Learning through technology

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Chapter 34: Learning through technology

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Introduction

With the rise of digital media and their increasingly pervasive use in educational settings, more and more attention is being paid to the ways technology can facilitate language learning. Most discussions about the effects of technology on language learning, however, have focused rather narrowly on 'new media' (computers, the internet, and mobile devices), ignoring the fact that *technological mediation* has been a central component of language learning ever since the invention of the printing press. While understanding the effects of digital technologies on language learning is of primary importance, especially as such technologies are becoming so much part of the fabric of our everyday communicative practices, doing so requires a more general understanding of *technological mediation* itself (see Norris & Jones, 2005), and the ways it influences both cognitive and social processes.

Overview

The most important thing to remember when trying to make sense of the impact of technological mediation on language learning is that *all* learning is mediated through tools which act both to support users' cognitive development and to connect them to the social contexts in which learning takes place. Vygotsky (1962) divided these tools into *psychological tools* (such as languages and counting systems), and *technological tools* (such as printed texts and other media). "An essential

key to understanding human social and psychological processes", according to Vygotsky, "is the tools … used to mediate them" (Wertsch, 1990, p. 113). More recent scholars have taken this idea even further, arguing, as does Clark (2003), that the advance of human culture (including the development of language) has always depended on our ability to use technologies to mediate our interaction with the environment. Humans are, Clark insists, 'natural born cyborgs.'

Another important thing to remember when considering the effect of technology on language learning is that all technologies are biased (Innes, 1951). All tools bring with them different affordances and constraints when it comes to the psychological and social actions (including actions associated with learning and communicating) that we can perform with them. Writing, for example, allows us to record language in a form that is more permanent than spoken language and to transport it over space and time, affordances which, according to the literacy scholar Walter Ong (1988), facilitated the development of modern 'rational' thought and cultural memory. A constraint of writing is that it is less efficient at transmitting the phonological and non-verbal aspects of spoken language, affordances that are more associated with electronic media (television, radio, and audio and video recording devices). As a result of their inherent biases, technologies do not just affect how we learn language, but also how we use it in our everyday lives. In some respects, learning a language is as much a matter of learning how to use the technologies through which language is recorded and transmitted as it is learning a set of grammatical or phonological conventions.

Finally, technologies do not just affect how we learn and use language, but also the *ideologies* that we adopt regarding what we consider to be 'correct' or 'standard' language or the 'best way' to learn language. The invention of the printing press, for example, played a big role in the development of standard grammars and lexicons, giving rise to a bias in both linguistics and language teaching towards written language over spoken language (Linnell, 2011), and advances in

audio recording, especially as they were implemented in the context of language laboratories, played an important role in ensuring the prominence of the audiolingual approach that dominated language learning in mid 20th century.

My goal in this chapter is not to present an account of the various methods and techniques associated with different language learning technologies, nor to review the considerable literature on the effectiveness of different technologies used in different ways to learn language (for such reviews see Kenning, 2007; Salaberry, 2001; Zhao, 2003). Rather, I will attempt to lay out the key aspects of *technological mediation* which impact on the way people learn language, providing for learners (and teachers) a framework with which to understand and evaluate their own use of technology in language learning.

Key learning issues

Technologies influence language learning in at least four ways. First, they influence the kinds of meanings that can be made with language, and thus, the kinds of meaning-making processes that learners are given the opportunity to practice. Second, they determine the ways we can record, preserve and transmit language, affecting the type and quality of input learners are exposed to and what they are able to do with that input, as well as how they are able to reflect on their output. Third, they affect the kinds of interactions learners are able to have with the language, the kinds of people they are able to interact with, and the roles they are able to play in these interactions. Finally, technologies play a role in learners' ability to develop autonomy in their learning, to determine their own learning trajectories, and to apply what they have learned to authentic situations.

Meaning making

As I mentioned above, perhaps the most important effect technology has on language learning is on the types of language it allows us to produce — or, more accurately — the types of 'meaning

making' it allows us to engage in. Different technologies channel their users into particular kinds of meaning making: written texts, for example, channel them into forms of asynchronous, decontextualzed meaning making, whereas spoken language channels them into more multimodal, context dependent forms of communication in which meaning can depend as much on resources like prosody and gesture as it does on words and grammar. New forms of communication made possible by digital technologies are introducing new forms of meaning making which depend on the rich combination of words and images arranged in hypertextual rather than linear patterns (Kress, 2003; Jones & Hafner, 2012).

Using different material resources for making meaning requires different kinds of skills. Learners who spend the bulk of their time studying and producing written texts are sometimes less able to engage effectively in conversations, not because they are deficient in lexical or grammatical knowledge, but because they lack ability to apply that knowledge to conventions of meaning making in spoken language (see also Chapter 22). Similarly, those who spend most of their time practicing speaking are likely to have more difficulty producing effective written texts. Most considerations of the relationship between channel and meaning-making have not gone much beyond this spoken/written binary. Many technologies used for language learning, however, have the effect of disturbing that binary. Audio recording technologies, for example, put students in situations in which they need to produce and interpret spoken language without many of the resources (such as gesture and facial expression) normally associated with speech, and technologies like SMS and instant messaging, although regarded as forms of writing, employ many of the discourse conventions of spoken language. The main point is that whenever people communicate through technologies, they are not just using 'language' — they are using particular combinations of communicative resources each with their own particular potentials for meaning making. Much of what it means to be a competent user of language is understanding how to effectively exploit the different modes and media we have available to us to make the kinds of meanings we want to make.

