Web 2.0 and Second Language Learning: What Does the Research Tell Us?

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ABSTRACT:

This article reviews current research on the use of Web 2.0 technologies in second language (L2) learning. Its purpose is to investigate the theoretical perspectives framing it, to identify some of the benefits of using Web 2.0 technologies in L2 learning, and to discuss some of the limitations. The review reveals that blogs and wikis have been the most studied Web 2.0 tools, while others, such as social networking applications and virtual worlds, have been less frequently explored. In addition, the most commonly investigated languages have been English, Spanish, German, and French. Considerably less research has been conducted on applying Web 2.0 technologies to less commonly taught languages, such as Arabic, Chinese, or Russian. Additionally, the language learning environments afforded by Web 2.0 technologies have greatly broadened the scope of topics explored in computer-assisted language learning (CALL): from earlier research which tended to concentrate on the traditional four broad language skills, to more recent topics, such as learners' identities, online collaboration, and learning communities. Although very few studies surveyed have actually examined students' progress and learning outcomes associated with these tools, the most frequently reported benefit associated with Web 2.0 technologies is the favorable language learning environments they help to foster. Finally, this review found that much research on Web 2.0 technology and language learning is not clearly grounded in theory, and that a number of studies suffer from a set of common methodological limitations.

KEYWORDS

Technology, Web 2.0, Second Language Learning, Computer-Assisted Language Learning

INTRODUCTION

Web 2.0 technologies have become a ubiquitous component of our daily lives (McBride, 2009). As Warschauer and Grimes (2007) point out, millions of people now use Web 2.0 technology to interact, collaborate, network, and entertain through blogs, wikis, social networking tools, and multiplayer games; many of these individuals enjoy the thrill of instant self-publishing and feel stimulated by their dynamic interactions online. During the past decade, the shift from Web 1.0 to 2.0 has been remarkable. People do not merely read and retrieve information, but also create and share information (Lomicka & Lord, 2009).[1] Indeed, Web 2.0 technologies exploit the participatory potential of the Web. As a consequence of this, Web 2.0 communications have become an indispensable component of many students' daily and academic lives (McBride, 2009).

It is generally acknowledged that the term Web 2.0 dates back to the first Web 2.0 conference (O'Reilly, 2005). According to O'Reilly (2005), the concept of Web 2.0 emerged from a conference brainstorming session in 2004, when he and other web pioneers were discussing the future of dot-com businesses. However, what Web 2.0 actually means today remains

controversial (Bloch, 2008; Lomicka & Lord, 2009; O'Reilly, 2005; Warschauer & Grimes, 2007; Weiter, 2008). Different researchers and scholars offer various definitions. For example, Warschauer and Grimes (2007) have argued that the term Web 2.0 stands for not just a new version of existing Web technology, but that it represents actual "changes in the communicative uses of the underlying Web platform" (p. 2). Tu, Blocher, and Ntoruru (2008) define Web 2.0 as "a Web technology that aims to enhance creativity, information sharing and collaboration among users" (p. 336). Similarly, Zhang (2009) claims that Web 2.0 is a rather loose concept that describes a set of dazzling technologies currently in rapid development. In fact, most researchers and scholars prefer to cite definitions offered by Wikipedia, a platform which itself is supported by Web 2.0 technology. According to Wikipedia, "'Web 2.0' refers to a perceived second generation of web development and design, that facilitates communication, secure information sharing, interoperability, and collaboration on the Internet. Web 2.0 concepts have led to the development and evolution of web-based communities, hosted services, and applications such as social-networking sites, video-sharing sites, wikis, blogs, mashup and folksonomies" (Wikipedia entry on June 13, 2009, http://en.wikipedia.org/wiki/Web_2.0).

Tens of thousands of educators have begun to experiment with the tools offered by Web 2.0 and the field of L2 education is no exception to this trend. The potential impact of Web 2.0 technologies on language learning and teaching is indeed revolutionary (Sturm, Kennell, McBride, & Kelly, 2009; Warschauer & Grimes, 2007). Some scholars have claimed that Web 2.0 represents the most current state of CALL (Walker, Hewer, & Davies, 2008); however, some controversy related to identifying the different stages of CALL development exists (Bax, 2003; Warschauer, 2000).[2] Furthermore, several recent articles discussing the state-of-the-art in CALL make little or no reference to the role of Web 2.0 in L2 learning (e.g., Chapelle, 2009; Egbert, Huff, McNeil, Preuss, & Sellen, 2009; Garrett, 2009). Therefore, the aim of the present study is to examine this particular strand of CALL research, i.e., focusing specifically on studies that investigated Web 2.0 technologies in a variety of L2 learning contexts.

Since the end of the last century, second language learning/acquisition research has been experiencing a paradigm shift: it is moving from a cognitive orientation to a social orientation, from classroom contexts to naturalistic settings, from an acquisition metaphor to a participation metaphor, and from L2 learning to L2 use (Block, 2003; Firth & Wagner, 1997; Johnson, 2004). Interestingly, this paradigm shift in SLA research seems to be in alignment with many of the fundamental attributes of Web 2.0 technology (such as ease of participation, communication, information sharing, and collaboration). It has been claimed that the application of Web 2.0 technology in many L2 learning contexts has transformed pedagogy, curriculum design, the conception of language learning, and even the research in this field (Sturm et al., 2009; Sykes, Oskoz, & Thorne, 2008; Warschauer & Grimes, 2007). Though empirical research on Web 2.0 learning environments is currently in its infancy (Ducate & Lomicka, 2008; Lomicka & Lord, 2009), results of existing studies have found that Web 2.0 technologies offer language learners the potential for a collaboration-oriented and community-based learning environment (Antenos-Conforti, 2009; Dippold, 2009; Ducate & Lomicka, 2008; Kessler, 2009; Tu, Blocher & Roberts, 2008). In addition, a number of conceptual and theoretical articles have discussed other potential benefits of Web 2.0 technologies in language learning, and still other authors have offered anecdotal accounts of pedagogical implementations of Web 2.0 tools (e.g., Chinnery, 2008; Godwin-Jones, 2006, 2008; Sykes et al., 2008; Thorne & Payne, 2005; Thorne & Reinhardt, 2008).

This review study aims to explore the current state of research on Web 2.0 technology and L2 learning, to investigate the theoretical perspectives framing the current research, to identify some of the benefits of using Web 2.0 technologies in L2 learning,[3] and to pinpoint possible limitations in the existing research. This review is also designed to shed light on the

latest stages of CALL research in Web 2.0 contexts and to propose possible directions for future research. The following research questions guided this study:

1. Which Web 2.0 technologies have been investigated in L2 learning?
2. Which aspects of L2 learning have been explored in this body of literature? What types of languages, learners, and contexts have been investigated?
3. Which theoretical frameworks ground the current research? Which research methodologies have been used to study Web 2.0 technologies? What are some of the limitations associated with the methods used?
4. What have been some of the identified advantages and disadvantages of Web 2.0 technologies for language learning in the studies reviewed?

