Polysynchronous: 
dialogic construction of time in online learning

MURAT OZTOK
Graduate School of Education, University of Pennsylvania, Philadelphia, USA
LESLEY WILTON, KYUNGMEE LEE, DANIEL ZINGARO,
KIM MACKINNON, ALEXANDRA MAKOS, KRISTLE PHIRANGEE,
CLARE BRET & JIM HEWITT
Ontario Institute for Studies in Education, University of Toronto, Canada

ABSTRACT Online learning has been conceptualized for decades as being delivered in one of two modes: synchronous or asynchronous. Technological determinism falls short in describing the role that the individuals’ psychological, social and pedagogical factors play in their perception, experience and understanding of time online. This article explores the history of synchronous and asynchronous concepts and argues that an examination of students’ perception of time in online contexts is required if we are to move past asynchronous-synchronous dualities toward a more nuanced understanding of how time manifests itself and affects pedagogical practices. Bakhtin’s concept of the dialogic is used as a framework to explore how time in online learning has been reshaped through dialogue. A new description of time online as being polysynchronous is suggested and the illustrations provided explore the educational implications of this time shift on online discussions.

Introduction
Synchronous and asynchronous modes of communication have been conceptualized in online learning literature as important, distinct modes of online learning. Yet existing research tends to treat each of these modes as being synonymous with the kinds of technologies that are designed to support it. For example, instant messaging (IM) is seen as synchronous because people are communicating in real time, whereas thread-based discussion is seen as asynchronous because the conversation is relatively independent of a shared timeframe (Harasim, 2012). This invocation of technological determinism, based on earlier and simpler conceptualizations of time in relation to technological function, fails to problematize and consider the potential roles played by psychological, social, and pedagogical factors in the perception, experience and understanding of time online.

We argue that the terms asynchronous and synchronous do not accurately represent time as understood by participants in online learning settings. By focusing solely on technology, we fail to acknowledge time’s individual effects and its impacts on pedagogical practice. As suggested by transactional distance theory (Moore & Kearsley, 1996), structure is an important aspect of learning that affects dialogue and autonomy – two critical elements for effective online learning. As such, we suggest that our current conceptualizations of time in terms of synchronicity and asynchronicity are inadequate for understanding students’ dynamic and increasingly complex communication patterns. The computer is no longer the single access point through which students are engaging in online learning; tablets, smart phones and other Internet-connected devices now act as portals to these learning environments where access is controlled by the users and cannot be simply define as either asynchronous or synchronous.

http://dx.doi.org/10.2304/elea.2014.11.2.154
In this conceptual article, we draw from the literature to argue that the current perceptions of synchronous and asynchronous communication are historical relics that cannot adequately explain how students perceive the concept of time in their online experiences. We use Bakhtin’s (1981) concept of dialogicality to explain how time is socially constructed through pedagogical practices. According to this perspective, time is tied to the context and is a relational construct emerging from the connections among the author, the work, and the reader, each of which affects and influences the others. That is, time evolves dynamically and is affected by and affects the context that produces and uses it. Such an account challenges current understandings of online environments as enabling ‘any-where, any-time’ access.

Background

We begin by examining the history of computer-mediated communication (CMC) in order to understand how and why the historical development of CMC has influenced the ways current online education scholars perceive, conceptualize, examine, and draw conclusions about pedagogical practices. The literature indicates that the distinction between the two modes of communication is conceptualized in terms of data transmission, ignoring the human agency in the use of such communication technologies. We shall demonstrate that such technologically based definitions remain inherent in current conceptualizations.

Throughout the 1970s, 1980s and 1990s, the term asynchronous was defined as ‘a mode of data communication that provides a variable time interval between characters during transmission’ (Spencer, 1993, p. 16). Asynchronous transmission, when referring to the 2400 bps (bits per second) transmission speeds of the early 1990s, was understood as a ‘[m]ethod in which data characters are sent at random time intervals’ (p. 16). At the time, this method was used as a ‘basis for all modern calls, E-mail, and links to networks. Communications software tells the receiving computer when the transmission of each character starts (called a start bit) and stops (called a stop bit)’ (Morse, 1996, p. 23). At this time, while this mode of communication was termed asynchronous, the technologies (such as email or network communication) were not characterized as such. Recently, scholars have suggested that asynchronous communication occurs in delayed time and does not rely on simultaneous access for educational outcomes (e.g. Tu & Corry, 2003; Johnson, 2006; Rovai, 2007). Harasim (2012) analyzes the current meaning of asynchronous and notes that while the term originally referred to transmission without the need for clock synchronization, it is currently used to refer to ‘communication occurring at different times such as when users send email messages to each other that are stored until read by the recipient’ (p. 175). For example, asynchronous online learning refers to the ‘use of computer communications to enable learners to participate in common educational activity without having to be in communication at the same time’ (p. 175).

