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Discourse Analysis of Knowledge Construction in an Online Teacher Education Course

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DISCOURSE ANALYSIS OF KNOWLEDGE CONSTRUCTION IN AN ONLINE TEACHER EDUCATION COURSE

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ABSTRACT

Peer discourse is a valuable tool for knowledge construction in the higher education classroom environment, and can sometimes be neglected in asynchronous online classes, which have become increasingly prevalent in the past several years. Students interact in different ways online than they do in person, which can affect the class dynamic and the way in which knowledge is constructed within it. Using Weinberger & Fischer's (2005) Framework to Analyze Argumentative Knowledge Construction in Computer-Supported Collaborative Learning, this single-case qualitative case study utilizes self-study, content analysis, and discourse analytic methods to investigate undergraduate students' approaches to knowledge co-construction via discussion boards in a fully asynchronous online education course. This two-article dissertation presents five different interaction styles utilized by students in the course and discusses implications for instructors of online and hybrid courses that utilize discussion for peer knowledge construction.

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Chapter 1: Introduction

Claire: I think if there is a correct way to use English dialect, it should be based on these dictionary pronunciations … but after watching the video I'm a little torn. Is there really a correct way to speak? And even if there is, who gets the authority to decide this? Language has already changed so much, and I believe it will continue to change far into the future. The bigger part of me thinks it is already too late to do anything or to implement a "correct" way to speak. But I also think that as long as everyone is using words in the language the correct way, as in using them correctly in sentences, it should not matter how they pronounce them or what accent they may use. Your dialect is a part of your culture and identity, and there shouldn't be anything wrong with that.

Elliot: Hi Claire! I think i would agree that there is absolutely no such thing as a proper way to [pronounce] "English". There might be some forms of words that we as a collective society pronounce in a certain way, but we must choose to celebrate this diversity.

Felix: Claire, I like how you talked about how it's part of their culture and identity and how there shouldn't be anything wrong with that. I agree that it's important to use proper grammar or at least to know how to use it. As time goes on languages will change and [there] will be new standards for what is considered "proper" English.

Samantha: Hey Claire! My quiz was actually spot on. Since I'm from NJ, I expected that I would at least show a little of that in my results, but it pinned me right at upstate NY, which is very accurate. As someone who's heard you speak verbally, I don't think you have a MA accent at all! That being said, I'm not exactly sure what a Maine accent sounds like. I also completely agree with what you said about sneakers! I had no clue that anyone calls them anything else, and it sounds so strange to hear it differently. My dad calls them tennis shoes, and I've always been bothered by that because they're not explicitly shoes for tennis (haha)!

The above vignette highlights an authentic interaction from an online teacher education course. Claire, Elliot, Felix, and Samantha are all undergraduate students engaging in a discussion about language variation and linguicism. Claire opens the discussion by providing some context and then forwarding an argument: "Your dialect is part of your culture and identity, and there shouldn't be anything wrong with that." Elliot

aligns himself with Claire and pushes her argument a step further: “we must choose to celebrate this diversity.” Felix acknowledges and agrees with Claire’s argument and adds a new element for consideration with “languages will change and their [sic] will be new standards.” Samantha provides a personal anecdote to illustrate an example of variation (sneakers vs. tennis shoes). Each student is approaching the topic by recognizing and building upon their peers’ previous input, in a process known as knowledge construction, by which learners engage in discourse which is connected to knowledge acquisition. Peer discourse is indeed a valuable tool for knowledge construction in all academic contexts including asynchronous online classes, and students interact in different ways to construct this knowledge, depending on a variety of factors.

With the nationwide transition of higher education to online platforms in 2020 came the shift of class discussions to discussion boards, forums, and other asynchronous chat spaces. While classroom discourse has been researched at length in face-to-face environments, studies of online learning generally focus on measurable outcomes, for example exam grades, rather than qualitative measures of peer discourse. This is despite the fact that peer discourse has been shown to be a valuable tool for knowledge construction (Scardamalia & Bereiter, 2010; van Dijk, 2014). Furthermore, students interact in different ways online as opposed to in person, which can affect the class dynamic and the way in which knowledge is constructed within it. This dissertation presents a study of knowledge co-construction among undergraduate students via discussion boards in a fully asynchronous online education course.

Background

Several contextual factors influenced the conditions under which this research was conducted: the changes which online learning is currently undergoing, the diversification of the college student population writ large, and the proliferation of the Covid-19 pandemic. I will elaborate on each of these factors below.

The Changing Landscape of Online Learning in Higher Education

The incredible and unprecedented increase in the number of online classes in 2020 has been thoroughly documented and affected most Americans, by virtue of their role as a student, parent, employee, or stakeholder of an educational body of any kind. However, even prior to the effects of the Covid pandemic on our educational system, online teaching and learning had already become standard in higher education. According to the National Center for Education Statistics (NCES), "In fall 2018, there were 6,932,074 students enrolled in any distance education courses at degree-granting postsecondary institutions." 35% of students were enrolled in one or more online ("distance") courses. Among graduate students, it was 40%. While, as of the time this is being written, NCES has not yet published statistics for the 2020-2021 school year, we know that the worldwide shuttering of schools in spring of 2020 caused a massive shift toward online learning which has had lasting effects on the way online learning is offered and perceived.

Increased Accessibility

The increase in "non-traditional" student populations means that colleges and universities have seen increases in the numbers of students who are 25 or older (about 40%), who work while attending college (62%), and who report having a physical disability (11%) (NCES, 2015). All of these factors can serve as barriers to a students'

physical presence in a scheduled face-to-face class. Older students are more likely to have family obligations that require them to be at home for childcare or spousal/household support; students who work are likely to have job-related scheduling conflicts that would prevent attendance at daytime classes during the week; and students with physical disabilities may face obstacles getting to inaccessible classrooms or accessing all the supports that may be necessary to do so. Therefore, consistently higher rates of online course attendance are seen across these nontraditional populations. Online courses often also reduce the barrier of cost, with tuition of online classes generally lower than traditional face-to-face classes. As the postsecondary student population continues to diversify in these ways, then, a broadening in scope of the format of course offerings will increase accessibility and encourage learning in a student-centered platform for students who many not otherwise be able to do so.

Diversification of the Student Population

The diversification of the college student body, and the increase in accessibility attributed to a shift online, go hand in hand. Additional demographic information serves to contextualize the "average" college student, with the additional understanding that online classes are more likely to include greater diversity than in-person classes. In the 2015-2016 academic year, 20% of undergraduate students reported having a disability. A subset of this population includes the 11% with a physical disability, as mentioned above. In 2019, about 25% of the 16.6 million postsecondary students in the U.S. (including both graduate and undergraduate) were at least 25 years of age. In the past decade, the number of bachelor's degrees awarded to Black students increased by 28%, Hispanic students by

118 percent%, and AAPI students by 38%. Also in 2018, “nonresident aliens” made up 5% of total postsecondary enrollment (NCES).

The Covid-19 Pandemic

At the time of writing, 83 million people have contracted the Covid-19 virus in the United States, which has led to one million deaths. 51% of students who responded to a National Student Clearinghouse survey indicated that their fall 2021 enrollment plans had changed as a result of Covid, either directly or indirectly. 30% of those whose plans had changed indicated that they could not return to school because they personally had COVID or were taking care of someone who did. And, unsurprisingly, almost all students said that the format of their classes had changed, presumably from in-person to online (National Student Clearinghouse Research Center, 2021).

Online Learning

Collaborative Learning

Peer interaction while learning can generally be categorized into one of three styles: competitive, independent, or cooperative. Despite the popularity of public-facing calls for community and cooperation, *competition* remains the most common form of interaction in the U.S. education system (Johnson & Johnson, 1999). Competition is a zero sum game in which one student’s success is reliant upon another’s loss. Briefly stated, this can be described as *negative interdependence;* students are dependent upon each other to fail so that they may succeed. The second style, *independent* learning, does not rely on others’ performance at all. Students’ success depends on their own performance in relation to pre-established criteria, such as a rubric, or on improvement compared with their own past performance. Finally, *cooperative* learning requires

students to rely on each other for mutual success or failure, as each student's success is dependent upon their peers' success as well as their own. This dependence upon others' success as a condition of one's own is also described as *positive interdependence*; the opposite of the negative interdependence created by competition.

This dissertation deals with peer knowledge construction, which is a cooperative endeavor. Often, in practice, positive interdependence is not a necessary condition of work that is labeled "cooperative"; cooperation is used frequently as a synonym for group work. "Cooperation" can mean merely "working together towards a shared goal," in which work is divided up and cooperating students each take responsibility of a piece to work on. This does not necessarily promote positive interdependence; the work that has been delegated to someone else is no longer other students' responsibility. Peers may care about the quality of the final product, if their name will be attributed to it, but they have no particular incentive to be invested in their peer's process (Pilkington, 2016). *Collaborative* learning differs from cooperative learning in this regard. Dillenbourg, Baker, Blaye, and O'Malley (1996) clarify this distinction in their *Evolution of Research on Collaborative Learning* by stating that "successful collaboration requires participants to share in the process of knowledge creation" (p. 190).

Herein, I will refer not only to cooperation, but *collaboration.* Within the realm of computer-supported collaborative learning, collaboration refers to a specific type of cooperation in which participants are mutually reliant upon each other as they work together "to produce something that neither could have produced alone" (Forman & Cazden, 1985, p. 324). Group members "should need each other to complete the task,"

agrees Pilkington (2016, p. 107); in other words, positive interdependence is a necessary condition of collaborative work.

Relevance of Collaboration in Higher Education

Why is the nature of peer interaction relevant to studies of knowledge construction and learning? Forman and Cazden (1985) continue: "theoretically, most developmental research studies in the United States have traditionally focused on the value of peer interactions in the socialization of behavior and personality and have said less about their possible value for cognition and intellectual learning" (p. 324). This gap was noted and addressed, and a decade after this claim was made, Cohen and Lotan forwarded that the potential value was indeed high:

> one of the most robust findings of the research on complex instruction is the positive relationship between student interaction in small groups and average learning gains. … At the classroom level, the proportion of students talking and working together is a positive predictor of average learning gains; at the individual level, the student's rate of participation in the small group is a significant predictor of his or her posttest scores, holding constant the pretest scores (p. 20).

Research began to support the idea that peer interaction was not only a valuable condition for positive academic outcomes, but a necessary one, explained further in the same article:

> Because the tasks in complex instruction require multiple perspectives and varied input for creative problem solving, the students are not likely to achieve a satisfactory group product unless they exchange ideas. When there

is mutual exchange, the pattern is one of reciprocal interdependence—each person's output is an important input for other persons in the group" (p. 33).

By the 1990s, constructivist theorists seemed to be in agreement when recommending the implementation of cooperative groups to promote learning (Tobin & Tippins, 1993; von Glasersfeld & Steffe, 1991). By 1999, Johnson and Johnson concluded that: "cooperative learning resulted in more higher level reasoning, more frequent generation of new ideas and solutions, and greater transfer of what is learned within one situation to another than did competitive or individualistic learning." They further describe cooperative learning by identifying five elements: 1) positive interdependence, 2) promotive interaction, 3) individual accountability and responsibility to achieve the group's goals, 4) frequent use of interpersonal skills, 5) frequent processing of current functioning to improve future effectiveness (Johnson & Johnson, 1999). In addition to its academic benefits, integrating cooperation into lessons provides the opportunity to gain a useful life skill for personal and professional success.

Argumentation as Collaboration

In this dissertation, I explore the discursive nature of collaborative dialogue among peers who engage in argumentation. At first, argumentation may seem incongruent with collaboration or even cooperation. However, the academic definition of argumentation in this sense differs somewhat from the lay meaning of, literally, arguing or fighting. Andriessen and Baker (2014) distinguish *oppositional* argumentation from *collaborative* argumentation as such: while the goal of an oppositional argument is to "win," and is likely to interfere with learning, collaborative argument engages two (or

more) individuals who are working together towards a common understanding, and "can help students learn to think critically and independently about important issues and contested values" (p. 439). Arguing for or against a claim has been a strategy for gaining knowledge since Aristotle laid out guidelines for the dialectic (debate) as mental training (Owen, 1968), and argument has since been integrated into the philosophies of educational theorists such as Dewey and Vygotsky (Derry, 2013; Garrison et al, 2012). When one makes an argument, preconceived ideas are challenged and additional, previously undiscovered perspectives are brought to light for the arguer's audience. Arguing for or against an idea requires the use of reason, critical thinking, and articulation of one's thoughts. When two arguments, or an argument and a counterargument, are in conflict, therein lies an opportunity for consensus-building, which is a form of collaborative knowledge construction. In this section, I will focus specifically on argumentation's role in collaborative knowledge construction. Argumentation theory writ large is a broad area of study that spans the fields of education, psychology, linguistics, political science, and law, among others, with each having various definitions of what constitutes an argument or argumentation, and each its own schemes to deconstruct and analyze arguments (Schwarz, 2009; van Eemeren et al, 1996). As such, its thorough exploration lies beyond the scope of this dissertation; however, the sources cited in this chapter may serve as a useful introduction for interested readers. I have laid out my selection and justification for my chosen analytic scheme of argumentation, and the theoretical framework based upon it, in Chapter 3.

Argumentation among peer learners has been found to be an effective means of generating new knowledge (Andriessen & Baker, 2014). In a 2003 study, Nussbaum and Sinatra found that

> [student p]articipants who were asked to argue in favor of an alternative explanation of a physics problem (the scientific explanation) were more likely to show improved reasoning on that problem than control participants who were asked to solve the problem without argumentation. ... This intervention is consistent with other pedagogical techniques that promote conceptual change... in that it fosters high engagement and opportunities to juxtapose ideas" (p. 1).

Forman and Cazden agree, arguing that "peer interaction enhances the development of logical reasoning through a process of active cognitive reorganization induced by cognitive conflict. ... Cognitive conflict is most likely to occur in situations where children with moderately discrepant perspectives … are asked to reach a consensus" (p. 326).

Not only is argumentation, then, a collaborative activity that yields positive learning outcomes, it has been posited as actually essential to knowledge building – that, out of the "messiness" of argumentative discourse arises a new synthesis of ideas (Bakhtin, 1981; Scardamalia & Bereiter, 2010). From this, we may conclude that it is the role of educators to establish conditions likely to foster argumentation in order to maximize students opportunity for learning.

Statement of the Problem

The above arguments have been made in regard to peer knowledge construction and not teacher-directed learning. The difference between knowledge construction (or co-construction) and "learning," in this sense, is that learners are creating their own understanding of a particular problem or situation amongst themselves, as a social process, and not simply absorbing information via input. Therefore, the ways in which learners interact with each other is an essential component of the knowledge construction process. And yet, often studies of online learning focus on outcomes and not processes. The way in which learners collaborate to achieve these outcomes is a phenomenon worthy of further study, in fact a neglected one. This disparity in focus is reflected in educational practice as well, with research indicating that a majority of students in the U.S. continue to view school as an overall competitive, not cooperative, environment (Thousand, Villa, & Nevin, 2002).

While a plethora of research has been conducted to assess online courses in higher education for effectiveness, as measured by student evaluations, exam scores, and other performance outcome measures (Allen et al, 2004; Lee et al, 2011; Means et al, 2013), far fewer have focused on the learning process and knowledge construction in online environments. Furthermore, online courses are conducted in nearly every field of study, and therefore only a fraction of studies of computer-supported collaborative learning focus specifically on teacher education courses (Brown, 2014; McCrory et al, 2008). The global shift to online learning that occurred in response to the Covid-19 pandemic has muddied our understanding of the learning processes that happen in these courses even further, due to the multiple confounding variables that presented themselves alongside this unprecedented and unanticipated disruption. As a result of all these circumstances,

research on peer knowledge construction in courses in which this subject matter and environment intersect is greatly needed.

Statement of Research Purpose

Understanding how knowledge construction happens in online courses is important for several groups of stakeholders. Colleges and universities need to know how transferring existing face-to-face courses to an online format will affect the nature of the student experience. Students need to know how and whether to adjust their expectations of what constitutes "classroom learning" when enrolling in their first online class. Instructors need to know what to expect from students in terms of participation throughout their online learning process. This study addresses the lack of existing literature on online education courses by investigating the process of students' knowledge co-construction in one online diversity class in a teacher education program. This process-oriented analysis is intended to explore how students' identities, perceptions of self and course content, and interactions with each other may develop their own understanding and each other's throughout the semester. The purpose of this analysis is to explore the process of knowledge construction among these undergraduate students in an online teacher education course, to answer the research question: how do students co-construct meaning in an online teacher education course?

Significance of the Study

This study builds upon existing literature on students' learning processes in online courses. The reader may note that it does not include a focus on research on diversity courses in particular. This is due to the fact that a) the study of student learning in diversity courses is itself fairly new, and b) that study has not yet been extended to online

platforms in education programs. In addition, the fast-paced development of educational technology renders research in online education outdated more quickly than in other fields of educational research, warranting frequent study. Existing research may also not take into account the structure and ubiquity of current institution-run learning management systems, which most students now use regardless of whether any of their courses are online or not. The current study attempts to address each of these gaps in the existing literature.

