

# **A systematic Review of Research on Intersubjectivity in Online Learning: Illuminating Opportunities for Cohesion and Mutual Understanding in the Research Conversation**

Vanessa P. Dennen  
*Florida State University, USA*

Barbara M. Hall  
*National University, USA*

Amber Hedquist  
*Arizona State University, USA*

## **Abstract**

Many online learning experiences integrate some form of dialogic interaction among instructors and learners. However, the degree to which these individuals come to a mutual understanding of their task and topic, a phenomenon called intersubjectivity, often remains a question. This systematic review of online learning research examines 48 peer-reviewed journal articles published between 2004 and 2021, looking at the overall trajectory of the research conversation across time, disciplines, modality and learning activities; major trends in methods, and focus; and interconnectedness. Findings suggest a dispersed body of literature, with some small groups of interconnected work but little cohesion or traction as a research field. This review has implications for future researchers in this area, who are encouraged to synthesize across this body of research and work together to establish and pursue an agenda for the field that will not only further inquiry in this area but also lead to practical knowledge about learning activity design and facilitation that is useful to online instructors.

*Keywords:* intersubjectivity, mutual understanding, online learning, systematic review

Dennen, V., Hall, B. M., Hedquist, A. (2023). A systematic review of research on intersubjectivity in online learning: Illuminating opportunities for cohesion and mutual understanding in the research conversation. *Online Learning*, 27(1), 158-186.

DOI: 10.24059/olj.v27i1.3430

“Do we agree that this is true?” Such a deceptively simple query defines intersubjectivity, according to Babbie (1986).

Intersubjectivity is a fancy word for a basic concept: People need to have a mutual understanding of a task to successfully participate in its completion. The task could involve a tangible product, such as a written report, or could be more ephemeral, such as a learning-oriented conversation. In everyday life, people can interact and complete tasks effectively when they have shared sociocultural understandings achieved through intersubjectivity.

Intersubjectivity does not always exist, but rather is manifest “when interlocutors share some aspect of their situation definitions” (Wertsch, 1985, p. 159). In more common language, this definition means that two or more people engaged in some sort of interaction must share their perspective or knowledge with each other and engage in the collective task of negotiating that knowledge.

This description may sound as if intersubjectivity is a task to be accomplished unto itself, but really intersubjectivity is a byproduct of engagement. Intersubjectivity occurs in levels, with individuals needing to be more explicit in their communication where less intersubjectivity exists, and less explicit when a high level of intersubjectivity has already been established (Wertsch, 1985). Furthermore, intersubjectivity should not be confused with agreement; rather, intersubjectivity can also incorporate intentional disagreement that occurs when people engage in joint activities (Matusov, 1996). In this sense, intersubjectivity represents situations when people discuss *with* each other rather than *at* or *past* each other.

To make this complex concept more concrete, consider the following example: A group of three students are assigned to work on a group project together. They meet, discuss their vision of the final product, and divide the work. Each group member pulls their weight and produces a section of work about which they feel proud. When the whole group meets again a few weeks later to merge their work into a final submission they find that the parts do not fit together. They are surprised because they all put forth a strong effort, but it becomes clear that they lacked intersubjectivity. During this second meeting, they again discuss the vision and decide on modifications that will help produce a coherent project. In other words, through their discussion of the overall idea and what each member had produced, they now negotiated a common vision and intersubjectivity was achieved. Working independently again, they edit their prior sections. At their third and final meeting they are pleased to see that their separate sections now fit together well, and that they all shared an understanding of the work they were doing together.

Interaction alone is insufficient to develop intersubjectivity, and people frequently have experiences where they initially assumed mutual understanding with others but later discovered that it was lacking. In other instances, people may remain unconcerned about or unaware of their lack of mutual understanding with the people with whom they interact. Suthers (2006), who discussed intersubjectivity in the context of computer supported collaborative learning (CSCL), noted more research on intersubjectivity was needed because existing research in this area tended to be scattered and focused on counting interactions rather than elucidating the co-construction of knowledge. Whereas interactions are highly visible transactions, intersubjectivity is not. Still, educators are concerned not only with students exchanging words but rather the degree to which student engagement yields meaningful learning dialogues.

These meaningful learning dialogues are built on a foundation of smaller, highly functional engagements including the introduction of content, social interactions, perspective sharing, repair sequences, and more (Stahl, 2006). In other words, through engagement in meaningful learning

dialogues, students can achieve intersubjectivity. However, student dialogues do not necessarily result in intersubjectivity. In this systematic review, we explore how intersubjectivity has been studied in online learning, focusing on how this area of research has evolved and the extent to which it has developed into a cohesive research conversation. Through this analysis, we aim to elucidate gaps and points of opportunity for future researchers. This review will also have implications for online learning practitioners by summarizing what is known about supporting intersubjectivity in online discussion.

## Literature Review

Intersubjectivity has deep roots and applications in the fields of philosophy, sociology, and psychology (Hall, 2019). In education, the concept is most frequently tracked back to Vygotsky's (1978) sociocultural theory, with language and culture introduced as key parts of the developmental process, Vygotsky introduced the idea of collaborative dialogue in his discussion of children's relationships with parents or other caregivers (who play the role of more knowledgeable other) or tutor. The caregiver's interactions with the child represent a form of collaborative dialogue that contributes to the child's understanding of and ability to engage in different tasks.

Adults similarly rely on mutual understanding, or intersubjectivity, developed through collaborative dialogue. Within educational circles, intersubjectivity is a concern whenever interactions among learners and between learners and instructors occur. Without intersubjectivity, misunderstandings readily occur—even when interaction levels may be high. Intersubjectivity is of particular interest in online learning because of the increased capacity for misunderstanding across what Moore (1993) termed transactional distance, which is the perception of distance between individuals interacting in a computer-mediated setting. Additionally, the availability of written transcripts from asynchronous learning environments, and increasingly from auto-transcribed synchronous ones, facilitates the process of capturing and analyzing data about how learners interact and negotiate discursive meaning.

Because intersubjectivity is manifested through interactions, it is often confused with or used synonymously with terms like interaction, engagement, collaboration, and knowledge construction. Two definitions might be useful in establishing the differences between interaction and intersubjectivity. While interaction has been defined in many ways, a useful definition of interaction within the context of online learning is suggested by Gunawardena et al. (1997, p. 407): “the process through which negotiation of meaning and the co-creation of knowledge occurs.” Intersubjectivity within online learning is an outcome of the synergistic progression from individual contributions to sequences of interdependent contributions (Belcher et al., 2015). While interaction represents a learning process, intersubjectivity represents a potential (but not automatic) outcome of that process.

Whereas in education intersubjectivity refers to a psychological construct, the definition of that construct reflects core elements of the initial definitions of intersubjectivity presented in philosophy, psychology, sociology, and linguistics, which may be unfamiliar to many instructional designers and educators. Still, the intersubjectivity family tree is important to consider if one is to fully grasp the meaning behind this psychological construct. In philosophy, intersubjectivity emerged from phenomenology, representing an interactional achievement between independent subjectivities (Husserl, 1931), which include people or personal experiences. Intersubjectivity expanded from philosophy to psychology through the relationship between the psychoanalyst and the client (Stolorow & Atwood, 2014). In sociology,

intersubjectivity was recognized less as a static intersection of individuals and more as the dynamic interplay between two participating subjective systems (McMahon, 1999). In linguistics, the field has drawn upon phenomenology to consider intersubjectivity at the intersection of cognition and interaction (Etelämäki, 2016). These definitions across foundational fields have implications for education, where the cognitive synergy and interdependence associated with intersubjectivity may serve as hallmarks of learning progression.

Some educational researchers and practitioners may question why it is important for people to share perspectives, negotiate knowledge, and construct socially oriented outcomes. In response, social constructionists explain how meaningful realities and valuable actions exist only when we socially construct such realities and actions. In the words of Gergen (2015), “*everything we take to be real, rational, or good—everything we hold dear—finds its origins in our processes of relating ... our worlds and our traditions are held together by nothing stronger than what we share together*” [emphasis in original] (p. 13). Nothing—not even self—exists outside of the social relationships in which an individual is one part. Such thinking harkens back to Mead and Schubert’s (1934) argument that there is no thinking outside of social processes along with Vygotsky’s (1978) emphasis on culture and the recognition everything that exists within the mind is a reflection of something already present in society. For Vygotsky in particular, learning occurs within relationships, which suggests that at a baseline level, it is important for students to interact. Ideally, that interaction leads to the development of intersubjectivity.

Interaction and related topics have been of great interest to online learning researchers. A systematic review of research on online teaching and learning focused on the decade from 2009 to 2018, Martin et al. (2020) found more than one-fourth of their sample focused on engagement ( $n = 179$ ), with 43 articles more narrowly focused on interaction. Additionally, there have been several review articles specifically focused on interaction. Earlier reviews focused on strategies to increase interaction (Berge & Mrozowski, 2001; Sherry, 1996), whereas later ones have explored connections between community and interaction (Hung, 2012; Zawacki-Richter et al., 2009). These systematic reviews provide a broad overview of the range of research focused on interaction, yet none of these reviews explicitly discusses research on intersubjectivity. A search for systematic reviews on intersubjectivity in online learning yielded no results.

Although typically mentioned in connection with intersubjectivity, interaction is not the same as intersubjectivity. Interaction is global term for a variety of activities including discussion, negotiation, and collaboration. Intersubjectivity, however, is not a form of interaction. Rather, it represents a psychological state in which two or more people share a deep mutual understanding that allows them to smoothly engage in interdependent dialogues and tasks. In this sense, interaction is the gateway to intersubjectivity, as it is necessary for intersubjectivity to develop (Dennen & Wieland, 2007). Learners can post messages on the same forum and respond to each other nominally or via threading and it would count as interaction. However, learners must take this interaction a step further and engage with each other’s thoughts, finding common ground and negotiating or affirming meaning, in order to achieve intersubjectivity. Intersubjectivity is necessary to achieve a deep discussion in which knowledge is co-constructed (Bober & Dennen, 2001), and although researchers have been able to identify intersubjectivity, designing for and fostering intersubjectivity among online learners remains a challenge.