In the 1990s, synchronous communication was defined as ‘[i]nformation sent over a telephone line by separating data by time, not by start and stop bits’ (Morse, 1996, p. 264). Furthermore, in synchronous transmission, ‘strings of multiple characters are continuously transmitted. These strings are preceded and followed by a synchronization character that aligns the sending and receiving devices’ clocks, so they can track the position of each character’ (Morse, 1996, p. 23). Synchronous transmissions were tied to clocks in the communicating devices and required dedicated connections not available via a typical circuit-switched voice service. Current conceptualizations of the term continue to reflect this perspective and argue that synchronous communication involves real time communication between teachers and students, most commonly in the form of text chat (e.g. Schwier & Balbar, 2002; Johnson, 2006; Kuyath, 2008). Harasim (2012) explains that the definition of synchronous communication has expanded and that it currently refers ‘to communications between people in real time. Telephone calls are examples of synchronous communications. Chatting on computer systems (the sending of short text messages by people on the system at the same time) is also synchronous’ (p. 180).

Built on these historical definitions, current literature continues to make a distinction between synchronous and asynchronous communication. For example, some work argues that asynchronous CMC has advantages over synchronous CMC. Asynchronous threaded discussions have been associated with the idea of anytime learning, referring to having no temporal boundaries.
since students are ‘spread out in both space and time’ (Hiltz & Goldman, 2005, p. 5, emphasis added). Others espouse the ability of synchronous CMC to support social cues and immediacy that are considered lacking in asynchronous communication. While there are several studies suggesting that the line between the two communication modes is blurred as individuals appropriate the technologies as convenient (e.g. Haythornthwaite et al, 2000), current understandings continue to ignore, to a great extent, the ways in which humans perceive and use these tools.

Technological determinism is an important concept inherent in both historical and current definitions of how time is perceived. Technological determinism suggests that technology is an autonomous force that is independent of context and devoid of the complex interplay of social, economic, and political forces. In its simplest definition, technological determinism is the philosophical stance that technology is the driving force in the modern world. According to this perspective, ‘communication technology sets the conditions for social formation. It influences our cognition and sensorium, changes our social behavior and shapes our culture’ (Lee, 1996 p. 201). Proponents of this perspective argue that technology’s effects are not bounded by the processes within which it is used. In line with this perspective, the literature indicates that both historical and current definitions of how time is perceived are based on the signal transmission protocols and technological tools used in this process. For example, text-based instant messaging and videoconferencing are not deemed asynchronous because these technologies require learners and instructors to be available at the same time (Hiltz & Goldman, 2005). Building upon this deterministic perspective, online education research suggests that pedagogical benefits and pitfalls are inherent in these commutation modes and that each mode should be used accordingly. As briefly mentioned above, online learning research overwhelmingly suggests that while asynchronous communication allows individuals to reflect and think critically, it does not foster sense of belonging and other important social notions. On the other hand, it is argued that synchronous communication supports immediacy but lacks the capacity to carry deep and meaningful reflection (Oztok & Brett, 2011; Oztok et al, 2013). Much of the associated argumentation focuses on the technologies themselves, not how they are appropriated in context-specific ways.

It is important to note that we do not deny the potential of technology to shape and constrain the types of communication that occur under its purview. Indeed, changes in modern structures and rapid developments in information and communication technologies can impact or alter our culture, lifestyle, behaviors, personal taste, and perceptions. However, we argue that the capacity of the medium cannot be the only variable in defining the curriculum and pedagogy of online learning. We suggest a dialectical approach and search for balance between any extreme position in order to ‘move beyond the notion of technology as a simple cause of social change [on the one hand] and the idea of technology as an easy fix for complex social problems [on the other]’ (Buckingham, 2008, p. 12). That is, while technology has inherent constraints and possibilities for affecting social life, its production, use, and distribution is shaped and appropriated by social actors and institutions.

