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Second Language Learning Online

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Second Language Learning Online

Carol A. Chapelle

Electronic resources for language learning and communication have created new pedagogical practices and informal language learning opportunities. Language learners may benefit from software designed specifically for language learning (i.e. language tutorials) as well as from access to electronic tools to help them with language comprehension (e.g. subtitles and text to speech synthesis) and production (e.g. spelling and grammar checkers). In addition, learners have access to what some would argue is the most important source of data for learning another language: a variety of spoken and written language that they can choose from on the Internet as well as opportunities to engage with other learners and speakers of the language they are studying on topics of their choosing. The range of resources and practices creates a wealth of opportunities for learners, teachers, materials developers and course designers. With these many and varied opportunities come challenges for researchers who investigate how technology can support second language learners. Researchers aim to improve second language learning and increase knowledge about how learners learn through technology. Much scope exists for discovery in this domain, and, accordingly, the research methods span a range of quantitative, qualitative and mixed methods approaches. This chapter begins with a brief overview of the ways in which language learners use technology in support of their learning and then outlines how researchers investigate online second language learning.

E-LEARNING IN SECOND LANGUAGE STUDY

People of all ages study a language that is not their own first language for a variety of reasons. Many schools throughout the world require students from the early grades to study another language, typically English, with the goal of educating a population that can participate in the global economy. Students at many universities continue to study a second language or choose to study a third language for less pragmatic reasons, for instance to learn about another linguistic system and culture. For adults beyond university study, intellectual curiosity may also prompt learners to study another language or they may have needs such as military deployment, professional demands or tourism that send them back to the language classroom. With each of these various audiences and purposes for language study, a range of e-learning opportunities exists to assist with the challenge. In fact, for every one of the technologies for e-learning described in other chapters of this handbook – virtual worlds, games, social media and massive online courses – second language learning environments have been experimented with. Because humans learn all subject areas through the use of language, language learning is inherently part of most technological environments, but in the design and research of such environments for language learning, the language takes center stage.

Language teachers are adept at using technology to design pedagogy that provides certain advantages for language learners, and these include multiple levels of second language learning objectives from vocabulary learning and writing skills to development of intercultural competence. In fact, at least the following areas of language development are taught explicitly through technology: grammar, vocabulary, reading, writing, listening, speaking, pragmatics and intercultural competence. The pedagogical approaches that current technologies make possible or support are at least equally numerous and varied. Technology makes possible courses taught completely at a distance, various blended configurations of courses, short modules of tutorial language learning, various formats of electronic communication and

assessments within a primarily traditional classroom course.

Some educators have seen the new variety of pedagogies as an opportunity to evaluate which of the many possibilities creates ideal language learning conditions. However, evaluation is a challenge for at least three reasons (Chapelle, 2003). First, online learning is typically used as one of many forms of language practice for learners in a larger program of instruction and out-of-class activities, so the idea that learners would learn the language exclusively from online activities is at odds with the reality of many e-learning situations. Second, learners, not teachers, frequently select the linguistic points to be the focus of attention in online communication tasks, and therefore pre-planned assessment of acquisition of particular aspects of language is not feasible. Third, evaluation that informs software developers, teachers and learners about how to learn better through technology requires a delicate analysis of the process of learning based on language learning theory. Such analysis is possible to do, but extends beyond the interests, capabilities and resources of many evaluators. This chapter includes a discussion of the connection between second language learning theory and evaluation.

E-LEARNING RESEARCH: METHODS AND FINDINGS

Consistent with a learning sciences perspective (Hoadley, this volume), many researchers in this area seek to understand how second language learning takes place under certain technology-mediated conditions. Other more pragmatically oriented studies compare outcomes across technology-mediated and classroom conditions with the aim of finding evidence for the efficacy of technology-mediated learning over learning in face-to-face classrooms. Still other research seeks to describe the language and interaction that learners engage in while they are working with new forms of e-learning technologies. Across these different types of research, the methods used include quantitative comparative studies, qualitative studies of learners' language and behavior as well as case studies and mixed methods research designs.