Group work is an obvious example, and learners are often frustrated by group work because of a failure to foster intersubjectivity. Instead of representing true collaboration, which occurs “through joint activity related to the process of solving complex problems or engaging in

authentic tasks during which any knowledge, skill, attitude, or attribute is acquired or any product or idea is discovered or created” (Hall, 2014, p. 56), group work tends to reflect what students accomplish as individuals, including their effort, initiative, and sense of responsibility (Joo & Dennen, 2017).

Rather than focusing on collaboration, students may focus on distribution of work (Welsh & Slack, 2022) amid fears that classmates will be social loafers. Even within discussions, where student interdependence and grades may be less directly connected, students still may take a transactional approach to their participation (Dennen, 2008). The result is that after more than two decades of online learning, learners continue to feel distanced from each other which, in turn, affects their learning experience (Baber, 2021; Baker & Moyer, 2018).

## **Rationale and Research Questions**

Clearly interaction has been an important topic in online learning research—but what about intersubjectivity, which has been hailed as a goal of online discussion? This systematic review focuses narrowly on intersubjectivity, characterizing the nature of work done by researchers who attend directly to the concept in their work, examining participant-generated discourse artifacts for the evidence of presence and level of intersubjectivity in learning dialogues.

The research questions guiding this review are:

1. What are the trajectories of research on intersubjectivity in online learning across time, discipline, modality, and learning activities?
2. Through what approaches and foci have online learning researchers studied intersubjectivity?
3. How is the empirical research on intersubjectivity in online learning interconnected?

In other words, this systematic review seeks to map the field of research and determine whether the researchers themselves are iterating toward intersubjectivity.

## **Method**

### **Sampling**

The PRISMA guidelines for systematic reviews (Page et al., 2021) were followed for this study. Figure 1 provides an overview of the entire process, showing the number of records at each stage of the search and screening process.

A search was conducted in January 2022 using the ProQuest Education Collection. ProQuest was deemed an appropriate primary database for use in systematic reviews by Gusenbauer and Haddaway (2020) based on a comparative test of several databases. The specific search string required that the term “intersubjectivity” or a variant (e.g., intersubjective) appear anywhere in the article record including the full text.

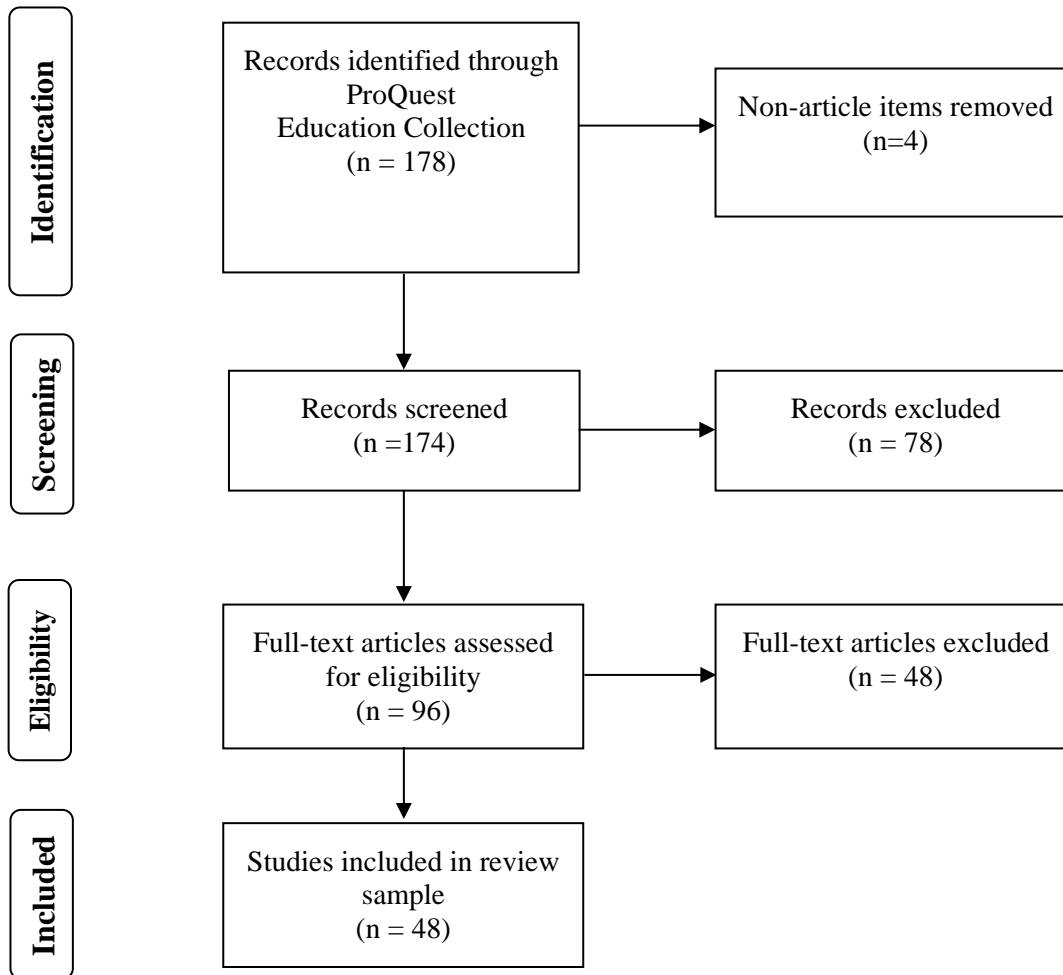
The search was not broadened to include often-related terms such as interaction, engagement, and knowledge construction because, as noted in the literature review, these are not synonymous with intersubjectivity. The terms may co-occur in a manuscript due to their relationship within the dialogic learning process, but the focus of this systematic review was specifically research that engaged with the psychological process of intersubjectivity and not any of its possible activity manifestations or possible outcomes.

The search string also required that one of the following terms appear anywhere in the article record except for the full text:

- asynchronous discussion
- asynchronous learning
- chat
- distance education
- distance learning
- e-learning
- online discussion
- online learning
- synchronous discussion
- synchronous learning
- virtual learning

A full text search was excluded for this part of the search string because of the large number of irrelevant articles netted in a full-text search. Additional search parameters required that articles were written in the English language and published in peer-reviewed journals, and the search was set to automatically exclude duplicates. This initial search yielded 178 records. A similar search was conducted in Web of Science as a means of verifying the appropriateness of the search strategy, yielding 172 records that were duplicates.

**Figure 1**  
Overview of Screening Process



### Refining the Dataset

Search results were imported into EndNote. There were no duplicates, but four records were immediately removed because they did not have any data in the author field and, upon closer inspection, represented non-article publications (e.g., journal tables of contents, editorials). The remaining 174 articles were screened at the title and abstract level by two researchers, which eliminated an additional 78 articles. The articles eliminated during this screening process had clear indicators that they did not fit the four inclusion criteria, which were:

1. Report of original empirical research;
2. Intersubjectivity as a primary or secondary focus of the study;
3. Study is situated in a computer-mediated or online learning context; and
4. Dataset includes authentic, participant-generated discourse artifacts.

To be included in the sample, all four criteria must be met. In other words, neither a systematic review of online learning nor a study of intersubjectivity in a face-to-face conversation would be included. During the review of titles and abstracts it was possible to eliminate articles that were obviously theoretical or philosophical or that were situated in contexts outside of education and learning. When in doubt, an article was left in the sample for further eligibility screening.

For the full-text screening process, the remaining 96 articles were imported into rayyan.ai (Ouzzani et al., 2016). Two researchers independently reviewed the full text to determine eligibility, with the blind screening option turned on. These researchers agreed in 89 instances (92.7%). The third researcher entered the conversation for determining inclusion for the seven articles in dispute, resulting in six being included. These articles were ones that skirted the boundary of one of the inclusion criteria or that lacked clarity in their description of purpose or method.

### Data Coding and Analysis

Articles were coded in rayyan.ai by two researchers for the following elements:

- Level of education (e.g., K–12, Higher Education)
- Academic discipline (e.g., education, humanities, social sciences, etc.)
- Modality (asynchronous, synchronous)
- Type(s) of participant-generated discourse artifacts (e.g., discussion board, blog wiki)
- Type(s) of learning activity (e.g., discussion, groupwork, feedback)

These codes were used to develop frequency counts. Additionally, frequencies were calculated for publication years and journals. These data were used to help answer the first research question.

To answer the second research question, each article was reviewed in depth, with two researchers reading the research questions, method, and findings. During this review, articles were coded for type of data analysis and the focus of the study. In terms of data analysis, three types of analysis were anticipated to be in the codebook:

1. Content analysis, most clearly defined by Berelson (1952) as a means of “objective, systematic, and quantitative description of the manifest content of communication” (p. 18). While some researchers might argue against the quantification of qualitative data, Krippendorff (2019) offers a reminder that the reading of all texts is subjective and therefore qualitative, even if the characteristics of those texts are later converted to numbers (Neuendorf, 2017).
2. Conversation analysis, a technique for analyzing naturally occurring conversations, is used by social scientists in the disciplines of psychology, communication, and sociology (Sudnow, 1972). The goal of conversation analysis is to examine the sequences of interaction—how the conversation proceeds through each turn taken.
3. Discourse analysis, which like conversation analysis attends to the properties of how language is actually used, but focuses on a much broader level considering, for example, the social purpose of an entire passage of text.

Other forms of data analysis were added to the codebook as they appeared in the articles. The codes for topical focus were established inductively. One researcher coded the articles initially, establishing the categories. A second researcher then used the categories to code independently. There were no discrepancies between their codes.