As we have described, terms that once described the transmission protocols between computer devices have now been adopted to define the theory and practice of temporal dimensions in online education. However, this appropriation seems insufficient for describing the reality of current practices. For example, can an IM entry really be considered synchronous if it is not immediately read or does not receive an immediate response? Should a threaded discussion entry written on a portable device continue to be considered asynchronous if it replies to the preceding note within a few minutes of its posting? How then do our current perspectives answer the existing types of online learning interaction from a temporal perspective? There is a need for new perspectives in conceptualizing the temporal dimensions and their effects on online learning. While we do not deny the affordances of technological tools, we argue that the concept of time requires perspectives that accept the capacity of technology while at the same time acknowledging the importance of social construction.
Bakhtin’s Concept of Dialogic

According to Mikhail Bakhtin, a practice remains meaningless until someone from ‘outside’ of the context constructs specific meaning out of it (Holquist, 2004). Bakhtin has built this idea upon Einstein’s concepts of relativity and has suggested that ‘outsideness’ is a critical principle of meaning-making (Marchenkova, 2005). The relation of the self and the other in dialogue emerges through their interaction with each other in particular social and cultural contexts. Consequently, dialogue inevitably involves collaboration between the self and others (Ewald, 1990). It is therefore assumed that acts of speaking and listening or observing and being observed are shared experiences of the simultaneous event of meaning-making (Holquist, 2004, p. 19). In addition to outsideness, Bakhtin provides two other useful notions for understanding dialogue: ‘heteroglossia’ and ‘simultaneity’. Heteroglossia refers to a fundamental condition of the dialogic collaboration in which multiple perspectives and voices deriving from different backgrounds of participants can co-exist. Simultaneity refers specifically to the different cognitive sets of time and space categories that are inherent in the two bodies and the conversation situation (Holquist, 2004). Heteroglossia and simultaneity suggest that two individuals involved in the same event exist in different positions; thus, they cannot physically occupy the exact same space at the same time. Consequently, unclosed distance between two entities exists as each entity brings different cultural and social backgrounds to the dialogue.

The literature shows that Bakhtin’s dialogism has been employed for understanding the dialogical processes within diverse ‘social learning spaces’ (Zack & Graves, 2001, p. 235). Along with other socio-cultural theories, this dialogical understanding of educational practices emphasizes the interaction among learners for making meaning from their conversation (Marchenkova, 2005). Kubli (2005) defines learning as constructing knowledge based on exchanging ideas with others and accepting different voices into the dialogue of the classroom. From this perspective, it becomes critical to increase heteroglossia in the classroom discussion as a means to promote effective learning rather than to standardize or homogenize learners’ utterances. Similarly, Hamston (2006) suggests the importance of including diverse social perspectives and cultural backgrounds in classrooms and having students participate in conversation about that diversity, not only to construct particular kinds of knowledge, but also to build students’ identities. He also points out that simple language exchange or physical participation in conversation should be differentiated from true dialogue involving both utterances and responses that make meaning. Freeman and Ball (2004) utilize the Bakhtinian concept of ideological becoming and refer to how we develop a way of viewing the world rather than how we construct knowledge or concepts (p. 5). This conceptualization also presupposes the diversity of ideologies – sets of ideas reflecting the different social needs of individuals, groups and cultures – which can only be shared and understood through dialogical interactions.

Educational Implications

In order to understand the implications of Bakhtin’s perspective in online learning practices, we employ transactional distance theory (Moore & Kearsley, 1996). Transactional distance has been prominently employed as a theoretical framework to identify and examine a broad range of pedagogical activities in distance learning (Kang & Gyorke, 2008). Transactional distance is the learner’s perception of psychological and pedagogical gaps that are caused and determined by amounts of dialogue, structure, and learner autonomy in CMC environments. While dialogue refers to the interplay between teacher and learners in CMC environments, structure indicates the extent to which a course’s elements can be individualized to meet the specific needs of learners. In relation to these two variables, learner autonomy refers to individuals’ control over their learning activities and processes. Transactional distance suggests that when there is considerable structure and low autonomy, individuals will engage in only small amounts of dialogue. Thus, they are less likely to engage with each other and consequently will perceive a higher degree of transactional distance (Moore & Kearsley, 2005). In other words, structure is the decisive element in the extent to which individuals have autonomy in dialogue in online learning environments. Therefore, according to transactional distance theory, dialogue and autonomy are two important concepts by which individuals engage with each other and make sense of their learning.
When transactional distance theory is conceptualized in terms of Bakhtin’s concept of dialogic, we believe that the deterministic definition of synchronous and asynchronous communication and pedagogical practices associated with these terms can represent the concept of structure in transactional distance theory. That is, when the instructional or pedagogical design of the course is built upon deterministic perspectives, these perspectives may limit students’ autonomy and their dialogue with each other. However, as we demonstrated elsewhere (Oztok, 2013), students’ participation in threaded discussions and engagements with each other are not predefined; rather, students appropriate the use of available communication tools depending on situational constraints. Similarly, the concept of autonomy in transactional distance theory can be interpreted as the concept of simultaneity and heteroglossia in Bakhtin’s perspective since all of these concepts refer to the actions, practices, and enactments of individuals in the same time-space continuum. In this article, we foreground the concept of dialogue in transactional distance theory and use structure and autonomy in the background to explain how time can be constructed dialogically in online learning environments. Specifically, we use the concept of dialogue to explain Bakhtin’s perspective of dialogic construction.