METHOD

The research reviewed was mainly published in refereed journals between 2005 and 2009. Articles published in the first quarter of 2010 were also included, in order to keep the review as up-to-date as possible. The decision to limit the review to the last five years was made because the term Web 2.0 was first coined in 2004 (O'Reilly, 2005), and empirical research typically follows the advent of new technological inventions. In addition to research articles published in journals, the review includes selected chapters from two recent edited volumes (Table 1) and two dissertation studies. The reason for including these publications was to diversify the review base and to make it more comprehensive. However, this analysis does not cover chapters about technology in general from these sources, nor does it cover work on technology that borrowed the term 2.0 from Web 2.0 (such as "Whiteboard 2.0").

Table 1
Distribution of Empirical Research in Books

No.	Book	# of Chapters	Empirical Study
1	Lomicka, L. & Lord, G. (Eds.) (2009). *The next generation: Social networking and online collaboration in foreign language learning*. San Marcos, Texas: CALICO.	5	Antenos-Conforti (2009); Arnold, Ducate, and Kost (2009); Kuriscak and Luke (2009); Sykes (2009); Williams and van Compernolle (2009)
2	Thomas, M. (Ed.) (2009). *Handbook of research on Web 2.0 and second language learning*. Hershey, PA: Information Science Reference.	7	Alm (2009); Baten, Bouckaert, and Kan (2009); Halvorsen (2009); McCarty (2009); Raith (2009); Travis and Joseph (2009); Viswanathan (2009)
	Total	12	

Appropriate articles, dissertations, and books were selected via keyword search in seven databases. The keywords for searching were *Web 2.0*, *Web 2*, *technology*, *blog*, *microblog*, *wiki*, *Twitter*, *Facebook*, *social networking*, *Second Life*, *virtual world*, *language learning*, *language teaching*, and *language education*. The seven databases searched are ERIC (Cambridge Scientific Abstracts), JSTOR Education, Wilson Web (Education Index Retro), Sage Full-Text Collection, PsycINFO (EBSCO), ProQuest, and Google Scholar. Eighty-five publications were identified, including 55 peer-reviewed journal articles, 28 chapters from the two books, and 2 dissertation studies. Of the 85 publications, 43 were empirical studies and 42 of the texts were non-empirical. As Table 2 shows, 29 of the empirical studies were published in 15 peer-reviewed journals. The two aforementioned dissertations account for two additional empirical studies. Thus, the 29 articles, 2 dissertations, and the 12 chapters in Table 2 comprise the 43 empirical studies reviewed in this article. In addition, Table 3 displays the non-empirical work on the topic, which was sorted into three broad categories: conceptual discussions (e.g., Sykes, et al., 2008), which focused on theoretical issues; po-

tential benefit discussions (e.g., Godwin-Jones, 2006, 2008), which proposed or outlined, possible pedagogical applications of new technologies; and project descriptions, or anecdotal accounts (e.g., Ducate & Lomicka, 2005), which reported on some specific use of Web 2.0 in language learning contexts.

Table 2
Distribution of Empirical Research in Journals

No.	Journal Title	# of Articles	Empirical Study
1	*ReCALL*	7	Abdous, Camarena, and Facer (2009); Deutschmann, Panichi, and Molka-Danielsen (2009); Dippold (2009); Jauregi and Banados (2008); Lund (2008); O'Bryan and Hegelheimer (2007); Petersen, Divitini, and Chabert (2008);
2	*Computer Assisted Language Learning*	4	Ducate and Lomicka (2008); Lee (2009); Kessler and Bikowski (2010); Peterson (2006)
3	*Language Learning & Technology*	3	Kessler (2009); Lee (2006); Sun (2009);
4	*Foreign Language Annals*	2	Elola and Oskoz (2008); Lord (2008)
5	*System*	2	Liou and Peng (2009); Mark and Coniam (2008)
6	*CALICO Journal*	2	Lee (2010); Stevenson and Liu (2010)
7	*AACE Journal*	1	Armstrong and Retterer (2008)
8	*Australasian Journal of Educational Technology*	1	Zorko (2009)
9	*Computer-Supported Collaborative Learning*	1	Lund and Rasmussen (2008)
10	*Educational Technology & Society*	1	Yang (2009)
11	*International Journal of Emerging Technologies & Society*	1	Harrison and Thomas (2009)
12	*Journal of Asian Pacific Communication*	1	Choi (2009)
13	*Language and Intercultural Communication*	1	Diehl and Prins (2008)
14	*Language Teaching Research*	1	Soares (2008)
15	*The JALT CALL Journal*	1	Pinkman (2005)
	Total	29	

Table 3
Distribution of Non-empirical Research

Category	Format	N
Conceptual discussions	Articles	9
	Book chapters	14
Potential benefit discussions	Articles	10
	Book chapters	1
Project descriptions/Anecdotal accounts	Articles	7
	Book chapters	1
Total		42

In order to determine the implications for future research on Web 2.0 and language learning, the present analysis focuses on the findings of the empirical studies. However, this does not in any way preclude the value and contribution of the non-empirical work, some of which may inform research and teaching, offering both theoretical insights for researchers, as well as practical suggestions for language teaching practitioners (for example, Lomicka & Lord, 2009; Thorne & Payne, 2005; and Warschauer & Grimes, 2007).

The methodology of this review study was informed by previous review studies in the field by Liu, Moore, Graham, and Lee (2003), who reviewed research on computer-based technology use from 1990 to 2000; Stockwell (2007), who organized his review of technologies by language skill area and surveyed research from 2001 through 2005; and Zhao (2003), who investigated technology developments and language learning from 1997 to 2001.

FINDINGS AND DISCUSSIONS

In our review, empirical studies (43) comprised approximately half of the total number of research publications (85), which is consistent with what previous review studies (e.g., Stockwell, 2007; Zhao, 2003) have found. The following section begins with our findings for Web 2.0 technologies that have been researched. Next, we discuss the areas of language learning and languages that have been investigated. We conclude this section by addressing theoretical and methodological perspectives and issues.

Web 2.0 Technologies Researched

The most commonly investigated Web 2.0 technologies are blogs and wikis (Table 4). There were 15 studies on integrating blogs into L2 learning, covering 35% of the total empirical studies. Ranking second (ten studies, or 23% of the total) was research on the application of wikis to L2 learning. The next most investigated tools were 3-D virtual world (such as Second Life), podcasts, and social networking tools (such as Twitter and MySpace). One study examined embedding Google Docs (Baten, Bouckaert, & Kan, 2009) and another explored the use of Chatbot (Williams & van Compernolle, 2009). In addition, two studies examined multiple Web 2.0 technologies: Castaneda Vise (2008) examined student performance on Spanish preterit and imperfect verb forms, comparing one group which used blogs and another which used wikis, and Stevenson and Liu (2010) investigated how learners worked with three language learning websites which embedded different Web 2.0 tools.