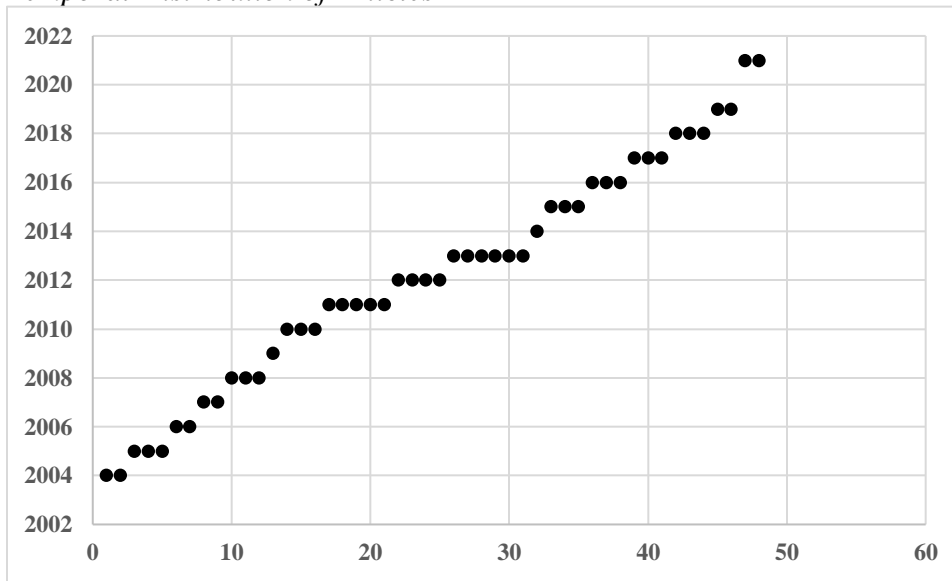
To answer the third research question, citations from the articles were cross-referenced, looking for articles within the sample that cited other articles in the sample as well as commonly cited foundational articles. Additionally, a citation count from Google Scholar was retrieved for all the articles.

## Findings

### Research Question 1: Research Trajectories

The first studies in the sample were published in 2004, with a slow but steady trajectory of studies being published through 2021 (see Figure 2). Annual publication totals ranged from zero in 2002 to a high of six in 2013, and a cluster of fifteen articles (32.5%) published in the three-year period from 2011 to 2013. Although year of publication provides a general sense of temporal trends, it is important to remember that these publication dates do not represent when the data were collected or when the analyses completed.

**Figure 2**  
*Temporal Distribution of Articles*



*Note:* Each dot represents a single article published in the year along the y axis. The x axis represents the cumulative number of articles published.

Most of the articles in the sample (42; 87.0%) involved research in higher education settings. Four were situated in K–12, and one in a teacher professional development context. The final article did not give a clear indicator of level. In terms of teaching discipline, the most common areas were education (20; 41.7%) and language (13; 27.1%), collectively accounting for more than two-thirds of the sample, followed by articles in the social sciences (10; 20.8%) and hard sciences (3; 6.3%). The remaining four articles were from the humanities, fine arts, and professional programs. In one of the articles (Dennen, 2005), multiple classes from more than one teaching discipline were studied.

The articles appeared in 20 different journals, with six journals publishing more than one article on intersubjectivity (see Table 1). The thirteen language education articles all were

published in journals focused explicitly on language education. Notably, *ReCALL* and *CALICO Journal* each included multiple intersubjectivity articles. Additionally, there were article clusters in journals related to CSCL (14 articles, all in *International Journal of Computer-Supported Collaborative Learning*) and Distance Learning (nine articles, including four each in *Distance Education* and *Quarterly Review of Distance Education*). The remainder of the articles appeared in journals with more general educational technology scopes.

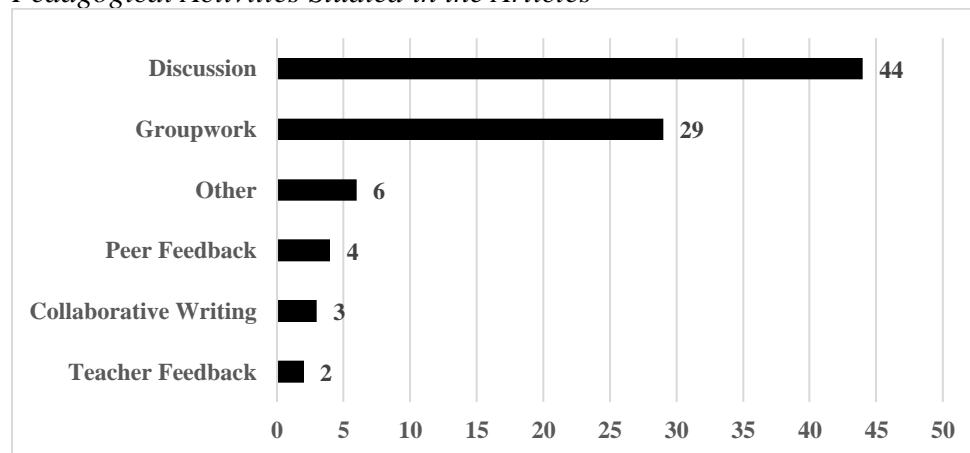
**Table 1**  
*Journals With More Than One Intersubjectivity Article*

<b>Journal</b>	<b>Number of Articles</b>
<i>International Journal of Computer-Supported Collaborative Learning</i>	14
<i>ReCALL: The Journal of EUROCALL</i>	6
<i>CALICO Journal</i>	4
<i>Distance Education</i>	4
<i>Quarterly Review of Distance Education</i>	4
<i>Education and Information Technologies</i>	2

Intersubjectivity has been studied in both synchronous and asynchronous modalities. The sample was almost evenly split between studies of synchronous (12; 43.8%) and asynchronous (23; 47.9%) learning, with four articles (8.3%) studying learning contexts that incorporated both modalities. Asynchronous learning interactions included discussion boards, wikis, and blogs, whereas synchronous learning interactions included videoconferencing, audioconferencing, real-time text chat, and games and simulations.

Unsurprisingly, most of the articles explicitly studied intersubjectivity as it occurred within course discussions (see Figure 3). In 29 (60.0%) of the articles, small group work was studied, ranging from isolated learning activities to semester-long group projects. The group work often included discussion as a component of the work process. Additionally, in a small number of articles, the focal point included feedback or collaborative writing. Collectively, these different activities allude to the broad range of learning activities to which intersubjectivity is relevant.

**Figure 3**  
*Pedagogical Activities Studied in the Articles*



*Note:* Articles could examine more than one type of activity.

All the studies used participant-generated discourse artifacts as a data source, and additional forms of data were used in 21 studies. Surveys (used in 14 studies) and interviews (used in eight studies) were the most common additional data sources. They were used together in six studies. Surveys and interviews were typically used to elicit student and teacher perceptions of pedagogical activities and interactions. Grades were only included as a data source in three articles.

### **Research Question 2: Research Approaches and Foci**

The second research question examined how intersubjectivity has been identified and studied by online learning researchers. By looking at the questions different researchers ask and their analytic approaches to answering those questions, it is possible to search for overall trends and progression of knowledge over time.

#### ***Types of Analysis***

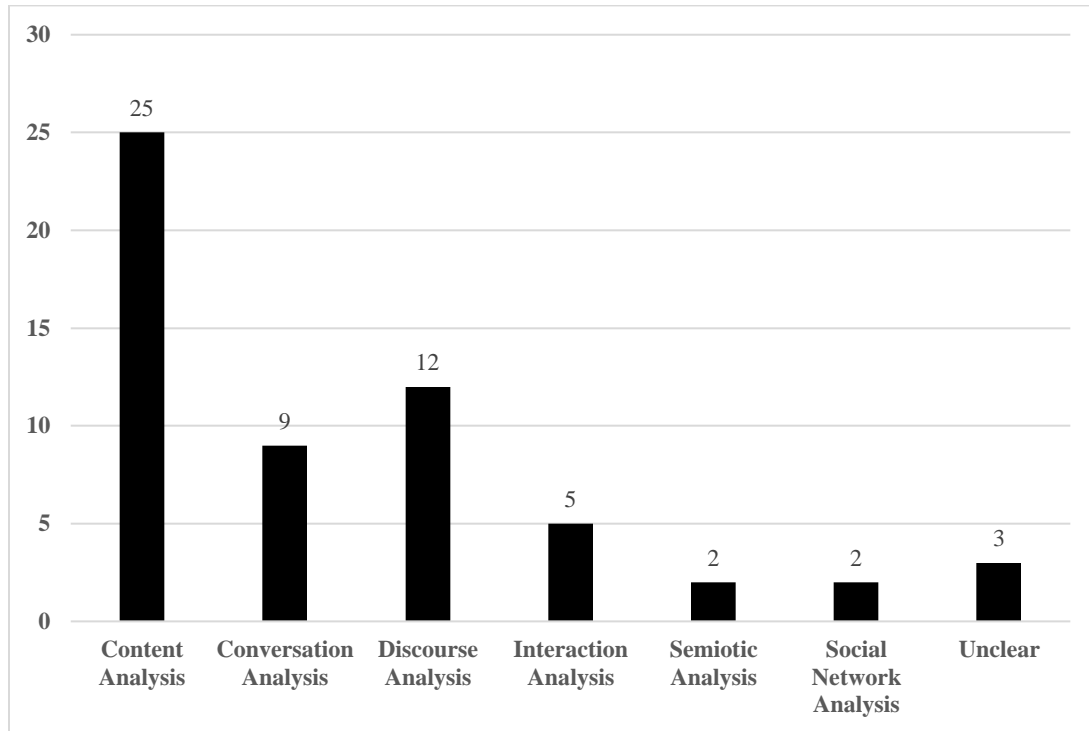
To explore types of analysis, this review focuses solely on the approaches researchers used to analyze participant-generated discourse artifacts. In other words, approaches used to analyze interview, survey, and grade data were not examined. In many instances, the researchers clearly named the analytic approach that they used in their article, and that statement was accepted at face value. There were instances in which authors stated that they used discourse analysis but the findings suggest that a more fine-grained conversation analysis approach was used. This is not surprising given their commonalities, such as the use of natural data and social actions along with the search for their underlying meaning (Antaki, 2008). Although Hammersley (2003) notes that the two approaches, discourse analysis and conversation analysis, have different underpinnings that make them distinct, they nonetheless tend to be presented together in textbooks and articles; in some research circles the term *discourse analysis* has been used as an overarching term inclusive of conversation analysis (Ten Have, 2006).