We have argued that synchronous and asynchronous are inadequate for understanding dialogue as it occurs in today’s reality. To this end, we introduce a new term, polysynchronous, to capture a middle ground between technological determinism and the affordances of technology. We offer the following definition of polysynchronous communication: a form of dialogue that takes place via technical functionality that flows flexibly and simultaneously between asynchronous and synchronous potential, and according to individual end-user workflows. What is important about this concept is that it distinguishes pedagogical practices from the more traditional synchronous-asynchronous dichotomy and that it suggests that communication is not constrained by a singular definition of what the technology can afford, but rather is free to emerge in a form that reflects the evolving needs of the user over time. In other words, we use polysynchronous communication to argue that a single medium can be both synchronous and asynchronous, as the need arises and in response to individual circumstances; and that one person’s needs does not circumvent the needs of other users. In this way, synchronicity is seen as a dynamic phenomenon that results from the constantly changing and varied relationship between workflow and technology rather than being a fixed attribute of the particular device or program being used.

Illustration of Polysynchronous Communication

How does polysynchronous communication look in practice, and why is it distinct from synchronous and asynchronous communication? We provide the following scenarios as a starting point for understanding what we mean by polysynchronous communication. Such scenarios will feel familiar, as they are intended to emphasize the ways in which we use technology today.

Illustration 1:

Dexter has been teaching for nine years and decided to take an online course this year to familiarize himself with new teaching and learning theories. On the first day of the semester, he received an email from his instructor that introduced the course, the required readings and the weekly group and module structure. While he was able to keep up with the course work for the first three weeks, work demands prevented him from working at all on the course in the fourth week. It was not until the weekend following week four that he was able to log in to the course website and read the notes that had already been posted by his peers. He read many of the notes, responded to some of them, and then kept reading some more notes. Right before he was about to log off, he realized that moments ago one of his peers, Erin, responded to one of his notes disagreeing with one of his thoughts on technological determinism. Dexter, of course, replied to her message in order to further articulate his ideas. After responding, he logged off.

In this scenario, Dexter was engaging with his peers through asynchronous threads. He read notes that were written before he logged into the environment – a perfect example and classical definition of asynchronous communication. However, if we consider how Dexter makes sense of his learning practice, we can argue that he experienced little asynchrony. That is, he logged into the environment once, read notes all in one sitting, and even communicated with one of his peers...
Polysynchronous: dialogic construction of time in online learning

while he was still logged into the environment. For Dexter, his engagements with his peers and
with course materials were not purely asynchronous and not purely synchronous. We would argue
that his behaviour reflects polysynchronous communication, since he was able to move flexibly
between both asynchronous (catching up on old notes) and synchronous (back and forth
conversation with a co-present peer) forms of dialogue within the same medium. This is indeed
where we can employ Bakhtin’s concept of the dialogic construction of meaning in order to
understand how and why Dexter’s experience of the temporal dimension is different from those
that would emerge from a technologically deterministic perspective.