Quantitative comparative research

Quantitative research has compared learning outcomes of students who studied their second language with and without the use of technology. In the current environment of second language studies, it may seem anachronistic to think about comparing a 'technology condition' to a 'no-technology condition' because almost all learners use some forms of technology for language learning. For some audiences, however, particularly those more distant from the profession, such comparisons are central to research on the use of e-learning for second language learning. As a consequence, over the past 40 years researchers have conducted many studies intended to measure and compare the effects of the different pedagogical approaches. A sufficient number of such studies has been conducted to raise questions about the overall findings across studies. Over the past decade, as meta-analysis, a methodology for summarizing across multiple quantitative studies, has attracted the attention of second language researchers (Norris & Ortega, 2006), meta-analyses of studies comparing language learning through technology with language learning in face-to-face classrooms have been conducted, as well. In fact, one of the early meta-analyses in second language studies investigated findings from a technology – classroom comparison. Zhao's (2003) meta-analysis included nine studies 'comparing language learning through technology and language learning in the face-to-face classroom', published in five journals in the five-year period from 1997 through 2001. Overall findings were positive, indicating superior

language learning outcomes for students using technology for language learning than for those studying in a face-to-face classroom.

A second, more comprehensive meta-analysis gathered studies in journals on language education and dissertations published from 1970 through 2006 (Grgurovic et al., 2013). This meta-analysis was more complex because studies needed to be grouped depending on precise aspects of the methodology. Nevertheless, Grgurovic and colleagues (2013) found that when research was conducted using appropriate equivalence testing for the pretest scores, small positive effect sizes were found in favor of the groups using technology. Moreover, when gains in language test scores from pre-tests to post-tests were evaluated, statistically significant positive gains were found for the groups of students using technology. The conclusion was that when comparisons between technology and non-technology groups were made in rigorous research designs, the technology groups performed better than the non-technology groups, as indicated by a small but positive and statistically significant difference. Overall, results did not indicate that technology was inferior to classroom conditions.

These meta-analyses provide a basis for making claims that language learning through technology has been found overall to be superior to classroom learning alone. However, this type of quantitative summary lacks the detail needed for teachers and course designers to use the results to develop better learning materials and tasks (Pederson, 1987). Moreover, comparing the effects of classroom instruction versus a technology condition is more complex than it first appears as we consider the many types of activities that learners might engage in under both conditions. Therefore, researchers working to understand how people learn through technology and to develop better technology-based tasks have primarily pursued qualitative lines of research.

Qualitative research

Qualitative research on technology-mediated language learning examines the language learners' experience in detail, which has helped researchers to understand the affordances of new technologies for language learning. Moreover, qualitative linguistic research has strong foundations in second language learning, which has made it possible for researchers to draw on theoretical perspectives and methodologies from the larger field of research on second language learning and teaching. For example, in 2004, the main research journal for English language learning and teaching, *TESOL Quarterly*, published guidelines for qualitative research including conversation analysis, case study and (critical) ethnography. Research on technology-mediated language learning has benefited from the applied linguistics adaptations of these social science methods in addition to linguistically based methods.

Qualitative methods for language and interaction

Researchers in applied linguistics have developed methods for the analysis of interaction and discourse in second language classrooms and in research settings. Data consist of the language that is spoken by teachers and learners as they conduct lessons, undertake collaboration and engage in small talk. The language is examined by researchers to obtain results about what language was used, the grammatical and lexical choices, linguistic accuracy, pragmatic aspects, communication breakdowns and recovery, and the way that conversational turns are distributed, for example. These initial results are sometimes subjected to secondary quantitative analysis, as well. The many approaches to qualitative linguistic research in technology studies share an objective of gaining an understanding of

the learners' experience as they work and learn through technology, but they do so from a variety of theoretical and empirical perspectives for different purposes. Examples of these purposes are provided in the following three sections: describing interaction, identifying negotiation of meaning, and seeking evidence for development.