When researchers did not label their approach in the method section, the approach was classified based on details provided in the findings section, except for three articles in which the specific analytic approach was unclear.

We accepted researchers' statements about the types of analyses used, though some articles may have stated discourse analysis when their analyses more accurately reflected conversation analysis, which is only one part of discourse analysis. When articles did not specify their analyses, we classified the analyses ourselves based on information in the article except in the case of three articles in which the types of analyses were unclear.

As illustrated in Figure 4, 25 articles used content analysis more than any other type of analysis, followed by discourse analysis and conversation analysis. Four articles used more than one type of analysis. Each incorporated content analysis in their study, and the second analytic approaches were social network analysis (Eryilmaz et al., 2021; Oh et al., 2018), discourse analysis (Alterman & Larusson, 2013) and conversation analysis (Kenning, 2010). Semiotic analysis was the sole form of analysis when present (Satar, 2013, 2015).

**Figure 4**  
*Types of Data Analysis*



### ***Titles and Research Questions***

Titles ideally provide a distilled overview of an article's topical focus. In this sample, the word *intersubjectivity* appeared in the title of six articles and another ten article titles used the word *interaction*. The words used most within article titles included *collaboration* or *collaborative* followed by *discourse*, and *dialogue* or *dialog*.

An examination of research questions and statements of purpose demonstrates that this is a diverse collection of studies. The word *collaboration* and its variations as well as the words *group* or *team* commonly appeared, as one might expect in research about the negotiation of meaning in online learning.

***Topical Similarities.*** While there were no distinctive patterns, there were some topical similarities. For example, several articles used specific frameworks or models, such as elements of Garrison et al.'s (2000) Community of Inquiry framework (Kaul et al., 2018; Oh et al., 2018; Satar, 2013, 2015), Gunawardena et al.'s (1997) Interaction Analysis Model (Eryilmaz et al., 2021; Lim & Hall, 2015; Lim et al., 2017), Poole and Holmes (1995) functional category system (Mahardale & Lee, 2013), Mercer's typology (Pifarré & Cobos, 2010), Stahl's (2006) CSCL frame (Johnson, 2016), and Pena-Shaff and Nicholl's (2004) Knowledge Construction Category System and Indicators (Gibson, 2013). van Heijst et al. (2019) proposed and tested their own framework focused on socio-cognitive openness. Other articles did not anchor their analysis around a specific framework, but nonetheless referred to taking systems perspective (e.g., Ligorio et al., 2008; Vogler et al., 2017), or focused on issues of quality (Eryilmaz et al., 2021; Nandi et al., 2012; Schneider & Pea, 2013; Sykes, 2005). These frameworks are evidence of the varied ways that researchers have sought to elucidate intersubjectivity within a data set.

Although most of the articles were situated in small classes and examined either discussion boards as a means of asynchronous learning and text or video chat tools as a means of synchronous learning, there were also articles that examined various other tools and less common course configurations through which discourse and thus intersubjectivity might occur. Wikis (Antoniadou, 2011; Larusson & Alterman, 2009; Pifarré & Kleine Staarman, 2011) and blogs (Alterman & Larusson, 2013) serve as platforms for co-writing and commenting, whereas Second Life (Blankenship & Kim, 2012) provides avatar-based, real-time interaction. One study was situated in a massively open online courses (MOOCs) (Kaul et al., 2018), considering how intersubjectivity might be apparent in learning experiences that occur at scale. Although the sample size for this study ( $n = 78$ ) is not large in the context of MOOCs, it is, nonetheless, larger than the samples for most individual courses across the rest of the articles examined in this review. Another study was unique in that it explored the connection between students participating on-site and other students attending remotely (Stewart et al., 2011). Interestingly, three other studies looked not only at what was said, but also the role of student gaze (Satar, 2013, 2015; Schneider & Pea, 2013).

Other articles considered course design elements as key components that shape intersubjectivity. The structure of the course and discussions were prominent in several articles (Barbera, 2006; Lim & Hall, 2015; Lim et al., 2017), including one that compared cooperative and collaborative group styles (Rose, 2004). Other studies focused on facilitation (Dennen, 2005; Gibson, 2013; Szabo, 2015), and reviewed the roles of teachers and instructors (Dennen & Wieland, 2007; Onrubia & Engel, 2012), especially when those roles are compared with peer roles (Barbera, 2006; Oh et al., 2018; Pifarré & Cobos, 2010; Szabo, 2015). Similarly, scripts were considered as a device that helps both instructors and students have productive interactions in mediated environment (Mahardale & Lee, 2013; Onrubia & Engel, 2012).

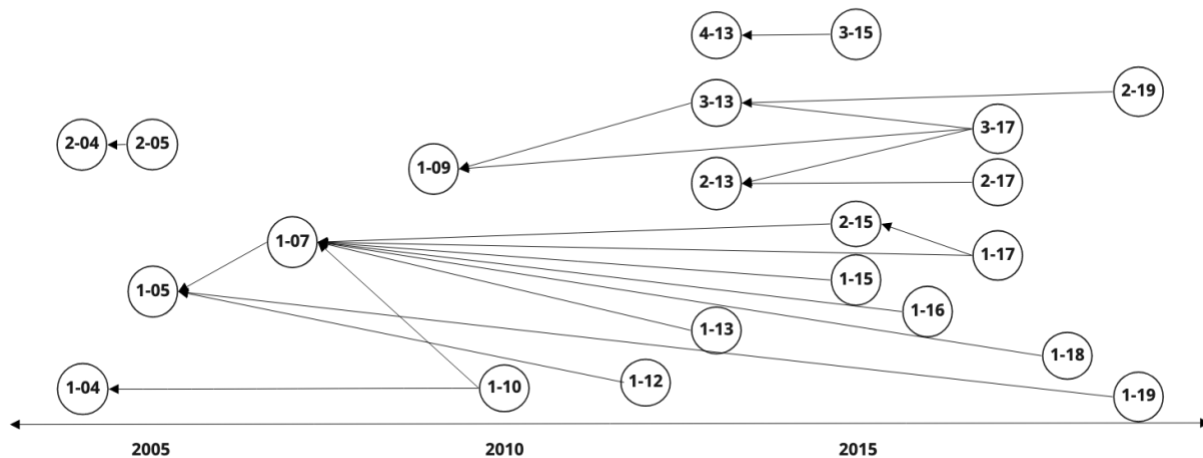
**Language Contexts.** As noted above, about one-third of the overall sample focused specifically on the discipline of language and linguistics. All thirteen articles in this subset had participants who were language learners. Ten (77%) of these articles examined synchronous learning interactions, and five (38%) used conversation analysis. The research questions in the language articles varied from a general assessment of the effectiveness of computer-mediated communication (CMC) for English as a Foreign Language (EFL) (Chen & Chen, 2008) to specific questions about translanguaging (Canals, 2021) and social and linguistic interaction in multiplayer games for EFL students (Peterson, 2012). Other articles in this language-focused group looked at specific linguistic acts, including speech moves (Sykes, 2005), openings and closings (Abrams, 2008), and the use of repair in native and non-native text chats (Vandergriff, 2013). Further, many of the articles considered negotiation of meaning at the level of a learning task (Chen & Chen, 2008; Cho, 2016; Kenning, 2010; Sert & Balaman, 2018; Yu & Zeng, 2011). Two articles by Satar (2013, 2015) focused on multimodal social presence, particularly gaze in videoconferencing. While gaze is not discursive per se, eye gaze does influence discursive practices and, therefore, the potential for intersubjectivity.

### **Research Question 3: The Research Conversation**

The third research question asks about the interconnectedness of this body of research. Figure 5 depicts the articles that cite others within the sample. Within-sample citations were sparser than expected, with only 22 (45.8%) of the articles somehow interlinked. There were four

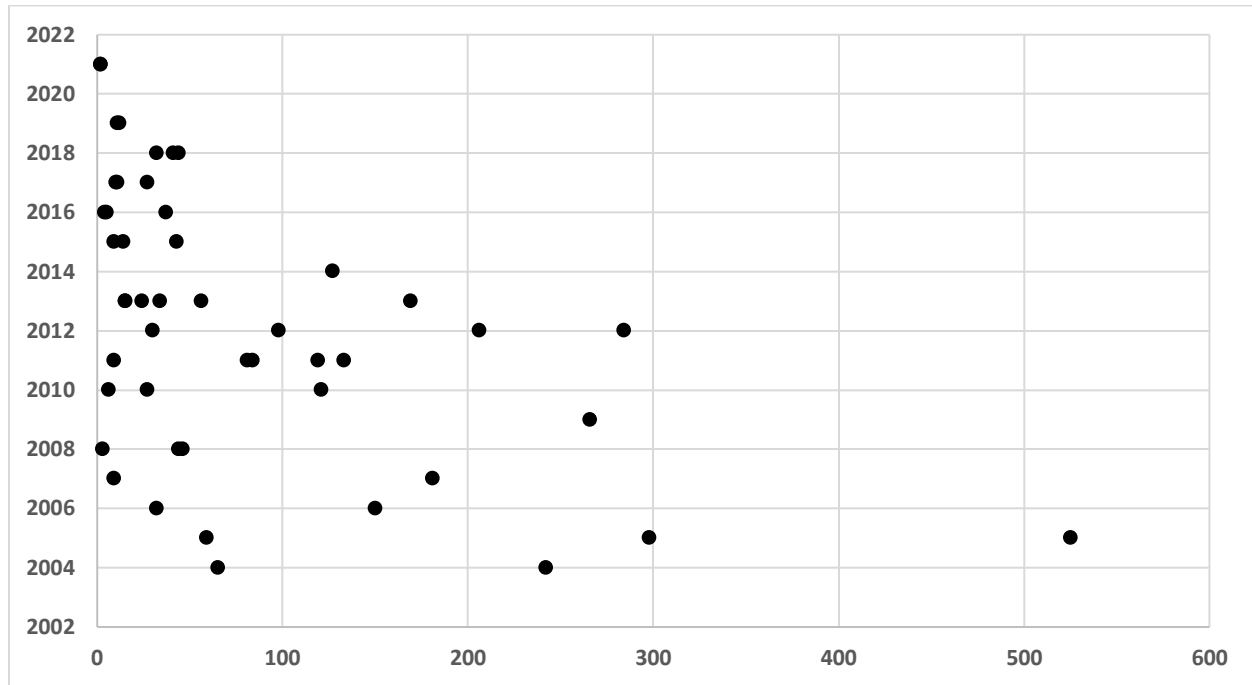
clusters of interlinked articles. Two were otherwise-isolated dyads, in which an author cited their own work (Satar, 2013, 2015) and Matusov et al. (2005) cited Rose (2004). A third cluster of six articles has four articles by Alterman, beginning with Larusson and Alterman (2009). The other two articles in this cluster are Schneider and Pea (2013), which is cited by Vogler et al. (2017) in addition to Alterman and Harsch (2017). The final cluster of twelve interlinked articles is primarily composed of articles citing Dennen (2005; three citations) and Dennen and Wieland (2007; seven citations).

