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NETWORK-BASED LANGUAGE TEACHING

INTRODUCTION

Over the past 20 years, computer networks have introduced unprecedented opportunities for language learners to access and publish texts and multimedia materials and to communicate in new ways within and beyond the classroom. Whereas computer-assisted language learning (CALL) refers broadly to a wide range of applications (e.g., tutorials, drills, simulations, instructional games, tests, concordancers, etc.), network-based language teaching (NBLT) refers specifically to the pedagogical use of computers connected in either local or global networks, allowing one-to-one, one-to-many, and many-to-many communication. NBLT research explores what happens when learners are brought together with texts, media, and other speakers of the language in computer-mediated contexts of interaction.

NBLT arose at the confluence of both technological and educational change. In the 1980s and 1990s, networking technologies and infrastructure developed with dramatic rapidity in many industrialized countries, making low-cost connections possible. At the same time, educational theory and practice were increasingly influenced by social constructivism, which emphasized the social and cultural construction of knowledge, the importance of collaboration among individuals and groups, and a learner- and problem-based approach to pedagogy.

EARLY DEVELOPMENTS

Although computer networks have been used for interpersonal communication since the 1960s, it was not until the 1980s that they began to serve language teaching. One of the first pedagogical uses of local area networks was to teach writing to deaf students via synchronous conferencing at Gallaudet University. The University of Texas at Austin was another early adopter institution, where synchronous conferencing was incorporated into English literature and writing courses as well as foreign language teaching (in Portuguese, German, and French). These early studies (for reviews, see Ortega, 1997, and Warschauer, 1997) pointed to a number of potential benefits of synchronous conferencing compared with face-to-face class discussions: (i) increased and more democratically distributed student participation; (ii) more time to

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develop and refine comments—possibly leading to greater precision and sophistication of expression; (iii) encouragement of a collaborative spirit among students; (iv) enhanced motivation for language practice and, in particular, greater involvement of students who rarely participated in oral discussions; (v) reduction of anxiety related to oral communication in a foreign language; and (vi) positive effects on students' writing ability and perhaps speaking ability as well.

There soon followed a number of studies that systematically compared the dynamics of synchronous conferencing with face-to-face classroom interaction (reviewed in Ortega, 1997, and Warschauer, 1997). These studies confirmed the expected benefits of synchronous conferencing, with the exception of its effects on general writing and speaking abilities—an area that has been taken up more recently (see Major Contributions later). They also revealed an overall greater level of sophistication of students' language use (in terms of the range of morphosyntactic features and discourse functions). However, synchronous conferencing was also found to introduce a number of unsettling changes. For example, Kern (1995) noted that teacher control over class discussions was compromised, that the rapid pace of written discussion sometimes taxed students' comprehension abilities, and that although participation was more equitably distributed than in normal classroom discussion, the coherence and continuity of discussions often suffered. Kern concluded that effectiveness had to be evaluated in relation to instructional goals. Synchronous conferencing fostered free expression, student responsiveness, and the voicing of multiple perspectives on issues, but it did not improve grammar or reinforce standard discourse norms.

Noticeable in early NBLT studies was a tendency to test the technology to see what effects it might have on language use. In the next section, we see a gradual shift toward testing theories of second language acquisition (SLA) within the context of computer-mediated communication.

MAJOR CONTRIBUTIONS

Two general trends characterize the bulk of current research on NBLT. The first emphasizes SLA theory and interactionist models of learning. Data analysis typically consists of quantitative counts of the occurrence of morphological, lexical, and syntactical features in online discourse.

The second trend, described by Kern and Warschauer (2000) in the introduction to their key collection of research articles on NBLT, is informed by sociocultural and sociocognitive theories and draws on a mixture of quantitative, qualitative, ethnographic, and discourse analytic methods. At issue here is not only quantifying language development,

but also understanding how learners interpret and construct meaning online across culturally situated contexts.

Although the primary research emphasis of each trend differs, the studies typically share a focus on discourse written by postsecondary foreign language learners in asynchronous and synchronous environments.