Organization of the Dissertation

The multi-paper dissertation model consists of two separate chapter/articles with each addressing the same research question as articulated above. However, each chapter engages its own distinct data set, applies its own methods of analysis, and produces its own set of findings (Davis, Parker, & Straub, 2012). This model was selected for the present study due to the variety of elements in the data – the participants, their dialogue, and their interactions – that each warranted their own focus. Davis et al. encourage this approach as such: "Multiple methods may need to be learned and applied in order to effectively address research questions. … The variety of issues and sources in the multiple papers may require a variety of methodological and analytical tools" (p. 172). This was determined to be an appropriate model for the study at hand because several different analytic methods were used with the same dataset to address the same research question. The multi-paper dissertation model also lends itself to research which incorporates literature from multiple domains or fields of study, as I have done here. Additionally, the multi-paper model allows for chapters to be published as independent journal articles. A version of Chapter 4, the self-study, has been published prior to

dissertation completion, under the title “Visibility in virtual space: Racial identity in an online diversity course” in the edited volume “Textiles & tapestries: Self-study for envisioning new ways of knowing” (Edge, Cameron-Standerford, & Bergh, Eds., 2020). Upon reflection, the multi-paper model has also allowed me to hone my skill in several methodological approaches, which suits my pragmatic paradigm worldview (Held, 2019) and has equipped me with a stronger arsenal of methodologies with which to consider future research questions. Held (2019) describes the pragmatic paradigm of research design by its four key attributes: an emphasis on the intersubjectivity of social life, a perspective that allows the researcher to study whatever is of interest or value, an ethical goal that is limited to gaining knowledge in the pursuit of desired ends, and the freedom to choose whichever methods, often utilizing both quantitative and qualitative, that are most appropriate for answering the research question. I believe this dissertation demonstrates all of these attributes and is explained, in part, by the boundaries of this paradigm. Additionally, Mertens (2015) describes the pragmatist as “methodologically eclectic,” (p. 304), which is demonstrated in my use of network sociograms as a qualitative analytic tool alongside content analysis discourse analysis, and self-study.

Chapter 2: Literature Review

This study combines several subject areas to create a previously uninvestigated research question; therefore, it is supported and informed by research from several discrete and overlapping areas. The following review is a synthesis of literature of online learning in higher education, diversity courses in education, and classroom discourse.

Online Learning in Higher Education

Research of online learning, or computer-based learning and educational technology in general, has developed at a rapid pace since the advent of the internet and spans several fields of study. While research of online learning encompasses all levels, ages, subjects, and student populations, this review will focus specifically on online classes offered as part of a wider curriculum that includes face-to-face instruction at accredited, degree-granting institutions of higher education within the United States. While the mode of instruction – synchronicity, learning management system, etc. – does play a part in the online learning, methodological literature concerning the online format will be further explored in the next chapter. Here, I focus more on theoretical and empirical research into the learning process itself, as it occurs via knowledge construction in online courses.

Research of online learning in higher education that focuses specifically on teacher education courses tends to include slightly more focus on the learning process and student experience than the outcomes-oriented research on online education in general. For example, McCrory, Putnam, and Jansen (2008) argued that "students' disposition to engage in constructive discourse (or not) is an important and only partly controllable factor in what happens in online discussion," (p. 155) further explaining that

students may choose how (and whether) to participate in online discussions regardless of instructor guidance. This reads as a nudge to researchers to shift focus away from instructional strategy and measurement of outcomes and towards students' engagement in dialogue. Similarly, Brown (2014) noticed that preservice teachers in her online class showed a greater increase in the application of higher-order thinking skills throughout the semester than her face-to-face class did, and that this higher-order thinking was demonstrated most often when students posted on the class discussion board. Here we see not only a shift in focus to the knowledge construction process, but its benefits as demonstrated as a product of the students' discourse.

More recently, as learning management systems have increased in functionality and the demands of online courses have become more robust to include a wider variety of activities and assessments, research has begun to include more different types of online learning as well as a broader lens for analysis of outcomes. Historically, much research of online learning has measured its effectiveness as compared with face-to-face courses, by way of searching for significant correlations between the mode of study (face-to-face vs. online) and learning outcomes (often operationally defined by final grades and evaluations). Within the past decade, however, Archambault and colleagues (2010) suggest that incorporating social media, for example, helps to create a more student-centered, active learning environment. The focus throughout this study remains on building and fostering peer discourse rather than quantitative indicators of academic success. Students' role in their learning, in fact, is foregrounded in several of the more widely cited recent studies of online learning. Wang, Shannon, and Ross (2013) examined the relationship between self-regulated learning, self-efficacy, and course

outcomes; and Lee, Srinivasan, Trail, Lewis, and Lopez (2011) studied the effects of peer support on student satisfaction. Both studies found significant correlations between the stated independent variables and positive outcomes. On the other hand, Eom & Ashill (2016), in an attempt to identify critical success factors (CSFs) in online higher education, found that, while peer dialogue was found to significantly affect students' learning outcomes, self-regulation did not. Therefore, a theme appears to emerge in which students' individual choices regarding engagement in the class, rather than solely instructor-led course design, are highlighted as crucial determinants of learning outcomes in online courses. These empirical findings support theories of learning that prioritize social interactivity rather than independent passive learning; theories which have long been present in the study of computer-mediated communication, and specifically in the subfield of computer-supported collaborative learning.

Computer-Mediated Communication

The invention of instantaneous text-based modes of communication has disrupted conventional conceptions of discrete categories of verbal and written communication, in which the former is informal, immediate, and interactive, whereas the latter is more formal, distant, and unidirectional (Davis & Brewer, 1997; Ferrara, Brunner, & Whittemore, 1991). The appearance of a new type of communication, which was not quite one nor the other, problematized not only this dichotomy but the linguistic theories which were built upon it. Davis and Brewer (1997) tackle this issue as such:

> Electronic communication, written on keyboards and read on computer screens, has many characteristics of both speaking and writing. Like telephone conversations, it is transmitted by a technology that replaces face-

> to-face communication, in the case of the telephone conversation with voices speaking and in the case of electronic discourse with images on a screen. … As a consequence, electronic discourse is writing that very often reads as if it were being spoken -- that is, as if the sender were writing talking. … Electronic conference discourse exchanged by university students participating in mainframe conferences as part of a course is multiparty interaction through extemporaneous, rapidly written keyboard composition. It reads like and to a certain extent acts like conversation (p. 2).

Another layer of complication in the understanding of communication in online classes is that online forums are *polylogal*; "communicative situations involving multiple people which are complex interactions involving multiple actions, and aims simultaneously … discussions often take place chaotically with lengthy gaps intermixed with overlapping topic discussions" (Beaulieu, Sarker, & Sarker, 2015, p. 3). Furthermore, text-based online conversation has no prosody (intonation & stress) or paralinguistics (pitch, rhythm, loudness) which had previously been taken for granted as omnipresent in research on conversation. From all of these new challenges, it became obvious that the study of discourse aided by new technology would necessitate its own separate area of study with its own shared set of beliefs and assumptions about the nature of communication. This area became the study of *computer-mediated communication.* I discuss this concept of a new type of discourse at greater length – and its implications in applying discourse analysis to asynchronous written communication – in the Methods

chapter, where I elaborate in greater depth on the methods of discourse analysis when applied to text-based discourse.

Computer-Supported Collaborative Learning

While the study of computer-mediated communication deals with any communication that occurs online – on social media, search engines, forums, etc. – the study of computer-supported collaborative learning (CSCL) focuses specifically on the "collaborative construction of knowledge in face-to-face and online settings" (Wallace, 2003, p. 244).

Louis Major and Paul Warwick (2020) have identified three themes in literature on computer-supported collaborative learning: 1) study of dialogue activity, including knowledge co-construction; 2) study of the learning environment, 3) study of technological affordances. I use Major and Warwick's structure here to briefly review some of the sub-themes that underlie much of the research on CSCL.

Dialogue Activity. Dialogue is essential to collaboration, and therefore dialogue activity is considered essential to computer-supported collaborative learning. Studies of dialogue activity include concepts of knowledge co-construction (Enyedy, 2003), exposure to alternative perspectives (Munneke et al, 2007), and expressing meta-cognitive learning through dialogue (de Vries, Lund, & Baker, 2002) among their most common themes. Many of these studies also share theoretical underpinnings with Robin Alexander's concept of dialogic teaching, which "views the social and the cognitive as interdependent and speech as the mediator" (p. 77) and that describes how "language not only manifests thinking but also structures it, and speech shapes the higher mental processes necessary for so much of the learning that takes place, or ought to take place, in

school" (p. 15) (Alexander, 2020). Scardamalia and Bereiter's (1994) work on knowledge building, and Hakkarainen's (2009) follow-up connecting Scardamalia and Bereiter's concept of knowledge building with social practices, were also influential to the field in explicitly labeling knowledge construction as a social practice. "Knowledge creation," Hakkarainen clarifies,

> is not … to be understood as based on ideas, or their leading to new ideas. From an educational reformer's or an educational psychologist's point of view, it is about creating knowledge practices, that is epistemic practices of working with knowledge, channeling the participants' efforts in ways that elicit knowledge advancement, in which the development of ideas is one component. … rather than rigid routines or repeated procedures, such practices are focused on constant re-creating in a way that elicits successful pursuit of innovation (p. 224).

Study of dialogue activity within CSCL settings primarily focus on the ways in which computer-mediated dialogue produces new ideas, arguments, consensus, and other practices of academic dialogue, with the understanding that, as illuminated by the previous quote, the end goal is not always a specific solution or conclusion, but rather the practice and honing of these knowledge construction skills themselves.

Learning Environment. The second sub-theme of CSCL literature, after dialogue activity, is study of the online learning environment. This sub-theme includes research on classroom atmosphere, motivation and engagement, and learner inclusion among its most commonly recurring focal areas. Relevant research on classroom

atmosphere has investigated, for example, how the physical organization of face-to-face classrooms influences students' engagement with classroom technology (Mercier, Higgins, & Joyce-Gibbons, 2016), and the purposes and benefits of using smartphone-enabled social apps such as WhatsApp for teacher-student communication (Bouhnik & Deshen, 2014). Research on motivation and engagement has investigated innovated uses of interactive white boards (e.g. SMART® boards) as a tool for encouraging knowledge co-construction in the face-to-face classroom (Kerawala et al, 2012), and the influence of collaborative technology on students' attitudes and perceptions towards science (Looi et al, 2010) and for encouraging student-centered discussion (Maher, 2012). Finally, research into learner inclusion has found that microblogging can serve as an effective learning tool for reluctant and struggling participants (Rasmussen & Hagen, 2015), that arguments initiated by students on an online discussion board can promote higher rates of participation than teacher-led classroom discussion (Kim et al, 2007) and that open-ended iPad apps can encourage higher quality of peer talk and engagement, while more complex apps encourage higher level independent engagement (Kucirkova et al, 2014). While these three focal areas are differentiated from each other in Major and Warwick's 2018 meta-analysis (upon which this subsection is organized), one can see also a considerable amount of overlap of findings across these areas among research on the learning environment, due to the multiple uses and benefits that educational technology can provide. These uses, or *affordances*, are expanded upon below.

Affordances

Finally, the third sub-theme identified by Warwick and Major is that of affordances and constraints. The term "affordances" used to describe interrelations

between a subject and object was coined by Maurice Merleau-Ponty (1973) and was subsequently adapted to apply specifically to the relationship between an agent (in this case, a learner) and the tools in its environment (in this case, a computer or other technology) by psychologist James Gibson (1986[1]). In studies of discourse and dialogue, affordances generally refer to the potential uses or interpretations of concrete tools and objects by people (Linell, 2009). More specifically, in CSCL, technological affordances generally describe opportunities for dialogue that are made possible by digital technologies (Major & Warwick, 2020). The most frequently recurring themes in the study of technological affordances for CSCL include the creation of shared dialogic space, accessibility and versatility, and representation of content. Creation of a shared dialogic space can mean piloting or experimenting with technological platforms in an educational setting to encourage dialogue among learners, as in Nikolaidou's 2012 work with ComPLuS for collaborative music composition; Looi, Chen, and Ng's (2010) use of GroupScribbles for collaboration in science class; Kerawala, Petrou, and Scanlon's 2012 application of Talk Factory in an elementary school science plenary.

The concept of affordances arises often in studies of computer-supported collaborative learning, as the collaboration is inevitably influenced by the platform on which dialogue takes place. Manovich (2013) reminds us that learning management systems such as Blackboard or Brightspace are not merely tools for course content delivery, but classroom environments that shape the encounters among participants just

[1] Some scholars attribute the original creation of the noun "affordances" to Gibson, including Gibson himself, stating in his 1979 *The ecological approach to visual perception*: "The verb to afford is found in the dictionary, but the noun *affordance* is not. I have made it up" (p. 127)

as a physical classroom does. Making note of the affordances offered (or not offered) to participants by the LMS, then, clarifies to users the ways in which the platform guides and limits the discourse that happens on it (Manovich, 2013).

Diversity Courses in Education

As the content of a course drives the content of learners' dialogue activity and helps to shape the learning environment, therefore, the content of the course in this case study is relevant in an exploration of its learners' knowledge construction. As the importance of diversity preparation in pre-service teacher education has been widely established, more work has been done on learning processes and knowledge construction that occur in students – specifically, pre-service teachers – during their enrollment in these courses (Hurtado et al, 2014; Ladson-Billings, 1995 & 2014; Pantic & Florian, 2015; Paris, 2012; Spratt & Florian, 2015).

Gloria Ladson-Billings (1995; King & Ladson-Billings, 1990) was among the first to advance a theory for integrating cultural competence in teacher education which reframed "culture" as a deficit anthropological concept of the "other" to an integral component of all students' identities, to be recognized and respected as a tool for teaching and learning. Paris's (2012) call for a revision of the theory and proposition of a *culturally sustaining pedagogy* prompted Ladson-Billings' 2014 "remix" of her original theory, which continues to be frequently cited in work related to diversity courses in teacher education. Building on the call for inclusion of diversity courses in teacher education programs, research now suggests concrete skills which such courses instill or help pre-service teachers to develop. Gay & Kirkland (2003) defined *critical cultural consciousness,* "a thorough understanding of [teachers'] own cultures and the cultures of

different ethnic groups, as well as how this affects teaching and learning behaviors" (p. 182), and more recently, Florian and others have identified pedagogical tools for *inclusion* and *inclusivity* as elements of successful diversity education as well (Pantic & Florian, 2015; Spratt & Florian, 2015). These examples demonstrate a growing interest not only in the existence and availability of diversity courses, but their content and pedagogy, as well as how they help develop more competent teachers.

Student Identity

A subsection of research on diversity courses in teacher education focuses on the development and presentation of student identity within these courses. Hurtado, Alvarado, and Gillermo-Wann (2015) found a significant difference in identity salience among white students and students of color, as referenced in the introduction of this proposal. Hurtado's earlier work on institutional diversity and campus climate (Hurtado 1996; Hurtado, Milem, Clayton-Pedersen, & Allen, 1998; Hurtado, Carter, & Kardia, 1998), which identified how student identity influences learning styles, perceptions of campus climate, belongingness, and inter-group behavior, has contributed not only to teacher education, and higher education curriculum in general, but also to research in student affairs and higher education policy. Relevant recent work on student identity in teacher education includes the area of *white teacher identity studies,* which seeks to "prepare and conscientize a predominantly White preservice and professional teaching force for teaching and learning across cultural differences in public schools" (Jupp, Berry, & Lensmore, 2016, p. 1). Even though white students comprise less than half of the PreK-12 students in the USA, they represent about 80% of the teachers, perpetuating underrepresentation of teachers of color in the workforce (Sleeter, 2016). Matias, Nishi,

and Sarcedo (2017) caution that this imbalance "reifies institutional white supremacy in education," and that teacher education must necessarily involve the study of daily manifestations of white supremacy in education. White teacher identity studies characterize pre-service white teacher identity as "race evasive," holding a colorblind ideology or resisting concepts of white privilege (DiAngelo, 2018, Nieto, 1999; Tatum, 1997); however, some more recent work in this arena is critical of such generalization of white teacher candidates, arguing that they are not as homogenous a demographic as previous scholarship assumes (Laughter, 2011; Lowenstein, 2009). Whether it is framed as identity salience, teacher identity studies, or ideology, the prevalence of these identity-related concepts in teacher education literature suggest that considering one's identity and how it influences one's experiences with others is positioned as an important element in teacher education courses. Chapter 4 in this dissertation is a self-study which engages my own identity as a white teacher of a diversity course and how that impacts the way I teach the content, as well as how students choose to engage in the course.

Online Diversity Courses

All of the aforementioned research in teacher education diversity courses concerns – either explicitly or implicitly – traditional, campus-based, face-to-face courses. There has been little research to date regarding online diversity courses in teacher education programs, although there has been some in social work education (Marson, Wei, & Marson, 2010; Stauss, Koh, & Collie, 2018). Smith & Ayers (2007) investigated students' relation to cultural "insiders" and "outsiders," among other knowledge, in distance-learning community college courses, and conclude that the online format "may not solve problems of equity and inclusion. In fact, it may even exacerbate

such problems" (p. 413) – certainly an undesirable quality in any course, but especially ironic for one concerning diversity with the goal of teaching inclusively. More recently, however, Stauss, Koh, & Collie (2018) assessed social work students' awareness of cultural diversity and oppression in online and face-to-face diversity courses. They reported significant improvements in both contexts, with no significant differences between groups, suggesting the potential for successful execution of an existing diversity course curriculum in an online format.

Schrum, Burbank, and Capps (2007) indicate a belief in the flattening of the classroom hierarchy in the online environment:

> we can see the benefits of establishing an online community of practice to help prepare preservice teachers to teach diverse students. Merryfield (2006) explains that online classes can facilitate efforts to democratize the teacher preparation classroom, allowing students to express attitudes and opinions that may contradict the instructor's position. As demonstrated by students' survey responses, online posts and the instructor's narrative, the students in this class took the risk of expressing socially uncomfortable feelings because of the faceless nature of the class.

Discourse

Concepts from the field of discourse studies have already been alluded to in earlier sections of this chapter, as it is nearly impossible to discuss research on communication or identity without invoking discourse. Due to its broad nature, several different fields of study bring various perspectives to discourse; in this section, I clarify the perspectives and approach which this study is built upon.

