potential of CALL to ensure that our administrators are aware of the value of language centers to the institution.

Professional Organization

Although many in the field might disagree with me, I feel that CALICO* and IALLT* should merge into one professional organization. IALLT* began in 1964 as the National Association for Language Lab Directors, and CALICO* began in 1982 as the professional organization of teachers interested in developing language software. At the time of CALICO*'s inception, almost no language labs had computer facilities, so the two groups originally focused on quite separate areas of language education, but today one professional organization could certainly accommodate complementary emphases on the theory, pedagogy, development, and management of CALL. Most teachers and CALL specialists get funding to attend only one conference per year. Given the surge in demand for expanded language education programs and consequently for a great expansion of CALL, the field needs more professional organization staff than either IALLT* or CALICO* alone can maintain.

A National CALL Center

CALL today faces challenges on a radically different scale from those that we explored in 1991. I have argued here that a massive expansion and reconceptualization of CALL as a field is crucial to academia's efforts to meet the new demands on language education and that we have so far only scratched the surface of CALL's potential for creating networks of resources to develop materials, to train teachers, to expand its theory and research, and to provide the complex support structures we need at individual institutions and in the field. The NFLRCs*, individual universities, consortia, and professional organizations already conduct important programs, but in the big picture those initiatives are piecemeal and ad hoc, and the needs already outstrip current resources.

The only realistic way for language educators to meet the challenges is to form a National CALL Center with the staff and resources to organize coalitions of organizations, teachers, and CALL specialists to develop extensive Web-based materials supporting the multiple curricular expansions we so urgently need.

A national CALL center should not compete with already-established NFLRCs; as Jackson and Malone (2009) insist, their funding needs to be significantly increased to continue and expand their projects. The National CALL Center should rather provide the infrastructure through which existing projects can be made accessible to a far greater number of teachers, administrators, professional organizations—and eventually students—than is currently possible. It needs both the mandate and the funding to accomplish the following: (a) develop and maintain a Web site coordinating and linking to all the various kinds of information on which the field depends; (b) publish, with permission, out-of-print research that is still relevant to current efforts (cf. the initiative by the Center for Applied Linguistics [CAL*] to create an archive of out-of-print publications); (c) work with developers of in-house or small-scale CALL applications to make these more widely distributable; (d) manage copyright permissions for already-developed materials that are currently not sharable; (e) redevelop CALL applications created with outdated tools such as PICS, HyperCard, and so on; (f) advocate and lobby for CALL; (g) develop radically innovative tools, templates, and techniques that could not be funded elsewhere; and (h) coordinate collaborative teaching online

of specialized courses to be offered across institutions. (For example, the CWL* has a Web application that allows language teachers to borrow materials and teaching techniques from their colleagues, using Web-based content management tools to create and share resources.[16])

A task force of CALL experts could no doubt expand on this list, and the leaders of many language teaching organizations will have to come together to convince national funding sources (government agencies or private foundations) of the viability of such a center and to establish priorities. CALL has the capability to make far greater contributions to language education than most institutions, or most language education organizations—perhaps even most CALL specialists—yet realize.

ACKNOWLEDGMENTS

I am deeply grateful to Sally Magnan, Leo van Lier, and Bobbie Lafford for giving me the opportunity to update my 1991 paper as part of this Focus Issue—especially Bobbie for her patience, generosity, kindness, and expert editorial advice. The other authors in this volume have extended my understanding of new technologies, new theories, and new pedagogies. Several anonymous reviewers of this article suggested important references. Omissions, overgeneralizations, or heresies are my responsibility. I am also grateful to people with whom I have discussed many of the ideas in this paper: Brad Gano, my colleague during my years at the Yale Center for Language Study; Cindy Evans (Skidmore College); Lisa Frumkes (Apex Learning); Kevin Gaugler (Marist College); and Betty Guthrie (UC Irvine).

NOTES

[1] The term *technology-enhanced language learning* (TELL) is sometimes used instead of CALL, as handheld communication devices join "conventional" computers. See Kern (2006) for a suggestion that the term CALL is outmoded in the context of the "normalization" of computers in education.

[2] An acronym or term with an asterisk refers the reader to the Appendix.