Describing interaction

The methodologies for describing interaction fall within the broad set of analytic perspectives which examine how writers and speakers use language to express particular meanings and enact social functions in view of the context in which communication takes place. An important descriptive study of online communication in a second language classroom was conducted by Chun (1994), who identified in learners' language interactional speech acts displaying a number of functions, such as asking questions and requesting clarifications. She showed the variety of functions used by first-year German learners in computer-mediated communication in a university classroom in the USA, contrasting with student talk in a typical classroom. This and other studies have concluded that the written interactive medium promotes relatively large amounts of participation and that learners practice a variety of communicative language use (Beauvois, 1992; Kelm, 1992; Kern, 1995; Warschauer, 1995/1996; Ortega, 1997). For example, learners perform functions such as greeting, questioning, providing information, joking, managing other students, and a variety of forms of play (Warner, 2004). This is important because second language learners benefit from engaging in meaningful conversation, and in order to develop their language fully they need to use language for a variety of functions in communication.

A number of questions can be posed by researchers interested in describing online interaction. For example, several studies by Stockwell (2003) and colleagues have attempted to identify factors in email communications that may affect the sustainability of exchanges between native and non-native speakers. The idea is that in order to be valuable as language practice for nonnative speakers, online communication needs to occur for an extended period of time, and learners need to be actively involved by initiating topics. The Australian students Stockwell studied were advanced learners of Japanese and the students in Japan were studying cross-cultural communication. Some linguistic factors found to affect the ceasing of communication included a lack of explicitness, syntactic errors, pragmatic errors and topics closed by one speaker. These results are intended to point toward directions for helping learners to maintain conversations. Similarly interested in the dynamics of cross-cultural interactions, Schwienhorst (2004) examined the extent to which topic initiation was shared between native speakers and non-native speakers in synchronous communication. Comparisons were made based on findings from previous research on oral face-to-face tasks and the chat scripts recorded during collaborative tasks performed by native speakers of German and learners of German. Findings indicated an equal sharing of topic initiation moves, which showed that learners maintained a position equal to that of the native speakers in the online communication. This is one of the ways that the electronic communication is an equalizer among participants who typically have uneven power in face-to-face conversation – an unevenness that works against the learner. A medium that empowers learners to contribute, and indeed share in the control of the conversation, appears promising for language learning.

These descriptive studies characterize certain aspects of online communication with the implicit intent of evaluating the quality of the learning tasks or at least understanding them better. The focus is on providing a careful description of the language that occurs when learners at a particular level engage in specific types of second tasks online. In such

research, conversation analysis is emerging as an important analytic method because it attempts to capture how language users' utterances accomplish communicative intent and social action through conversation, as Negretti (1999) did in a study of ESL learners in a text chat. Detailed examination of social interaction in a virtual environment described in a conversation analytic style is also provided by Roed (2003). Both of these studies suggest how communication and social acts such as openings, closings and creating cohesion are accomplished in the new forum for second language communication offered by synchronous text-based electronic communication. What is important for second language studies is the fact that learners need to develop a somewhat different set of linguistic resources than those required for writing on paper or communicating face to face.

Identifying negotiation of meaning

Several studies of learners' use of online communication for second language tasks have evaluated the quality of interactions by relying on interactionist second language acquisition theory (e.g. Pica, 1994; Gass, 1997). This theory hypothesizes benefits for learning from communication breakdowns which require learners to negotiate meaning (Long & Robinson, 1998). Example 1 below comes from such a study in which the researcher recorded the conversation of two learners communicating over voice chat on the Internet (Sauro, 2001). The key episode begins in the third turn, or contribution to the conversation, where Sumiko, the English as a Second Language (ESL) learner, signals a lack of comprehension of Andy's message. Sumiko's 'pardon' prompts Andy to modify what he said with a simplification, which she appears to understand. The process of misunderstanding and stopping to obtain a message that can be understood is hypothesized to be beneficial for second language learning, and therefore such sequences are the objects of interest to the researcher.