Group Interaction

As the researcher of discourse as a function of group interaction, I must trace the lineage of literature that has influenced this work back to Austin (1962) and Searle (1969, 1975). There were certainly western theories of speech and language that predate Austin and Searle, whose influence upon the former remain contested; but such theories were predominantly the territory of philosophers inspired by Aristotle and as such dealt with intrapersonal thought and the nature of speech as representations of ideas, rather than focusing on interpersonal communication and relationships (Smith, 1990). So for the purposes of the current study, I will begin in the 1960s. Austin's 1962 "How to do things with words," a collection of his 1955 Harvard lectures on perlocution, provided linguists with a taxonomy for classifying and describing communication into various "speech acts," allowing future work – including this dissertation – to analyze discourse by analyzing, or speculating on, each utterance's functional move; in other words, we can categorize and label utterances to assign a purpose to them. A few years later, moving beyond this taxonomic framework, Searle's *Speech Acts* (1969) "mov[es] beyond this cataloguing stage and providing a theoretical framework within which the three dimensions of utterance, meaning and action involved in speech acts could be seen as being unified together" (Smith, 2003 p. 8). In this sense, Searle introduced the social constructivist nature of language to Austin's existing speech act theory by contrasting "brute facts" (undeniable, collectively agreed-upon truths) with "institutional facts" (social constructions that contribute towards a productive and functional society). As Jeff Stickney (2006) notes,

> John Searle [engaged in] consideration of how we go about constructing social reality (e.g. how money or marriage have meaning only within the background context of our social practices and language). As Nelson Goodman once remarked, the stars do exist, but it is we who make the constellations.

In the move from a post-positivist, scientifically informed study of discourse to a more constructivist lens, then, Searle guided the study of group interaction towards a more critical stance suitable for the sociolinguistic angle taken up in this dissertation.

Discourse Analysis

While discourse analysis is utilized as both a theoretical framework and methodology in anthropology, critical race theory, and other critical theories (Gill, 2000), this dissertation takes a sociolinguistic approach to discourse analysis. Jan Blommaert (2005) reminds us: "In short, discourse is what transforms our environment into a socially and culturally meaningful one. But this kind of meaning-construction does not develop *in vacuo*, it does so under rather strict conditions that are both linguistic … and sociocultural."

A sociolinguistic approach refers to a discourse analysis which focuses on the implicit positioning and intentions behind individuals' discursive moves in an interaction, relative to others involved in the interaction. Sociolinguistic discourse analysts take up a constructivist approach, defining interaction as a process of ongoing negotiation and mediated actions (Gumperz, 2001; Scollon, 2004). Gill (2000) identifies three features of sociolinguistic discourse analysis that differentiate it from these other fields: 1) a social

(rather than cognitive psychological) orientation, and corresponding consideration of discourse as a process for socialization rather than strictly of expressing spontaneously conceived individual ideas and cognitive processes (Antaki et al, 2003); 2) the underlying acknowledgment of the influence of perspective and identity – that is, that various actors involved in a discourse will view the situation, and each action, differently, as will any researchers or analysts observing the discourse (Gee, 2014); and 3) a focus on interaction (van Dijk, 1997; 2014). In fact, Gee (2014) defines identity by the way one presents oneself via interaction with others in a given context: "as discourse analysts, we do not care whether there is really a core self or exactly what it is. We care about how people express their sense of who they are and their multiple other identities through language" (p. 112).

Gill (2000) categorizes the "field" of discourse analysis slightly differently, into three traditions: critical linguistics/social semiotics; speech-act theory/conversation analysis; and poststructuralism. In Gill's framework, this dissertation lies within the second camp – drawing upon the historical literature of speech act theory to include conversation analysis, which I explore in further detail in the next chapter.

Classroom Discourse. To understand the application of discourse analysis in this study, it is first important to establish: Why involve discourse at all when researching knowledge construction and learning? What is the connection between social interaction and learning, and is this connection relevant to online spaces? After all, Howe and Abedin (2013) report that "students do not necessarily regard dialogue as a vehicle for learning, perhaps even viewing it as a distraction from the main business of classrooms" (p. 341). Prior to the 1970s, little empirical research in education focused on classroom

dialogue or discourse (Edwards & Westgate, 1994). It was educational psychologist Lev Vygotsky's (1978) claims regarding the social influence of learning that laid the groundwork for modern theories of social constructivism (Newman & Holzman, 1993/2013; Spratt & Florian, 2015; Trent, Artiles, & Englert, 1998) which remains heavily influential in educational research. For one, Shulman's (1986; 2004) foundational work on pedagogy and content knowledge in teacher education has trended, over time, towards concepts of community and peer learning (emphasis mine):

> In our earlier studies of teacher learning, one of us (LSS) employed constructs that were strictly cognitive and individual, such as *pedagogical content knowledge* and *pedagogical reasoning and action* … But neither of these conceptions seemed comprehensive enough to account for what we were encountering. Rather than attempt to repair our older models, we approached the challenge of developing a new conceptual scheme from a fresh starting point. For our work on 'Fostering Communities of Teachers as Learners' (FCTL), as we dubbed our part of the larger initiative, we recognized the need to frame a more comprehensive conception of teacher learning and development **within communities and contexts** (2004, p. 258-259).

Shulman is not alone in his refocus towards the importance of community in teacher learning; Wenger's (1998) Communities of Practice framework has emerged to define "participation" in learning as dialogic exchanges in interpersonal contexts, and Bakhtin (1981) reminds us that "[t]he importance of struggling with another's discourse, its influence in the history of an individual's coming to ideological consciousness, is

enormous" (p. 348). Given this social, discourse-based definition of learning, I have chosen a framework of classroom discourse to characterize students' learning, an approach supported by applied linguist Courtney Cazden:

> Classroom discourse happens *among* students and teacher. But arguably the most important goal of education is change *within* each student that we call learning. How do the words spoken in classrooms affect this learning? How does the observable classroom discourse affect the unobservable thinking of each of the students, and thereby the nature of what they learn? (2001, p. 60).

Historically, most work on classroom discourse has presumed that such discourse is taking place face-to-face in the physical campus classroom. However, with the increasing prevalence of online learning, more recent research has expanded to include "classroom" discourse of online courses, in addition to raising philosophical questions of what constitutes a classroom, and indeed, how computer-mediated discourse can be considered discourse at all.

Discourse Analysis in the Virtual "Classroom"

Online classes need not be mere locations for content curation and assignment submission; rather, they can be lively virtual classroom spaces in which students may engage with instructors and peers. Warschauer (1997) was among the first to advance a framework for computer-based collaborative learning and introduced five features of online learning: text-based interaction, many-to-many communication, time-and-place-independence (now called asynchronous learning), long-distance exchanges, and hypermedia links. These first two – the ability to interact via text, and to communicate

with many peers at once – remain valuable features of online learning. Anagnostopoulos, Basmadjian, & McCrory (2005) posit that virtual classrooms allow for social spaces that are not only student-centered, but student-controlled – a "democratized discourse" (p. 1703). It is this democratized, student-controlled context that allows students to co-construct knowledge and foster positive interdependence, which Dennen and Wieland (2007) examined using discourse analysis of an online undergraduate writing class. "In order to engage in meaningful online discourse that supports social learning processes," they conclude, "students need to be focused on a shared mission" (p. 295). Collectively, the focus of discourse analyses of online classes on text-based interaction, many-to-many communication, democratized discourse, and shared mission suggest that the function of peer discourse plays a strong role in online class participation and learning. This peer discourse potentially contributes to an online *social presence*.

Social Presence Theory

Literature on student identity in online courses often invokes social presence. Derived from social presence theory (Short, Williams, & Christie, 1976), social presence in an online educational context refers to "the need for users to feel connected with each other and to perceive each other as real people" (Kear, 2010).

In one of the first such studies, Gunawardena and Zittle (1997) examined social presence as an indicator of student satisfaction in a computer-based conference. Increased social presence in Gunawardena and Zittle's sample was correlated with higher student satisfaction. More recent scholarship on social presence in online education has focused on identity construction. Lowenthal and Dennen (2017) point out that building identity through social presence is especially relevant in pre-professional programs such

as teacher education: “Of concern to many online instructors and learners is not only the identity one shares while being present in a class, but also the identity that is refined and developed within the class – an identity that may be focused on entry into a profession. For example, students in a teacher education class are not just college students, but students but are becoming teachers” (p. 137).

Social presence may be associated not only with personal and social factors such as students’ satisfaction and identity development, but with academic factors such as engagement and learning as well. In an investigation of the relationships among cognitive presence, social presence, and higher order thinking skills in an online undergraduate course in public health, Lee (2014) found that social and cognitive presence were positively correlated. Similarly, Leong (2010) found correlations between social presence and cognitive absorption, which both affected student satisfaction. Zhan and Mei (2013) also determined that social presence had a significant influence on achievement and satisfaction in an online course. Based on this work, among others, Van Alstyne (2018) suggested that social presence is an important enough factor in online learning that it should play a role in instructors’ development of online courses, so that the course design and platform may encourage social presence to the extent possible.

What has not yet been demonstrated is how and why expression of social presence is important for diversity courses, and how it may or may not be expressed in an online environment. Given the value and relevance of exploring identity as part of diversity course curricula, it is possible that the influence of social presence – or the lack of it – may be even more impactful. Hurtado, Alvarez, Guillermo-Wann, Cuellar, & Arellano’s Multicontextual Model for Diverse Learning Environments (2012) postulates

that students' identities are at the center of educational processes that occur in the classroom; given that diversity courses place such an emphasis on identity, and social presence and identity have been found to be connected in online courses, it is expected that a social presence-related theme is likely to be relevant to the current study.

Power and Hierarchy in the Online Classroom

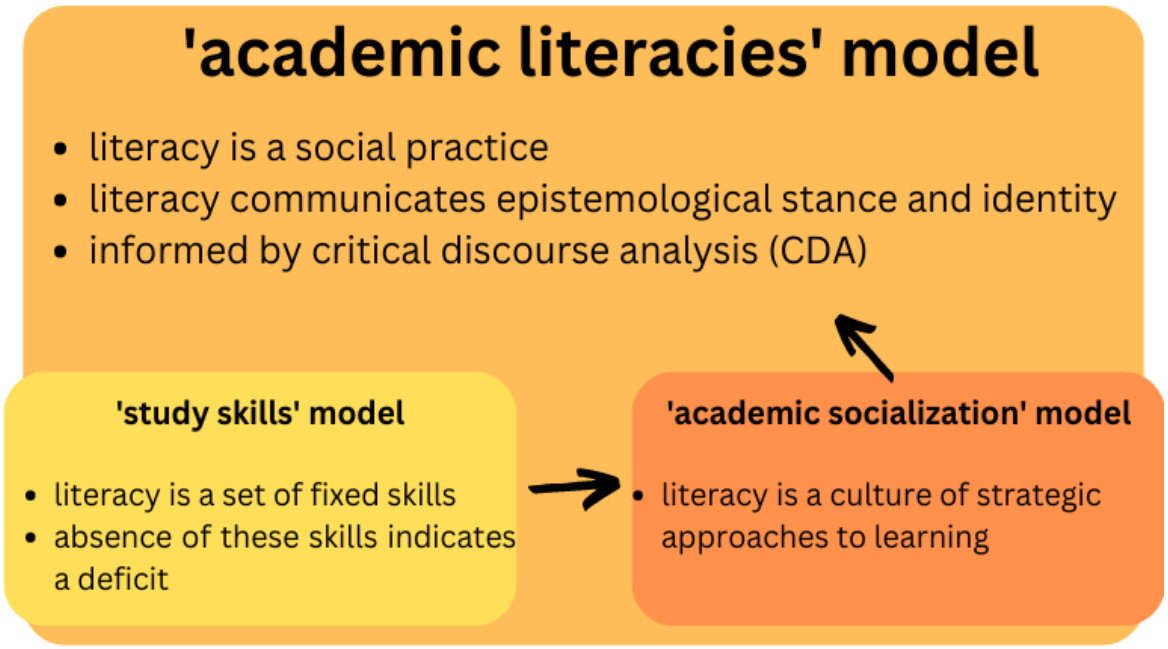
Outside of the context of online classes, power and hierarchy are pervasive constructs in analysis and discussion of academic and classroom discourse (Foucault, 1972; Freire, 1998; Giroux, 1980; Labov, 1972; Rogers et al, 2005). Michel Foucault, one of the best-known and most-cited scholars of power, proposed with his *Discourses on Language* that the study of discourse must include those participating in its production – the "subjects" – rather than rely solely on the expertise of its observers/studiers, therefore applying a critical lens (Foucault, 1972). Around the same time, Paulo Freire was advocating for respect of alternative student perspectives in the classroom as well. Freire recommended that educators not only honor non-standard or non-academic forms of speech, but explicitly teach these students more high-status discourses so that they may use language as a tool for their success rather than reveal it as an embarrassing mark of lower social status (Freire, 1970).

The concept of power, especially as articulated by Freire and his contemporaries, has informed the methodology of critical discourse analysis (CDA), the study of "how language as a cultural tool mediates relationships of power and privilege in social interactions, institutions, and bodies of knowledge" (Rogers et al, 2005), and is frequently applied to educational research in academic and classroom discourse as well as greater societal contexts (Fairclough 1992; 2001; Kumaravadivelu, 1999; Lea & Street, 2006;

Rogers et al, 2005). To create a model of CDA applicable specifically to the classroom, Lea & Street (2006) developed the academic literacies model to understanding and analyzing reading and writing practices in an academic context. An academic literacies model, Lea & Street explain, is necessary because it "is concerned with meaning making, identity, power, and authority, and foregrounds the institutional nature of what counts as knowledge in any particular academic context" (p. 369).

Figure 1

Lea & Street's (1998, 2006) Academic Literacies Model



Even outside the realm of CDA, however, power remains an inescapable reality. Here, I focus specifically on the construct as it applies to peer discourses within online classes. In 2000, Schrum, Burbank, and Capps argued that students of online classes benefit from a flattened hierarchy and power differential between students and their instructor, and possibly also among students themselves, therefore offering a platform for

the voices of students who are often marginalized in the classroom to be amplified. However, as online education became more prevalent, Valk (2008) warned online course instructors that, while online spaces can be construed as neutral spaces that convey only objective truth, this is not at all the case. Online courses are constructed by institutions and their educators, and as a result "we risk educating our students in the cultural language of dominant belief systems without so much as alerting them to this fact" (p. 209). Similarly, Postma, Blignaut, Swan, and Sutinen (2013)'s case study of an online undergraduate course revealed "intensified exclusion, inequality, and oppression … within a virtual space which is theoretically idealized as an equalizer and promoter of freedom of speech" (p. 529).

Similarly, Smith & Ayers (2006) warn that technology may not solve problems of equity and inclusion by creating an equitable, accessible course format. In fact, it may even exacerbate such problems by ignoring the power dynamic that is made more obvious in face-to-face classrooms, and merely hide it behind a screen with the pretense of equitability. Dare (2011) also notes that online classes separate the academic from our bodies and, therefore, aspects of our social identity. While the possibility of considering online spaces as "a post-gender and post-race utopia" (Dare, 2011, p. 2), this can also lead to harmful colorblindness and erasure. Instructors should engage, not avoid, students' diversity and their own.

Significance of This Study

This study attempts to combine classroom discourse analysis and social network analysis methodologies and apply them to an online course as a single case study to explore the research question: how do students co-construct meaning in an online teacher

education course? The application of social network analysis in a qualitative discourse analysis is a novel approach to studying online learning, and one that is likely to prove useful as online classroom discourse becomes increasingly central to the culture of higher education, broadly. Quite recent studies, such as Mørch, Andersen, Kaliisa, and Litherland (2020) suggest that "combining social networks and discourse analyses can provide quick and useful insights for teachers' understanding of their students' cognitive and social characteristics of their learning processes. Consequently, this can be used to empower teachers in creating informed decisions for the purpose of redesigning courses delivered on an LMS to improve networked learning processes … Further research is needed to understand how SNA and discourse analysis can be combined to monitor collaborative knowledge construction processes" (p.8). The intent of this study is to contribute to those insights and to further understanding about online classroom discourse, and how instructors can leverage that understanding to design courses that maximize knowledge construction via peer discourse among students. As Rod Gardner (2013) summarizes in the Handbook of Conversation Analysis, "if one sets aside the handful of early [conversation analysis]-inspired studies of classroom interaction, the field is not much more than ten years old. We have only begun to scratch the surface" (p. 610).

Chapter 3: Methodology

Context

The course in which these discussions and reflections took place was an introductory teacher education course held in Spring of 2019 in the Department of Education at the university at which I was a graduate teaching assistant at the time. This was a fully asynchronous online course administered through Blackboard, the learning management system used university wide. I was the sole instructor of the course. Course content was updated weekly; each Wednesday, a new module was made available to students, which contained multimedia content that included lecture videos, reading material, and at least one activity for students to complete. After completing the content in the module, students were expected to post a reflection on the week's content in the course discussion board, which was visible to all students in the class. These reflections were evaluated partially on how well their authors synthesized content from the module with existing knowledge and students' own experiences and informed opinions. This was modeled at the beginning of the semester via a sample reflection by the instructor, and a rubric was available for students to refer to as well. References to "reflections" in this dissertation generally refer to the initial posts made by students in each weekly discussion; subsequent posts, nested replies to their peers' reflections, are referred to as "responses." In the last week of class, students were asked to write a longer reflection on their experience in the class and submit it to me privately. Due to the unidirectional and personal nature of these reflections, and the fact that the intended audience was an instructor and not peers, these end-of-semester papers were considered a separate data source and maintained apart from the reflections posted on the discussion board.

The content of this teacher education course was primarily aimed at future teachers, with the primary objective of instilling an awareness of social theories and policies related to race and language in education, in order to prepare them to teach culturally and linguistically diverse student populations. These objectives and content qualify the course as one that fulfills a university-wide diversity requirement. The diversity requirement, which compels all undergraduate students to complete at least two courses with this designation, is intended to "provide undergraduate students with the awareness, knowledge, and skills necessary to function productively in a complex global society, by fostering an understanding of and respect for differences among individuals and groups of people" (University of Vermont, 2020). One of the two diversity courses that each student takes must explicitly address race and racism, which this course also does.