SLA-Grounded Research

Most studies grounded in SLA theories of networked classroom instruction are either (i) comparison studies that examine the effectiveness of online vs. face-to-face interaction in promoting negotiation of meaning, noticing, comprehensible output, and form-focused learning (for a review see Kern, Ware, and Warschauer, 2004), or (ii) transfer studies that explore the degree to which language use online transfers to language proficiency more generally, particularly to speaking and listening.

Promoting negotiation of meaning. A major benefit for SLA-based research is the ease of collecting interactional data online. In contrast to face-to-face conversation, online negotiation of meaning takes place in writing, which provides a readily usable database of transcripts for classroom and research use. In classrooms, this database of interactions has been used to facilitate the development of students' metacognitive and metalinguistic awareness (Sengupta, 2001). A significant number of studies have examined task type in promoting negotiation of meaning in the network-based classroom. In a synchronous chat study of intermediate level Spanish learners in a university course, Pellettieri (2000) found abundant evidence of form-focused modifications and corrective feedback among ten dyads of English-speaking adult participants, leading her to conclude that online chatting can improve learners' grammatical competence (cf. Kern, 1995). Additionally, she found that closed, goal-oriented tasks promoted greater frequency of meaning negotiation than open-ended tasks. A recent study by Smith (2003) supports Pellettieri's finding, except that he found that decision tasks promoted more negotiation of meaning than jigsaw tasks.

Transfer studies. Implicit in this line of research is the expectation that the linguistic and metalinguistic awareness developed online will transfer to other domains of language learning. Students who can converse in spontaneous online chat discussions, for example, should have an easier time contributing to the ongoing flow of a face-to-face conversation. Not surprisingly, a wave of research has put this hypothesis to the test, with differing methods and outcomes. For example, using rigorous quasi-experimental methods to examine the question of transfer into oral proficiency, Payne and Whitney (2002) provide strong

evidence that the intermediate-level Spanish learners in the synchronous chat group outperformed the face-to-face control group on a pretest/posttest oral proficiency measure. In another quasi-experimental study, Abrams (2003) considers language in a third-semester German course. Although the students in the synchronous group produced higher quantities of output in subsequent face-to-face discussions than their counterparts in either the asynchronous or control groups, she found no statistically significant differences in terms of lexical richness and diversity or syntactic complexity.

To summarize, much of the research grounded in SLA theory and in cross-modality transfer builds off the premise that language itself remains a relatively stable target, and the overarching goals, outcomes, and processes of language learning are generally considered similar whether conducted in physical or virtual space. Research is aimed at determining whether and to what extent technology-mediated interaction can support language acquisition at least as well as face-to-face interaction.

Sociocognitive and Sociocultural Approaches

Researchers who question the assumed stability and neutrality of linguistic forms and functions in virtual discourse have turned their focus to two main areas: genre differentiation and culture learning in networked classrooms.

Genre differentiation. Online communication is not a single uniform genre, but rather a range of genres generated situationally for different media (e.g., blogs, e-mail, instant messaging, wikis, online forums, MOOs, chat groups) and according to the particular needs and purposes of participants. For example, synchronous online language is typically characterized by the fragmentary nature of conversation flow, the multiplicity of discussion threads, the difficulty of back channeling to clarify one's message, the lack of paralinguistic and contextual cues, and the tendency to emphasize phatic communication. Asynchronous modes such as threaded discussion, however, tend to be less fragmentary, more informationally dense and complete, and focused on a single discussion topic. Variability in both technology and purpose leads to a range of online language that can resemble hybrid forms of standard and nonstandard language. Herring (2001) maintains that the fragmented, nonstandard language found in some online interactions is not the result of errors, but rather the result of deliberate choices by users to save typing time or to be creative with language. Warner's (2004) work on language play corroborates this view by showing how learners of German created hybrid language forms with code-mixing in their

synchronous chat sessions. From a critical pedagogical perspective, however, such tendencies in online discourse create tensions for teachers intent on assisting their students in developing, if not proficiency in standard forms of language, at least the ability to discern among standard, nonstandard, and hybrid uses.