**Figure 5**  
*Citations within Articles in the Sample*



*Note:* 1-04 McAlister et al. (2004); 2-04 Rose (2004); 1-05 Dennen (2005); 2-05 Matusov et al. (2005); 1-07 Dennen and Wieland (2007); 1-09 Larusson and Alterman (2009); 1-10 Bures et al. (2010); 1-12 Nandi et al. (2012); 1-13 Gibson (2013); 2-13 Schneider and Pea (2013); 3-13 Alterman and Larusson (2013); 4-13 Satar (2013); 1-15 Szabo (2015); 2-15 Lim and Hall (2015); 3-15 Satar (2015); 1-16 Johnson (2016); 1-17 Lim et al. (2017); 2-17 Vogler et al. (2017); 3-17 Alterman and Harsch (2017); 1-18 Oh et al. (2018); 1-19 van Heijst et al. (2019); 2-19 Altebarmakian and Alterman (2019)

This sample of articles also has broader impact in the field as evident by overall citation counts. In other words, citation counts demonstrate the degree to which other researchers are drawing on this work. Figure 6 shows the number of citations different articles have received, per Google Scholar, and Table 2 lists the 13 articles with more than 100 citations. The articles in Table 2 were all published eight or more years ago, and it is likely that as time passes more of the sample will cross this citation threshold.

**Figure 6***Google Scholar Citations by Publication Year*

*Note:* Each dot represents a single article. The y-axis is the year of publication and the x-axis is the number of citations the article has received.

**Table 2***Articles With More Than 100 Google Scholar Citations (May 2022)*

Citations	Article
525	Dennen (2005)
298	Sykes (2005)
284	Nandi et al. (2012)
266	Larusson and Alterman (2009)
242	McAlister et al. (2004)
206	Peterson (2012)
181	Dennen and Wieland (2007)
169	Schneider and Pea (2013)
150	Thompson and Ku (2006)
133	Stewart et al. (2011)
127	Damsa (2014)
121	Pifarré and Cobos (2010)
119	Pifarré and Kleine Staarman (2011)

Within-sample cross-referencing is not the only way to identify conceptual connections among this body of research. An examination of commonly Across the studies, the most cited foundational work included Vygotsky (1978), Wertsch (1991), and Rogoff (1990), as shown in Table 3. Vygotsky, of course, is the educational theorist who is affiliated with the introduction of sociocultural theory and intersubjectivity educational psychology during the 1920s and 1930s. Wertsch and Rogoff are both contemporary scholars who have built on Vygotsky's work, albeit in

face-to-face settings. Other commonly cited articles relate specifically to the study of online discourse, such as Henri's (1992) often-cited coding system that offered early guidance for the content analysis of online discourse. Additionally, Stahl (2006) laid a foundation for studying distributed cognition in computer-supported environments, whereas Suthers (2006) specifically argued for the study of intersubjective learning, and offers direction on the issues, method, and unit of analysis for such studies. Finally, Bober and Dennen (2001) provide insights into the relationship between online interfaces and the development of intersubjectivity from an instructor's perspective. Beyond these works, the articles demonstrate foundations in fields like linguistics, sociology, communication, instructional design, and learning sciences, with many notable scholars referenced.

**Table 3***Shared Research Foundations*

<b>Article or Book</b>	<b>Cited by (number)</b>	<b>Cited by (articles)</b>
Vygotsky (1978)	20	Altebarmakian & Alterman, 2019; Alterman & Larusson, 2013; Antoniadou, 2011; Bures et al., 2010; Damsa, 2014; Evans et al., 2011; Hui & Russell, 2007; Larusson & Alterman, 2009; Lee & Song, 2016; Ligorio et al., 2008; Mahardale & Lee, 2013; McAlister et al., 2004; Onrubia & Engel, 2012; Peterson, 2012; Pifarré & Kleine Staarman, 2011; Satar, 2013, 2015; Schneider & Pea, 2013; Vogler et al., 2017; Yu & Zeng, 2011
Wertsch (1991)	7	Alterman & Harsch, 2017; Alterman & Larusson, 2013; Barbera, 2006; Damsa, 2014; Hui & Russell, 2007; Peterson, 2012; Pifarré & Kleine Staarman, 2011
Wertsch (1985)	5	Dennen & Wieland, 2007; Evans et al., 2011; Hui & Russell, 2007; Johnson, 2016; Yu & Zeng, 2011
Stahl (2006)	8	Altebarmakian & Alterman, 2019; Alterman & Harsch, 2017; Bures et al., 2010; Cho, 2016; Dennen & Wieland, 2007; Evans et al., 2011; Johnson, 2016; Mahardale & Lee, 2013
Henri (1992)	7	Barbera, 2006; Dennen & Wieland, 2007; Gibson, 2013; Hui & Russell, 2007; Lim & Hall, 2015; Lim et al., 2017; Rose, 2004
Suthers (2006)	7	Altebarmakian & Alterman, 2019; Alterman & Harsch, 2017; Alterman & Larusson, 2013; Lim & Hall, 2015; Mahardale & Lee, 2013; Onrubia & Engel, 2012; Vogler et al., 2017
Rogoff (1990)	5	Cho, 2016; Hui & Russell, 2007; Pifarré & Cobos, 2010; Pifarré & Kleine Staarman, 2011; Yu & Zeng, 2011
Bober and Dennen (2001)	4	Lim & Hall, 2015; Lim et al., 2017; Stewart et al., 2011; Thompson & Ku, 2006



## Discussion

### Research Trajectories

Temporally, the trajectory of intersubjectivity research in online learning has been slow and steady. The strongest cluster of articles appears between 2010–2013 but then, rather than continuing to grow, the body of research settles in at a slower, somewhat stable publication rate. During this same time, research on engagement continued to grow at a more rapid pace, but with quantitative research outpacing qualitative research (Martin et al., 2020). Additionally, this body of research is dispersed in terms of disciplinary focus and journals, within limited focus on areas such as social sciences and sciences. These represent areas of opportunity for researchers, and could be connected to other bodies of research outside of education. For example, studies of intersubjectivity in online science courses might be considered alongside conversation analysis studies about the process of scientific discovery, seeking similarities and differences between novices and experts, modality, and pedagogical activities.

The reason for the slow growth of intersubjectivity research when other areas of online learning research have received greater attention is uncertain. One potential explanation could be the parallel rise of learning analytics, with steadily growing research on topics like dashboards (Matcha et al., 2020) and use in higher education (Ifenthaler & Yau, 2020). Whereas identifying and measuring intersubjectivity remains a somewhat elusive pursuit, a wide variety of student analytic data can easily be collected from learning management systems and used to identify patterns related to successful course outcomes (Kew & Tasir, 2021). The stories told by analytic data lack the rich insights into how to design, scaffold, and facilitate learning interactions in order to foster mutual understanding, but in the current era of educational accountability, the focus on objective measures of student activities and outcomes may be more attractive.

### Research Approaches and Foci

In this sample, researchers used content analysis more than any other type of analysis. The predominance of content analysis is likely due to its flexibility across research settings and purposes, although it suffers some disadvantages, too. Returning to Suthers' (2006) work toward a research agenda for CSCL, his critique of quantitative analysis methods as potentially reducing rich interactions to counts holds true today. Across the studies using content analysis, researchers worked with various coding frameworks designed to capture interaction or engagement. However, the lack of a common framework—which may not even be desirable or feasible—makes it difficult to confidently synthesize findings across studies.

Researchers who study intersubjectivity using discourse and conversation analysis face a different set of challenges. These methods facilitate close examination of negotiation and meaning making in learning interactions (or, conversely, can demonstrate the absence of such). To establish trustworthiness, researchers need to provide rich examples from their data. Many journals that publish distance-learning articles have strict word and page count limits, often prohibiting the inclusion of transcripts or substantial examples. Alternately, researchers might opt to include more examples, thereby skimping on detail in other parts of their manuscripts such as the conceptual framework or method. In short, current journal publication guidelines effectively discourage this kind of work and make it difficult to produce in a typical-length manuscript. At the same time, as our study revealed, many researchers persist and make the necessary tradeoffs between breadth and depth to publish their work.

There is also an ethical dimension to be considered when these methods are used. When verbatim transcripts of online discussions are shared, participant anonymity is inherently

compromised. Discussions that occur in public online spaces are easily searchable. Even when participants provide consent, they may not fully connect consent to the analysis and public sharing of all their interactions over time in an online space (Yadlin-Segal et al., 2020). Although relatively few people may be able to identify individuals from these transcripts, instructors and students who were class members may either recall specific conversations or be able to revisit course archives and search for them. It is human nature for research participants to be curious about the outcomes of studies to which they contributed (Brettell, 1996), and would be unsurprising if research participants read the final report and either felt discomfort at the portrayal of their words or returned to the archived course to identify specific participants. Although the practical risk of harm to participants in most situations is likely to remain low, nonetheless, there is the potential for discomfort among participants whose vulnerable learning moments are published for a wider audience to see and dissect.