During the spring semester that this course took place, student activism on campus was high. In February, a prominent student group who described their mission as "fighting the good fight for equity and inclusion for marginalized peoples" held a rally on campus in honor of the one-year anniversary of several days of student-led protests in 2018, including one held in a major academic building to make demands of the university president to further the safety, equity, and representation of marginalized students on campus. These demands followed several incidents of race-based hate crimes, including the theft of a university Black Lives Matter flag and the proliferation of white supremacist flyers around campus. These students' demands included changes to diversity courses such as the one in this study. One such demand stated, "*We Demand All Faculty, Staff, And Administration Attend Annual Diversity And Inclusion Training*

Including, But Not Limited To The Following Topics: Ableism, Classism, Gender-Based Violence, Homophobia, Rape Culture, Racism and White Supremacy, Religious-Based Discrimination and Violence, Transphobia And Transmisogyny, Xenophobia and White Nationalism, And Any Other Matters Of Equity For Marginalized Peoples" [sic]. At the time of the one-year anniversary in February 2019, the university's senior advisor for diversity assessment and research stated that mandated faculty trainings are controlled by the faculty, and therefore administration could not mandate this change. In response to another demand, "*We Demand For The Renovation Of Diversity Courses. We Demand That Professors That Teach These Courses Receive D1 and D2 Specific Training And Resources,"* university administration reported that work was "actively being done," although the spokesperson did not provide specific information (Lesch, Young, Choi, & Loftus, 2019, p. 1). The success of the student protests and administrative response remained a disputed issue during the semester that this study took place, as indicated in a campus climate survey conducted at the time which indicated that "79% of students characterize the general climate at UVM as 'somewhat or very inclusive'," and that 82% of students "want to learn about identity groups that are different from their own" (University of Vermont, 2019). Debate also remained among campus groups regarding the acceptability of these results, which suggest that about 20% of student survey respondents do not consider the climate inclusive (Elletson, 2019). It is possible that many of the respondents in this 20% are BIPOC students at this predominantly white institution, which would provide further evidence in support of the aforementioned demands. At the time of the study, the university's vice provost of student affairs stated

that “a lot has changed [for the better] from a year ago” regarding inclusivity and equity (Lesch et al, 2019).

Participants

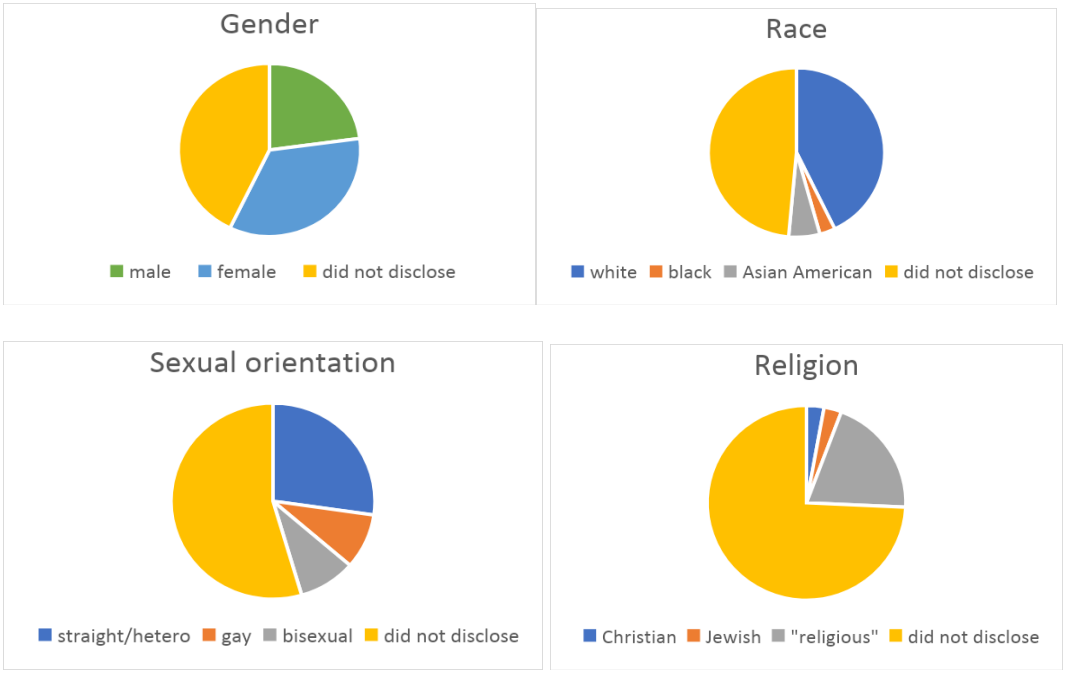
Undergraduate Students

In this single case study, 35 students were enrolled in the course, all of whom participated in the discussion boards and reflections. A 36th student initially enrolled in the course, but withdrew prior to completing any of the assigned posts, so that student’s data was not included in the study. All participants were undergraduates of traditional college student ages, ranging from 18 to 23; 3 were first-years, 15 sophomores, 9 juniors, and 8 seniors. 14 of the 35 were education majors; of the remaining 10, no more than 2 shared the same major. The high number of non-education majors in this teacher education course is likely due to several factors: 1) its introductory level, requiring no prerequisites for enrollment; 2) its fulfillment of the university-wide diversity requirement; and 3) the accessibility of the asynchronous online format. Participants were not required to disclose specific aspects of their identity, so further demographic information was not systematically collected. However, many chose to self-disclose. Of the 20 participants who referred to their gender, 12 identified as a “woman” or “female,” and 8 as “male.” Of the 18 who disclosed their racial identity, 15 were white, two Asian American, and one Black. 9 students mentioned religion as an important aspect of their identity, although only two specified which religion (one Christian, one Jewish). 10 participants revealed their sexual orientation: 6 “heterosexual” or “straight,” two “gay,” and two “bisexual.” 12 chose not to explicitly identify with any of the above categories. The following charts display these self-disclosures from an emic perspective, and

therefore the categories and labels shown represent only those chosen by participants, and not by the researcher or any survey methods.

Table 1

Self-Disclosed Student Identity Affiliations



Data Collection

The primary source of data came from student reading reflections, posted weekly on the Blackboard discussion board area of the course, and peer responses to these reflections. As the instructor of the course, I had full access to this data prior to this study; therefore, no additional steps for obtaining access and collecting data were necessary. For ease of analysis, all discussion board posts were downloaded to Excel and then imported to NVivo, both on the researcher's personal, password-protected computer. Students' end-of-semester reflections were packaged and downloaded as one file, maintained in Microsoft Word, and imported to NVivo. Students' evaluations of the class

were made available via the university platform, Blue, and were downloaded for inclusion in the self-study. I also maintained a record of researcher/instructor memos. Posts and reflections were graded throughout the semester, but only downloaded and prepared for analysis for research purposes after the course had ended. Memoing took place during the course and throughout the analytic and writing processes. My role as instructor of the course also provided access to additional contextual information about the course curriculum, instruction, and learning platform.

While the full semester consisted of 16 weeks, only seven modules required reflections with peer response and discussion. Discussions were not held on the same week as midterms or final exams, nor during weeks that a larger project was due. Additionally, one week's prompt required students to post an article reporting a current event in educational policy from the local or national news. This type of content tended to yield discussions that were substantively different than those in other weeks, as they were not reflection-based, and therefore did not provide data that would be useful in addressing the research question. Therefore, discussion board content from this week was omitted from data collection. This technique of eliminating data that is irrelevant to the present analysis, or that would not serve to focus the data into something meaningful, is recommended as a first step in data reduction for qualitative data sets (Miles & Huberman, 1994; Namey, Guest, Thairu, & Johnson, 2007).

Weekly Discussions

Peer interaction was an important part of the course, which was woven into the required activities each week of the semester. In this asynchronous online format, collaborative learning took place in the form of discussion boards on Blackboard.

Prompts were provided to students each week to guide and scaffold reflection and discussion. Prompts are shown below in Table 2 for the weeks in which data was collected.

Table 2

Weekly Discussion Board Prompts

Week of semester	**Prompt**	**Sources referenced**
1	Please create a new post to tell us whatever you'd like us to know about you. I've created my own post, so you know a little about me, which you can use as a model. After you're done with your own post, check out your peers' introductions and comment on at least two of them. Looking forward to getting to know you!	
2	Please start your own thread to post your 200-300 word reflection on the Johnson reading. Reflections can, but do not necessarily need to, include responses to the following prompts: • Which concepts resonated with you especially strongly? Why?	Johnson, A. (2005). Privilege, power, and difference. New York: McGraw-Hill. 2nd ed.

	• Which concepts can you personally relate to? Have you had an experience that is relevant to, or can be explained by, Johnson's concepts? • Consider the diversity wheel on page 15. Which of these aspects of your identity -- your age, gender, educational background, etc. -- do you identify with most strongly? Do you think you are similar or different from most of your peers in this way? How does this affect the way you interact with your peers/in general? After posting your reflection, you must read and respond to **at least two** of your peers' posts. Please refer to the syllabus for specific instructions and grading.	
3	Please start your own thread to post your 200-300 word reflection on the documentary. Reflections can, but do not necessarily need to, include responses to the following prompts:	Cran, W. (Director). (2005). *Do you speak American?* [Video file]. USA: McNeil/Lehrer & Paladin InVision

	• Do you consider yourself a language descriptivist or prescriptivist? Why? • Do you identify with any of the regions or dialects that were displayed in this episode? What is your connection to that region and do you think you use the dialect? Why do you think some people use a local dialect and others do not? • What was your reaction to the report of the treatment of students at Martin Luther King Jr. Elementary School? Should public school students who speak a nonstandard dialect be made to use Standard American English in school, or allowed to use their own dialect? What constitutes a dialect vs. a language? After posting your reflection, you must read and respond to **at least two** of your peers' posts. Please refer to the syllabus or attached rubric for specific instructions and grading.	Production. Retrieved from https://www.pbs.org/speak/
5	Create a thread to answer the questions at the end of the case you chose from Chapter 10 of the	Gorski, P. and Pothini, S. (2018). *Case studies on*

	Gorski & Pothini text. You only need to read and reflect on one case, not the whole chapter, and it must be from Chapter 10. Then, respond to two or more of your peers' posts.	*diversity and social justice education.* Routledge. 2nd ed.
10	Post your response to one of the cases on School and Classroom Policy and Practice. Please include a brief summary for your peers who didn't read that case, followed by your answers to the questions posed at the end of the case. Then, respond to at least two of your peers' reflections.	Gorski, P. and Pothini, S. (2018). *Case studies on diversity and social justice education.* Routledge. 2nd ed.
11	Post your response to one of the cases from Chapter 3. Please include a brief summary for your peers who didn't read that case, followed by your answers to the questions posed at the end of the case. **Also**, refer to at least one concept from Sensoy & DiAngelo in your response. Is a student in the case subject to one of the classist beliefs described in the chapter? Are any of the "everyday class privileges" being demonstrated in the chapter? Is the issue in the case a result of the	Gorski, P. and Pothini, S. (2018). *Case studies on diversity and social justice education.* Routledge. 2nd ed. Sensoy, O., & DiAngelo, R. (2017). Is everyone really equal? New York: Teachers College Press.

	intersection of a student's language/ability/gender/etc. and their class? After posting your reflection, you must read and respond to at least two of your peers' posts. Please refer to the syllabus or attached rubric for specific instructions and grading.	
13	Please post your 200-300 word analysis of the book you chose to review for this week's last activity. Books tend to focus on one character or theme, so as you review the "criteria for equality" checklist, you will probably find that some of the questions are not addressed. The overarching purpose of the questions is to ensure that the books we select do not reinforce negative stereotypes, and offer some type of positive depiction of people who are often omitted from children's literature. Please include in your review: • the title and author of the book you chose • the intended audience (age/grade/reading level)	Schniedewind, N., & Davidson, E. (2006). Open minds to equality: A sourcebook of learning activities to affirm diversity and promote equity. Milwaukee: Rethinking Schools.

	• how well the book meets the criteria for the Rethinking Schools checklist, AND whether you think the checklist is an adequate tool for assessing the book you chose • whether you would recommend this book for classroom use and why or why not Photos of pages from the book are not required, but encouraged!	

Instructor participation in Blackboard discussions was high at the beginning of the course and tapered off throughout the semester. This was an intentional choice, as my early participation was intended to model the style and quantity of participation that I expected of students, then this scaffolding was slowly reduced to increase the freedom and responsibility of students to exercise their peer learning and discussion skills. However, I continued to engage with all students, whereas participants were only required to respond to two peers, resulting in my participation appearing higher than any student's. Because I, the instructor, contributed far more content to the discussion boards than any other individual participant, my posts will be included in the data to be analyzed, so as to preserve the full context of all student reflections and responses. However, instructor posts are not coded or analyzed. As the focus of the research question is on knowledge co-construction among students, all dialogue in the analysis

will be learner-learner interactions, as opposed to learner-content (participants' interactions with course materials) or learner-instructor (participants' interactions with the instructor) (Moore, 1989; 1993).

Unit of Analysis: Student-Produced Discourse

The data obtained for this study was mined from student-produced discourse within the course platform. This plethora of text-based data provides the opportunity for several levels of units of analysis. Units of text are often analyzed at one of three levels: *syntactical* (individual words or sentences) (Fahy et al, 2001); *paragraph* or *message* (in this case, a forum post) (Gunawardena et al, 1997); or *thematic* (Henri, 1992). While syntactical units are of fixed, objective scope, and therefore provide the benefit of high reliability, delimitation of discourse by syntactical rules does not always make practical, meaningful sense (Rourke, 2001). Analysis of individual words or sentence parts, in the case of this study, is too fine-grained an analysis to be logistically feasible, and even an analysis of sentences is not likely to reveal as much meaning in analysis as a more flexible and "zoomed-out" analysis would. Paragraph or message units would make more meaningful sense in the context of discussion board discourse; after all, the limits of the "message" are predetermined, if they are defined as the contents of an individual post. However, since students were assigned to post reflections of about 300 words and respond to multiple prompts, posts ("messages") frequently contained more than one theme or construct. Therefore, I have chosen to analyze thematic units. While researchers who conduct content analysis may claim that the use of thematic units invites subjectivity and poor reliability into a study (Krippendorf, 1980), this perspective comes from a quantitative research perspective, and as I believe this qualitative discourse

analysis is entirely subjective in nature, as is all similar research, I do not believe this potential limitation poses a problem for this project and, in fact, suggests it may be a better fit than more granular, if "objective," traditional quantitative content analysis techniques. Such content analysts recognize that "the process of unitization involves considerable compromise" (Krippendorf, 1980, p. 64) between meaningfulness, productivity, efficiency, and reliability (Rourke et al, 2001) – for the purposes of this study, priority has been given to meaningfulness over an attempt at a sense of objectivity.

Research Methods

A maximal sampling strategy was employed to analyze a wide variety of student experiences and to strengthen validity, as a larger sample can increase confidence in the findings obtained in case study research (Yin, 2016). This study was determined by institutional IRB to not qualify as human subjects research; therefore, providing written consent was not a requirement of participation, allowing inclusion of all students' work in the dataset.

Although both textual and numerical data were collected and analyzed, a qualitative research design was chosen due to the personal and individual nature of the context and data involved. Utilizing Todd et al.'s justification for qualitative design as the preferable way to obtain "a more *naturalistic, contextual* and *holistic understanding* of human beings in society" (Todd, Nerlich, & McKeown, 2004), it seems the most fitting choice for a study of this nature which focuses on a small number of participants, known to the researcher, in an educational context that explores identity, personal experiences, and social interaction. Additionally, Maxwell (2004) argues that qualitative methods are preferable for process-oriented research, as opposed to a "scientifically-

based research" model, which is better suited to experimental research in which variables are manipulated and quantitative differences between test and control groups are observed. I determined that a qualitative design would be more appropriate because of my process-oriented and iterative approach to analyzing students' interactions and knowledge co-construction throughout a semester of a discussion-based class. Maxwell (2004) continues to posit that randomized control trial-model quantitative research "neglects the importance of context, meaning and process as essential components of causal and interpretive analysis" (p. 3). As this study is highly context-bound, qualitative methods are more appropriate for providing rich description and relevant contextual information important for understanding findings. Additionally, despite the natural fit of qualitative methods to the topic at hand, the application of such methods in studies of online courses is underrepresented in the field of online education research. Therefore, the methodological choices made for this dissertation both allow for maximum understanding of the case and address a gap in the existing literature.

An instrumental case study methodology was chosen for this study for several reasons. First, all available data was contained within a bounded system (Yin, 2009); one section of one course which was held in Spring 2019 in the context of a particular class, department, college, and university. This study would be impossible to replicate due to this specificity of context and the individuals who comprise the sample, and therefore its findings are not intended to be generalized beyond the environment in which it occurred – within a single case. Second, in contrast to some qualitative approaches such as narrative inquiry or phenomenology, a case study approach can be conducted with rich description of the environment to support written data without the requirement of

interviews or narrated speech (Creswell, 2013). My role as a participant-researcher provided me with this rich description and a wealth of written data from students, with no additional effort expended on their behalf. Case study allows for study of the context and data without the intrusion, ethical violation, or participant attrition that interviews, or follow-up may constitute in this given situation, especially considering the role of the instructor as researcher and the implicit power differential inherent in that researcher/participant relationship. Finally, Stake (2005) defines *instrumental* case study as one that is "examined mainly to provide insight into an issue or to redraw a generalization. The case is of secondary interest, it plays a supportive role, and it facilitates our understanding of something else " (p. 437). A case study that is instrumental is useful for providing insight into a phenomenon or issue, as is the intent here; the case itself is not of special intrinsic importance as in a narrative inquiry or intrinsic case study, but a context in which to explore the process of learning through online peer discourse, and is therefore likely to hold useful implications for future practice and research (Merriam, 2009; Stake, 2005).

Data analysis took place in three stages: content analysis, discourse analysis, and social network analysis. This integration of multiple approaches serves as a form of triangulation to limit the biases of any one approach (Creswell, 2013) as well as to strengthen the study by providing multiple sets of findings to support or disconfirm each other (Pokorny, Zanesco, Sahdra, Norman, Bauer-Wu, & Saron, 2018).