From 2001 to 2005, according to Stockwell (2007), researchers mainly investigated how teachers used courseware (self-developed, commercial, or free) — or computer-mediated technologies that were predominantly text-based (e.g. text-based chat, MOOs, email, audio-conferencing) — to teach a particular language skill. Compared with these older technologies, more current technologies afford greater interactive learning opportunities through genuine communication and social interaction in the target language, which has provided researchers with a broader range of topics to explore in L2 learning. Current research on using technology to facilitate language learning is demonstrating a clear shift from Web 1.0 to Web 2.0 technologies. Nevertheless, the findings summarized in Table 4 suggest that research on the application of Web 2.0 technologies to L2 learning is still quite limited. Specifically, blogs and wikis are "just the tip of an integration iceberg" in the educational context (Oliver, 2010, p. 50). As of summer 2010, the website Go2Web20 (http://www.go2web20.net), which constantly updates a directory of Web 2.0 tools, has listed more than 3000 services and applications. Therefore, future research should investigate the less-studied Web 2.0 technologies, such as Facebook, Twitter, and Second Life, as well as other widely used Web 2.0 tools, such as social bookmarking tools, mind-mapping tools, etc., in order to provide both researchers and practitioners with more information about various options for technology integration.

Table 4
Types of Web 2.0 Technology Investigated in Empirical Research

Web 2.0 Technology	Research	# of Research	%
Blog	Alm (2009); Armstrong and Retterer (2008); Dippold (2009); Ducate and Lomicka (2008); Elola and Oskoz (2008); Jauregi and Banados (2008); Lee (2009); Lee (2006); Liou and Peng (2009); Petersen, Divitini, and Chabert (2008); Pinkman (2005); Raith (2009); Soares (2008); Sun (2009); Yang (2009)	15	35%
Wiki	Arnold, Ducate, and Kost (2009); Chen (2009); Choi (2009); Kessler (2009); Kessler and Bikowski (2010); Lee (2010); Lund (2008); Lund and Rasmussen (2008); Mark and Coniam (2008); Zorko (2009)	10	23%
3-D Virtual World	Deutschmann, Panichi, and Molka-Danielsen (2009); Diehl and Prins (2008); Kuriscak and Luke (2009); Peterson (2006); Sykes (2009)	5	12%
Podcast	Abdous, Camarena, and Facer (2009); Lord (2008); O'Bryan and Hegelheimer (2007); Travis and Joseph (2009); Viswanathan (2009)	5	12%
Social Networking Tools	Antenos-Conforti (2009); Halvorsen (2009); Harrison and Thomas (2009); McCarty (2009)	4	9%
Google Doc	Baten, Bouckaert, and Kan (2009)	1	2%
Chatbot	Williams and van Compernolle (2009)	1	2%
Multiple Technologies	Castaneda Vise (2008); Stevenson and Liu (2010)	2	5%
	Total	43	100%

Topics Related to Language Learning

Numerous topics have been investigated with respect to the application of Web 2.0 technology to L2 learning (Table 5). Among these, L2 writing represents the most investigated topic area, followed by attitudes towards and perceptions of pedagogical applications of different Web 2.0 tools, learner autonomy in Web 2.0 learning environments, and skills related to oral proficiency. These results differ from Liu et al.'s (2003) review study of technology and language learning from the period of 1990 to 2000, in which there was a much narrower range of topics investigated, and where the vast majority of studies addressed reading and writing skills.

The 18 different research topics listed in Table 5 can be grouped into three broader categories: language issues, learner issues, and technology issues (Sturm, et al., 2009). In terms of language issues, apart from focusing on the traditional four language skills (listening, speaking, reading, and writing), researchers have also investigated culture, literacy, peer feedback, interaction, discourse, knowledge construction, communication skills, and comparisons of instructional methods. From the perspective of learners, researchers have examined learners' attitudes and perceptions, identities, motivation, autonomy, and learning communities. Within the third category of technology, researchers have compared the effect of different technological tools on L2 learning. In short, the language learning environments

afforded by Web 2.0 technologies seem to have expanded the scope of inquiry on technology and language learning, which was historically more restricted to focusing on the traditional four language skills. Web 2.0 learning environments have created new contexts in which new literacies, new genres, new identities, and new pedagogies can be investigated (Warschauer, 2004).

Table 5
Language Learning Related Topic in Empirical Research

Research Focus	Study	# of Studies
L2 writing	Antenos-Conforti (2009); Armstrong and Retterer (2008); Arnold, Ducate, and Kost (2009); Ducate and Lomicka (2008); Kessler (2009); Lee (2010); Lund (2008); Mark and Coniam (2008); Raith (2009); Zorko (2009)	10
Attitudes and perceptions	Antenos-Conforti (2009); Armstrong and Retterer (2008); Chen (2009); Dippold (2009); Ducate and Lomicka (2008); Pinkman (2005); Lord (2008); Soares (2008)	8
Learner autonomy	Alm (2009); Halvorsen (2009); Kessler (2009); Kessler and Bikowski (2010); Pinkman (2005)	5
Pronunciation/Oral	Deutschmann, Panichi, and Molka-Danielsen (2009); Lord (2008); Sun (2009); Travis and Joseph (2009)	4
Literacy	Choi (2009); Lee (2006); Halvorsen (2009)	3
Culture	Elola and Oskoz (2008); Jauregi and Banados (2008); Lee (2009);	3
Identity	Choi (2009); Halvorsen (2009); Petersen, Divitini, and Chabert (2008)	3
Learning community	Baten, Bouckaert, and Kan (2009); Petersen, Divitini, and Chabert (2008); Yang (2009)	3
Peer feedback/review	Dippold (2009); Liou and Peng (2009)	2
Technology comparison	Castaneda Vise (2008); Chen (2009); Stevenson and Liu (2010)	3
Interaction & Discourse	Peterson (2006); Williams and van Compernolle (2009)	2
L2 reading	Ducate and Lomicka (2008)	1
Listening strategy	O'Bryan and Hegelheimer (2007)	1
Motivation	McCarty (2009)	1
Knowledge construction	Lund (2008); Lund and Rasmussen (2008)	2
Communication skills	Viswanathan (2009)	1
Grammar	Castaneda Vise (2008)	1
Comparison of instructional methods	Abdous, Camarena, and Facer (2009)	1

Note. Some studies have more than one main research focus. Consequently, a single study may appear more than once in this table.

Target Languages

Regarding the target languages under consideration, English as a second or foreign language (ESL/EFL) was the most studied (Table 6). Of the 43 empirical studies, 25 (58%) examined Web 2.0 technologies in ESL/EFL contexts. The next most frequently studied languages were Spanish (9), German (4), and French (2). In addition, there was one study on Italian (Antenos-Conforti, 2009), which examined the use of a social networking tool, Twitter, and one other study which focused on the use of blogging with Korean-American students to maintain their heritage language (Lee, 2006). However, studies of the use of Web 2.0 technology for instruction in many of the "less commonly taught languages" (Brecht & Walton, 1994) — e.g., Arabic, Chinese, Japanese, and Russian — have not yet been investigated, at least based on the search parameters used in this investigation. This finding is consistent with Zhao's (2003) conclusion that the languages studied were limited to ESL/EFL and the more commonly taught foreign languages.