[3] The Yale Center for Language Study Web site offers an intellectual property/copyright manual at http://www.cls.yale.edu/ip; the IALLT* Web site also covers these issues at http://www.clas.ufl.edu/llc/copyright/.

[4] Major volumes treating these and related topics: Belz and Thorne (2006), Lomicka and Lord (2009), Thorne and Payne (2005), and Levy and Stockwell (2006).

[5] Descriptions of Yale's LSP courses in Spanish (SPAN 221–226) may be found at http://students.yale.edu/oci/ycps/ycpsProgramCourses.jsp?subject=SPAN&dept=Spanish.

[6] "Institutional missions and teaching approaches typically reflect either the instrumentalist or the constitutive view of language. Freestanding language schools and some campus language resource centers often embrace an instrumentalist focus to support the needs of the students they serve, whereas university and college foreign language departments tend to emphasize the constitutive aspect of language and its relation to cultural and literary traditions, cognitive structures, and historical knowledge" (MLA, 2007, p. 2).

[7] See Steward (2006) for a discussion of the importance of adequate foreign language competence for student majors, doctoral candidates, and faculty in English.

[8] *Translation* refers to the rendering of a written text from one language into another; *interpretation* refers to spoken language.

[9] Kent State University, for example, offers a doctorate in translation studies: http://appling.kent.edu/PhD.html. See Colina (2003) for further discussions of teaching translation. Divace (WareSeeker, 2009) is a software program for practicing interpretation, and TRADOS (Translationzone, 2009) http://www.translationzone.com/en/ is a resource for translators.

[10] Information on various concordancing tools may be found at: http://www.concordancesoftware.co.uk/, http://www.athel.com/mono.html, and http://www.niederlandistik.fu-berlin.de/textstat/software-en.html.

[11] See, for example, Kinginger (2008), which includes a fairly comprehensive bibliography.

[12] See Garrett (1991b), Kelly (1969), and Mulroy (2003).

[13] See University of California, Davis: http://SLAI.ucdavis.edu/; Carnegie Mellon: http://ml.hss.cmu.edu/ml/sla-program.html; University of Iowa: http://international.uiowa.edu/centers/flare; University of Illinois: http://www.slate.illinois.edu; University of Arizona: http://www.coh.arizona.edu/SLAT; and University of Minnesota: http://cehd.umn.edu/students/Graduate/ILP/SLC/ for descriptions of CALL degree programs or SLA programs with CALL tracks.

[14] Interest in the theoretical underpinnings of CALL was reflected in a 2009 CALICO* conference extended panel presentation called "Second Language Acquisition Theories, Technologies, and Language Learning" (Payne, Smith, Thorne, & van Lier, 2009), which explored (respectively) psycholinguistic, interactionist, sociocultural, and ecological approaches to SLA and the ways in which they have been used as the basis for CALL research.

[15] See http://www.iallt.org/about/publications.

[16] See http://bolca.international.ucla.edu/Browser.aspx for its initial offerings.

[17] The News & Notes column of the *The Modern Language Journal* lists regular annual or biennial conferences for language organizations not listed here.

REFERENCES

Abraham, L. (2008). Computer-mediated glosses in second language reading comprehension and vocabulary learning: A meta-analysis. *Computer Assisted Language Learning*, *21*, 199–226.

Allum, P. (2002). CALL and the classroom: The case for comparative research. *ReCALL*, *14*, 146–166.

Baker, M. (1992). *In other words: A coursebook on translation*. New York: Routledge.

Barlow, M. (2007). *ParaConc: Concordance software for multilingual parallel corpora*. Retrieved June 21, 2009, from http://.athel.com/parapaper.html

Bauer, B., deBenedette, L., Furstenberg, G., Levet, S., & Waryn, S. (2005). The *Cultura* project. In J. A. Belz & S. L. Thorne (Eds.), *Internet-mediated intercultural foreign language education* (pp. 31–62). Boston: Thomson Heinle.

Beauvois, M. (1998). Conversations in slow motion: Computer-mediated communication in the foreign language classroom. *Canadian Modern Language Review*, *54*, 198–217.

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

Blake, R. (2009). The use of technology for second language distance learning. *Modern Language Journal*, *93*(s1), 822–835.