Entextualization

Related to the fact that different technologies make possible different forms of meaning-making is the fact that they also make possible different means of *entextualizing* language (Jones, 2009)—that is, of creating artefacts that can be transported from place to place, reviewed and analyzed, and manipulated in various ways. Entextualization — what Bauman and Briggs (1990, p. 73) define as "the process of rendering discourse extractable, of making a stretch of linguistic production into a unit−a *text*−that can be lifted out of its interactional setting" — has an enormous impact on language learning, dramatically increasing both the learner's ability to be exposed to comprehensible input and to engage with that input in meaningful ways. The technology of writing, for example, gives learners access to a range of linguistic artefacts which they can read and review multiple times, and the technology of audio recording not only gives them the chance to listen to a variety of speakers and accents, and to replay stretches of talk over and over again, but also gives them the opportunity to 'entextualize' (record) their own voices and reflect on their own linguistic performance

Extextualization acts as an important cognitive support for language learning in several ways, First, it serves as an aid to memory, rendering linguistic behaviour more durable so that learners can return to it and revise or review it when necessary. Second, texts serve as instruments through which input can be made more comprehensible and salient (Warschauer & Meskill, 2000). Texts do not just preserve language; they also give us the opportunity to manipulate it, annotate it, edit it, recontextualize it, and divide it up into more manageable units. Finally, technologies of entextualzation encourage reflexivity. The most obvious example of this is when learners engage in their own acts of entextualization, and so are able to read, listen to, or watch representations of their own linguistic performance. But even engaging with texts made by others provides useful opportunities for learners to monitor and reflect upon their linguistic performance.

The feature of digital technologies that is sometimes overlooked in discussions about their potential to aid language learning is the range of new ways they facilitate entextualization. Not only do computers allow us to store a staggering number of texts, and to access millions more through the internet, but they also allow us to search through these texts in sophisticated ways and to create concordances that can reveal patterns of language use. Many learners nowadays carry around with them (in the form of smart phones) devices which allow them to record written texts, voice, images and videos in nearly any situation in which they find themselves, and most interactions that they engage in using these devices — from SMS chats to comment threads on social networking sites — are preserved in the form of 'persistent conversations'(Erickson, 1999) that come to constitute an archive of their past language use and a record of their progress (see also Chapter 36).

Interaction

The third important dimension of technological mediation for language learning is the way in which technologies either amplify or constrain opportunities for social interaction, and the kinds of patterns of participation within these interactions that they make possible. There is among many researchers in language acquisition a longstanding conviction that effective learning requires more than just comprehensible input and reflexivity, but also requires opportunities for learners to engage in authentic, spontaneous and purposive communication with others (see for example Long, 1981, see also Chapter 11). Interaction, however, is not a simple or unitary thing — people use language to interact for a variety of different purposes, through a variety of different channels, with a variety of different opportunities for participation. As Goffman (1981) points out, our conventional concept of communication involving simple roles of 'speaker' and 'listener' does not accurately convey the patterns of participation in most real life communication. There are many different kinds of speakers and listeners — from performers and audiences to partners in conversation, from addressees to overhearers— who have very different kinds of rights and roles in interaction.

Different technologies help to create the conditions for these different patterns of participation, or as Goffman (1981) calls them, 'participation frameworks'.

Printed materials, for example, enable a kind of asynchronous, one-way interaction in which readers generally cannot 'talk back' to writers, whereas new forms of reading made possible by hypertext and web 2.0 allow readers to formulate their own pathways through texts and to interact with the writer and other readers through comments (Jones & Hafner, 2012). Language laboratories and computer labs in which learners sit in separate cubicles, often wearing earphones, can severely constrain opportunities for interaction, and when interaction is part of activities involving these technologies, as when students are asked to have conversations with 'partners' in language labs, these conversations are usually highly controlled, contrived, and limited to dyadic interactions. Networked computers and the internet have revolutionized the opportunities for participation and interaction open to language learners. Not only are learners able to take the roles of 'authors' or 'broadcasters', engaging in the kind of one to many communication that heretofore was only the province of the few, but they can also engage in complex multiparty interactions in chatrooms and on social networking sites.

Multiparty interactions in digital networks are very different from group discussions in classrooms. First of all, such networks give students a chance to seek out and interact with people who have similar interests within what linguist James Gee (Gee, 2004; Gee & Hayes, 2011) calls 'affinity spaces', in which motivation for communication is generally much higher than it is in the artificially formed groups characteristic of language classrooms. Second, networked communication provides a greater variety of participant roles than does group discussion. Participants in networked interaction can address large groups of people, break off for discussions in small groups or pairs, 'lurk' or 'listen in' to other people's conversations, or engage in a variety of 'low cost' forms of interaction such as 'liking' (Jones & Hafner, 2012). The value of this interaction for language learners is that it

gives them a wide range of opportunities to engage in what Lave and Wenger (1991) call 'legitimate peripheral participation', allowing them to gradually build up the skills and confidence that they will need to participate more fully both socially and linguistically in these communities.