In terms of topical focus, there appear to be several articles that match what Borko (2004) referred to as existence proofs: studies that demonstrate how intersubjectivity can be present in a specific technological context. While these studies are important in their own way, showing that transactional distance (Moore, 1993) does not prevent intersubjectivity, their one-off nature is not surprising. More robust are the studies examining course design and facilitation, which were among the cluster of articles from the sample that cited each other. These studies demonstrate the field's ongoing desire to learn how to foster intersubjectivity. In other words, intersubjectivity researchers are not only concerned with identifying moments when intersubjectivity occurs, but also with using that as a starting point for generating knowledge that will help instructional designers and educators better support intersubjectivity. The topical cluster of language learning articles, although not connected to the other design and facilitation-focused articles, similarly sought to find ways of improving instruction.

These findings provide an interesting overlap with Paulus et al.'s (2016) review of research on conversation analysis and online talk. They found that studies tended to focus on four key topics, comparisons with face-to-face talk, coherence, repair, and accomplishment of tasks in asynchronous settings. Although the intersubjectivity studies in this sample do not focus on comparison, the other three topics are present, suggesting that conversation analysis is an appropriate method. Paulus et al. also had similar issues with distinguishing conversation analysis from other similar methods in their sample as well as concerns with the accuracy and clarity of authors' self-labeling.

## **The Research Conversation**

Intersubjectivity in online learning is a research area that has yet to develop into a cohesive research conversation. Individual researchers are studying intersubjectivity in their own research contexts, with isolated studies or study dyads situated in the much larger body of research on online learning. The presence of many isolated studies and individual cases in the sample is fitting with the nature of the phenomenon being studied (i.e., it is micro-level and highly situated) but leads to two final questions:

1. Should there be a more coherent research conversation in this area?
2. If so, how might this conversation be developed?

The need for a more coherent research conversation is suggested in various ways. For example, researchers continue to find themselves drawn to intersubjectivity, either as a main topic of their studies or through citing studies of intersubjectivity. Although the body of research is small and dispersed, it is not ignored. Other studies of student group work have recognized the

importance of intersubjectivity, citing research in this area while discussing how students negotiate when working collaboratively (Kuo et al., 2017). In other words, intersubjectivity provides the psychological and conceptual foundation for fully understanding why learners are successful or unsuccessful when engaged in discursive, interdependent learning activities.

Another rationale for developing a more robust research conversation on intersubjectivity is evident in practice, specifically how the field of online learning still suffers from stilted student discussion. Students post messages, but may focus more on meeting requirements (e.g., word counts, deadlines, and message counts) than on developing a dialogue with one or more classmates. Researchers continue to explore this topic at the activity level, seeking insights into structures and supports that will help students have productive learning dialogues and achieve desired collaborative outcomes.

Students who lack a clear sense of discussion goal or purpose tend to produce perfunctory replies and topical threading (Dennen, 2008), which can be frustrating to an instructor or peers who uphold co-construction or collaboration as an ideal (Capdeferro & Romero, 2012). Some students and instructors may find it normal that rich dialogues fail to occur in their classes, as if this is what one should expect from online learning. Others may orient to the instructor for affirmation, and not value contributions from and interactions with their peers. As Matusov (2020) demonstrates, students are accustomed to teachers interjecting themselves into learning conversations, either affirming or redirecting students, and, in the process, cutting off the ability for students to follow through on their developing thoughts and negotiate knowledge with peers. To combat these forces, instructors need to know how to design for intersubjectivity, how to facilitate it, and how to assess it.

The field's ability to improve practice will be intertwined with continued research developments in this area. Although there is no shortage of research on online discussion forums and learner engagement, the field has yet to be able to confidently and reliably measure intersubjectivity in online learning, or to foster online intersubjectivity development through activity design and facilitation. Perhaps putting intersubjectivity at the center of research and practice, upholding it as an ideal and building empirical support for how to identify and develop it, would provide researchers and practitioners with a solid foundation for promoting online learning through discursive learner interactions.

## **Limitation**

A potential limitation of this review is the way the sample was constituted, focusing specifically on articles that make overt use of the term intersubjectivity. There is a larger body of research that examines online activities related to intersubjectivity, such as interaction, negotiation, and co-construction. These articles would have been included in the sample if they used the term intersubjectivity and focused on the underlying psychological state rather than activities that may lead to it. The connection between these articles and intersubjectivity is unknown. Researchers familiar with the psychological state should use the term and cite the relevant literature when studying it. However, some researchers who lack a background in educational psychology may not be familiar with the term and the related literature base. To go through the entire body of research on interaction, negotiation, co-construction and similar activities seeking evidence that the research extends beyond the visible mechanics of the activity and investigates the underlying cognitive elements would be a daunting task, like searching for needles in haystacks. We believe that the likelihood that these articles exist yet were not captured in our search serves as further evidence of the dispersed and disconnected nature of this body of

research which this article sought to address. Of course, this limitation could be turned into a future research opportunity, in which the degree to which connections between intersubjectivity and specific activities related to developing intersubjectivity could be established.

## **Conclusion and Future Research**

This systematic review demonstrates that over the last twenty years researchers have laid the initial groundwork for studying intersubjectivity in online learning by exploring different analysis methods and frameworks. However, the research base is still dispersed and small despite the foundational importance of intersubjectivity to online pedagogy. Online instructors need to be attuned to intersubjectivity in the same way that they attend to sense of community (Rovai, 2000), social presence and identity (Lowenthal & Dennen, 2017), and transactional distance (Moore, 1993), to name a few others. The articles included in this review provide insights into different ways to draw upon interdisciplinary foundations in the service of better understanding what intersubjectivity looks like in online dialogue across learning modalities.

This study has several implications for researchers and practitioners. For researchers, it provides potential indicators of where the research on intersubjectivity might head. There are opportunities to compare the various frameworks that have been applied across different studies, and standardize analytic approaches for different disciplines, modalities, and learning activities. Intersubjectivity researchers should synthesize across this literature base, and in the process develop a new foundational platform for research and practice. This synthetic platform could help future researchers start their inquiry from common ground. In essence, this recommendation is that the intersubjectivity researchers seek intersubjectivity among themselves and the work that they do. Additionally, researchers studying interaction and related learning activities more generally should consider the role that intersubjectivity plays in the phenomena that they study.

For practitioners, these findings suggest a need to consider intersubjectivity when designing and facilitating courses. The studies in this review consistently demonstrate how critical it is to allow time for students to develop intersubjectivity. Instructors should be aware that interaction does not automatically lead to intersubjectivity. Discussion activities that fall flat (i.e., yield outcomes that look more like threaded message posting than responsive learning dialogues) are generally those in which intersubjectivity was not achieved. Although often blamed for an activity's interactional shortcomings, asynchronous discussion as a learning modality is not at fault. Instead, activity design and facilitation are the culprit, along with learner motivation and online learning norms established in other classes. Online instructors seeking to engage students in rich, meaning-making processes need to consider how their learning activities will motivate and scaffold learners to establish intersubjectivity and not merely post messages.

The future holds opportunities to connect research on intersubjectivity across modalities and disciplines. Although intersubjectivity may be manifest differently across modalities, learning tasks, and even topical areas, the underlying psychological construct is the same. Given what is known about the relationship between the development of humanistic connections and student satisfaction in online courses (Bickle et al., 2019), if researchers, instructors, and, eventually, students collectively identified intersubjectivity as a target learning outcome whenever and however online dialogues are required, perhaps an overall increase in student satisfaction and learning outcomes also might occur.

### **Declarations**

The author(s) declare no conflicts of interest or external funding.

## References

- Abrams, Z. I. (2008). Sociopragmatic features of learner-to-learner computer-mediated communication. *CALICO Journal*, 26(1), 1.
- Altebarmakian, M., & Alterman, R. (2019). Cohesion in online environments. *International Journal of Computer-Supported Collaborative Learning*, 14(4), 443–465. <http://dx.doi.org/10.1007/s11412-019-09309-y>
- Alterman, R., & Harsch, K. (2017). A more reflective form of joint problem solving. *International Journal of Computer-Supported Collaborative Learning*, 12(1), 9–33. <http://dx.doi.org/10.1007/s11412-017-9250-1>
- Alterman, R., & Larusson, J. A. (2013). Participation and common knowledge in a case study of student blogging. *International Journal of Computer-Supported Collaborative Learning*, 8(2), 149–187. <http://dx.doi.org/10.1007/s11412-013-9167-2>
- Antaki, C. (2008). Discourse analysis and conversation analysis. In P. Alasuutari, L. Bickman, & J. Brannen (Eds.), *The SAGE handbook of social research methods* (pp. 431–446). Sage.
- Antoniadou, V. (2011). Using Activity Theory to understand the contradictions in an online transatlantic collaboration between student-teachers of English as a Foreign Language. *ReCALL: The Journal of EUROCALL*, 23(3), 233–251. <http://dx.doi.org/10.1017/S0958344011000164>
- Babbie, E. (1986). *Observing ourselves: Essays in social research*. Wadsworth.
- Baber, H. (2021). Social interaction and effectiveness of the online learning—A moderating role of maintaining social distance during the pandemic COVID-19. *Asian Education and Development Studies*, 11(1), 159–171. <https://doi.org/10.1108/aeds-09-2020-0209>
- Baker, K. Q., & Moyer, D. M. (2018). The relationship between students' characteristics and their impressions of online courses. *American Journal of Distance Education*, 33(1), 16–28. <https://doi.org/10.1080/08923647.2019.1555301>
- Barbera, E. (2006). Collaborative knowledge construction in highly structured virtual discussions. *Quarterly Review of Distance Education*, 7(1), 1–12.
- Belcher, A. R., Hall, B. M., Kelley, K., & Pressey, K. L. (2015). An analysis of faculty promotion of critical thinking and peer interaction within threaded discussions. *Online Learning*, 19(4). <http://dx.doi.org/10.24059/olj.v19i4.544>
- Berelson, B. (1952). *Content analysis in communication research*. Free Press.
- Berge, Z., & Mrozowski, S. (2001). Review of research in distance education, 1990 to 1999. *American Journal of Distance Education*, 15(3), 5–19. <https://doi.org/10.1080/08923640109527090>