CALICO, EuroCALL, & IALLT. (1999). *Scholarly activities in computer-assisted language learning: Development, pedagogical innovations, and research*. Retrieved August 19, 2009, from https://calico.org/page.php?id=285

Chapelle, C. (2009). The relationship between SLA theory and CALL. *Modern Language Journal*, *93*(s1), 741–753.

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* (pp. 69–98). San Marcos, TX: CALICO Book Series.

Chun, D., & Payne, J. (2004). What makes students click: Working memory and look-up behavior. *System*, *32*, 481–503.

Colina, S. (2003). *Translation teaching, from research to the classroom: A handbook for teachers*. New York: McGraw-Hill.

Cummins, J. (2008). BICS and CALP: Empirical and theoretical status of the distinction. In B. Street & N. H. Hornberger (Eds.), *Encyclopedia of language and education, Volume 2: Literacy* (2nd ed., pp. 71–83). New York: Springer Science + Business Media.

Cummins, P., & Davesne, C. (2009). Using electronic portfolios for second language assessment. *Modern Language Journal*, *93*(s1), 848–867.

Davydov, V. V. (1988). The concept of theoretical generalizations and problems of educational psychology. *Studies in Soviet Thought*, *36*, 169–202.

Doughty, C., & Long, M. (2003). *Handbook of second language acquisition*. Somerset, NJ: Wiley-Blackwell.

Dunkel, P. (Ed.). (1990). *Computer-assisted language learning and testing: Research issues and practice*. Boston: Newbury House.

Egbert, J., Huff, L., McNeil, L., Preuss, C., & Sellen, J. (2009). Pedagogy, process, and classroom context: Integrating teacher voice and experience into research on technology-enhanced language learning. *Modern Language Journal*, *93*(s1), 754–768.

Egbert, J., & Petrie, G. (Eds.). (2005). *CALL research perspectives*. Mahwah, NJ: Erlbaum.

Facebook. (n.d.). www.facebook.com

Farris, M., & Fischer, R. (1994). Libra [Software]. San Marcos: Texas State University.

Felix, U. (2005). Analyzing recent CALL effectiveness research: Towards a common agenda. *Computer Assisted Language Learning*, *18*, 1–32.

Fischer, R. (2007). How do we know what students are actually doing? Monitoring students' behavior in CALL. *Computer Assisted Language Learning 20*, 409–422.

Gal'perin, P. I. (1989). Organization of mental activity and the effectiveness of learning. *Soviet Psychology*, *27*(3), 65–82.

Garrett, N. (1986). The problem with grammar: What kind can the language learner use? *Modern Language Journal*, *70*, 133–148.

Garrett, N. (1987). A psycholinguistic perspective on grammar and CALL. In W. F. Smith (Ed.), *Modern media in foreign language instruction: Theory and implementation* (pp. 169–196). Lincolnwood, IL: National Textbook.

Garrett, N. (1991a). Technology in the service of language learning: Trends and issues. *Modern Language Journal*, *75*, 74–101.

Garrett, N. (1991b). Theoretical and pedagogical problems of separating grammar from communication. In B. Freed (Ed.), *Foreign language acquisition research and the classroom*. (pp. 74–89). Lexington, MA: D.C. Heath.

Garrett, N. (2001). Language centers: Mandates and structures. In E. Welles (Ed.), *Chairing the foreign language and literature department II*, a special issue of the *ADFL Bulletin*, *32*(3), 17–27.

Gaugler, K. (2008, March). *Language learning for the increasingly global and wired workplace*. Presentation given at the Northeast Conference on Language Teaching, New York.

Google. (n.d.). Videos captioned in multiple languages. http://video.google.com/videocaptioned

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

Henning, S. D. (2009, June). *Strategies for promoting the study of literature*. Paper presented at ADFL Seminar East, Brown University, Providence, RI.

Holland, M., Kaplan, J., & Sams, M. (Eds.). (1995). *Intelligent language tutors: Theory shaping technology*. Hillsdale, NJ: Erlbaum.

Hubbard, P., & Bradin Siskin, C. (2004). Another look at tutorial CALL. *ReCALL Journal*, *16*, 448–461.

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

Hulstijn, J. (2000). The use of computer technology in experimental studies of second language acquisition: A survey of some techniques and some ongoing studies. *Language Learning & Technology*, *3*(2), 32–43.