Content Analysis

The first stage of analysis consisted of a content analysis. While originating in quantitative research, content analysis has been utilized in qualitative research since it

was recommended to be used as such by Kracauer (1952), who argued that meaning – the intended product of content analysis – is context-dependent and holistic, and therefore merits a qualitative approach (Kracauer 1952; Schreier, 2014). What exactly constitutes content analysis in qualitative research depends upon the research design and which literature is consulted. Patton (2014) defines it as "any qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings" (p. 790). De Wever (2006) frames content analysis as an uncovering of meaning that is not apparent in a surface reading of the text. France Henri, author of one of the most widely used content analysis tools in computer-mediated communication (Henri, 1992), argues for its use specifically in educational research that explores research questions dealing with learning processes:

> Content analysis, when conducted with an aim to understanding the learning process, provides information on the participants as learners, and on their ways of dealing with a given topic. Thus informed, the educator is in a position to fulfil his main role, which is to offer immediate support to the individual and the collective learning process. (p. 118)

While much has changed in the landscape of CMC since the development of Henri's analytic tool, her philosophy about the underlying goals of this method remain valid and relevant as ever. In light of its proximity to the context of the current study, Henri's definition of content analysis is the preferred one for informing the analysis in the following chapters.

In qualitative research, content analysis provides a systematic approach to categorizing data using a preselected coding frame. Three features that distinguish

content analysis from other analytic approaches made it ideal for this study specifically. First, qualitative content analysis reduces data. The application of a coding frame to organize data prior to a close read is useful for studies that require analysis of large quantities of textual data, such as this one. Second, content analysis is systematic. Utilizing a systematic approach to analysis strengthens a study's consistency and validity (Schreier, 2014). It requires a review of the full body of data, reducing the likelihood of the researcher overlooking or excluding data that may not support their biases or assumptions. Finally, despite its systematic nature, content analysis is flexible. Combining quantitative data (via word frequency counts, tabulation, and similar methods) and qualitative data (coding patterns that emerge in the text) allows the researcher to cross-compare to ensure that the coding frame fits the data at hand; and, if not, necessitates the revision of the coding frame. These three features – data reduction, systematization, and flexibility – all serve to strengthen the analytic process (Schreier, 2014).

While quantitative content analysis is primarily deductive in nature, applying an existing hypothesis or theory to a dataset to test its fit, qualitative content analysis is generally more inductive (Patton, 2014). The purpose of an inductive qualitative content analysis, according to Patton, is "generating new concepts, explanations, results, and/or theories from the specific data of the qualitative study" (p. 791). This was the approach utilized in this research design, since the goal, in addressing the research question, was the development of an explanation of knowledge co-construction from textual data. More specifically, the method of inductive content analysis used was a *summative* approach. In contrast to conventional content analysis, in which codes are formulated

strictly from the data corpus, or directed content analysis, in which codes are derived from existing theory and then applied to the data corpus, summative content analysis consists of a two-step process. The first step involves calculating the frequency or relative prevalence of certain keywords or codes, which is comparatively quantitative in nature. However, this initial "boiling down" of data via quantitative methods is then followed by a latent content analysis, which involves exploring and interpreting the *meaning* of the patterns that emerge in step one. In addition to the value of this approach for large qualitative data sets, as mentioned above, a summative content analysis is valued in case studies in which it is useful for the research activity to be "unobtrusive" for participants (Hsieh & Shannon, 2005). In this case, it is essential that my work be unobtrusive so that it does not interfere with students' naturalistic learning process or the authenticity of their experience in the class. It is worth noting that the presence of numeric data in the use of code frequency counts (i.e. the summation) does not in itself constitute quantitative research, nor is it inherently inconsistent with the overall research design; as Lincoln and Guba (2013) point out in their *Constructivist Credo,* "quantitative methods will also be widely used whenever appropriate … constructivists do not eschew quantitative methods unless those methods are inconsistent with constructivist presumptions" (p. 69). This position was reaffirmed in firsthand conversation with self-study research pioneer Stefinee Pinnegar regarding this particular study and its incorporation of numeric data.

The complete dataset, after reduction, included 701 discrete posts, so a first round of categorization was necessary prior to engaging in meaningful coding. This categorization was conducted by *tabulation,* also known as "coding-and-counting" of

absolute frequency, the most common content analysis technique (Krippendorff, 1980; Herring, 2004). Following the condensation of data into categories, a cross-categorical analysis was conducted to find *association* and/or *correlation* between or among categories or participants. This involved the comparison of each category in an Excel spreadsheet which contained tabulations of codes across participants (in the y-axis) and categories (in the x-axis). This approach to content analysis is a recommended technique for determining "replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use" (Krippendorff, 2004, p. 18). Although quantitative content analysis utilizes methods intended to be replicable and systematic, such as word frequency analyses, I again align my methodology here with qualitative scholars who argue that any study of language or discourse is by nature subjective and qualitative; interpretations of text are not discovered literally within the text, but rather extrapolated by the imagination of the researcher. Klaus Krippendorff, whose publications on content analysis have helped define the methodology, further clarifies: "all reading of texts is qualitative, even when certain characteristics of a text are later converted into numbers" (p. 16). Therefore, the numerical data charted in Excel at this stage of data analysis was not handled as a finding or "data" in and of itself, but rather a stage in the process of boiling down the 701 posts to identifiable and meaningful patterns. It is therefore important to note that the cases being counted were not of specific keywords, but of codes. The framework that determined the categories used for this database, and guided the coding process, is identified, and explicated below.

Framework Selection

To determine the best framework to apply to the content analysis, first a review was conducted of literature related to analytic methods in computer-supported collaborative learning. While many theoretical frameworks have been forwarded in this area, few have demonstrated reliability and feasibility beyond the context of their original construction. Frameworks identified in the literature were ranked on relevance to the context and population at hand, conceptual fit, and reliability as shown by frequency of use, demonstrated in citation data and age of the framework. Those that showed the most promise based on these criteria were selected for a shortlist. Each of the shortlisted frameworks was then applied to an excerpt of data, each containing several thematic units of analysis. It was important to me that the framework I chose would not only be of good quality in accordance with the above criteria, but also would be a good enough fit for my specific case that its application would yield meaningful themes. As Lincoln and Guba again remind us, "that theory is most useful which lends itself most easily to meaningful local adaptations" (2013, p. 201). The preliminary frameworks that were identified by this process, and the subsequent shortlist, are presented in Table 3, below.

Table 3

Content Analytic Frameworks Considered for Application

Source	Construct(s)/Theory(ies)	Shortlisted?
Henri (1992)	participative, social, interactive, cognitive, & metacognitive dimensions of CSCL	Yes

Zhu (1996)	Vygotsky's theory of proximal development	No
Gunawardena, Lowe, & Anderson (1997)	Interaction Analysis Model for Examining Social Construction of Knowledge in Computer Conferencing	Yes
Fahy, Ally, Crawford, Cookson, Keller, & Prosser (2000)	Transcript analysis tool based on Zhu's (1996) instrument	No
Veerman & Veldhuis-Diermanse (2001)	Knowledge construction	No
Weinberger & Fischer (2005)	Argumentative knowledge construction	Yes
Salmon (2000)	online socialization, information exchange, and knowledge construction	No
Bales (1950)		No
Chen & Caropreso (2004)	Big Five personality traits and engagement	No
Dillenbourg (2003)		No
Fauske & Wade (2004)	Tannen's feminine discourse	No
Moore (1993)	Transactional distance	No
Gunawardena & Zittle (1997)	Social presence	No
Rourke, Anderson, Garrison, & Archer (2001)	Social presence	Yes

Abbasi & Chen (2008)	Systemic functional linguistics	No
Alexander (2008)	Dialogic interactions	No
Hennessy, Rojas-Drumming, Higham, Márquez, Maine, Ríos, García-Carrión, Torreblanca, & Barrera (2016)	Hymes' Ethnography of Communication	Yes
Duff (2010)	academic discourse socialization theory	No

The five shortlisted models were assessed for fit after their application to the excerpts. They were then compared based on the usefulness and relevance of their coding schemes to the data. The final selection was made based on the following determinations.

Hennessy et al's (2016) Scheme for Educational Dialogue Analysis (SEDA) is very granular and highly detailed; while this is also a positive quality of the scheme, which could allow for a wide variety of analyses in smaller datasets, the volume of posts in the present study made this scheme an impractical choice for this reason. Gunawardena et al's (2014) Interaction Analysis Model remains one of the most popular models for analyzing CSCL. It identifies five phases of operations in knowledge construction, ranging from "statement of observation or opinion" (Phase I/A) to "metacognitive statements by the participants illustrating their understanding that their knowledge or cognitive schema have changed as a result of the conference interaction" (Phase V/C). As the authors themselves note in a 2014 critique of the model, the

existence of such high-level operations in most phases results in the majority of analyzed text to be coded in Phase I. This was found to be the case in the data for the present study as well, and so the Interaction Analysis Model was determined to not be the most useful instrument for extracting themes and patterns from the data. Henri's (1992) framework is also widely cited and the article in which it is introduced remains foundational in the landscape of CSCL literature. However, most of the analyzed text fell under the cognitive dimension of the framework ("statement exhibiting knowledge"), which is outside of the purview of the research question. Therefore, Henri's framework was determined to not be the most relevant for this study. Rourke et al's (2001) instrument for assessing social presence is based on Garrison, Anderson, and Archer's (2000) Community of Inquiry model, created to assess, and support critical thinking in CSCL in higher education. While the Community of Inquiry model is certainly relevant and popular in the study of interaction in online learning environments (Weltzer-Ward, 2011), it is more of an assessment model than a theoretical framework, and its categories of affective, interactive, and cohesive messages are also not the best fit for this study.

Weinberger and Fischer's (2005) framework to analyze argumentative knowledge construction in CSCL is one of the most recent contributions among those presented above. It has, however, been widely used and referenced, showing 907 citations on Google Scholar at the time of the search. Unlike the frameworks that described their applicability to content analysis, Weinberger and Fischer explicitly describe their approach as discourse analysis. Weinberger and Fischer's framework includes four dimensions of argumentative knowledge construction: participation, epistemic, argumentative, and social modes. Argumentative knowledge construction is defined here

as a situation in which learners "discuss their perspectives on a problem with the goal to acquire knowledge" (p. 1). The example discourse used in Weinberger and Fischer's application of the framework was discussion of "problem cases" – classroom-based case studies – in an online discussion board for undergraduate education students. Due to the similarities between the author's context and the current study, I determined the framework to be a good fit for the data and for a discourse analytic methodology, and the focus on knowledge construction allows for emergence of themes that are most likely to address the research question. A first round of coding applied the dimensions, and a second round parsed the social dimension for each social category: externalization, elicitation, quick consensus building, integration-oriented consensus building, and conflict-oriented consensus building. Examples were found of each category, and the category descriptions were found to be a good fit for the coded excerpts. Therefore, I selected Weinberger and Fischer's framework for the coding and analysis of data. A complete collection of tables identifying and describing each category is available in Appendix A.

Discourse Analysis

Following the preliminary categorization of posts in the content analysis, a discourse analytic approach was used to extract meaningful themes from participants' discussion board posts. Discourse is generally defined as the content and construction of knowledge through language. Discourse analysis is concerned with the construction of meaning via language within a given timeframe (Herrera & Braumoeller, 2004) – in this case, a semester. A new forum was posted on the discussion board each week with prompts related to that week's content. Each student created their own thread in response

to the prompts in a 200-300 word reflection. They were then asked to reply to at least two peers' reflections. Responses were expected to be substantive and provide additional information, support, or refutation to the assertions in the original post; i.e., they should be, qualitatively and quantitatively, more than a simple agreement. This pattern of threads and replies created multiple dialogues within each forum in which students discuss, debate, and elaborate on each other's ideas; in other words, they are constructing meaning. Discourse analysis is recommended as an appropriate tool for examining "holistic meaning making" and "context, complexity and interrelatedness of messages within a dialogue" (Dennen, 2008, p. 207). It is especially relevant for process-oriented, constructivist research, and has been previously established as an analytical tool applicable to text-based online discussion (Gee, 2004 & 2015; Herring, 2004; Tannen & Trester, 2013). It is typically used for in-depth analyses, being "more likely than [content analysis or structural analysis] to uncover indicators of learning or meaning making through ideas being refined and negotiated via group interaction, and of students having 'a-ha' moments through their interactions with others" (Dennen, 2008, p. 207). Even more specific to this study, Gee (2014) names discourse analysis as a useful tool particularly for analyzing language that is used to build relationships, connections, and knowledge. Gee's reflexive property of context states that "activities, identities, and institutions [e.g. universities] have to be continuously and actively rebuilt. … This is what accounts for change and transformation" (p. 91).

The discourse analytic stage of data analysis focuses not on the words and information that participants post, as much as the function or purpose of said posts. The performativity inherent in an online discussion, of which there is a permanent record of

one's stated thoughts and beliefs for all of one's peers to read and judge, may strongly influence participants' discursive choices (Antaki, Edwards, & Potter, 2003). In fact, it is suggested that asynchronous written discourse forms such as discussion boards provide "fertile ground for analysis … it makes possible interesting forms of social and linguistic interaction and brings into play a unique set of temporal, spatial, and social dimensions" (Beaulieu, Sarker, & Sarker, 2015, p. 47).

As discussion boards are a type of dialogue among peers, and knowledge construction is the target process of the study, discourse analysis was determined to be the best methodological fit for this research design. Utilizing discourse analysis with discussion board threads, or chains of dialogue among students, was expected to uncover patterns of meaning-making dialogue that reoccur across threads and forums. While discourse analysis is a broad field consisting of both theory and method, with no consensus on the boundaries of what constitutes discourse analysis, Gill (2000) forwards a framework that categorizes discourse analytic approaches into three general theoretical traditions: 1) a critical approach, 2) a functional action/interaction approach including pragmatics, conversation analysis, and ethnomethodology, and 3) poststructuralism. This study lies within the second camp, which will become more evident in the presentation of findings.

Social Network Analysis

The third method of analysis in this study is social network analysis (SNA). "Social network" in this context refers to any network (a system of connections) which is social in nature; it should not be confused with social media networks such as Facebook and Twitter, although these social media networks are examples of a type of social

network. This social network analysis was conducted by exploring which participants interacted with each other on the discussion boards, and how often, throughout the semester. This exploration was conducted by creation of network sociograms, visualizations of relationships among participants in the data. While data visualization is commonly thought to be a means of communicating findings, visualization techniques can also play a part in analysis, revealing patterns and connections in new ways. Few (2012) explicates these separate functions of data visualization as such: "when you use tables and graphs to discover the message in data, you are performing analysis. When you use them to pass a message on to others, your purpose is communication" (p. 10).

Background. While the application of social network analysis to online communication is new, SNA's existence in qualitative research is not. Prior to the 1990s, SNA was used primarily as a deductive system of categorization, best suited to positivist experimentation and classification. In 1994, Emirbayer and Goodwin connected SNA with sociological theory, arguing that an analysis of social networks required a "more sophisticated approach" that recognizes the human agency of the individuals that comprise the network, considers context, and prioritizes investigation of intra-network relationships. Emirbayer dubbed this approach "structuralist constructionism," in contrast to the deductive approach, which was dubbed "structuralist determinism." Harrison White, the "father of modern network theory" (Aspers, 2010) takes this approach a step further, deeming SNA *anti*-categorical (2010) due to the dynamic, temporal, and content-bound nature of networked individuals' identities. While I do not take up White's poststructuralist stance or critical examination of power structures in this study, it is worth noting that a space has already been carved out for the

use of SNA in the research design of qualitative studies of social and discursive processes (Seeley, 2014).

SNA was chosen for this study due to its focus on relationships among individuals, which play a key role in my focus on peer-to-peer knowledge co-construction. Graphical visualization of social networks is ideal for portrayal of relationships among participants, as it focuses on the space between individuals rather than on the qualities of the individuals themselves (Krempel, 2011). Visualizations of networks, such as network sociograms, enable the researcher to step back and view the network as a gestalt, identifying patterns in a complex and complicated web of interactions. This is a singularly useful analytic technique for discourse analysis, due to its graphical presentation of connections in a way that would likely be overlooked by the researcher if analyzing textual data alone (Rinker, 2017).

The way in which participants in this study co-construct knowledge is dependent upon their role and participation in this class – it is a context-dependent social phenomenon, not solely an individual one. The collaborative work of building knowledge as a class is even more relevant to the research question at hand than the topical content of the posts themselves. The relationship-based nature of the data, therefore, calls for an analytic technique that focuses on relationships and connections among participants as demonstrated by who they choose to respond to and interact with in their discussions. As Mørch, Andersen, Kaliisa, and Litherland point out in their analysis of a case study utilizing SNA,

> combining social networks and discourse analyses can provide quick and useful insights for teachers' understanding of their students' cognitive and

social characteristics of their learning processes. Consequently, this can be used to empower teachers in creating informed decisions for the purpose of redesigning courses delivered on an LMS to improve networked learning processes (2020, p. 8).

Table 4 provides a summary of the stages of data preparation and analysis as described in this section.

Table 4

Stages of Data Analysis

Stage 1		Import posts from Blackboard to Excel and NVivo; pseudonymize names and vocatives; nest responses to their parent posts (original reflections) to clarify relationships among posts
Stage 2	Content analysis	Apply Weinberger & Fischer's coding scheme to relevant discussions (7 weeks, 214 threads, 701 posts)
Stage 3	Discourse analysis	
Stage 4	Graphical analysis	Conduct semantic network analysis and network sociogram visualizations

Considerations

The application of discourse analysis methods to text-based genres such as computer-mediated communication requires some investigation of the definition and nature of *discourse*, and how textual forms of discourse are to be interpreted, especially

considering that traditional definitions of *discourse* include extralinguistic features of communication that are generally considered only possible in a face-to-face medium, such as gestures and body language. First, we must consider whether asynchronous computer-mediated communication qualifies as "discourse," or even "speech"; then, we must consider whether an online forum may be considered a "classroom," and whether application of analytic methods designed for "classroom discourse" is appropriate in an online context.