Example 1: Negotiation of meaning (from Sauro, 2001)

Sumiko: Alright. So about our friend Harry.

Andy: Yeah, I'm a little concerned about him. I don't know, I'm a little concerned about him. I think he should take some leadership courses so he can gain some confidence. It looks like he's got a choice. He's interested in either Stanford or MIT.

Sumiko: Pardon?

Andy: It looks like Harry is interested in Stanford and MIT.

Sumiko: Yeah.

Andy: I don't know exactly how much you know about Harry... (Sauro, 2001)

The negotiation-of-meaning lens has been adopted regularly by researchers investigating interaction in various online language learning tasks across different types of participants (Blake, 2000; Blake & Zyzik, 2003) with positive results. Other research provides less clear support for online communication as a forum for fostering negotiation of meaning. Lee found that in terms of linguistic accuracy, learners tended to ignore each other's mistakes and moved on with the discussions. This shows that students 'focused on the meaning of the communication rather than on the form itself' (Lee, 2001, p. 242). In a setting where getting the meaning across is the only goal, this finding would be good news, but in conversations intended to help the development of linguistic accuracy and complexity of learners' language knowledge, good negotiation of meaning encompasses attention to linguistic form to repair

communication breakdowns. Some studies have compared the amount and effects of negotiation of meaning in chat with that appearing in comparable tasks carried out through face-to-face interaction. Fernández-García and Martínez-Arbeláiz (2003) found that more communication breakdowns occurred in face-to-face communication in part due to difficulty in perceiving the oral language for university-level Spanish speakers. The written mode of communication facilitated comprehension, precluding the need for the use of repair strategies. De la Fuente (2003) found both modes to be equally effective in promoting negotiation of meaning when the tasks were appropriately designed.

Other ways of identifying language focus during interaction have also been used in research on second language interactions. Such language-related episodes (Swain, 1998) are hypothesized to be useful for language development. Kitade (2000), for example, analyzed transcripts from the chat sessions of Japanese learners, finding instances where the learners had noticed and corrected their errors, either because they had recognized the errors themselves or because other chatters had pointed out the errors to them. In addition to this type of repair, she also found negotiation of meaning, concluding that the use of Internet chat with 'task-based second language interaction facilitates comprehensible and meaning-making interaction, awareness raising, as well as collaborative learning' (p. 162). She attributes these positive attributes of the communication to the fact that learners do not have to compete under time pressure for turns in the conversation. Instead, they can compose and post their messages at their own speed. Lamy and Goodfellow's (1999) construct of 'reflective conversation' – online discussion among learners about language and language learning – seems to get at the same idea of putting the language under the learners' direct attention. They contrast this with social conversation which requires little negotiation of meaning or stretching of competence. Overall, this research suggests that online communication can include both the focus on meaning that occurs in social conversation and the focus on form that can push learners' linguistic competence. However, these positive qualities need to be investigated rather than assumed.

Investigating development

A third way that interaction and discourse have been examined in the study of online learning is by seeking evidence for development of specific aspects of communicative language ability. For example, Salaberry (2000) investigated Spanish learners' development of present-tense verb inflections in oral face-to-face versus written chat interactions, finding that the written conversation was the better mode for development of verb forms because they are more salient in written exchanges than they are in oral communication. This finding is consistent with Pellettieri's (2000) findings that learners negotiated *form* in addition to negotiating meaning in text chat tasks, similar to those used in Blake's (2000) study. Presumably, these Spanish learners were able to focus on the details and the correctness of the morphosyntax that they had studied when they were not operating under the pressure of face-to-face communication and the elusiveness of oral language. A second example is a study by Belz (2004), who investigated data from online communication of learners of German over the course of a semester. She examined students' development of *da*-compounds, which are used to create cohesion within and across sentences, and are considered to reflect an advanced level of proficiency in German. Belz examined a 100,000-word corpus of online, collaborative correspondence through a microgenetic analysis, which 'traces the history of development of particular phenomena (e.g. the appropriate use of a particular grammatical structure) through close examination of its ecology of use in a given task' (Belz, 2004). The findings demonstrate the qualitative process of incremental development, i.e. microgenesis, of the construction: the idiomatic use of this feature is the first to appear, followed by uses of the