Jackson, F., & Malone, M. (2009). *Building the foreign language capacity we need: Toward a comprehensive strategy for a national language framework*. Washington, DC: Center for Applied Linguistics. Retrieved June 21, 2009, from http://www.cal.org/resources/languageframework.pdf

Johns, T. (1994). From printout to handout: Grammar and vocabulary teaching in the context of data-driven learning. In T. Odlin (Ed.), *Perspectives on pedagogical grammar* (pp. 293–313). Cambridge: Cambridge University Press.

Kassen, M. A., Lavine, R. Z., Murphy-Judy, K., & Peter, M. (Eds.). (2007). *Preparing and developing technology-proficient L2 teachers*. San Marcos, TX: CALICO Book Series.

Kelly, L. G. (1969). *Twenty-five centuries of language teaching*. Boston: Newbury House.

Kern, R. (1995). Restructuring classroom interaction with networked computers: Effects on quantity and characteristics of language production. *Modern Language Journal*, *79*, 457–476.

Kern, R. (2006). Perspectives on technology in learning and teaching languages. *TESOL Quarterly*, *40*, 183–210.

Kinginger, C. (2008). (Ed.). Language learning in study abroad: Case studies of Americans in France [Monograph]. *Modern Language Journal*, *92*.

Lahaie, U. (Ed.). (2003). *IALLT management manual* (2nd ed.). Retrieved August 18, 2009, from http://www.iallt.org/about/publications

Levy, M. (2009). Technologies in use for second language learning. *Modern Language Journal*, *93*(s1), 769–782.

Levy, M., & Stockwell, G. (2006). *CALL dimensions: Options and issues in computer-assisted language learning*. Mahwah, NJ: Erlbaum.

Lightbown, P., Halter R., White J., & Horst, M. (2002). Comprehension-based learning: The limits of 'do it yourself'. *Canadian Modern Language Review*, *58*, 427–464.

Lightbown, P., & Spada, N. (2006). *How languages are learned* (3rd ed.). Oxford: Oxford University Press.

Lomicka, L., & Lord, G. (Eds.). (2009). *The next generation: Social networking and online collaboration in foreign language learning*. San Marcos, TX: CALICO Book Series.

Lyman-Hager, M., & Davis, J. (1993). Glossing authentic language texts: An authoring program for foreign language reading [Software]. University Park: The Pennsylvania State University (CBEL).

Modern Language Association. (2007). *Foreign languages and higher education: New structures for a changed world*. Retrieved August 19, 2009, from http://www.mla.org/pdf/forlang_news_pdf

Mulroy, D. (2003). *The war against grammar*. Portsmouth, NH: Heinemann-Boynton/Cook.

MySpace. (n.d.). www.myspace.com

Negueruela, E., & Lantolf, J. (2006) Concept-based instruction and the acquisition of L2 Spanish. In R. Salaberry & B. Lafford (Eds.), *The art of teaching Spanish: Second language acquisition from research to praxis* (pp. 79–102). Washington, DC: Georgetown University Press.

Neville, D. (2009). Recession-proofing the profession with technology. *The Language Educator*, *4*(2), 52–54, 56.

Ockey, G. (2009). Developments and challenges in the use of computer-based testing (CBT) for assessing second language ability. *Modern Language Journal*, *93*(s1), 836–847.

Otto, S., & Pusack, J. (2009). Computer-assisted language learning authoring issues. *Modern Language Journal*, *93*(s1), 784–801.

Payne, J. S., Smith, B., Thorne, S., & van Lier, L. (2009). Second language acquisition theories, technologies, and language learning. Paper presented at CALICO 2009. Retrieved June 21, 2009 from https://www.calico.org/p-433-...html

Payne, S., & Whitney, P. J. (2002). Developing L2 Oral proficiency through synchronous CMC: Output, working memory and interlanguage development. *CALICO Journal*, *20*(1), 7–32.

Plass, J., Chun, D., Mayer, R., & Leutner, D. (2003). Cognitive load in reading a foreign language text with multimedia aids and the influence of verbal and spatial abilities. *Computers in Human Behavior*, *19*, 221–243.