Interpreting Text as Speech

The findings presented in the next three chapters as a result of this analysis are based upon the understanding that text posted in this discussion board can be classified as "speech." Some readers may question whether it is appropriate to apply methods intended for "discourse" to a written medium. The hybridity of computer-mediated communication – not purely speech, not purely text, yet incorporating elements of both – has been argued by scholars who forward its categorization as a new register or language variety (Androutsopoulos, 2006; Baym, 2010; Leppänen, et al, 2014). In early days, when this "hybrid" register was first recognized by scholars of discourse as "displaying characteristics of both oral and written language," it was dubbed Interactive Written Discourse (IWD) (Ferrara et al 1991); more recently, it has been described as "silent speech" and "digital orality" (Soffer, 2010). Despite its embodiment in a textual medium, computer-mediated communication shares several important features with oral speech. Several such features are: interactivity, which includes a greater likelihood of addressing the audience specifically than traditional text-based media; informality, which is characterized by a less formal overall register than most text-based communication;

playfulness, as demonstrated by greater syntactical affordances such as emojis and more liberal use of italics and other emphatic tools; and close community (Danet, 2001; Ferrara, Brunner & Whittemore, 1991; Rheingold, 1994). The recognition of computer-mediated communication as a new register which qualifies as a form of discourse is already established tradition in some methodological fields, such as among qualitative content analysts, who, as Krippendorff (2004) states, "clearly recognize the need to respond to texts as connected discourse" (p. 204). Similarly, Barton and Lee (2013) argue that "commenting [in online social networks] is an important act of positioning oneself and others, that is *stance-taking* ... Such activities are highly textually mediated" (p. 10).

Classroom Discourse

The second consideration in utilizing discourse analytic methods to this current study is whether a classroom discourse analysis would be applicable to the context. Classroom discourse analysis can be applied in some ways that are specific to online communities. For example, while discourse analysis generally relies on the analysis of individual speech acts in dialogue (Searle, 1969), an online text-based discourse analysis considers lines of text to be the speech acts under analysis. A speech act is an utterance used to perform (1969), and examples of speech acts involved in meaning-making, which may be identified in the discussion threads, include description of one's own experience, providing clarification and explanations of what one has previously shared, making assumptions or generalizations, providing evidence about one's assumption, and labeling – assigning a name to an experience. While these speech acts may be performed within one post and in isolation, many others require at least one other participant for *co-*

construction of meaning. Some of these dialogue-based speech acts include finding commonalities and differences between experiences, requesting clarification, providing refutation to one's statement, and challenging other's assumptions (Ziegler, Paulus, & Woodside, 2013). When analyzing speech acts within the context of a dialogue, or discourse, it becomes possible to identify these strategies and, from that, specifically describe how students are constructing meaning and knowledge through their discussion and shared perspectives.

While online academic discourse, then, shares some features of academic discourse that occurs face-to-face, it also provides some unique challenges. Some argue that the online environment minimizes power structures and hierarchy that are constitutive elements of brick-and-mortar academia, and therefore its discourses. Among those making this claim are Leppänen and colleagues (2014):

> they exemplify what could be called 'post-Panopticon' sociality (e.g. Haggerty, 2006; Arnaut, 2012; Leppänen & Piirainen-Marsh, 2009), manifest in their lack of centralized mechanisms of control by 'those in power' and in a shift to forms of grassroots, 'bottom-up' and peer surveillance. These are often polycentric in that participants can orient to, and shift between, several competing and complementary orders of normativity (Blommaert, 2010, pp. 37–9) (p. 114).

However, empirical evidence refutes this idea. Brokensha and Conradie (2016) explicitly state, "we do not ascribe to this colour-blind ideology; it is an unavoidable fact that discussions of race and racism – whether carried out in a face-to-face environment or in an online space – may generate micro-aggressions, covert 'everyday exchanges that send

denigrating messages to certain individuals because of their group membership' (Sue 2010, xvi)" (p. 2). Their case study, among others, showed less frequent posts from students who identified with an ethnicity that was underrepresented in the class, which could be due to a lack of cultural responsiveness in the online course curriculum, perceived cultural differences among the students, and the centering of whiteness that is the product of ignoring or denying cultural diversity within a group (Dare, 2010; Ke & Kwak, 2013; Kumi-Yeboah, Yuan, & Dogbey, 2017). In this sense, therefore, online class discussions are likely similar to those held in person.

Another potential difference is that online discourse does not allow for the same range of extralinguistic cues that facilitate face-to-face communication. Since extralinguistic cues can be vital to the performance of identity and contextualizing one's statements, users of social media (defined here in the literal sense, media that is social, and not limited to popular social media networking platforms) have cleverly adapted to this constraint with the use of what Leppänen et al have coined *resemiotization* and *entextualization:*

> Communication in social media involves not only resources provided by language(s), but also other semiotic resources – textual forms and patterns, still and moving images, sounds and cultural discourses … The language of social media is thus woven from multiple and intertwined semiotic materials" (p. 112-113).

In other words, while online discourse lacks physical nonverbal cues such as hand gestures and facial expressions, this can be compensated for with the use of emoji, memes, gifs, and other creative devices.

Reliability and Validity

Online class discourse served as an indicator of knowledge construction in several ways. I examined social presence and the development of an online social identity via the frequency and content of participants' discussion board posts, responses to their peers' posts, and peers' comments on their own posts. I also triangulated analysis of participants' engagement with the content of their end-of-semester reflections as a form of member-checking, and to strengthen or disconfirm themes that emerged from the discussion board data analysis. I recorded reflective memos throughout the data analysis process which served as a third source of validation. As this was a single case study conducted independently and from the position of a researcher-participant, LaBoskey's (2004) criteria for trustworthiness and validity in self-study of teacher education practices were applied as well. In accordance with these criteria, this study was self-initiated, improvement-aimed, and utilized qualitative research methods. In my analysis of my own discussions with students throughout the semester, I engaged in multiple cycles of interpretation, which I could then utilize to strengthen validity when member-checking was not possible (de Wever, 2006).

My memoing process served as an additional source of trustworthiness, in several ways. First, it provided a level of coder stability. Coder stability, also known as intra-rater reliability, occurs when the researcher checks, re-checks, and evaluates her coding throughout the research process (Rourke, 2002). My memo document also played an integral role in the retention of knowledge and information from relevant literature that is cited throughout each chapter of this dissertation, as it remained open alongside each article I read and was the notebook in which I recorded quotes, concepts, and my own

related questions and musings throughout the reading and information collection stages of the research process. Additionally, I met with my dissertation advisor regularly throughout the processes of planning, data collection, and analysis. These meetings served as member-checking, and as this advisor was also the designer of the course under examination and the coordinator of the program in which the course was housed, she was in a uniquely informed and qualified position to provide feedback on all aspects of the study, which played a significant role in shaping the direction of each stage of the research process.

Researcher Positionality and Ethical Considerations

As is the case in all research involving human participants, my positionality as a researcher and other aspects of my identity potentially influenced my research process and affected the participants' experiences as well as my findings (Merriam, 2009). The first, and possibly foremost, way in which my position informed and influenced the study in all its stages was my role as the instructor in the course. As the sole instructor of the course, I was responsible for designing activities, evaluating assignments, and assigning grades, as well as monitoring and managing students' interactions with each other and with me. Not only was I the instructor of the course in this study, but I have held a position of "teacher" since 2006 – thirteen years, at the time of the study. During this time, I had developed a teacher identity and a sense of obligation to care for my students and facilitated their learning to the extent possible. Along with my identity as an instructor, and the one responsible for this course, cane my desire for the participants – and all my students – to succeed in learning. Therefore, my desire to investigate my own

students' knowledge construction does not come without the desire to assess and reflect on my own teaching practices and to utilize the findings to improve upon them.

Second, my identity as a middle-class white woman was relevant when teaching and studying issues of diversity education. Both instructors and students may have mixed or negative feelings about an instructor who holds dominant identities teaching about social issues and injustices which they have never personally experienced or may feel that it is inappropriate. Additionally, imposter syndrome among white educators like myself complicated my relationship with diversity-related curriculum, as Smith et al (2017) point out: "underlying White professors' impostor syndrome is the fear that we are not as far along in our understanding of our Whiteness and racism as we think we are or should be, and that this deficit will be exposed if we dare to speak about race in the company of others" (p. 657). Compounding this phenomenon was my status as a doctoral student. Smith continues, "Not only are many professors poorly prepared for such moments in the classroom, those who are new to academia and/or are facing tenure review may feel especially unmoored by them" (Smith et al, 2017). And yet, deferring to faculty of color to bear the responsibility of teaching these courses results in unfair "cultural taxation" when, "along with all their other responsibilities as members of the professoriate, [faculty of color] are frequently called upon to be the in-house, on-the-spot diversity experts and multicultural educators when the need arises" (Smith, Kashubeck-West, Payton, and Adams, 2017). This poses a dilemma for any faculty member who tackles such a course, opening multiple aspects of their identity to scrutiny, especially those which are marginalized or minoritized.

The above factors were ways in which I expected my identity and positionality to influence, and be reflected in, the work conducted in this study. Because of my closeness to my data, I have endeavored to maximize transparency, defined as a global standard for empirical research by the American Educational Research Association (AERA, 2006), throughout the study and presentation of data, given the impossibility of neutrality in this, or any, work.

Discourse analysis is a methodology especially prone to variation in interpretation depending on the background of the individual conducting the interpretation. Jones, Holmes, Macrae, and Maclure (2010) warn us that

> interpretation and significance are … personal matters. While we are all subject to the imperatives of discourses (of childhood, education, family) that shape what it is possible to see and say, each individual makes a different trajectory among these culturally constructed spaces (p. 490).

Therefore, one step I undertook to maximize transparency in the discourse analytic process was memoing. Maintaining memos throughout the process of analysis helped to codify the thought process and evolution of analysis from data to theory and were intended to help prevent me from jumping to conclusions based on personal knowledge or beliefs rather than evidence drawn from data (Creswell, 2012; Glesne, 2011).

Another way in which I attempted to maximize transparency was by maximizing the participant sample. It is probable that a range of discursive styles, pedagogical preferences, and approaches to online learning were represented in a class of thirty-five students; therefore, including all consenting students in the sample of participants allowed for presentation of *deviant cases*, thereby increasing rigor (Mullet, 2018). The

presence of disconfirming, or deviant, cases will provide a check against the potential to cherry-pick quotes and data to support preferable themes or findings, as well as provide a counterbalance against overgeneralization of themes.

Due to the complex and large role that my positionality played as researcher in the proposed study, I have devoted a full chapter of this dissertation, Chapter 4, to my reflective practice throughout this project.

It is also important that, while I have made every effort to ensure maximum trustworthiness, my findings are mine alone and not intended to be construed as the only possible results of analyzing this dataset. In the social constructivist perspective from which I have undertaken this project, my findings are the result of my own efforts to make sense of, and seek knowledge from, this case, and are inherently unique and subjective. Certainly, any other researcher in my position, upon analyzing the same case, would arrive upon their own different and unique findings.

Limitations

Consideration of a researcher's relationship with participants, and how it is understood and managed by the researcher, is a necessary component of ethical research design (Jones et al, 2014). While I have attempted in the previous section and in the next chapter to reflect on my positionality and role as both researcher of this case study and the instructor of the course, acknowledging this potential conflict does not eliminate it. Corinne Glesne (2011) warns that "reflexivity is not a 'cure'… one can never know oneself well enough to critique oneself" (p. 151). In the next two chapters, I attempt to strike a balance between epistemological reflection (Baxter Magolda, 2004) and external data. This balance is particularly delicate in educational research in which instructors

research their own institutions and courses, as advised by Gardner et al: “one must be particularly discerning and discriminating about what is self-indulgent and personal and what makes a true contribution” (p. 104).

A related limitation in this study is the impossibility of participant anonymity due to our academic relationship. While I have made my best effort to ensure that participants’ identities are confidential, the information I have provided about the context and my own known identity could compromise this confidentiality for those who wish to break it. Even if they remain anonymous to the general audience, I conducted all the data collection and analysis after the conclusion of the course and after getting to know them for a full semester, making anonymity to me impossible. This is a necessary compromise for participant-researchers, as any guarantee of anonymity or confidentiality is impossible (Lincoln & Guba, 1989).

Self-Study of Teaching Practices

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Abstract

Integrating diversity material into teacher education curricula is necessary to foster professional competency and increase identity salience among pre-service teachers, a practice that must be modeled by course instructors. I engaged in this self-study to examine my practices as a white instructor of an online diversity course in education. Applying Korthagen and Verkuyl's theory of professional identity to an online context, I discuss themes that emerged from students' reflections on their own professional identity development as well as personal findings on my experience teaching the course, as well as implications for future teaching and qualitative research of students' experiences in an online teacher education course.

Introduction

Along with the increased diversification of the U.S. public education system as well as the United States as a whole (NCES, 2018) comes an increase in the number of institutions of higher education that are implementing mandatory diversity courses in their teacher education curricula (Bowman, 2010; Parker et al., 2016). Diversity courses, which may include courses teaching concepts such as equity literacy, cultural competence, culturally responsive pedagogy, or culturally relevant pedagogy, are generally defined as those that introduce students to diverse social groups and issues relating to race and ethnicity, and often also gender, ability, and socioeconomic status. The benefits of introducing concepts of diversity explicitly through required coursework are multiple and may include better preparation for a diverse workforce, better educational outcomes, increased civic engagement, and improved moral reasoning, empathy, communication, and collaboration skills (Bowman, 2010; Castellanos & Cole, 2015; Gurin et al, 2002; Parker et al, 2016). It has been suggested that such courses are especially beneficial for future educators, as a vehicle for instilling "cultural critical consciousness" or "intercultural fluency" that allows teachers to provide a culturally appropriate curriculum to their students (Gay & Kirkland, 2003; Williams, 2019).

Why is integrating diversity into the curriculum necessary when students are increasingly surrounded by diversity among their peers? While naturally occurring intergroup exposure as a result of diversification of the student body is beneficial, it has not been shown to be as effective in developing the above outcomes as diversity curricula which include a focus on identity–in other words, it is necessary but not sufficient. Hurtado, Alvarado, and Guillermo-Wann's (2014) study of approximately 5,000

undergraduate students across institutions found that over half of white students surveyed never or seldom think about their race, and only about 20% think of it "often"; the reverse was true for Arab American, Asian American, Black, and Latinx students.

This reveals disproportionate intergroup levels of what Hurtado et al. label *identity salience*, "the frequency with which individuals think about their group membership" (p. 128). This is a gap which diversity courses that explore identity may help to narrow. It may be due to white students' generally low identity salience that teacher educators' expectations of their knowledge and skill when it comes to issues of racial diversity can be low (Laughter, 2011)–an assumed deficit that, if more students received diversity education, may be better contested, and changed.

One vehicle for introducing diversity courses that are more available and accessible to the most students is making them available through an online format. Online courses are increasing in prevalence alongside diversity curricula, including at brick-and-mortar colleges and universities that have traditionally delivered courses exclusively face-to-face. However, questions remain about the "effectiveness" of online diversity courses. Smith and Ayers (2006) investigated students' relation to cultural "insiders" and "outsiders," among other knowledge, in distance-learning community college courses, and conclude that the online format "may not solve problems of equity and inclusion. In fact, it may even exacerbate such problems" (p. 413)–certainly an undesirable quality in any course, but especially ironic for one concerning diversity with the goal of teaching inclusively. More recently, however, Stauss, Koh, and Collie (2018) assessed social work students' awareness of cultural diversity and oppression in online and face-to-face diversity courses. They reported significant improvements in both contexts, with no

significant differences between groups, suggesting the potential for successful execution of an existing diversity course curriculum in an online format. This contradiction in the existing literature suggests the need for further exploration of the perceptions of online diversity courses for those involved in them.

As a white female instructor of an online teacher education course on diversity, I engaged in this self-study to examine my practices not only as an online instructor but as a white instructor of diversity material. Self-study is necessary for those of us in this position, as Gloria Ladson-Billings (1999) has observed, "Teacher educators are reluctant to address their own culpability in reproducing teachers who cannot (and will not) effectively teach diverse learners" (p. 98).

Outside of this practical justification, I would argue that it is the moral and professional responsibility of any teacher educator of social justice to practice reflexivity, a primary goal of self-study. A self-study of my own teaching practices is warranted, then, not only because of my positionality as a teacher researcher, but also due to my role as a white teacher of social justice-oriented content, and teacher of topics concerning racism to predominantly white pre-service teachers (Hancock & Warren, 2016). Mary Lynn Hamilton, an innovator in the field of modern self-study of teacher education practices (s-step), recognizes:

> If, as teacher educators, we cannot recognize and respond to [injustice], we cannot expect our students as future teachers to be socially just. From my perspective as a white woman in a position of authority, I believe that my work can contribute to the exposure of white privilege. White privilege is too often an unseen barrier to social justice that dams the progress that might

> be made. Also, the use of a story form of self-study reporting might help other white scholars recognize their (personally unseen) privilege, and the study itself might contribute to our understanding of the change process related to teacher education reform efforts. Research studies by white scholars confronting the hegemonic, racist structures within the institution have only been in the literature within the past ten years. Much of this work, however, has been theoretical rather than from a more self-reflective perspective. As scholars, particularly white scholars – as many of us are – we must call attention to our role in confronting these structures as well as our failures to address the tenets of our unjust system. This includes the promotion of social justice. As visible change agents, white scholars must ask questions and *confront* issues that are too easily overlooked in a privileged environment (2002, p. 187)

Hamilton recognizes here the necessity for literature to not only discuss privilege and positionality from a detached, impersonal perspective, but to connect it to oneself and "confront" one's personal role in these systems. More recently, education scholars Matias and Nishi (2016) have encouraged the same practice, despite their position outside the field of s-step, urging white anti-racist teachers to be critically reflexive and focus on their own whiteness and role in perpetuating racism, rather than framing racism and white privilege as a "people of color problem." Nishi calls out "how problematic it is for intercultural trainers to be equipped with the knowledge of race and diversity if they cannot even engage in a topic about how their whiteness impacts intercultural training itself" (p. 110).