feature that refer to previously mentioned text, i.e. anaphoric reference, and finally occurrences referring to subsequent text, i.e. cataphoric reference, appear over time through the online collaboration. The perspective taken is that this emergence of grammatical competence in use is something that is seen over the course of communication among competent interlocutors, which, practically speaking, could only occur through the type of extended dialogue engaged in by the learners in this study.

Online cross-cultural collaborations yield data that are ideal for examining the development of pragmatic competence, which refers to the knowledge that allows speakers to make contextually appropriate linguistic choices. Pragmatic competence presents a different challenge to language learners than development of grammatical competence because the 'rules' are different. Typical classroom discourse is not conducive to development of pragmatic competence because of the lack of variety in the social contexts present in the classroom (Kasper, 2001). Belz and Kinginger (2003) and Kinginger (2000) reported on the analysis of data from a study of the German–English and French–English collaborative teams who communicated with each other over a two-week period during the overlapping segment of their language classes. The data demonstrate the development of pragmatic competence in the choice of the formal versus the informal variety of the word 'you' in French and German. As shown in Example 2, the English speaker uses the formal form of you, 'vous', to say 'But sometimes I would like to write in English for you.' The French speaker, who is also a student of the same status as the English speaker responds, 'I'm 21 years old, so therefore you should say "tu" [familiar "you"] to me.'

Example 2

English speaker: 'Mais, quelquefois, je voudrai ecrire en anglais pour vous...'

French speaker: 'J'ai 21 ans, aussi, donc TU dois me dire "TU".'

(Kinginger, 2000, p. 36)

The tu/vous distinction had been taught in the classroom, but without a real need to use the appropriate forms to keep from offending the interlocutor, this pragmatic choice is not mastered in the classroom. In contrast, 'The long-distance relationships formed by students offer contexts for language socialization, with support for conscious awareness of, and assisted performance in, the appropriate uses of the second-person pronoun (tu vs. vous)' (Kinginger, 2000, p. 23). The data from the weeks of collaborative work of the Americans with the Germans and with the French display many instances of help, such as the one shown in Example 2, and demonstrate that most learners improved dramatically in this area.

Online cross-cultural collaborations will continue to provide a rich source of data for examination of the grammatical and pragmatic aspects of learners' communicative language development. In addition, such data have proven valuable for the study of students developing intercultural competence, and for the attitudes and skills needed to be open to communication with interlocutors from other cultures (Belz, 2003; Thorne, 2003; Ware & Kramsch, 2005).

Case study

Case studies of technology and language learning typically examine multiple sources of data which are interpreted to understand how and why technology is used for language learning.

Factors of interest may be the educational context as well as teachers' and learners' knowledge and experience, in addition to the tasks learners engage in and their language, interaction and achievement. Cases can be individual students, classes or language programs; a single research project typically examines multiple cases. For example, Chang (2014) conducted a multiple case study to investigate the utility of corpus use for graduate students in Korea in STEM fields who were learning to produce professional and academic writing in English. Five master's and five PhD students had access to a corpus of academic English and to a specialized corpus constructed to contain writing in their own fields of study. The data came from weekly interviews and a final survey to assess their opinions about the utility of each of the corpora for the students' writing needs over a 22-week period. The specialized corpus was most appreciated by the PhD students, who made the following comments in interviews (Chang, 2014, pp. 249–250):