Autonomy

Finally, technologies have a potential impact on learners' capacity to develop autonomy in their language learning, that is, their capacity to take control of their own learning trajectories and develop strategies for learning independent of teachers and of staged materials written for language learning. Technology, of course, has been a central feature of self-access centres, which have typically made available to students things like audio recordings, video tapes, and more recently, computer programs to assist them in learning independently (Gardner & Miller, 1999). Recently, however, more attention has been paid to the opportunities learners have to build autonomy outside of controlled spaces like self-access centres. In this respect, the internet has made the self-access centre obsolete. It has given learners access wherever they are to nearly all of the multimedia resources they used to have to go to self access centres to use, as well as many of the support services normally associated with self access centres, such as vocabulary glosses, graded exercises, language learning games and other activities, and interaction with online teachers and other learners.

The shift that digital technology has brought about in the way we understand autonomy in language learning, however, goes far beyond the expansion of self access opportunities into cyberspace. The capacities introduced by digital media and the internet for accessing information and initiating interaction do not just facilitate the development of conditions more traditionally associated with autonomy (such as the chance to plan and monitor one's own learning), but also create new conditions, such as opportunities to initiate relationships with all sorts of different kinds of people

and to explore and create new kinds of learning opportunities according to one's own interests and abilities (Ito et al., 2008). As Benson (2013, p. 840) observes:

> Early work on autonomy… placed a high priority on the collection and provision of resources through self-access and on programmes to train learners in their use for self-directed learning. Learner control was, in effect, both institutionalized and other-initiated. The advent of digital literacies, however, means that autonomous language learning is more likely to be self-initiated and carried out without the intervention, or even knowledge, of language teachers.

This shift in focus has led to a greater appreciation for learners' everyday literacy practices such as blogging, social networking, and online gaming (Chik, 2013; see also Chapter 13), and how these practices can create unique and powerful opportunities for language learning, even when language and learning are not necessarily foregrounded or explicitly attended to.

Another important, though still nascent, capacity of digital technologies to enhance autonomy lies in the capacity of digital texts to 'read their readers' (Jones, 2015), and to adapt themselves to individual users' needs or interests. Adaptive systems are a central component in most everyday internet experiences such as online shopping sites that make recommendations to customers and search engines which filter content based on users' past behaviour. Now such technologies are finding their way into language learning programs that use algorithms to analyse the way learners interact with them and provide recommendations and feedback based on this analysis (Kerr, 2015).

Implications for teaching and assessment

In this chapter I have suggested a framework for analyzing the effects of technology on language learning, which can be expressed in a series of questions which learners and teachers can consider when introducing different forms of technological mediation into the learning process:

1) What kind of meanings does this technology allow users to make that might be different from those that can be made with other technologies? How might this meaning-making potential affect the forms of language and communicative skills that can be practiced?

2) How does this technology allow users to create, store, and transmit texts, and to review and reflect on them? What affect might this capacity have on users' ability to be exposed to useful input?

3) What sorts of social interactions does this technology make possible? What sorts of participant roles are made available to them, and what kinds of opportunities might these interactions provide for meaningful language practice?

4) What opportunities does this technology provide for learners to plan and monitor their own learning, and to create new learning opportunities for themselves?

Asking these questions will not just sensitize teachers to the inherent 'biases' built into the technologies they use in their classrooms, but also to the affordances for learning that students might exploit in their use of technology outside the classroom, including affordances for self-monitoring and self-assessment.

Conclusion

The most important insight we can take away from an analysis of technological mediation and language learning is that technologies — from the printed word to digital video — do not just change the way we can learn language, but also change the way people *use* language. New technologies give rise to new social practices, involving new linguistic forms, new forms of interaction, and new communicative roles and social identities for people. When looked at from this

perspective, the focus of our inquiry into the relationship between language learning and technology shifts from questions about how technology is changing the way language can be learned to questions about how technology is changing the kind of language we must learn, and the kinds of things we must learn to do with language.

Questions for further discussion

1. Choose a technology that you have used to learn or teach language and analyze it based on the four dimensions of technological mediation introduced in this chapter: meaning-making, entextualization, interaction, and autonomy. What does your analysis tell you about how the technology might affect how people learn language and the kind of language they might learn?

2. We often think of the ways technologies aid language learning, but technologies can also constrain opportunities for learning. Can you think of any examples of this constraint?

3. Different technologies seem to fit better with different theories of how languages are learned. What theories of language acquisition are supported by the following technologies: print media, audio recordings, the internet and web 2.0?

4. Technology does not just change the way we learn language, but also the way we use language in our everyday lives. Choose a technology and talk about how it has altered the kinds of language and communicative practices language learners need to master.

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