Culture in NBLT. A significant shift in NBLT in the last 5 years is the growing emphasis on cultural aspects of language learning. In part, the result of theoretical trends toward sociocultural and social constructivist frameworks, and in part an outgrowth of the increasing popularity of online collaborative partnerships, many researchers are turning to a broader conception of language learning that insists on its inextricable cultural layering. Often referred to as telecollaboration, these international partnerships link language learners in online discussions to promote language use and intercultural learning. Within the key pedagogical and discourse analytical work on culture and NBLT (for an extended analysis see Kern, Ware, and Warschauer, 2004), the most significant trends have been the move from monolithic to multidimensional presentations of culture (Furstenberg, Levet, English, and Maillet, 2001); the notion of authenticity in online cultural texts (Kramsch, A'Ness, and Lam, 2000); the potential for communication breakdown (Ware, 2005); and the development of intercultural competence (Belz, 2003).

WORK IN PROGRESS

New studies investigating the viability of technology-integrated teaching for supporting SLA and intercultural learning continue to appear each month at a rate that shows little sign of slowing. The goals, content, and structure of NBLT are changing rapidly. Traditional definitions of language learning, as measured by demonstrated proficiency and control of the target language, no longer suffice as the primary knowledge base for teachers in online contexts (see discussion in Ware and Kramsch, 2005). In contrast to the primarily task- and product-oriented, classroom-controlled online interactions that characterized early research in NBLT, recent work examines online learning in two new areas: nonclassroom contexts and multimodality.

Nonclassroom Contexts

Ethnographic work has provided a unique lens on the kinds of language practices that shape linguistic socialization outside of the traditional classroom. Lam's (2000, 2004) extensive research on Chinese-American adolescents documents how students develop textual

identities and hybrid language forms through their participation in multilingual online communities. Such studies of how learners' identities mediate (and are mediated by) their language practices *outside* educational contexts offer an important perspective for classroom teachers. In Thorne's (2003) study of the "cultures of use" of online learning, for example, he notes the generational shift in college-level students' preference for conversing via instant messaging outside of class and their professors' requirement that they communicate over e-mail for in-class work, resulting in a potentially derailing mismatch of tools and purposes. Research by Black (2005) documents the experiences of adolescent English language learners on *fan fiction* writing sites, and the ways learners on these sites construct their identities as writers solicit and make use of peer feedback. By exploring the affiliations, preferences, and practices of learners in their chosen environments, researchers can provide powerful insights into how we might change the shape of classroom-based teaching.

Unlike the nonclassroom communities Lam documented, which typically form around common interests without an explicit focus on language, tandem partnerships form online for the explicit purpose of improving proficiency in standard forms of the target language. These bilingual partnerships, grounded in two basic principles of learner autonomy and reciprocity, are goal-directed toward improving traditional markers of language proficiency such as syntactic complexity, lexical precision, and morphosyntactic accuracy. Two recent studies have integrated the tandem model of learner autonomy and reciprocity, mostly used in voluntary contexts, into classroom-based MOO environments (Kötter, 2003; Schwienhorst, 2002). Although the focus of both studies was primarily on the development of linguistic and metalinguistic awareness, Schwienhorst also found that students became more autonomous in their regulation of native and nonnative discourse in their chatting.

Multimodality

The environments of technology-mediated teaching and learning are changing to keep apace with innovations in technology tools. A major shift in recent years has been toward the expansion of semiotic modes beyond text. Increasingly, researchers are exploring the flexibility and interactivity of multimodal venues for communication. Thorne and Payne (2005) provide a detailed inventory of cutting-edge research in communication media such as blogs, wikis, podcasting, personal digital assistants, and cell phones. They emphasize the importance of these personalized, portable multimedia tools, not merely for fostering learners' linguistic proficiency in a conventional sense, but also for

challenging them to use the technologies as a springboard for thinking deeply and engaging with content in the ways promoted in classroom language instruction.