Table 6
The Target Language Investigated in the Empirical Research

Target Language	Study	# of Studies	%
EFL/ESL	Baten, Bouckaert, and Kan (2009); Chen (2009); Choi (2009); Deutschmann, Panichi, and Molka-Danielsen (2009); Diehl and Prins (2008); Halvorsen (2009); Harrison and Thomas (2009); Kessler (2009); Kessler and Bikowski (2010); Liou and Peng (2009); Lund (2008); Lund and Rasmussen (2008); Mark and Coniam (2008); McCarty (2009); O'Bryan and Hegelheimer (2007); Peterson (2006); Pinkman (2005); Raith (2009); Soares (2008); Stevenson and Liu (2010); Sun (2009); Travis and Joseph (2009); Viswanathan (2009); Yang (2009); Zorko (2009)	25	58%
Spanish	Armstrong and Retterer (2008); Castaneda Vise (2008); Elola and Oskoz (2008); Jauregi and Banados (2008); Kuriscak and Luke (2009); Lee (2010); Lee (2009); Lord (2008); Sykes (2009)	9	21%
German	Alm (2009); Arnold, Ducate, and Kost (2009); Dippold (2009); Ducate and Lomicka (2008);	4	9%
French	Petersen, Divitini, and Chabert (2008); Williams and van Compernolle (2009);	2	5%
Italian	Antenos-Conforti (2009)	1	2%
Korean	Lee (2006)	1	2%
Multiple languages	Abdous, Camarena, and Facer (2009)	1	2%
	Total	43	100%

Theoretical Perspectives

As a discipline, second language acquisition (SLA) does not suffer from a lack of theories. Nearly two decades ago, Larsen-Freeman and Long (1991) claimed that there were "at least forty 'theories', 'models', 'perspectives', 'metaphors', 'hypotheses', and 'theoretical claims' in the SLA literature" (p. 288). This diversity of perspectives is also evident in research on CALL. Interestingly, of the 43 empirical studies in this review, 24 either did not clearly state their theoretical framework or did not appear to have an obvious theoretical foundation (Table 7); this represents 56% of the total empirical studies. This finding echoes Lomicka and Lord's (2009) statement that "there is not a solid base of well-grounded research investigating Web 2.0 tools in language learning from theoretical and empirical perspectives" (p. 5).

Huh and Hu (2005) provided a similar critique of previous CALL research, claiming that many of its conclusions were devoid of links to a well-grounded theory. Theory is important in research, particularly with respect to advancing the field. Therefore, it would seem that in order to build a coherent disciplinary knowledge base, future research on Web 2.0 technologies and L2 learning should be guided by clearly-stated, clearly-identifiable, theoretical frameworks.

Table 7
Theoretical Framework of the Empirical Research

Theoretical Framework	Study	# of Studies	%
Sociocultural Approach	Lee (2009); Castaneda Vise (2008); Lund (2008); Raith (2009);		
Activity Theory	Diehl and Prins (2008)		
Socio-constructivist Approach	Petersen, Divitini, and Chabert (2008); Lee (2010); Harrison and Thomas (2009)		
Community of Practice	Petersen, Divitini, and Chabert (2008); Yang (2009)		
Social Cognitive Theory	Chen (2009)		
A framework for autonomy	Kessler (2009); Kessler and Bikowski (2010);		
Interactionist Model	Antenos-Conforti (2009)	19	44%
Critical Language Learning	Halvorsen (2009)		
Speech Act	Sykes (2009)		
Self-determination Theory	Alm (2009)		
Diffusion of Innovation	Chen (2009)		
Vygotsky's notion of double stimulation	Lund and Rasmussen (2008)		
No identifiable theoretical framework		24	56%
	Total	43	100%

Nineteen of the empirical studies in the current data set were grounded in and supported by different theoretical frameworks. Most of this research was framed along sociocultural and sociocognitive dimensions such as sociocultural theory, activity theory, socio-constructivism, community of practice, social cognitive theory, etc. This finding corresponds to the shift of computer use in language learning, at least in this domain of CALL, from a structural/cognitive approach to a more sociocognitive approach (Warschauer, 2000), which views the computer as a tool that mediates interactions between language learners and other humans. The finding further corresponds to the current development of Web technology shifting from "linking information to linking people" (Wesch, 2007), which creates more opportunities for greater interaction. Interaction, and more specifically interaction-based learning, is a cornerstone of many socially oriented approaches to L2 learning.

Methodological Perspectives

Perry (2005) defines qualitative research as any study that is conducted in a real-life setting, involving intensive holistic data collection through the researcher's close observation, and comprised of mostly textual analysis; whereas quantitative research relies mainly on statistical techniques to draw conclusions and to make generalizations. Following these general criteria, 26 qualitative (60%) and 11 quantitative studies (26%) were identified (Table 8). Additionally, two studies (Mark & Coniam, 2008; Stevenson & Liu 2010) adopted mixed methods, and four studies can be classified as action research (Deutschmann, Panichi, & Molka-Danielsen, 2009; Pinkman, 2005; Soares, 2008; Viswanathan, 2009). Thus, most of the empirical research in this area is qualitative in nature, which represents another departure from CALL research from the decade of 1990-2000, when the majority of studies were conducted using quantitative methods (Liu, et al., 2003; Huh & Hu, 2005). This finding also parallels a larger shift of the research paradigm — from dominantly quantitative to increasingly more qualitative — in applied linguistics as well as CALL research since the late 1990s (Davis, 1995; Duff, 2006; Edge & Richards, 1998; Motteram, 1999; Yihong, Lichun & Jun, 2001).[4]

Table 8
Methodological Approaches Used in Empirical Research

Methodological Issues	Categories		# of Studies
Research Approach	Qualitative	Case study	12
		Non-case study	14
	Quantitative	Descriptive	9
		Experimental	2
	Mixed-methods		2
	Action research		4
Participants	University students		39
	K-12 students		4
Sampling	Convenience sampling		40
	Purposeful sampling		1
	Random sampling		2
	Total		43

In this line of research, 39 out of the total 43 empirical studies (91%) were conducted in a college or university context. Conversely, only four studies (Lund, 2008; Lund & Rasmussen, 2008; Mark & Coniam, 2008; Raith, 2009) were carried out in K-12 settings. The findings with respect to sampling are, no doubt, related to this trend as well: 40 of the empirical studies adopted a convenience-sampling strategy. Only two of the studies used a random-sampling strategy and one employed a purposeful-sampling strategy. These limita-

tions are familiar, and no doubt represent some of the common logistical issues facing researchers—issues related to access to participants, increased security measures in public schools, additional constraints presented by working with minors, etc. Nevertheless, these findings illuminate a clear gap in the research, which is the need for researchers to not only explore Web 2.0 and language learning in other (i.e., non-university) educational contexts, but perhaps also to explore how Web 2.0 is being used by learners who are learning, or using, an L2 independently, that is, outside of any formal schooling context.