I can search English used in various fields, but it seems hard to search for English in the field that I need. (D2-Survey-0622)

In fact, the word that I type in is not the focus. I usually look for how that word is used in my field and how frequently it is used, so dictionaries are not helpful ... What is difficult is mainly those terms like 'FTL' or 'garbage collection,' which we do not use every day. Michelangelo [the field-specific corpus] shows how uncommon words such as those are used in my field, and that is its biggest advantage. (D2-Interview-0506)

I feel the usage of a word is very different depending on the context. Although a word is frequently used, if it is not used in my field, I feel that I don't need to use it. That's why I looked up words in Michelangelo. (M3-Interview-0401)

By examining learners' behavior in addition to their reflection on the use of the corpus tools, the researcher was able to find evidence useful for the selection of such resources for students who were learning to use discipline-specific language.

Classes were treated as the cases in another multiple case study investigating the use of a sophisticated set of multi-media materials (Jamieson & Chapelle, 2010). Twelve English language classes in four countries were investigated through student surveys, teachers' surveys and teacher interviews. The research provided a means of examining how the materials, which were developed by a large international ESL/EFL publisher, were received in different parts of the world. The surveys were developed to draw on professional knowledge about language learning in the evaluation process in order to yield results interpretable to applied linguists and materials developers. The multiple case study analysis was able to address the tension between the need for evaluation results that are relevant beyond a single class and the inherent context-specific nature of evaluation.

Case studies by their very nature invite researchers to gather and analyze a variety of data to provide insights into various aspects of the case. As a consequence, researchers investigating language learning and technology tend to find the logic of case study designs to fit well with their interest in gathering data on interaction and language use in addition to other data about, for example, achievement and attitudes. Additional qualitative data (Warschauer, 1998, 1999) have been useful in providing an in-depth understanding of technology use in the classroom as well as of language learners' selection and use of technologies beyond the classroom (Lam, 2000).

Mixed methods research

Like case studies, mixed methods research draws on multiple sources of data and interpretation strategies – those reflecting both qualitative and quantitative traditions of research methods. Mixed methods studies of language learning and technology are typically conducted with a pragmatic orientation to advance the field by finding ways of improving students' learning. Within a theoretical frame of pragmatism, research methodologists across the social sciences have developed foundations of mixed methods research well suited to studying technology and language learning (Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 2010). The goal is to obtain and interpret two types of data within a single study. The qualitative data allow for the investigation of the detail of how students interact with the technology to understand factors that prompt success and failure, learners' engagement and its limitations. These data hold interest particularly for teachers and materials designers. The quantitative data are of particular interest to researchers wanting to investigate the effectiveness of technology use to obtain results with consequences for teaching and teacher education, i.e. generalizable results.

An example of a mixed methods study by Cotos (2014) investigated the use of automated writing evaluation tools for providing feedback on students' writing. The research was guided by the analysis of research needs in this area by Warschauer and Ware (2006), who noted the need for a more detailed examination of student use of such tools and their effects. The study used a mixed methods approach, which provided a methodological framework for gathering empirical data about learners' interaction with the tool, as well as about the factors influencing the interactions and learning. The qualitative and quantitative data were collected concurrently and integrated during the analysis and interpretation stage. Data from pre-/post-test scores, automated scores, survey questions, a Likert-scale questionnaire, think-aloud protocols, interviews, observations, student drafts, and screen recordings were examined. Results were interpreted in terms of the characteristics of technology tools that had been identified as important based on an evaluation framework for second language learning technologies (Chapelle, 2001). The findings indicated that students' use of the tool could be linked to improvement in writing for the whole group. The qualitative data revealing the detail of interaction and the students' perceptions of that interaction demonstrated reasons for the positive findings. More mixed methods studies continue to appear because of researchers' need to obtain comprehensive data about learning (e.g. Li & Hegelheimer, 2013).