Self-study can also help redress other potential pitfalls for teacher educators – not only avoiding critical examination of the implications of one's own racial identity, but also inadvertently teaching from the deficit perspective that we caution our students against. Warren and Talley (2016) recommend self-study as a means of seeking out this problem in our practice, advising that "critical examination of one's teaching practice facilitates exposure to and replacement of deficit perspectives" (p. 153). In this chapter, I take up a self-study of my own teaching practices within the context of the case.

What is Self-Study?

While the term self-study has been used in multiple fields to describe a variety of practices, I use "self-study" here to mean a self-study of teacher education practices, also referred to as s-step.

> The use of the term self-study is used in relation to teaching and researching practice in order to better understand: oneself; teaching; learning; and, the development of knowledge about these. … Self-study in relation to teaching and teacher education practices has emerged from the work of teachers and teacher educators themselves. That is, that their attempts to better understand the problematic worlds of teaching and learning have led to an increasing focus on their work so that researching their practice better informs them about their teaching and enhances their students' learning. Therefore, from the initial use of the term self-study has grown a strong and vibrant educational community that generally seeks to, '... investigate question[s] of practice ... that are individually important and also of broader

interest to the teacher education community' (Pinnegar & Russell, 1995, p. 6)" (Loughran, 2004, p. 9).

S-step remains a niche methodology in educational research. Its community is intimate, which – combined with the humble nature of its theoretical underpinnings – render it comparatively accessible to new scholars; a version of this chapter is already published in an open-access book of s-step practices (Richter, 2020). This uniqueness is partially explained by s-step scholars' recognition of its lack of fit in the academy at large, well-articulated by Lighthall (2004):

> I view our situation regarding the traditional disciplinary methods and aims of research as being like the person who is looking for a penny buried somewhere in the sand nearby and being offered by traditional searchers the use of bulldozers to find it. The academy's bulldozers are ill suited to our task. We need to develop the equivalent of our own metal detectors, sifting screens, and trowels, and we need to get down on our knees to make careful and close observations. That metaphor of looking for a penny in the sand while being offered bulldozers emphasizes the fine-grained character of the phenomena we have to deal with. … Most of the academy and most of its refereed journals would find little of interest in such a microscopic focus. Yet for me, as for s-step colleagues generally, it is only that kind of context and time-specific focus that can show us our actual practices and effects (p. 223-224).

I have witnessed the "little interest" that Lighthall describes, while interviewing for my current position as a PhD student. When discussing my scholarly interests and the

potential focus of my doctoral studies, I was discouraged by one faculty member from pursuing teacher education due to a lack of interest or prestige among the scholarly educational research community and advised to instead develop my disciplinary expertise in applied linguistics and academic discourse. The university's Research Protections Office also did not consider any portion of this dissertation to constitute human subjects research by their definition of such, which is: "systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge" (University of Vermont, 2020). Even though my investigation was intended to shed light on the peer knowledge construction process in an online undergraduate course, as we enter a time of unprecedented ubiquity of online learning and a dire under preparedness of faculty who bear the responsibility of facilitating it, this study was determined to be "not designed to contribute to, or to advance generalizable knowledge." Thusly, I was informed by our research review analyst that "your 'research' presents more as a quality improvement project"; in other words, my "research" was outside the scope of what the office considered to constitute "research."

I provide this background not to critique the epistemologies of my university nor any individuals in it, but rather to illustrate the positioning of research orientations such as that of s-step as precariously testing the boundaries of what is considered valid knowledge, even in scholarly communities that generally support a variety of perspectives and ways of knowing (Butler & Branyon, 2020; Garbett et al, 2019). Ham and Kane (2004) acknowledge this positioning of s-step as such:

> The point, or points, at which a 'self-study' might become 'research' is a matter of some discomfort and 'dissensus' even among those who work and

> write in the self-study of teaching and teacher education areas. … In our interests we straddle precariously a perceived chasm between the high theory of academe and the rich chaos of situated practice (p. 103).

I am grateful to my advisor and other faculty in my department for not sharing the perspectives of the aforementioned faculty member and RPO, and in fact, as I emerge from my program of study several years later with even more experience, I believe as strongly as ever in the necessity of professors, teachers -- anyone with students -- to engage in self-study practices, whether for publication purposes or solely for personal professional development. I also believe that engaging in the self-study for this chapter benefits the rest of this project, as suggested by Scollon (2004):

> The fact that discourse analysis as done by academics has often been rather ineffectual is not to attest to the weakness of discourse analysts as agents of social change; it is to attest that discourse analysts in many cases have been networked in nexus of practice so distant from the worlds under examination that their analyses are not in any way part of the discourses which are constructing those worlds (p. 9).

In examining my positionality via this self-study, it is my intent that I may minimize this "ineffectuality," and therefore bolster the value of my work, by engaging in research and practice within the same nexus, or world – that of my own class. Specifically, the purpose of this self-study is to investigate the role of my disclosures about my own identity, and students' perceptions of racial identity, in the effectiveness of my teaching of an online diversity class on race and racism.

Review of the Literature

Before embarking on the present study, it is important to situate it within the context of s-step methodologically, theoretically, and topically. In this section, I review literature in three areas relevant to the present study: the evolution of s-step as a methodology; theoretical frameworks that underlie my approach to analysis; and the role of culturally responsive instruction in s-step.

Self-Study in Teacher Education Practices

As the field of s-step, as mentioned above, is new and also loosely organized, few scholars have as yet put on record its creation, development, and definition. Therefore, I rely heavily on the few that do – namely, Frederick Lighthall (2004) and J. John Loughran (2004), both in the first handbook dedicated to s-step research. Loughran notes that the origins of self-study in teacher education practices were formalized in 1992 with a symposium at the annual meeting of the American Educational Research Association (AERA) by a collection of scholars who came to be known as the Arizona Group. The Arizona Group, comprised of Karen Guilfoyle, Mary Lynn Hamilton, Stefinee Pinnegar, and Peg Placier, was formed during the members' tenure at the University of Arizona in the 1980s and, in their own words,

> in our teaching of future teachers we are committed to model the kind of work we expect from them. … [W]e constantly examine our own practices as teacher educators and the implications of our own teaching for our students' teaching" (Guilfoyle, Hamilton, & Pinnegar, 1997, p. 183).

The members of the Arizona Group continue to steer the direction of s-step today.

From this symposium grew an official AERA special interest group (SIG) – the S-STEP SIG, founded the following year. At the same time, other educational scholars

were beginning to integrate more reflection and focus on their own practices in their scholarship, indicating a broader movement in the field of educational research beyond the Arizona group (Cochran-Smith, 1993). In 1996 s-step scholars met outside the context of AERA at Herstmonceux Castle for the first semi-annual Castle Conference (S-STEP, 2020). S-STEP as a SIG now publishes its own journal, *Studying Teacher Education*, and is active in several counties (Butler & Branyon, 2020).

Lighthall identifies several themes that characterize most self-study literature. Three of these themes relevant to the present study are: 1) reframing; 2) tensions and dilemmas; and 3) reflection. The first theme, reframing, usually involves bringing in voices outside the researcher to reveal alternative perspectives on the research problem or question. Often these voices belong to the teacher-researcher's students or colleagues, a "critical friend" familiar with the researcher's professional context (Hamilton, 2002; LaBoskey, 1997; Loughran 2002; Whitehead 1994). The second theme that Lighthall identifies is one of tensions and dilemmas. These are natural consequences of formally studying one's own practices, as research is problem-based; the self-study researcher, then, is investigating a problem that one is experiencing. Hannon (2019) identifies several sources of "dissonance" and tension: tension between our teaching practices and our personal values; between our values and the structure of the school system within which we must work; and, for many of us, between our role as a teacher and as a parent of children. Also, recognizing and engaging thoughtfully in our own role in perpetuating injustices and exclusion results in personal discomfort (Guðjónsdóttir & Jónsdóttir, 2016; Hamilton, 2002). This tension is a byproduct of reflection, as Lincoln & Guba point out: "[the] value of reflexive journaling [is] to come to now, continually, the nature and shape

of prior constructions, including most especially those which are held tacitly, and which may be previously unknown to the inquirer" (2013, p. 57). This leads us to the last theme, reflection, which I will expand upon in the next section.

Theoretical frameworks

Reflective Practice

Studying one's own teaching practices is an essential feature of s-step (Lighthall, 2002), as self-study is grounded in the "notion of reflection" (Loughran, 2004). When defining reflection, self-study scholars often turn to Dewey (1910) and Schön (1987). For Dewey, reflection was a rigorous mode of inquiry consisting of stages, much like the scientific method. Dewey considered it an essential part of connecting a learner's experiences with greater ideas to create meaning. Influenced by Dewey, Schön emphasized the importance of *reflection-on-action*, reflecting on an action that you have already taken, and considering both the positive results and opportunities for improvement. Lighthall (2002) points out that reflection based on empirical data is a key feature of s-step, further connecting the practice to Dewey's definition.

Culturally Responsive Instruction

Bukhanwala and Dean (2019) note that, in general, "across the landscape of self-study in teacher education, there is a shared urgency and passionate concern for issues of equity and social justice" – they provide as evidence the fact that "in the volumes [of s-step journal *Studying Teacher Education]* from 2015 and 2016, the percentage had grown to 47% of included articles explicitly naming topics related to the broad category of social justice" (p.3). This focus is turned inward in self-study, identifying the ways in

which one's own teaching practices serve to either disrupt or perpetuate inequity in teacher education. Brown (2004) identifies how this focus manifests in praxis:

> It is through these self-studies that we may continue to gain insights into the particular ways in which the normalization of inequity manifests itself throughout the educational system, gain an understanding of probable means of intervention, based on the unique histories of the persons and institutions with which we are involved, and gain a profound understanding of the theoretical implications that this local work has for educational practice and hence, for teacher education (p. 568).

As a white female instructor of an online teacher education course on diversity, I engaged in this self-study to examine my practices not only as an online instructor, but as a white instructor of diversity material. Self-study is necessary for those of us in this position, as Gloria Ladson-Billings (1999) has observed, "Teacher educators are reluctant to address their own culpability in reproducing teachers who cannot (and will not) effectively teach diverse learners" (p. 98).

Epistemic Justice

S-step's radical focus on the personal is, in part, a reaction to traditional, more positivist educational research which is conducted from an etic perspective, in which research is "done" to a separate group of people. Findings of this research are connected to the subjects, or participants, and not (generally) the researcher's role in the project – a stance that is not particularly credible when the researcher is an educator conducting action research on one's own work. Gilson (2011) identifies how an attempt at

impersonal objectivity in teacher education research is not only a poor fit, but perpetuates a privileged role for the researcher which is not conducive to effective reflection:

> The projection of vulnerability onto others and disidentification with those vulnerable others goes hand in hand with the idea of vulnerability as a negative state … something one feels one ought to eschew. Invulnerability, accordingly, is a stance that enables us to ignore those aspects of existence that are inconvenient, disadvantageous, or uncomfortable for us, such as vulnerability's persistence. As invulnerable, we cannot be affected by what might unsettle us (pp. 312-313).

As teacher educators, we are theoretically proponents of learning and growth, and encourage activities that promote these goals among our students. And yet, an avoidance of vulnerability stymies learning and growth within our own practice. Gilson continues: "the impetus for ignorance is an attempt to avoid what might unsettle us, when we ignore we are necessarily avoiding our own vulnerability" (p. 319). S-step's focus on *self* is "an act of epistemic vulnerability … and thus a reduction of ignorance" (p. 324).

The concept of epistemic vulnerability and justice originates from feminist theory (hooks, 1994; Ortega, 2006). Applied to s-step, it requires an examination of an educator's implicit biases and ignorances and how they impact students (Dotson, 2012; McHugh & Davidson, 2020). Additionally, making students – future educators – aware of that responsibility as well, and modeling vulnerability by acknowledging these biases and privileges, grants students the possibility for *epistemic credibility* – they have the power to know things that their teacher does not (Loya, 2020).

Methods

Context of the Study

Self-study serves us as a tool to maintain and develop our professional identity. As Lunenberg, Zwart, and Korthagen (2010) explain, "[i]dentity is socially constructed by how others perceive and define us, by our relationships with others, and by the setting ... to be a teacher educator at this time, in this culture, is complex, culturally determined, and dialogical" (p. 1281). This is especially the case when teaching courses that deal with issues of social justice and diversity. In these cases, the teacher educator's identity is brought to the forefront by class discussions and debates around social identity and its meaning and power in student-teacher interaction.

This self-study was conducted within the context of the case study I conducted in a class which I also taught. The dual nature of my positionality as instructor and researcher prompted me to engage in a self-study alongside my educational case study. I felt that dedicating this space to reflexivity was necessary to provide a balance to the analytic nature of the rest of the project, which Feldman (2003) points out, "while satisfying criteria for validity, do not allow for the subtleties required to present one's way of being to others" (p. 27).

I utilize Korthagen and Verkuyl (2002)'s theory of professional identity to investigate the role of my disclosures about my own identity, and my students' perceptions of identity, in the effectiveness of my teaching of a diversity class on race and racism. Korthagen and Verkuyl explain that, in their own self-study, "we could not undertake this enterprise without questioning our own professional identities and missions as teacher educators. ... A major role must be reserved for reflection on one's own professional identity and one's social-pedagogical goals and responsibility" (pp. 43-

44). Therefore, in a course that grapples with race and identity, my own race and identity must be addressed both internally via reflection, and externally via acknowledgement to my students.

Another important element to the context of this study is that the class is held entirely online. In the past few years, more self-studies are beginning to focus on the growing area of online teacher education (Cutri & Whiting, 2018). This broadening of teaching modalities provides an opportunity for expansion of S-STEP methodology (Hamilton & Pinnegar, 2017; Dacey et al, 2017). An online platform is, in fact, an ideal environment in which to conduct a self-study as defined by LaBoskey's (2004) criteria, as the "construction, testing, sharing, and re-testing of exemplars" are retained as written record via the course materials themselves; the Blackboard LMS serves as a validation tool, as it has preserved every word of my interactions with my students in their original context.

Purpose of the Study

The areas of exploration in this study are twofold. First, I considered my own racial identity and how explicit acknowledgment of it, and its influence on my professional identity as a teacher educator, affects students' own racial identity development. Smith, Kashubeck-West, Payton, and Adams (2017) point out that "underlying White professors' impostor syndrome is the fear that we are not as far along in our understanding of our Whiteness and racism as we think we are or should be, and that this deficit will be exposed if we dare to speak about race in the company of others" (p. 657).

The second area of focus in this study is the confounding factor of the course being online. The experience of a white person teaching ethnic and racial diversity has previously been explored in self-studies (Bass, 2002), and I will apply a similar lens to an online context, exploring my credibility as a white woman teaching a diversity class. My racial identity was made visible to students through my modeling of course assignments and engagement of identity-related course content with students on the discussion board. Students were also able to make judgments about my racial identity based on my physical presentation in video lectures, avatar, and photos I posted. In this exploration, I seek to investigate the role of these disclosures about my own identity, and my students' perceptions of online race- and identity-centered class discussions, in the effectiveness of my teaching of a diversity class on race and racism.

In addition to these objectives specific to this study's context, I also subscribe to the broader, collective objective of all quality self-study research, to find commonalities in experience – "to see if the case for me is also the case for you" (Ham & Kane, 2004, p. 117).

Data Collection and Analysis

My data collection and analytic method selection were driven by my research question and data types, as recommended by Loughran (2004), who states: "the 'one true way', the template for a self-study method, has not emerged. Rather self-study tends to be methodologically framed through the question/issue/concern under consideration so that it invokes the use of a method(s) that is most appropriate for uncovering evidence in accord with the purpose/intent of the study" (p. 17). The participants of this study are the 35 students in my course and myself. The research plan was reviewed by institutional

IRB and, perhaps unsurprisingly as is sometimes the case with self-study research work, the project was deemed "not research" (Ham & Kane, 2004). Three data sources were utilized for this study: first, students wrote reflections on the course content, which I coded and analyzed for reflectivity on their own identity. In their reflections, students were encouraged to respond to the following prompts: "What was the most challenging part of this class?" "Which diversity competencies[2] did you achieve from this class?" "What suggestions would you provide future students and/or instructors of this class?" Secondly, I used reflective journaling as a primary data source throughout the course, which was analyzed and mined for meaningful excerpts. In order to determine what constituted meaningful excerpts, I utilized in vivo coding as described below, and cross-referenced my own codes with those reflected in students' writing, to identify patterns in experiences that students and I shared, as well as incidents that we may have both written about but interpreted differently. Finally, I used students' evaluations from the course as an anonymous source of relevant insights they may have had into my teaching. Frederick Lighthall recommends examining one's own teaching by "study[ing] students' responses to one's efforts" (2004, p. 208), which implicitly suggests that student evaluations and course reflections would constitute a legitimate data source for such a self-study.

Although I engaged in many informal conversations with colleagues and my advisor during the time I taught this class, I conducted this self-study as an independent researcher (e.g. without intentional involvement of "critical friends" as co-researchers).

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[2] [1] "Diversity competencies" are 14 institutionally-defined outcomes of diversity courses, described in general as "the awareness, knowledge, and skills necessary to function productively in a complex global society, by fostering an understanding of and respect for differences among individuals and groups of people."

In the absence of potential opposing viewpoints, I have strived to meet and exceed standards for trustworthiness and validity while analyzing these three data streams. In accordance with LaBoskey's (2004) criteria, it is self-initiated, improvement-aimed, and utilizes qualitative research methods. It is also interactive in that I engaged in discussions of teacher identity with students throughout the semester as well as provided responses to their reflections, and in my analysis of these discussions, I engaged in multiple cycles of interpretation. In alignment with my research question, coding was open and a priori; I did not want to impose any assumptions I may have made about the student experience onto their own words. I applied both *in vivo* and *emotion* coding following Saldaña's (2016) recommendations of both coding methods for "attuning yourself to participant perspectives" (p. 73). I also applied *emotion* coding (Saldaña, 2016; Prus, 1996) in order to properly attend to the participants' feelings and personal experiences.