Multimodal learning also includes bimodal chat rooms (Blake, 2005) and multimedia authoring tools (Nelson, 2006). Blake (2005) examines a bimodal (oral and written) chat room, in which learners studying Spanish as part of a distance learning course can write and speak to one another and their professor. Although he reports on a case study of only a single learner, his analysis indicates that such bimodal CMC classrooms offer important new venues for student participation and negotiation of meaning. Nelson takes a different approach to multimodality in his examination of postsecondary ESL writing students who, in addition to writing traditional print-based essays, authored multimodal projects. His analysis shifts the focus away from usual concerns of fluency and accuracy in foreign languages and suggests that instructors attend more broadly to students' developing awareness of language as just one aspect of a larger system of semiotics.

PROBLEMS AND DIFFICULTIES

As NBLT expands its early focus on linguistic features to include cultural, communicative, and social aspects of online teaching and learning, a number of problematic areas arise. Differences in medium (Thorne, 2003), linguistic style (Belz, 2003), and levels of engagement (Ware, 2005) complicate online language learning.

In order to grapple with these issues, researchers have adopted a number of theoretical perspectives. Reeder, Macfadyen, Roche, and Chase (2004), for example, take an intercultural perspective on online communication and suggest that significant cultural gaps and differences in *cyberculture values* strongly impact the success or failure of online communication. Ess (2005) takes a postcolonial position and argues that because current CMC technologies favor Westernized values and communicative preferences, researchers need to work toward "middle grounds" (p. 162) that better connect global trends with local traditions. Warschauer (2003), drawing on his ethnographic case studies of postsecondary writing instruction (Warschauer, 1999), has pushed for a more integrated, nuanced conception of electronic literacy. He elaborates the plural construct of *electronic literacies*, including computer literacy, information literacy, multimedia literacy, and computer-mediated literacy, to investigate the relationship between the sociocultural contexts of networked classrooms and the particular ways that literacy is valued and practiced by teachers, learners, and members of the larger society.

Another issue has to do with technocentrism, which can draw us toward testing the technology to the point where we risk becoming

stagnated in terms of developing better theories of online language use. Related to technocentrism is the concern that technology-mediated language learning is becoming more and more commercialized, that is, packaged into convenient software programs and marketed to mass audiences. If the technology is attractive, it will tend to woo customers, regardless of the quality of its content or empirical base. In this regard, educators need to become critical consumers, just as their students need to evaluate online sources critically.

Finally, a number of methodological and ethical issues arise as well. Due to the short-term duration of most NBLT studies, a great deal more longitudinal research is needed to examine the effects of NBLT across time. Tracking language learning through year-long or multiyear studies helps mitigate, for example, concerns about how the novelty of technology might affect learner outcomes. Furthermore, longitudinal studies provide a more adequate basis for understanding how language learning might transfer across skill areas, as researchers are better poised to track students across multiple contexts of use.

Ethically, a key methodological issue has to do with subjects' informed consent to participate in research (and the real difficulty of maintaining student privacy in the virtual world.) It is easy to collect data on the Internet without subjects' knowledge or consent, and because boundaries between what is private and public are often unclear, it is essential that researchers follow procedures for obtaining informed consent of subjects. Other ethical issues involve copyright/intellectual property issues, which are especially thorny in multimodality projects in which students download images, sounds, text, and video off the Internet. This is of course also tied to issues of plagiarism that tend to coincide with the easy access of technology-mediated learning.

FUTURE DIRECTIONS

As the field of NBLT develops in the coming years, research is needed that continues many of the strands discussed earlier. In addition, we anticipate that research will grow in a number of other areas.

First, more work is needed that explores multimodal learning contexts. Computers have had an impact on the ways we communicate. To date, the research conducted on computer-mediated communication has been mostly text-based, but now image and voice are becoming integral parts of how we interact and represent ourselves online. As digital media become more readily available to wide audiences of users, teachers and students are increasingly able to develop novel ways of integrating multiple modes of learning into the language classroom. In some cases, such integration will certainly take the form

of more conventional approaches, such as the use of audio or video clips to reinforce standard uses of the target language, but we also anticipate innovation in NBLT driven by newer technologies such as podcasting and wikis, as documented by Thorne and Payne (2005).