Apart from these more general limitations, many of the case studies reviewed have failed to provide truly in-depth analyses of the investigated phenomena. To offer one example, Armstrong and Retterer (2008) aimed at investigating whether blogging provided an opportunity for students to become more actively immersed in a Spanish language class over the course of a semester, and whether students wrote more using a blog than in a traditional course. The findings of the study concentrated primarily on the number of words produced by students in each group. However, the researchers did not include the students' perspectives on why they felt more comfortable writing in Spanish in one mode rather than the other. Qualitative research techniques enable researchers to offer rich descriptions of observed phenomena, and to address issues related to participants' individual perspectives as well as to their personal, lived experiences. These are areas, we feel, that can be more thoroughly addressed by future Web 2.0 studies.

Another methodological weakness existing in some research is the technocentrism underlying some of the research designs.[5] In spite of an ongoing debate among educational researchers (with one side arguing that technology per se has little or no effect on learning and the other side claiming that certain technology affords distinct pedagogical approaches that can in and of themselves enhance learning) researchers generally agree that it is not the technology that causes learning but rather the pedagogical approach that impacts learning (Mayer, 2005). Some of the studies reviewed here compared the effects of using different Web 2.0 technologies; thus, additional research is needed to examine how various technology-supported instructional methods affect students' language learning, rather than on comparing the effects of different technologies (Mayer, 2005). For example, Castaneda Vise (2008) conducted a study comparing students' achievement levels and satisfaction levels in learning Spanish preterit and imperfect verb forms: one group in the study used wikis and the other used blogs. The researcher found no significant differences between the two groups of students either in achievement level or in satisfaction level. Research designs such as these, which compare two types of technological media, may overlook the human and situational factors that inevitably also affect the findings.

In another study, Chen (2009) compared two groups of students when examining the effectiveness of applying wikis in language learning and students' attitudes towards language learning. Chen found statistically significant differences in attitude and language performance between the groups that used wikis and those that did not; the wiki group performed better in listening and reading and had more favorable attitudes towards the class, their English ability improvement, and cooperative learning. Chapelle (2001) has pointed out that the results generated by this type of design—which are very commonly used to evaluate the effectiveness of CALL—are difficult to interpret, owing to the difficulty in controlling extraneous variables related to situational and human factors. These limitations suggest that more ecological approaches (van Lier, 2000), which take into account a variety of contextual variables as well as learner agency, may be appropriate when investigating the applications of Web 2.0 to L2 learning.

Advantages and Disadvantages of Web 2.0 Technologies

In terms of the impact of integrating Web 2.0 technologies on learners' language ability, the most commonly reported benefits are increase in students' writing confidence, facilitation of

students' use of writing strategies, and enhancement of students' overall writing skills (Armstrong & Retterer, 2008; Arnold et al., 2009; Ducate & Lomicka, 2008; Kessler, 2009; Lee, 2010; Mark & Coniam, 2008; Raith, 2009; Zorko, 2009). For example, results in Armstrong and Retterer's (2008) study revealed that all participants felt more comfortable when writing in Spanish and more confident in their ability to use Spanish verbs after a one-semester blogging experience. Another study (Arnold et al., 2009) found that both groups of German learners in two different wiki writing projects made considerable revisions related to content and formal accuracy, which contributed to the improvement of their overall L2 writing quality. Moreover, Ducate and Lomicka (2005) discovered that students perceived blog writing as a helpful way to practice vocabulary and grammar, which was conducive to enhancing their L2 writing skills. In addition, the results of Mark and Coniam's (2008) study revealed that EFL learners in Hong Kong, after using wikis, wrote significantly more words than expected in the last phase of a study exploring the use of wikis, and that they made a large number of revisions including expanding, reorganizing and correcting in the writing process, when compared to the first phase of the study.

From the overall findings of this body of research, several benefits related to Web 2.0 have been discussed. In general, the major advantage reported in several studies is that Web 2.0 technologies help to create learning environments which are: comfortable (Antenos-Conforti, 2009; Armstrong & Retterer, 2008; Chen, 2009), relaxed (Ducate & Lomicka, 2008), collaboration-oriented (Kessler, 2009; Lee, 2009, 2010; McCarty, 2009; Zorko, 2009), and community-based (Antenos-Conforti, 2009; Baten et al., 2009; Harrison & Thomas, 2009). A related benefit of Web 2.0 technology for language learning is the obvious potential it yields for increased student interaction and collaboration as well as output in the target language (Baten et al., 2009; Chen, 2009; Lee, 2006; Peterson, 2006). Additionally, a number of studies have indicated that, in general, learners tend to have favorable attitudes towards the pedagogical use of Web 2.0 technologies (Antenos-Conforti, 2009; Armstrong & Retterer, 2008; Chen, 2009; Dippold, 2009; Ducate & Lomicka, 2008; Lord, 2008). More specifically, several studies reported that Web 2.0 technologies increased students' interest and motivation in language learning (Liou & Peng, 2009; Kessler, 2009; McCarty, 2009; Pinkman, 2005; Román-Mendoza, 2009). And still other studies focused on more specific benefits, such as a greater awareness of audience (Alm, 2009; Raith, 2009) and increased cultural knowledge and cultural competence (Elola & Oskoz, 2008; Jauregi & Banados, 2008; Lee, 2009).

Although it is clear that Web 2.0 technologies yield great potential in their application to L2 education, the studies reviewed here have also identified some potential pitfalls that researchers (and practitioners) should be aware of. More specifically, the interactive potential of Web 2.0 technologies may come with its own set of associated challenges. For instance, one study (Lee, 2006) found that in an authentic blog environment, students felt frustrated by their inability to distinguish between standard and non-standard forms of the target language, which could ultimately affect their language use in other situations. Another study (Kessler, 2009) found that when writing their blog entries, students tended to focus their attention on the creation of meaning and to be far less concerned about the accuracy of language output. In yet another study, students indicated that they considered their blogs to be a private place for them to describe, explore, and express their own ideas and feelings in the target language; in other words, they did not fully exploit the interactive potential offered by the technology and basically overlooked input provided by their peers (Ducate & Lomicka, 2008). Two additional studies found that interactivity may be something that teachers need to explicitly prepare learners for and orient them to; for example, both Dippold (2009) and Ducate and Lomicka (2008) found that when providing feedback, students felt reluctant, insufficient in expertise, and lacking specific guidance on how to give appropriate comments to their peers. Finally, in Pinkman's (2005) study of a blog project, participants expressed their desire to develop their oral communication skills instead of merely

improving their reading and writing skills in the L2. This finding echoes our earlier observation that the scope of Web 2.0 research should be expanded to include tools beyond wikis and blogs, and skills beyond reading.