Smith, B., & Lafford, B. (2009). The evaluation of CALL scholarly activity. *Modern Language Journal*, *93*(s1), 868–883.

Steward, D. (2006). The foreign language requirement in English doctoral programs. In R. Feal (Ed.), *Profession 2006* (pp. 203–218). New York: Modern Language Association.

Straight, H. S. (1998). *Languages across the curriculum*. Washington, DC: ERIC Clearinghouse on Languages and Linguistics. (ERIC Digest ED424789) Retrieved June 21, 2009, from http://www.ericdigests.org/1999–3/languages.htm

Thorne, S., Black, R., & Sykes, J. (2009). Second language use, socialization, and learning in Internet interest communities and online gaming. *Modern Language Journal*, *93*(s1), 802–821.

Thorne, S. L., & Payne, S. (Eds.). (2005). Computer-mediated communication and foreign language learning: Context, research and practice [Special issue]. *CALICO Journal*, *22*(3).

Translationzone. (2009). TRADOS [Software]. Retrieved July 19, 2009, from http://www.translationzone.com/en/

VanPatten, B., Williams, J., Rott, S., & Overstreet, M. (Eds.). (2004). *Form-meaning connections in SLA*. Mahwah, NJ: Erlbaum.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.). Cambridge, MA: Harvard University Press.

WareSeeker.com. (2009). Divace [Software]. Retrieved July 19, 2009, from http://wareseeker.com/Business-Finance/divace-lite-1.4.zip/1463

Warschauer, M. (1996). Computer assisted language learning: An introduction. In S. Fotos (Ed.), *Multimedia language teaching* (pp. 3–20). Tokyo: Logos International.

Winke, P., & Goertler, S. (2008). Did we forget someone? Students' computer access and literacy for CALL. *CALICO Journal*, *25*(3), 482–509.

APPENDIX
Most Commonly Used General Resources in CALL and Language Education[17]

AAAL American Association for Applied Linguistics: http://www.aaal.org

AATs Language teachers' associations, e.g., German: AATG; Spanish and Portuguese: AATSP. NCOLCTL's* Web site lists these: http://www.councilnet.org/council/Members.html

AAUSC American Association of University Supervisors and Coordinators and Directors of Language Programs: http://www.aausc.org/

ACTFL American Council on the Teaching of Foreign Languages: http://www.actfl.org; possible future technology special interest group: http://www.actfl.org/i41/pages/index.cfm?pageid=3428

ADFL Association of Departments of Foreign Languages, part of the MLA*: http://www.adfl.org

AILA International Association for Applied Linguistics, the umbrella organization for the AAAL* and other such associations worldwide: http://www.aila.info

ALLNet Autonomous Language Learning Network, a program at the University of Iowa that supports the learning of LCTLs for which the university does not have regular faculty: http://international.uiowa.edu/services/language/allnet/ (See also DILS* and NASILP*.)

CAL Center for Applied Linguistics: http://www.cal.org

CALI Computer Assisted Language Instruction Group: http://cali.arizona.edu, part of the University of Arizona's NFLRC* CERCLL

CALICO Computer Assisted Language Instruction Consortium: http://www.calico.org. (See also IALLT*.) In 1997 CALICO, IALLT, and EuroCALL* issued a policy statement titled "Scholarly Activities in Computer-Assisted Language Learning: Development, Pedagogical Innovations, and Research": https://www.calico.org/page.php?id=285

Change Magazine: www.changemag.org

Chronicle of Higher Education: http://chronicle.com/

COMET Course Materials and Templates, tools for developing pedagogical materials and for supporting students' engagement with authentic materials: http://comet.cls.yale.edu/

Computer Assisted Language Learning, a print journal: http://www.informaworld.com/smpp/title~db=all~content=t716100697~tab=issueslist

Consortium for Language Learning and Teaching: http://consortium.dartmouth.edu/ a consortium of the eight Ivy League Universities plus MIT and the University of Chicago

CWL Center for World Languages at UCLA: http://www.international.ucla.edu/languages/

DILS Directed Independent Language Study, an increasingly common name for university programs supporting study of LCTLs not offered by local faculty. (See the Yale Center for Language Study program: http://www.cls.yale.edu/dils, also ALLNet* and NASILP*.)