A second area of future research will likely be directed toward critical explorations of how culture functions in NBLT. Until now, terms such as cross-cultural and intercultural have been used rather interchangeably, and the task of researchers will be to refine the terms and develop viable methodologies and theories for examining issues of (pluri)cultural representation, identification, and contact in online contexts. Work in this area will not only influence how we define language learning in general, but also how we define key concepts such as communicative competence, and how we frame online pragmatics and sociolinguistics.

Third, expanded research will be needed on the relationship between form-focused in-class activities and online collaborations whose primary goals are social interaction and the representation of identity and knowledge. Crucial to this research will be attention to changes in the roles of teachers and students and how the classroom is imagined accordingly.

Fourth, as ethnographic work on language use and learning outside of educational contexts continues to grow, we anticipate that researchers will turn to the issue of curricular integration. As discussed earlier, much of the work on NBLT has taken place in postsecondary contexts. However, K-12 educators are increasingly interested in integrating technology into language classrooms, so researchers will need to explore ways to support such curricular initiatives. With an emphasis in many K-12 educational contexts on high-stakes testing, such work will undoubtedly facilitate the development of assessment tools and feedback loops for learners and teachers.

Finally, as more learning resources of all kinds become available via the Internet rather than as stand-alone applications, the distinctions between CALL and NBLT will increasingly fade. New forms of research will be required to investigate the learning processes and outcomes that occur when traditional CALL activities are carried out in networked environments and combined with computer-mediated communication.

CONCLUSION

Over the past 20 years, a rich body of research has been conducted on NBLT. The accelerating diffusion of digital media and wireless networks, together with the increased naturalization of computer-mediated communication, promises that NBLT will remain a critical area for teaching and research. We note, for example, that the first

generation of *digital natives* who have grown up using the Internet and view it as an entirely ordinary environment of interaction is now entering higher education. What's more, the Internet itself has changed dramatically in recent years, with the rapid spread of participatory tools and sites facilitating social networking, interactive game playing, collaborative writing and editing, and multimodal production. These tools provide opportunities for students in read, write, communicate, and construct knowledge in a second or foreign language in ways that are both new and unexplored.

Although the potential role of NBLT is thus greater than ever before, research has also shown that sound pedagogy and not computers or networks per se is what really counts in NBLT. Future success will thus require teachers' continued attention to the close integration of project goals, activity/task design, and technology interface within often complex logistical realities. Teachers also need to know how NBLT can constrain as well as enhance their students' language use and know when it is better not to computerize a particular activity. The growing complexity of decisions involved in NBLT highlights the importance of technology integration in both preservice and inservice teacher education.

Finally, given the rapid evolution of technologies and the fluidity of communicative environments, flexibility will be a prime requirement for teachers and researchers as they continue to explore language teaching and learning in new networked contexts. By adopting the same habits of mind that we seek to inspire in our students—autonomous learning; inventive thinking; and critical perspectives on the intersection of language, technology, and culture—teachers and researchers can help ensure that the impressive potential of network-based teaching to transform language learning is achieved.

See Also: *Kevin Leander and Cynthia Lewis: Literacy and Internet Technologies (Volume 2); Steven Thorne: Computer-mediated Communication (Volume 4); Robert Blake: Distance Learning for Second and Foreign Language Teaching (Volume 4); Ilana Snyder: Research Approaches to the Study of Literacy, Technology and Learning (Volume 10); Joan Kelly Hall: Language Education and Culture (Volume 1); David Block: Language Education and Globalization (Volume 1); Mary Kalantzis and Bill Cope: Language Education and Multiliteracies (Volume 1); Alan Rogers: Informal Learning and Literacy (Volume 2); Brian Street: New Literacies, New Times: Developments In Literacy Studies (Volume 2); Kathy Schultz and Glynda Hull: Literacies in and Out of School in the United States (Volume 2); Carey Jewitt: Multimodal Discourses across the Curriculum (Volume 3)*

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