Much literature would suggest that Dexter’s perception of time is not defined by how he
makes meaning of his interactions with his peers but by the communication medium itself.
However, according to the dialogic perspective, meaning emerges from individuals’ interactions
with each other. Furthermore, unlike current perspectives, Bakhtin’s concepts of heteroglossia and
simultaneity suggest that even though individuals use the same communication tool in their
interaction and engagement with each other, their perceptions of the same event can be quite
different. Since dialogue can be defined as the simultaneous events of meaning-making through
interactions among people in different time and space, current conceptualizations of synchronous
and asynchronous learning practices can no longer be regarded as the only options for learning.
Indeed, when Dexter’s engagement with Erin is considered, he communicated with her almost
synchronously even though they used an asynchronous communication tool.

Illustration 2:
Jane is reading through notes that were posted last night in the online forum for her course. She
decides to take a break and goes to the kitchen to make a cup of coffee. She does not log out of
her course before she leaves her computer. While she’s gone, her classmate Felix signs into the
forum and sees that Jane is also logged in. Felix sends Jane a chat message in the forum to say
that he liked her note that she posted yesterday, and to ask her a question. Receiving no response
for 10 minutes, Felix logs off. A few minutes later, Jane returns to her computer with her coffee
to discover Felix’s message. She sends a reply, which Felix sees later that evening when he has
time to log into the course again.

Much like Dexter, Jane logs into the online forum for the purpose of catching up on notes that have
been posted since she was last there – a form of dialogue that historically would be described as
asynchronous. But there is also the potential to engage in synchronous chat with Felix; however,
since Jane did not see the message until Felix had logged off, her reply to his message was not
received until later that evening. In effect, the exchange was relatively instantaneous from Jane’s
perspective, since she was able to reply right away, but from Felix’s perspective the exchange was
delayed. Assuming that Felix did not require an immediate response, this polysynchronous
exchange suited both of their needs, by allowing both to participate in the dialogue according to
their individual circumstances. In a more traditional synchronous scenario, their exchange might
have had to wait until both could be co-present.

Illustration 3:
Julia logs into her course website to read the notes that had been posted by her peers in the
discussion forum. As she finishes reading through her peers’ notes she begins to reply to the
module’s starter questions and some of her peers’ responses. As Julia is responding to these
notes, she gets an invitation to chat from her peer Andrew. Julia decides to accept the chat
invitation from Andrew but immediately asks him if it was okay to chat in an hour, since she was
catching up on the discussion forum notes. Andrew replies and says that would work for him and
agrees to continue the chat in an hour. After Julia replies to the notes of interest she resumes her
chat conversation with Andrew about their final project.

In this scenario, Julia logs into the online forum to catch up on the notes already posted, a form of
dialogue that would be described as asynchronous. In addition, Julia also engages in a chat with
Andrew, a form of dialogue that would be described as synchronous. However, Julia did not
engage in a chat immediately: she asked Andrew if it was possible to continue their chat in an hour,
to which he agreed because it was a convenient time that suited him. This is a polysynchronous
exchange that allowed both Julia and Andrew to participate in the dialogue according to their
individual circumstances. Furthermore, it can be argued that Julia exhibited polysynchronous communication because she was able to easily move between asynchronous (catching up on already posted notes) and synchronous (a chat with a peer) forms of dialogue within the same platform.

Bakhtin (1981) claims that each dialogue happens in its own particular situational context of the interaction, since individuals cannot physically occupy the exact same space at the same time. Similarly, Bakhtin analyzes the dialogic relations between an author who writes a novel decades ago and a reader who is now reading that novel. Without having direct interaction with the author (the other interlocutor of this dialogue), the reader constructs particular meanings from the written text based on his or her own social and cultural contexts; in this dialogue, the reader does not passively accept something given by the author but actively engages with the ideas using different perspectives and develops his or her own understandings through a personal lens.

Conclusions

Synchronous and asynchronous are well-worn terms for defining historically significant modes of communication. Existing research tends to treat each of these modes as synonymous with the kinds of technologies designed to support it; thus, it fails to problematize and consider the potential roles played by psychological, social, and pedagogical factors in the experience and understanding of time. Dialogism offers the possibility of developing different perceptions of time in online learning that allow us to escape the technologically dual modes of synchronous and asynchronous communication in online learning. Indeed, it is students’ practices that define the pedagogies, not the predefined definitions of synchronous or asynchronous tools.

In conclusion, Bakhtin’s concept of dialogical construction of meaning suggests an alternative perspective for conceptualizing temporal dimensions in online education literature and increasing our understanding of the nature of online discussion and the role of dialogue in online learning environments.

References


Polysynchronous: dialogic construction of time in online learning


Correspondence: oztokm@gse.upenn.edu