CONCLUSION

In this review study, we have aimed to include all of the recent relevant literature on using Web 2.0 technologies in L2 learning. Our findings indicate that blogs and wikis have been the most studied Web 2.0 tools to date. However, blogs and wikis represent only a fraction of the much larger Web 2.0 "iceberg" (Oliver, 2010), which supports previous observations that research on Web 2.0 tools in language learning is still in its beginning stages (Ducate & Lomicka, 2008; Lomicka & Lord, 2009). Further research is needed to investigate the pedagogical uses of less studied Web 2.0 technologies, such as Facebook, Twitter, and Second Life. Moreover, we believe that future research could also explore a number of other widely used (but as-yet-unresearched) Web 2.0 tools, such as social bookmarking or mind-mapping tools.

Next, consistent with the findings of previous research on technology and language learning (Zhao, 2003), the present study found that English, Spanish, German, and French have been the most commonly investigated languages in research focusing on Web 2.0 technologies. Consequently, we believe that future research should also focus on the use of Web 2.0 technologies in the teaching of the less commonly taught languages, such as Arabic, Chinese, Japanese, and Russian. Moreover, this review found that the majority of studies had been conducted in post-secondary settings. Thus, we believe that future research should also explore how learners in primary and secondary educational settings as well as in more informal learning contexts are using Web 2.0.

Another trend identified in this study suggests that the language-learning environments afforded by Web 2.0 technologies have, in fact, helped to broaden the scope of CALL research: from earlier research, which tended to concentrate on the traditional four language skills, to more recent topics such as learners' identities, online collaboration, and learning communities. Our review of research found that the most frequently discussed benefit associated with Web 2.0 technologies is the favorable language-learning environment that they help to foster. However, we also found that few studies surveyed have actually examined students' progress and specific language learning outcomes. We suggest, therefore, that future empirical research should examine how students' language proficiency and/or intercultural competence is enhanced or impacted in using Web 2.0 tools.

Moreover, our review found that much research was not clearly grounded in well-established theoretical frameworks and that a number of studies suffered from some common methodological weaknesses. Therefore we urge CALL researchers to build upon the current work and to further enrich epistemology in this field through solid, rigorous, and well-grounded research (Lomicka & Lord, 2009). In other words, future empirical research focusing on these new technological tools in second language learning/acquisition should be theoretically-driven and well-designed, in order to achieve greater transferability and external validity in this line of research. Warschauer (2009) has noted that technology should not be regarded as "a magic bullet to solve educational problems, but rather as a powerful tool that can have both positive and negative impact, and that must be carefully exploited" (p. xx). To this caveat we would add that Web 2.0 tools, like all technologies, must also be carefully researched.

NOTES

[1] For more on the differences between Web 1.0 and Web 2.0, see also Benito-Ruiz, 2009; O'Reilly, 2005; Warschauer & Grimes, 2007.

[2] Warschauer and Healey (1998) have identified three phases of CALL: 1) behaviorist/structural CALL (1970s-1980s), 2) communicative CALL (1980s-1990s), and 3) integrative CALL (21st century). However, Bax (2003) proposed three alternative phases: Restricted CALL, Open CALL, and Integrated CALL. Warschauer and Healey chronologically characterized CALL development, while Bax's identification of CALL phases was based on how the technology was used.

[3] For convenience, we use the term "second language learning" to cover two other terms ("foreign language learning" and "additional language learning") in the remaining text.

[4] The methodological paradigm chosen may vary as a function of the domain of CALL under investigation.

[5] Huh and Hu (2005) point out that some common traps include media comparisons, instructional comparisons, and tool analysis.

REFERENCES

Abdous, M., Camarena, M. M., & Facer, B. R. (2009). MALL technology: Use of academic podcasting in the foreign language classroom. *ReCALL, 21*(1), 76-95.

Alm, A. (2009). Blogging for self-determination with L2 learner journals. In M. Thomas (Ed.), *Handbook of research on Web 2.0 and second language learning* (pp. 202-221). Hershey, PA: Information Science Reference.

Antenos-Conforti, E. (2009). Microblogging on Twitter: Social networking in intermediate Italian classes. In L. Lomicka & G. Lord (Eds.), *The next generation: Social networking and online collaboration in foreign language learning* (pp. 59-90). San Marcos, Texas: CALICO.

Armstrong, K., & Retterer, O. (2008). Blogging as L2 writing: A case study. *AACE Journal, 16*(3), 233-251.

Arnold, N., Ducate, L., & Kost, C. (2009). Collaborative writing in wikis: Insights from culture projects in intermediate German classes. In L. Lomicka & G. Lord (Eds.), *The next generation: Social networking and online collaboration in foreign language learning* (pp. 115-144). San Marcos, Texas: CALICO.

Baten, L., Bouckaert, N., & Kan, Y. (2009). The use of communities in a virtual learning environment. In M. Thomas (Ed.), *Handbook of research on Web 2.0 and second language learning* (pp. 137-155). Hershey, PA: Information Science Reference.

Bax, S. (2003). CALL: Past, present and future. *System*, *31*(1), 13-28.

Benito-Ruiz, E. (2009). Infoxication 2.0. In M. Thomas (Ed.), *Handbook of research on Web 2.0 and second language learning* (pp. 60-79). Hershey, PA: Information Science Reference.

Bloch, J. (2008). From the special issue editor. *Language Learning & Technology, 12*(2), 2–6.

Block, D. (2003). *The social turn in second language acquisition.* Washington, DC: Georgetown University Press.

Brecht, R. D., & Walton, A. R. (1994). *National strategic planning in the less commonly taught languages.* NFLC Occasional Papers. Washington, DC: National Foreign Language Center.

Castaneda Vise, D. A. (2008). The effects of wiki- and blog-technologies on the students' performance when learning the preterit and imperfect aspects in Spanish. *Dissertation Abstracts International: Section A. The Humanities and Social Sciences, 69* (01), 0187.

Chapelle, C. A. (2001). *Computer applications in second language acquisition*. Cambridge, UK: Cambridge University Press.

Chapelle, C. A. (2009). The relationship between second Language acquisition theory and computer-assisted language learning. *The Modern Language Journal, 93*, 741–753.

Chen, Y. (2009). *The effect of applying wikis in an English as a foreign language (EFL) class in Taiwan* (Doctoral Dissertation). Retrieved from ProQuest Dissertations and Theses database. (Accession No. 200920820)

Chinnery, G. M. (2008). You've got some GALL: Google-assisted language learning. *Language Learning & Technology, 12*(1), 3–11.

Choi, J. (2009). Asian English language learners' identity construction in an after school literacy site. *Journal of Asian Pacific Communication, 19*(1), 130-161.

Davis, K. A. (1995). Qualitative theory and methods in applied linguistics research. *TESOL Quarterly, 29,* 427-453.