Theoretical bases for research

The variety of research methods for investigating technology and language learning has been integrally linked to theoretical perspectives on second language learning. On the one hand, researchers wishing to move beyond quantitative comparison studies need a richer more substantive theoretical basis for the design of their research. On the other hand, the precise data obtained from researchers investigating online performance require a theoretical lens for their interpretation. Twenty years ago, the link between second language learning theory and research practices was not readily made, but since that time more concrete links have been established. This advance in the field occurred when researchers began to make explicit the implications of some of the tenets of interactionist second language acquisition for the design of technology-mediated materials (e.g. Doughty, 1987; Chapelle, 1998, 2003, 2005), and for an evaluation of technology for language learning (Chapelle, 2001). The links between second language acquisition perspectives and technology research have been productive, and one can now find explorations into a range of theoretical perspectives as they pertain to technology research (Egbert & Petrie, 2005; Levy & Stockwell, 2006; Chapelle, 2009).

Examples in the literature of theory-linked investigations of technology for second language learning are numerous; the types of process and strategy data they capture include responses to feedback from the computer, look-up behaviors, chat logs, recorded screen captures and video-recorded sessions. For example, Suzuki's (2013) study of a university student in the USA learning Japanese gathered data using video recordings of students' behavior in front of the screen in addition to synchronized recordings of the on-screen activity. The carefully gathered data detailing the learners' actions in the context of the class are used as an argument for the value of the context set up in the online course: 'it is this learning context that generated the greatest affordances for language learning by allowing her to create a private learning environment of her own' (p. 386). This claim is made on the basis of the process data showing that the 'physical environment allowed her to actively take her private turns without being heard by others' (Suzuki, 2013, p. 386) and the interpretation of 'private turns' through the lens of sociocultural theory.

Suzuki's study is grounded in sociocultural theory and demonstrates a consistent theoretical framing of the study with the research question to the data collection methods and their interpretation. It is also common to see a framing for such research that combines more than one theoretical perspective to give meaning to process data. Lee (2009), for example, introduces the background for her study beginning with Skehan's (1998) cognitive perspective and then moves on to a sociocultural perspective. Such mixing of theoretical perspectives, constructs, data collection methods and frames of interpretation has developed within the pragmatist's stance that underlies much of the evaluation of technology for language learning. The goal is primarily to be able to create better designs for learning rather than to be loyal to a particular stance. This eclecticism is also evident in a recent theoretical approach to second language acquisition – dynamic systems theory (DST) – which theorizes in broad strokes the complexity of language development through a number of processes (Larsen-Freeman & Cameron, 2008). Sockett (2013) used DST to interpret language learning processes in a study of students engaged in informal, online language study. Students who were considered experienced in second language acquisition research reported their language learning experiences on blogs. Sockett (2013) interpreted their reports through the lens of DST to identify reported behaviors supportive of language development. The theory accommodates the variety of conditions that learners inadvertently create for themselves in informal learning through their participation in activities and their access to materials in English on the Internet.

CONCLUSION

As technologies continue to play an increasing role in communication and learning, these evaluation methods and their intersection with theory will undoubtedly evolve. In this environment, the simplicity of research comparing technology with no technology conditions is striking. Given the fascination that this question holds for many decision-makers in the educational system, it is fortunate that past research addressing it has been analyzed through meta-analysis to provide a defensible response. For the many professionals engaged in the study of language learning through technology, methodologies other than comparisons are helping to provide useful, even if complex, data to inform their practice and the development of the field. For them, this dynamic environment, where technologies, research methods and theory are all changing creates new challenges. One is to interpret research results in a manner that they can inform practices in teacher education so that future teachers and students can benefit from the research. Another is to attend to the need for evaluation frameworks to evolve to capture and use the results coming from a variety of research on the

expanding number and types of technologies and pedagogies.

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