- Bickle, M. C., Rucker, R. D., & Burnsed, K. A. (2019). Online learning: Examination of attributes that promote student satisfaction. *Online Journal of Distance Learning Administration*, 22(1), 1–8.
- Blankenship, R., & Kim, D. (2012). Revealing authentic teacher professional development using situated learning in virtual environments as a teaching tool. *International Forum of Teaching and Studies*, 8(1), 36–53,80.
- Bober, M. J., & Dennen, V. P. (2001). Intersubjectivity: Facilitating knowledge construction in online environments. *Educational Media International*, 38(4), 241–250.  
<https://doi.org/10.1080/09523980110105150>
- Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher*, 33(8), 3–15. <https://doi.org/10.3102/0013189X033008003>
- Brettell, C. B. (Ed.). (1996). *When they read what we write: The politics of ethnography*. Praeger.
- Bures, E. M., Abrami, P. C., & Schmid, R. F. (2010). Exploring whether students' use of labelling depends upon the type of activity. *International Journal of Computer-Supported Collaborative Learning*, 5(1), 103–116. <http://dx.doi.org/10.1007/s11412-009-9079-3>
- Canals, L. (2021). Multimodality and translanguaging in negotiation of meaning. *Foreign Language Annals*, 54(3), 647–670. <http://dx.doi.org/10.1111/flan.12547>
- Capdeferro, N., & Romero, M. (2012). Are online learners frustrated with collaborative learning experiences? *International Review of Research in Open and Distance Learning*, 13(2). <https://doi.org/10.19173/irrodl.v13i2.1127>
- Chen, I.-J., & Chen, W.-C. (2008). Cross-border telecommunication: A task-based collaboration at college level. *Journal of Asia TEFL*, 5(4), 163-189.
- Cho, H. (2016). Task dependency effects of collaboration in learners' corpus consultation: An exploratory case study. *ReCALL: The Journal of EUROCALL*, 28(1), 44–61.  
<http://dx.doi.org/10.1017/S0958344015000130>
- Damsa, C. I. (2014). The multi-layered nature of small-group learning: Productive interactions in object-oriented collaboration. *International Journal of Computer-Supported Collaborative Learning*, 9(3), 247–281. <http://dx.doi.org/10.1007/s11412-014-9193-8>
- Dennen, V. P. (2005). From message posting to learning dialogues: Factors affecting learner participation in asynchronous discussion. *Distance Education*, 26(1), 127–148.  
<https://doi.org/10.1080/01587910500081376>

- Dennen, V. P. (2008). Looking for evidence of learning: Assessment and analysis methods for online discourse. *Computers in Human Behavior*, 24(2), 205–219.  
<https://doi.org/10.1016/j.chb.2007.01.010>
- Dennen, V. P., & Wieland, K. (2007). From interaction to intersubjectivity: Facilitating online group discourse processes. *Distance Education*, 28(3), 281–297.  
<https://doi.org/10.1080/01587910701611328>
- Eryilmaz, E., Thoms, B., Zafor, A., & Kuo-Hao, L. (2021). Effects of recommendations on message quality and community formation in online conversations. *Education and Information Technologies*, 26(1), 49-68. <http://dx.doi.org/10.1007/s10639-020-10364-4>
- Etelämäki, M. (2016). Introduction: Discourse, grammar and intersubjectivity. *Nordic Journal of Linguistics*, 39(2), 101–112.
- Evans, M. A., Feenstra, E., Ryon, E., & McNeill, D. (2011). A multimodal approach to coding discourse: Collaboration, distributed cognition, and geometric reasoning. *International Journal of Computer-Supported Collaborative Learning*, 6(2), 253–278.  
<http://dx.doi.org/10.1007/s11412-011-9113-0>
- Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2–3), 87–105. [http://dx.doi.org/10.1016/S1096-7516\(00\)00016-6](http://dx.doi.org/10.1016/S1096-7516(00)00016-6)
- Gergen, K. J. (2015). *An invitation to social construction* (3rd ed ed.). Sage.
- Gibson, K. M. (2013). Fostering collaboration and learning in asynchronous online environments. *Journal of Teaching and Learning with Technology*, 2(2), 60–78.
- Gunawardena, C. N., Lowe, C. A., & Anderson, T. (1997). Analysis of global online debate and the development of an interaction analysis model for examining social construction of knowledge in computer conferencing. *Journal of Educational Computing Research*, 17(4), 397–431.
- Gusenbauer, M., & Haddaway, N. R. (2020). Which academic search systems are suitable for systematic reviews or meta-analyses? Evaluating retrieval qualities of Google Scholar, PubMed, and 26 other resources. *Res Synth Methods*, 11(2), 181–217.  
<https://doi.org/10.1002/jrsm.1378>
- Hall, B. M. (2014). Designing collaborative activities to promote understanding and problem solving. *International Journal of e-Collaboration*, 10(2), 55-71.  
<https://doi.org/10.4018/ijec.2014040104>
- Hall, B. M. (2019). Learning through asynchronous discourse: An interdisciplinary perspective on intersubjectivity. In S. Carliner (Ed.), *Proceedings of E-Learn: World Conference on*

- E-Learning in Corporate, Government, Healthcare, and Higher Education* (pp. 1100–1111). Association for the Advancement of Computing in Education.
- Hammersley, M. (2003). Conversation analysis and discourse analysis: Methods or paradigms? *Discourse & Society*, 14(6), 751–781.
- Henri, F. (1992). Computer conferencing and content analysis. In A. R. Kaye (Ed.), *Online education: Perspectives on a new environment* (pp. 115–136). Praeger.
- Hui, D., & Russell, D. L. (2007). Understanding innovative professional development for educators through the analysis of intersubjectivity in online collaborative dialogues. *International Journal of Information and Communication Technology Education*, 3(3), 25–38. <http://dx.doi.org/10.4018/jicte.2007070103>
- Hung, J. I. (2012). Trends of e-learning research from 2000 to 2008: Use of text mining and bibliometrics. *British Journal of Educational Technology*, 43(1), 5–16. <https://doi.org/j.1467-8535.2010.01144.x>
- Husserl, E. (1931). *Cartesian meditations: An introduction to phenomenology* (D. Cairns, Trans.). Kluwer.
- Ifenthaler, D., & Yau, J. Y.-K. (2020). Utilising learning analytics to support study success in higher education: A systematic review. *Educational Technology Research and Development*, 68(4), 1961–1990. <https://doi.org/10.1007/s11423-020-09788-z>
- Johnson, C. M. (2016). Rethinking online discourse: Improving learning through discussions in the online classroom. *Education and Information Technologies*, 21(6), 1483–1507. <http://dx.doi.org/10.1007/s10639-015-9395-3>
- Joo, M. H., & Dennen, V. P. (2017). Measuring university students' group work contribution: Scale development and validation. *Small Group Research*, 48(3), 288–310. <https://doi.org/10.1177/1046496416685159>
- Kaul, M., Aksela, M., & Wu, X. (2018). Dynamics of the Community of Inquiry (CoI) within a Massive Open Online Course (MOOC) for in-service teachers in environmental education. *Education Sciences*, 8(2), 40. <http://dx.doi.org/10.3390/educsci8020040>
- Kenning, M.-M. (2010). Collaborative scaffolding in online task-based voice interactions between advanced learners. *ReCALL: The Journal of EUROCALL*, 22(2), 135–151. <http://dx.doi.org/10.1017/S0958344010000042>
- Kew, S. N., & Tasir, Z. (2021). Learning analytics in online learning environment: A systematic review on the focuses and the types of student-related analytics data. *Technology, Knowledge and Learning*, 27(2), 405–427. <https://doi.org/10.1007/s10758-021-09541-2>
- Krippendorff, K. (2019). *Content analysis: An introduction to its methodology* (4th ed.). Sage.



- Kuo, Y.-C., Belland, B. R., & Kuo, Y.-T. (2017). Learning through blogging: Students' perspectives in collaborative blog-enhanced learning communities. *Journal of Educational Technology & Society*, 20(2), 37–50.
- Larusson, J. A., & Alterman, R. (2009). Wikis to support the "collaborative" part of collaborative learning. *International Journal of Computer-Supported Collaborative Learning*, 4(4), 371–402. <http://dx.doi.org/10.1007/s11412-009-9076-6>
- Lee, S., & Song, K. (2016). Exploring the relationship between resistance and perspectival understanding in computer-mediated discussions. *International Journal of Computer-Supported Collaborative Learning*, 11(1), 41–58. <http://dx.doi.org/10.1007/s11412-016-9228-4>
- Ligorio, M. B., Cesareni, D., & Schwartz, N. (2008). Collaborative virtual environments as means to increase the level of intersubjectivity in a distributed cognition system. *Journal of Research on Technology in Education*, 40(3), 339–357. <https://doi.org/10.1080/15391523.2008.10782511>
- Lim, J., & Hall, B. M. (2015). Intersubjectivity in theoretical and practical online courses. *Quarterly Review of Distance Education*, 16(4), 45–60.
- Lim, J., Hall, B. M., Jeong, A. C., & Freed, S. (2017). Intersubjectivity and discussion characteristics in online courses. *Quarterly Review of Distance Education*, 18(1), 29–44, 112–114.
- Lowenthal, P. R., & Dennen, V. P. (2017). Social presence, identity, and online learning: Research development and needs. *Distance Education*, 38(2), 137–140. <https://doi.org/10.1080/01587919.2017.1335172>
- Mahardale, J. W., & Lee, C. B. (2013). Understanding how social and epistemic scripts perpetuate intersubjectivity through patterns of interactions. *Interactive Learning Environments*, 21(1), 68–88. <http://dx.doi.org/10.1080/10494820.2010.547204>
- Martin, F., Sun, T., & Westine, C. D. (2020). A systematic review of research on online teaching and learning from 2009 to 2018. *Computers & Education*, 159, 104009. <https://doi.org/10.1016/j.compedu.2020.104009>
- Matcha, W., Uzir, N. A., Gasevic, D., & Pardo, A. (2020). A systematic review of empirical studies on learning analytics dashboards: A self-regulated learning perspective. *IEEE Transactions on Learning Technologies*, 13(2), 226–245. <https://doi.org/10.1109/tlt.2019.2916802>
- Matusov, E. (1996). Intersubjectivity without agreement. *Mind, Culture, and Activity*, 3(1), 25–45. [https://doi.org/10.1207/s15327884mca0301\\_4](https://doi.org/10.1207/s15327884mca0301_4)