DULAP Drake University Language Acquisition Program, which uses a DILS model for all languages offered at Drake: http://www.drake.edu/international/dulap/

EuroCALL European Association for Computer Assisted Language Learning: http://www.eurocall-languages.org, publishes *EuroCALL Review* and *ReCALL*. Its former president, Graham Davies, maintains a comprehensive Web site, ICT4LT, with 16 modules covering the basics of CALL: http://www.ict4lt.org/en/index.htm

FLASC–L the listserv of the AAUSC*: http://www.aausc.org/flasc.html

FL–TEACH Foreign Language Teaching Forum: http://www.cortland.edu/FLTEACH/

IALLT International Association for Language Learning Technology: http://iallt.org. (See also CALICO*.) The Web sites of IALLT's eight regional groups are linked here.

ILR Interagency Language Roundtable: http://govtilr.org. A federal organization coordinating information and resources among language-focused federal agencies. Links to ILR proficiency-level descriptors and other information. See especially its "Webliography" for less commonly taught languages: http://govtilr.org/Web_LCTL/index.htm

Inside Higher Ed: http://insidehighered.com/. A free online news source.

LCTL–List Listserv of the Less Commonly Taught Languages Project: http://www.carla.umn.edu/LCTL at CARLA, the University of Minnesota NFLRC*

LLT *Language Learning & Technology:* http://llt.msu.edu/. A free online journal, reporting on both theoretically and empirically motivated CALL research.

LLTI Language Learning and Technology International Information Forum: http://listserv.dartmouth.edu/scripts/wa.exe?A0=LLTI, a moderated listserv that serves as the principal forum for technology questions and discussions

LMP Language Materials Project: http://www.lmp.ucla.edu, an online listing of language learning materials for over 100 LCTLs with descriptions and availability information

MERLOT Multimedia Education Resource for Learning and Online Teaching: http://www.merlot.org/merlot/materials.htm?category=2440&& (language section)

MIIS The Monterey Institute of International Studies: http://www.miis.edu/; post-baccalaureate language study (Graduate School of Translation, Interpretation, and Language Education), also a CALL certificate program: http://language.miis.edu/tdc/call.html

MLA Modern Language Association: http://www.mla.org, with two essential links for language teachers: the MLA Language Map: http://www.mla.org/map and the report "Foreign Languages and Higher Education: New Structures for a Changed World": http://www.mla.org/pdf/forlang_news_pdf.pdf

MLJ *The Modern Language Journal*: http://mlj.miis.edu/

NASILP National Association for Self-Instructional Language Programs: http://www.nasilp.org

NCOLCTL National Council of Less Commonly Taught Languages: http://www.councilnet.org including the Online LCTL Teacher Training Initiative: http://languageinstitute.wisc.edu/content/projects/national_online_teacher_training_initiative.htm

NFLRCs National Foreign Language Resource Centers: http://nflrc.msu.edu/index.php; see http://calper.la.psu.edu/nflrc.php for details on all the NFLRCs and NRCs*

NHRC National Heritage Language Center: http://international.ucla.edu/languages/nhlrc/

NRCs National Resource Centers: http://www.ed.gov/programs/iegpsnrc/index.html, nationally funded area/international studies centers with language components

NSEP National Security Education Program establishing "Flagships" supporting post-baccalaureate study of Arabic, Central Asian Turkic languages, Korean, Mandarin, Persian, or Russian: http://www.borenawards.org/the_language_flagship/programs.html

NSLI National Security Language Initiative: http://exchanges.state.gov/NSLI/

NVTC National Virtual Translation Center: http://www.nvtc.gov/

SCOLA An educational organization that receives and retransmits television programming from around the world in many languages: http://www.scola.org/

System An international journal on education technology and applied linguistics: http://www.elsevier.com/wps/find/journaldescription.cws_home/335/description#description

TESOL Teachers of English to Speakers of Other Languages: http://www.tesol.org/s_tesol/index.asp

T.H.E. Journal Technology Horizons in Education: http://www.thejournal.com/ (K–12)

UC Consortium for Language Learning & Teaching: http://uccllt.ucdavis.edu/

University of Wisconsin-Madison Language Institute: http://languageinstitute.wisc.edu/

WorldCALL: http://www.worldcall.org/, links to CALL organizations worldwide