Deutschmann, M., Panichi, L., & Molka-Danielsen, J. (2009). Designing oral participation in Second Life — A comparative study of two language proficiency courses. *ReCALL, 21*(2), 206–226. doi:10.1017/S0958344009000196

Diehl, W. C., & Prins, E. (2008). Unintended outcomes in Second Life: Intercultural literacy and cultural identity in a virtual world. *Language and Intercultural Communication, 8*(2), 101-118. doi: 10.1080/14708470802139619

Dippold, D. (2009). Peer feedback through blogs: Student and teacher perceptions in an advanced German class. *ReCALL, 21*(1), 18-36.

Ducate, C. L., & Lomicka, L. L. (2005). Exploring the blogosphere: Use of Web logs in the foreign language classroom. *Foreign Language Annals*, *38*(3), 410-421.

Ducate, C. L., & Lomicka, L. L. (2008). Adventures in the blogosphere: From blog readers to blog writers. *Computer Assisted Language Learning, 21*(1), 9-28.

Duff, P. (2006). Beyond generalizability: Contextualization, complexity, and credibility in applied linguistics research. In M. Chalhoub-Deville, C. Chapelle & P. Duff (Eds.), *Inference and generalizability in applied linguistics: Multiple perspectives* (pp. 65 -95). Amsterdam: Benjamins.

Edge, J., & Richards, K. (1998). 'May I see your warrant, please?': Justifying claims in qualitative research. *Applied Linguistics, 19*(3), 334-356.

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. *The Modern Language Journal, 93,* 754–768.

Elola, I., & Oskoz, A. (2008). Blogging: Fostering intercultural competence development in foreign language and study abroad contexts. *Foreign Language Annals, 41*(3), 454-477. doi:10.1111/j.1944-9720.2008.tb03307.x

Firth, A., & Wagner, J. (1997). On discourse, communication, and (some) fundamental concepts in SLA research. *The Modern Language Journal, 81*(3), 285-300.

Garrett, N. (2009). Computer-assisted language learning trends and issues revisited: Integrating innovation. *The Modern Language Journal, 93,* 719–740.

Godwin-Jones, R. (2006). Tag clouds in the blogosphere: Electronic literacy and social networking. *Language Learning & Technology, 10*(2), 8–15.

Godwin-Jones, R. (2008). Web-writing 2.0: Enabling, documenting, and assessing writing online. *Language Learning & Technology, 12*(2), 7–13.

Halvorsen, A. (2009). Social networking sites and critical language learning. In M. Thomas (Ed.), *Handbook of research on Web 2.0 and second language learning* (pp. 237-255). Hershey, PA: Information Science Reference.

Harrison, R., & Thomas, M. (2009). Identity in online communities: Social networking sites and language learning. *International Journal of Emerging Technologies & Society, 7*(2), 109–124.

Huh, K., & Hu, W-C. (2005). Criteria for effective CALL research. In J. L. Egbert & G. M. Petrie (Eds.), *CALL research perspectives* (pp. 9-21). Mahwah, NJ: Lawrence Erlbaum.

Jauregi, K., & Banados, E. (2008). Virtual interaction through video-web communication: A step towards enriching and internationalizing language learning programs. *ReCALL, 20*(2), 183-207. doi: 10.1017/S0958344008000529

Johnson, M. (2004). *A philosophy of second language acquisition.* New Haven, CT: Yale University Press.

Kessler, G. (2009). Student-initiated attention to form in wiki-based collaborative writing. *Language Learning & Technology, 13*(1), 79–95.

Kessler, G., & Bikowski, D. (2010). Developing collaborative autonomous learning abilities in computer mediated language learning: Attention to meaning among students in wiki space. *Computer Assisted Language Learning, 23*(1), 41–58.

Kuriscak, L. M., & Luke, C. L. (2009). Language learner attitudes toward virtual worlds: An investigation of Second Life. In L. Lomicka & G. Lord (Eds.), *The next generation: Social networking and online collaboration in foreign language learning* (pp. 115-144). San Marcos, Texas: CALICO.

Larsen-Freeman, D., & Long, M. (1991). *An introduction to second language acquisition research.* London: Longman.

Lee, J. S. (2006). Exploring the relationship between electronic literacy and heritage language maintenance. *Language Learning & Technology, 10*(2), 93–113.

Lee, L. (2009). Promoting intercultural exchanges with blogs and podcasting: A study of Spanish-American telecollaboration. *Computer Assisted Language Learning, 22*(5), 425-443.

Lee, L. (2010). Exploring wiki-mediated collaborative writing: A case study in an elementary Spanish course. *CALICO Journal, 27*(2), 260-276.

Liou, H-C., & Peng, Z-Y. (2009). Training effects on computer-mediated peer review. *System, 37,* 514–525.

Liu, M., Moore, Z., Graham, L., & Lee, S. (2003). A look at the research on computer-based technology use in second language learning: A review of the literature from 1990-2000. *Journal of Research on Technology in Education, 34*(3), 250-273.

Lomicka, L., & Lord, G. (2009). Introduction to social networking, collaboration, and Web 2.0 tools. In L. Lomicka & G. Lord (Eds.), *The next generation: Social networking and online collaboration in foreign language learning* (pp. 1-11). San Marcos, Texas: CALICO.

Lord, G. (2008). Podcasting communities and second language pronunciation. *Foreign Language Annals, 41*(2), 364-379.

Lund, A. (2008). Wikis: A collective approach to language production. *ReCALL, 20*(1), 35-54.

Lund, A., & Rasmussen, I. (2008). The right tool for the wrong task? *Computer-Supported Collaborative Learning, 3,* 387–412.

Mark, B., & Coniam, D. (2008). Using wikis to enhance and develop writing skills among secondary school students in Hong Kong. *System, 36,* 437–455.

Mayer, R. E. (2005). Multimedia learning: Guiding visuospatial thinking with instructional animation. In P. Shah & A. Miyake (Eds.), *The Cambridge handbook of visuospatial thinking* (pp. 477-508). Cambridge: Cambridge University Press.

McBride, K. (2009). Social-networking sites in foreign language classes: Opportunities for re-creation. In L. Lomicka & G. Lord (Eds.), *The next generation: Social networking and online collaboration in foreign language learning* (pp. 35-58). San Marcos, Texas: CALICO.

McCarty, S. (2009). Social networking behind student lines in Japan. In M. Thomas (Ed.), *Handbook of research on Web 2.0 and second language learning* (pp. 181-201). Hershey, PA: Information Science Reference.

Motteram, G. (1999). Changing the research paradigm: Qualitative research methodology and the CALL classroom. In R. Debski & M. Levy (Eds.), *WorldCALL: Global perspectives on computer-assisted language learning.* Lisse, The Netherlands: Swets & Zeitlinger.

O'Bryan, A., & Hegelheimer, V. (2007). Integrating CALL into the classroom: The role of podcasting in an ESL listening strategies course. *ReCALL, 19*(2), 162-180. doi: 10.1017/ S0958344007000523

Oliver, K. (2010). Integrating Web 2.0 across the curriculum. *TechTrends, 54*(2), 50-60.