- Matusov, E. (2020). Pattern-recognition, intersubjectivity, and dialogic meaning-making in education. *Dialogic Pedagogy: An International Online Journal*, 8. <https://doi.org/10.5195/dpj.2020.314>
- Matusov, E., Hayes, R., & Pluta, M. J. (2005). Using discussion webs to develop an academic community of learner. *Journal of Educational Technology & Society*, 8(2), 16–39.
- McAlister, S., Ravenscroft, A., & Scanlon, E. (2004). Combining interaction and context design to support collaborative argumentation using a tool for synchronous CMC. *Journal of Computer Assisted Learning*, 20(3), 194–204. <https://doi.org/10.1111/j.1365-2729.2004.00086.x>
- McMahon, M. N. (1999). Applying Stolorow's theory of intersubjectivity to Hendrix's imago techniques. *Smith College Studies in Social Work*, 69(2), 309–334. <https://doi.org/10.1080/00377319909517557>
- Mead, G. H., & Schubert, C. (1934). *Mind, self and society*. University of Chicago Press.
- Moore, M. G. (1993). Theory of transactional distance. In D. Keegan (Ed.), *Theoretical principles of distance education* (pp. 22–38). Routledge.
- Nandi, D., Hamilton, M., & Harland, J. (2012). Evaluating the quality of interaction in asynchronous discussion forums in fully online courses. *Distance Education*, 33(1), 5–30. <https://doi.org/10.1080/01587919.2012.667957>
- Neuendorf, K. A. (2017). Defining content analysis. In K. A. Neuendorf (Ed.), *The content analysis guidebook* (2nd ed., pp. 1–35). Sage.
- Oh, E. G., Huang, W.-H. D., Amir Hedayati, M., & Ju, B. (2018). Facilitating critical thinking in asynchronous online discussion: comparison between peer- and instructor-redirection. *Journal of Computing in Higher Education*, 30(3), 489–509. <http://dx.doi.org/10.1007/s12528-018-9180-6>
- Onrubia, J., & Engel, A. (2012). The role of teacher assistance on the effects of a macro-script in collaborative writing tasks. *International Journal of Computer-Supported Collaborative Learning*, 7(1), 161–186. <http://dx.doi.org/10.1007/s11412-011-9125-9>
- Ouzzani, M., Hammady, H., Fedorowicz, Z., & Elmagarmid, A. (2016). Rayyan — a web and mobile app for systematic reviews. *Systematic Reviews*, 5, Article 210. <https://doi.org/10.1186/s13643-016-0384-4>
- Page, M. J., Moher, D., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hrobjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., McGuinness, L. A., Stewart, L. A., Thomas, J., Tricco, A. C., Welch, V. A., Whiting, P., & McKenzie, J. E. (2021). PRISMA 2020 explanation and elaboration: updated guidance

- and exemplars for reporting systematic reviews. *BMJ*, 372, n160.  
<https://doi.org/10.1136/bmj.n160>
- Paulus, T., Warren, A., & Lester, J. N. (2016). Applying conversation analysis methods to online talk: A literature review. *Discourse, Context & Media*, 12, 1–10.  
<https://doi.org/10.1016/j.dcm.2016.04.001>
- Pena-Shaff, J. B., & Nicholls, C. (2004). Analyzing student interactions and meaning construction in computer bulletin board discussions. *Computers & Education*, 42(3), 243–265. <https://doi.org/10.1016/j.compedu.2003.08.003>
- Peterson, M. (2012). Learner interaction in a massively multiplayer online role playing game (MMORPG): A sociocultural discourse analysis. *ReCALL: The Journal of EUROCALL*, 24(3), 361–380. <http://dx.doi.org/10.1017/S0958344012000195>
- Pifarré, M., & Cobos, R. (2010). Promoting metacognitive skills through peer scaffolding in a CSCL environment. *International Journal of Computer-Supported Collaborative Learning*, 5(2), 237–253. <http://dx.doi.org/10.1007/s11412-010-9084-6>
- Pifarré, M., & Kleine Staarman, J. (2011). Wiki-supported collaborative learning in primary education: How a dialogic space is created for thinking together. *International Journal of Computer-Supported Collaborative Learning*, 6(2), 187–205.  
<http://dx.doi.org/10.1007/s11412-011-9116-x>
- Poole, M. S., & Holmes, M. E. (1995). Decision development in computer-assisted group decision making. *Human Communication Research*, 22(1), 90–127.  
<https://doi.org/10.1111/j.1468-2958.1995.tb00363.x>
- Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in social context*. Oxford University Press.
- Rose, M. A. (2004). Comparing productive online dialogue in two group styles: Cooperative and collaborative. *The American Journal of Distance Education*, 18(2), 73–88.  
[http://dx.doi.org/10.1207/s15389286ajde1802\\_2](http://dx.doi.org/10.1207/s15389286ajde1802_2)
- Rovai, A. P. (2000). Building and sustaining community in asynchronous learning networks. *Internet and Higher Education*, 3, 285–297. [https://doi.org/10.1016/S1096-7516\(01\)00037-9](https://doi.org/10.1016/S1096-7516(01)00037-9)
- Satar, H. M. (2013). Multimodal language learner interactions via desktop videoconferencing within a framework of social presence: Gaze. *ReCALL: The Journal of EUROCALL*, 25(1), 122–142. <http://dx.doi.org/10.1017/S0958344012000286>
- Satar, H. M. (2015). Sustaining multimodal language learner interactions online. *CALICO Journal*, 32(3), 480–507. <http://dx.doi.org/10.1558/cj.v32i3.26508>

- Schneider, B., & Pea, R. (2013). Real-time mutual gaze perception enhances collaborative learning and collaboration quality. *International Journal of Computer-Supported Collaborative Learning*, 8(4), 375–397. <http://dx.doi.org/10.1007/s11412-013-9181-4>
- Sert, O., & Balaman, U. (2018). Orientations to negotiated language and task rules in online L2 interaction. *ReCALL: The Journal of EUROCALL*, 30(3), 355–374. <http://dx.doi.org/10.1017/S0958344017000325>
- Sherry, L. (1996). Issues in distance learning. *International Journal of Educational Telecommunications*, 1(4), 337–365.
- Stahl, G. (2006). *Group cognition: Computer support for building collaborative knowledge*. MIT Press.
- Stewart, A. R., Harlow, D. B., & DeBacco, K. (2011). Students' experience of synchronous learning in distributed environments. *Distance Education*, 32(3), 357–381. <https://doi.org/10.1080/01587919.2011.610289>
- Stolorow, R. D., & Atwood, G. E. (2014). *Contexts of being: The intersubjective foundations of psychological life*. Routledge.
- Sudnow, D. (1972). *Studies in social interaction*. Free Press.
- Suthers, D. D. (2006). Technology affordances for intersubjective meaning making: A research agenda for CSCL. *International Journal of Computer-Supported Collaborative Learning*, 1(3), 315–337. <https://doi.org/10.1007/s11412-006-9660-y>
- Sykes, J. M. (2005). Synchronous CMC and pragmatic development: Effects of oral and written chat. *CALICO Journal*, 22(3), 399.
- Szabo, Z. (2015). Better together: Teams and discourse in asynchronous online discussion forums. *Journal of Psychological and Educational Research*, 23(1), 73–88. <https://doi.org/10.17169/fqs-7.2.100>
- Ten Have, P. (2006). Review essay: Conversation analysis versus other approaches to discourse. *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, 7(2).
- Thompson, L., & Ku, H.-Y. (2006). A case study of online collaborative learning. *Quarterly Review of Distance Education*, 7(4), 361–375, 448–449.
- van Heijst, H., de Jong, F. P. C. M., van Aalst, J., de Hoog, N., & Kirschner, P. A. (2019). Socio-cognitive openness in online knowledge building discourse: Does openness keep conversations going? *International Journal of Computer-Supported Collaborative Learning*, 14(2), 165–184. <http://dx.doi.org/10.1007/s11412-019-09303-4>

- Vandergriff, I. (2013). "My major is English, believe it or not:)" - Participant orientations in nonnative/native text chat. *CALICO Journal*, 30(3), 393-n/a. <http://dx.doi.org/10.11139/cj.30.3.393-409>
- Vogler, J. S., Schallert, D. L., Jordan, M. E., Song, K., Sanders, A. J., Te Chiang, Y.-h. Y., Lee, J.-e., Park, J. H., & Yu, L.-t. (2017). Life history of a topic in an online discussion: A complex systems theory perspective on how one message attracts class members to create meaning collaboratively. *International Journal of Computer-Supported Collaborative Learning*, 12(2), 173–194. <http://dx.doi.org/10.1007/s11412-017-9255-9>
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Welsh, E. T., & Slack, M. E. (2022). A tale of two team formation methods: Innovative ways to form student teams. *Journal of Education for Business*, 1–7. <https://doi.org/10.1080/08832323.2022.2031087>
- Wertsch, J. V. (1985). *Vygotsky and the social formation of mind*. Harvard University Press.
- Wertsch, J. V. (1991). *Voices of the mind: A sociocultural approach to mediated action*. Harvard University Press.
- Yadlin-Segal, A., Tsuria, R., & Bellar, W. (2020). The ethics of studying digital contexts: Reflections from three empirical case studies. *Human Behavior and Emerging Technologies*, 2(2), 168–178. <https://doi.org/10.1002/hbe2.183>
- Yu, L., & Zeng, G. (2011). Managing CMC-based task through text-based dialogue: an exploratory study in a Chinese EFL context. *English Language Teaching*, 4(4), 221–233.
- Zawacki-Richter, O., Backer, E., & Vogt, S. (2009). Review of distance education research (2000 to 2008): Analysis of research areas, methods, and authorship patterns. *International Review of Research in Open and Distance Learning*, 10(6), Article 30. <https://doi.org/10.19173/irrodl.v10i6.741>