O'Reilly, T. (2005). What is Web 2.0? Retrieved June 11, 2009, from http://oreilly.com/pub/a/web2/ archive/what-is-web-20.html?page=1

Perry, L. F. (2005). *Research in applied linguistics: Becoming a discerning consumer*. Mahwah, NJ: Lawrence Erlbaum.

Peterson, M. (2006). Learner interaction management in an avatar and chat-based virtual world. *Computer Assisted Language Learning, 19*(1), 79–103. doi:10.1080/09588220600804087

Petersen, S. A., Divitini, M., & Chabert, G. (2008). Identity, sense of community and connectedness in a community of mobile language learners. *ReCALL, 20*(3), 361-379. doi:10.1017/S0958344008000839

Pinkman, K. (2005). Using blogs in the foreign language classroom: Encouraging learner independence. *The JALT CALL Journal, 1*(1), 12–24.

Raith, T. (2009). The use of weblogs in language education. In M. Thomas (Ed.), *Handbook of research on Web 2.0 and second language learning* (pp. 274-291). Hershey, PA: Information Science Reference.

Román-Mendoza, E. (2009). RSS and social personalized start pages: Optimizing e-language learning through content syndication. In L. Lomicka & G. Lord (Eds.), *The next generation: Social networking and online collaboration in foreign language learning* (pp. 91-114). San Marcos, Texas: CALICO.

Soares, D. de A. (2008). Understanding class blogs as a tool for language development. *Language Teaching Research, 12*(4), 517-533.

Stevenson, M. P., & Liu, M. (2010). Learning a language with Web 2.0: Exploring the use of social networking features of foreign language learning websites. *CALICO Journal, 27*(2), 233-259.

Stockwell, G. (2007). A review of technology choice for teaching language skills and areas in the CALL literature. *ReCALL, 19*(2), 105-120.

Sturm, M., Kennell, T., McBride, R., & Kelly, M. (2009). The pedagogical implications of Web 2.0. In M. Thomas (Ed.), *Handbook of research on Web 2.0 and second language learning* (pp. 367-384). Hershey, PA: Information Science Reference.

Sun, Y. (2009). Voice blog: An exploratory study of language learning. *Language Learning & Technology, 13*(2), 88-103.

Sykes, J. M. (2009). Learner requests in Spanish: Examining the potential of multiuser virtual environments for L2 pragmatic acquisition. In L. Lomicka & G. Lord (Eds.), *The next generation: Social networking and online collaboration in foreign language learning* (pp. 115-144). San Marcos, Texas: CALICO.

Sykes, J., Oskoz, A., & Thorne, S. (2008). Web 2.0, synthetic immersive environments, and mobile resources for language education. *CALICO Journal, 25*(3), 528-546.

Thomas, M. (2009). *Handbook of research on Web 2.0 and second language learning*. Hershey, PA : Information Science Reference.

Thorne, S. L., & Payne, J. S. (2005). Evolutionary trajectories, internet-mediated expression, and language education. *CALICO Journal, 22*(3), 371-397.

Thorne, S. L., & Reinhardt, J. (2008). "Bridging activities," new media literacies, and advanced foreign language proficiency. *CALICO Journal, 25*(3), 558-572.

Travis, P., & Joseph, F. (2009). Improving learners' speaking skills with podcasts. In M. Thomas (Ed.), *Handbook of research on Web 2.0 and second language learning* (pp. 313-330). Hershey, PA: Information Science Reference.

Tu, C., Blocher, M., & Ntoruru, J. (2008). Integrate Web 2.0 technology to facilitate online professional community: EMI special editing experiences. *Educational Media International, 45*(4), 335–341.

Tu, C., Blocher, M., & Roberts, G. (2008). Constructs for Web 2.0 learning environments: A theatrical metaphor. *Educational Media International, 45*(4), 253–269.

van Lier, L. (2000). From input to affordance: Social-interactive learning from an ecological perspective. In J. P. Lantolf (Ed.), *Sociocultural theory and second language learning* (pp. 245-259). Oxford: Oxford University Press.

Viswanathan, R. (2009). Using mobile technology and podcasts to teach soft skills. In M. Thomas (Ed.), *Handbook of research on Web 2.0 and second language learning* (pp. 223-236). Hershey, PA: Information Science Reference.

Walker, R., Hewer, S., & Davies, G. (2008). Introduction to the Internet—Module 1.5. In G. Davies (Ed.), *Information and communications technology for language teachers (ICT4LT)* [Online]. Slough, Thames Valley University. Retrieved June, 23, 2010, from http://www.ict4lt.org/en/en_mod1-5.htm#WEB2

Warschauer, M. (2000). The death of cyberspace and the rebirth of CALL. *English Teachers' Journal, 53*, 61-67. Retrieved May 12, 2009, from http://www.gse.uci.edu/markw/cyberspace.html

Warschauer, M. (2004). Technological change and the future of CALL. In S. Fotos & C. Brown (Eds.), *New perspectives on CALL for second and foreign language classrooms* (pp. 15-25). Mahwah, NJ: Lawrence Erlbaum Associates.

Warschauer, M. (2009). Foreword. In M. Thomas (Ed.), *Handbook of research on Web 2.0 and second language learning* (pp. xix-xx). Hershey, PA: Information Science Reference.

Warschauer, M., & Grimes, D. (2007). Audience, authorship, and artifact: The emergent semiotics of Web 2.0. *Annual Review of Applied Linguistics, 27,* 1-23.

Warschauer, M., & Healey, D. (1998). Computers and language learning: An overview. *Language Teaching, 31*, 57-71.

Web 2.0. (n.d.). In *Wikipedia*. Retrieved from http://en.wikipedia.org/wiki/Web_2.0

Weiter, S. (2008). Who's REALLY computer savvy? Web 2.0 technologies and your library. *Legal Information Management, 8*(4), 270-273.

Wesch, M. (2007). *Web 2.0: The machine is us/ing us* [Video]. Retrieved July 24, 2009, from http://www.youtube.com/watch?v=6gmP4nk0EOE

Williams, L., & van Compernolle, R. A. (2009). The Chatbot as a peer/tool for learners of French. In L. Lomicka & G. Lord (Eds.), *The next generation: Social networking and online collaboration in foreign language learning* (pp. 145-172). San Marcos, Texas: CALICO.

Yang, S. (2009). Using blogs to enhance critical reflection and community of practice. *Educational Technology & Society, 12*(2), 11-21.

Yihong, G., Lichun, L., & Jun, L. (2001). Trends in research method in applied linguistics: China and the West. *English for Specific Purposes, 20*, 1-14.

Zhang, J. (2009). Toward a creative social web for learners and teachers. *Educational Researcher, 38*(4), 274–279.

Zhao, Y. (2003). Recent developments in technology and language learning: A literature review and meta-analysis. *CALICO Journal*, *21*(1), 7-27.

Zorko, V. (2009). Factors affecting the way students collaborate in a wiki for English language learning. *Australasian Journal of Educational Technology, 25*(5), 645-665.

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