While maintaining standards of integrity and trustworthiness in alignment with accepted guidelines and recommendations for the field of self-study, I fall back on the reminder that "it is the reader of a report who ultimately judges the validity of the study by considering whether it is informative, relevant or useful in his/her own setting" (Vanassche & Kelchtermans, 2015, p. 518)**.**

Findings

Student Feedback

Reflections. Analysis of students' reflections on their own professional identity development uncovered three themes that appeared across five or more reflections: *recognition of whiteness, reflection on online discussion,* and *implications for teaching practice.*

Recognition of Whiteness. Acknowledgment of racial privilege and the impact of one's whiteness on their perception of the world often emerged in response to the "challenges" prompt, as students recognized the discomfort of these realizations. This pattern is evident in statements such as "Frankly, the most challenging part of this class was the very first reading I did. ... [It] forced me to spend some time contemplating what my privilege means for the career path I intend to follow. Thinking hard about myself was the most challenging part, as self-reflection has not always come easy." "This [class] made you think intellectually about how and why we present ourselves the way we do. I really enjoyed this ... because not only did it make you think, but we realized we don't typically walk around saying 'Hi my name's Jamie and I'm white' just because it's typically assumed."

Reflection on Online Discussion. For many students, this was the first online course they had taken. References to the online aspect of the course typically voiced trepidation towards the format or appreciation of the interactive nature of the discussion boards, which were an important and required part of the course. Positive reactions to the discussions included comments such as "I loved... the ability to look at other students' work. ... I grew through the sharing of my own opinions and the comments of others on my own work. I don't think that this class would have been as impactful for me if it weren't for the online structure filled with discussion boards and peer responses." "I really enjoyed the discussion board for this reason; it held each of us accountable for having positions and opinions." Negative reactions included "At times I did struggle with discussion board responses. I found that it was a very open space and I felt very vulnerable. This is something that I typically would not feel in a classroom setting if it

was in person feedback, but something about the 'behind the screen' users made me feel unsure and hesitant in my responses." "I think it's really easy to disregard viewpoints in the discussion board... that differ from yours. ... I think I wish I had sought out opinions that were different than my own when I was reading through and commenting on others' reflections." And "The only thing I'd like to suggest that the class would do in the future is to make the discussion posts anonymous. ... It is imperative to have open an [sic] honest 'conversations' through these posts, and I felt like students, including me, shied away from sharing some details and thoughts knowing that their name would be associated with whatever they say." The comments about accountability and lack of anonymity are consistent with Ham and Davey's (2002) proposition that the online format may change the nature of students' engagement with each other and the material, in part because thoughts committed to written text are rendered immortal, a permanent record that prompts more hesitation and reluctance from its authors than if the words were spoken face to face.

Implications for Teaching Practice. The final theme that emerged across reflections was the potential applications of course material to their professional praxis since the majority of students were Education majors. "My hope is that I can continue this work and have a really solid foundation of what my role as a privileged white female is, and then work these ideas into my classroom in a creative way in an attempt to make some change." "I believe that being cognizant of my privilege puts me at an advantage when dealing with people from all backgrounds because although I may not fully grasp where they are coming from I am self-aware in a way that makes me more

understanding."

Course Evaluations. Course evaluations did not provide a useful source of triangulation, as the content was not very substantive. The relative ineffectiveness of student evaluations of instructors as an assessment tool in isolation has been noted and seems to be at play in the present study as well (Boring et al, 2017; Zabaleta, 2007). Likert-score feedback concerning organization and course assignments did not align with research questions and were disregarded in this analysis; only qualitative responses were considered. Qualitative responses were optional, and therefore many chose not to provide them. Students who did provide qualitative feedback responded to three prompts, all listed below.

Prompt	**Response**
What to you were the most beneficial aspects of this course?	• I have expanded my knowledge on how to be inclusive to students with different backgrounds in many varieties of ways. • I learned many different things about english language learners. I learned about different policies and racisms effects people. [sic] • the beneficial aspects of this course was being able to communicate with other students that were taking this class even thought it was online. [sic]

What changes would you make to this course and why?	• the mini projects I felt were more informative than all the reading. Less reading and more activities • It would've been helpful to have that list you gave us for the midterm maybe at the beginning of the semester. There was a lot of readings and it would've been nice to see what information we should be focusing on.
Would you recommend this instructor to other students? Why or why not?	*N/A; notably, none of the responses here were identity-related. Of the 10 qualitative responses, 9 were affirmative, and one was left blank.*

Personal Findings

One theme that arose in my journaling is that of tensions inherent in me, as an educator, presenting and discussing aspects of my identity, and the corresponding potential for imposter syndrome, as a pedagogical tool. A teacher of diversity courses who wishes to be authentic must walk a fine line between "exposing one's vulnerability as a teacher educator and maintaining student teachers' confidence in the teacher educator as a leader" (Berry & Loughran, 2005, p. 171). Berry and Loughran describe this as

> the tension between a constructive learning experience and an uncomfortable learning experience. We argue that good teaching about teaching should lay bare one's practice to the scrutiny of others through

> honest discussion about the impact of teaching on the development of others' learning (p. 175).

Ultimately, after reviewing students' feedback and my own journals from the semester, as well as memos from the research process, I feel that this exposure, laying bare, and explicit acknowledgment of the corresponding tensions, is well worth the risks and have strengthened my own teaching practice as well as my confidence in my own qualifications.

When beginning to teach this course, I struggled with how to address my own identity as a white scholar. I perceived my race to be a weakness in my qualifications – or, more accurately, I believed my race to be a potential weakness in the eyes of my students (dig into this a bit more and explain). The appropriateness of a white person teaching courses on race could be, and has been, called into question on legitimate bases. On the other hand, some scholars argue that allies, including those who identify as white, need to take up their fair share of the work of social justice and not place the burden solely on the shoulders of people of color:

> It is necessary to explode the widely-disseminated myth that the minority scholar, for example, not only is a purveyor of difference but also represents its most competent spokesperson. Such a purview fails to account for the fact that not all minority scholars are interested in investigating 'minority issues.' ... This strategic segregation directly impinges on the minority scholar's right to academic freedom (Aching, 1996, pp. 288-289).

Once the course began, however, I also noted that most of my students shared similar racial and socioeconomic backgrounds to my own, and I decided that, despite my

discomfort, I could support my students' professional teacher identity development by urging them to consider the influence of their privilege and whiteness, when relevant, in their role as teacher. I decided to be open in acknowledging this influence, modeling reflexivity in the spirit of Mezirow (1991), who argues that transformative learning occurs in the presence of challenging one's core identities, a process often met with feelings of discomfort and vulnerability, and often – when one holds dominant identities – avoidance, which I recognized as exactly what I had been tempted to do. In order to foster transformative learning in my students, I need them to be open, so I decided that I needed to model this openness myself. Julian Kitchen (2019) came to a similar conclusion in a recent study, suggesting that "relational approaches, in which teacher educators are humble, vulnerable and receptive, can create safe spaces for teacher candidates to examine their resistance in order to become more inclusive as teachers" (p. 1).

Epistemic Vulnerability and Ignorance

Applying the theoretical framework of epistemic justice supports my reflective decision to err on the side of vulnerability and acknowledgment of "ignorance of experience" (Ortega, 2006, p. 57). *Epistemic credibility*, the "authority given to an individual to receive and produce knowledge … authority to be a learner as well as a contributing member in the teaching and learning process" (Loya, 2020, p. 118). Traditionally, credibility has been granted to an instructor by virtue of their position in the classroom; it is generally assumed that their position there has been earned by their collection and production of valid knowledge. Students' epistemic credibility, on the other hand, is being constantly evaluated and judged based on a variety of subjective

factors, including the way they present themselves in the classroom and assumptions made about them by the instructor – a practice which, however well-intentioned or even unconscious, is inevitably affected by structural inequities in the educational system (Fricker, 2007). Acknowledging to students the existence of this bias and that I, in fact, don't know everything, not only models epistemic vulnerability for them, but also grants students their own epistemic credibility: they have had lived experiences that I have not, and therefore hold knowledge that I do not.

Discussion

Although some students did tackle the tension of their own racial identity and their social justice orientation in their reflections, the relative lack of reflection on racial identity proportional to more "safe" content-based review of course materials reflect the avoidance previously referred to. Korthagen and Verkuyl (2002) describe similar avoidance and the role of the educator's disclosure:

> the workshop almost forced us to show our own genuine inner selves to student teachers, especially in those moments where these students were confronted with parts of themselves they had long tried to avoid being aware of. In trying to stay close to these students in such moments, we as teacher educators were confronted with the question "do we meet our students or ourselves?" (p. 46)

Other self-study researchers have highlighted the importance of vulnerability (Cutri & Whiting, 2015; Stolle et al, 2018), and modeling more of this vulnerability for our students may help encourage them to be more reflective practitioners themselves.

Encouraging this reflective vulnerability and risk-taking among students could reduce avoidant behavior, increasing student engagement as well.

Another theme that became apparent from multiple data streams was that development of one's professional identity involved growing pains for both the instructor and students. While I was concerned with students' impressions regarding my expertise and knowledge, students revealed discomfort in realizations about their ignorance in statements such as: "The most challenging part of this class ... realizing how uneducated I am about most of the topics we talked about," and "I had trouble because I was raised to believe that someone can do anything they want to if they set their mind to it. ... I have learned to recognize my affluent background in helping me achieve what I want easier than someone who may not have the same immediate opportunities." These excerpts depict not only personal growth, but acknowledgment of the difficulty inherent in recognizing one's privilege.

Further Study

Implications for Teaching

Personally, the "challenge" of self-reflection emerged as a theme in my own experience as well as students'. Self-reflection and social justice are both processes that are never fully achieved or "done," never to be checked off and moved on from. Therefore, this self-study has reaffirmed the value of continuing to reflect on my teaching practices and explore areas of vulnerability and discomfort to allow for further growth.

Students' reflections on the impact of the online format on their peer discussions also hold implications for educators hoping to discuss race and privilege in online teacher education courses. Ham & Davey's 2002 aforementioned observation appears to hold

true, at least in this case, as students reported feeling vulnerable posting their opinions on the discussion board with their names and avatars attached. However, most students who reported these feelings also acknowledged it as a valuable aspect of the course. While one student indicated that they would have preferred anonymity, this raises the question of whether the comfort provided by anonymity would be beneficial for this type of discussion; after all, one never has the opportunity to stand in front of a class and teach anonymously. Therefore, teacher educators utilizing online discussions may support students by acknowledging the vulnerability inherent in engaging in such a platform, and explicitly discuss the value of this vulnerability for advancing professional identity development.

Implications for Research

In response to the proliferation of online courses in recent years, S-STEP researchers have also begun to focus more on online teacher education (Garbett & Ovens, 2017; Murphy & Pinnegar, 2018). But it still represents a small sliver of self-studies when compared to those conducted in the context of more traditional classrooms. Continued self-studies conducted by online teacher educators would serve to further understanding from an emic perspective of how online classes contribute to teacher educators' development similarly to, or differently from, face-to-face contexts. They would also support the qualitative exploration of students' experiences of online teacher education courses, a question which has been addressed disproportionately by quantitative comparative studies of online versus face-to-face classes.

Educational researchers in general have recently devoted quite a bit of scholarship to computer-supported collaborative learning, but not much of this research overlaps with

the scholarship devoted to diversity and social justice education. As the demand for social justice- oriented curricula becomes clearer and more urgent, further research on social and ethical implications of engaging in such personal and identity-driven discussion on a virtual platform would be valuable for any teachers, teacher educators, and administrators who are involved in online teacher education.

Regarding the field of self-study in teacher education, specifically, I hope that, by situating this "not"-research within the greater context of a study that utilizes a more traditionally validated and accepted research design, it may contribute to forwarding the recognition of self-study as a valid method of educational research. After all, nearly a century has passed since John Dewey told us:

> Reflection is effective when it leads the teacher to make meaning from the situation in ways that enhance understanding so that she or he comes to see and understand the practice setting from a variety of viewpoints. Such learning can then impact on the development of one's attitudes for reflection (Dewey, 1933).

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A Discourse Analysis of Knowledge Construction in an Online Education Course

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Abstract

Understanding how knowledge construction happens in online courses is important for institutions, educators, and students alike to align their expectations of what constitutes participation and learning in online courses that involve peer discussion. However, most research of online courses has focused on outcomes rather than how knowledge is constructed via discourse. This process-oriented case study is intended to explore how students' interactions with each other may develop their own understanding and each other's throughout the semester. Through content analysis, discourse analysis, and social network analysis, I present five distinct interaction styles utilized by students in my class, and present implications of the recognition of these styles on teaching practice, research, and online education policy.

Introduction

The incredible and unprecedented increase in the number of online classes in 2020 has been thoroughly documented and affected most Americans, by virtue of their role as a student, parent, employee, or stakeholder of an educational body of any kind. However, even prior to the effects of the Covid pandemic on our educational system, online teaching and learning had already become standard in higher education. According to the National Center for Education Statistics (NCES), "In fall 2018, there were 6,932,074 students enrolled in any distance education courses at degree-granting postsecondary institutions." 35% of students were enrolled in one or more online ("distance") courses. Among graduate students, it was 40%. While, as of the time this is being written, NCES has not yet published statistics for the 2020-2021 school year, we know that the worldwide shuttering of schools in spring of 2020 caused a massive shift toward online learning which has had lasting effects on the way online learning is offered and perceived.

While a plethora of research has been conducted to assess online courses in higher education for effectiveness, as measured by student evaluations, exam scores, and other performance outcome measures (Allen et al, 2004; Lee et al, 2011; Means et al, 2013), far fewer have focused on peer discourse and the process of knowledge construction in online environments. The global shift to online learning that occurred in response to the Covid-19 pandemic has muddied our understanding of the learning processes that happen in these courses even further, due to the multiple confounding variables that presented themselves alongside this unprecedented and unanticipated disruption. As a result of all these circumstances, research on peer knowledge construction in courses in which this

subject matter and environment intersect is greatly needed. This study addresses the lack of existing literature on online education courses by investigating the process of students' knowledge co-construction in one online teacher education course. This process-oriented analysis is intended to explore how students' interactions with each other may develop their own understanding and each other's throughout the semester. The purpose of this analysis is to explore the process of knowledge construction among these undergraduate students in an online teacher education course, to answer the research question: how do students co-construct meaning in an online teacher education course?

Literature Review

Computer-Supported Collaborative Learning

The study of computer-supported collaborative learning (CSCL) focuses specifically on the "collaborative construction of knowledge in face-to-face and online settings" (Wallace, 2003, p. 244). Louis Major and Paul Warwick (2020) have identified three themes in literature on computer-supported collaborative learning: 1) study of dialogue activity, including knowledge co-construction; 2) study of the learning environment, 3) study of technological affordances. I use Major and Warwick's structure here to briefly review some of the sub-themes that underlie much of the research on CSCL.

Dialogue Activity. Dialogue is essential to collaboration, and therefore dialogue activity is considered essential to computer-supported collaborative learning. Studies of dialogue activity include concepts of knowledge co-construction (Enyedy, 2003), exposure to alternative perspectives (Munneke et al, 2007), and expressing meta-cognitive learning through dialogue (de Vries, Lund, & Baker, 2002) among their most

common themes. Many of these studies also share theoretical underpinnings with Robin Alexander's concept of dialogic teaching, which "views the social and the cognitive as interdependent and speech as the mediator" (p. 77) and that describes how "language not only manifests thinking but also structures it, and speech shapes the higher mental processes necessary for so much of the learning that takes place, or ought to take place, in school" (p. 15) (Alexander, 2020). Scardamalia and Bereiter's (1994) work on knowledge building, and Hakkarainen's (2009) follow-up connecting Scardamalia and Bereiter's concept of knowledge building with social practices, were also influential to the field in explicitly labeling knowledge construction as a social practice. "Knowledge creation," Hakkarainen clarifies,

> is not … to be understood as based on ideas, or their leading to new ideas. From an educational reformer's or an educational psychologist's point of view, it is about creating knowledge practices, that is epistemic practices of working with knowledge, channeling the participants' efforts in ways that elicit knowledge advancement, in which the development of ideas is one component. … rather than rigid routines or repeated procedures, such practices are focused on constant re-creating in a way that elicits successful pursuit of innovation (p. 224).

Study of dialogue activity within CSCL settings primarily focus on the ways in which computer-mediated dialogue produces new ideas, arguments, consensus, and other practices of academic dialogue, with the understanding that, as illuminated by the previous quote, the end goal is not always a specific solution or

conclusion, but rather the practice and honing of these knowledge construction skills themselves.

Learning Environment. The second sub-theme of CSCL literature, after dialogue activity, is study of the online learning environment. This sub-theme includes research on classroom atmosphere, motivation and engagement, and learner inclusion among its most commonly recurring focal areas. Relevant research on classroom atmosphere has investigated, for example, how the physical organization of face-to-face classrooms influences students' engagement with classroom technology (Mercier, Higgins, & Joyce-Gibbons, 2016), and the purposes and benefits of using smartphone-enabled social apps such as WhatsApp for teacher-student communication (Bouhnik & Deshen, 2014). Research on motivation and engagement has investigated innovated uses of interactive white boards (e.g. SMART® boards) as a tool for encouraging knowledge co-construction in the face-to-face classroom (Kerawala et al, 2012), and the influence of collaborative technology on students' attitudes and perceptions towards science (Looi et al, 2010) and for encouraging student-centered discussion (Maher, 2012). Finally, research into learner inclusion has found that microblogging can serve as an effective learning tool for reluctant and struggling participants (Rasmussen & Hagen, 2015), that arguments initiated by students on an online discussion board can promote higher rates of participation than teacher-led classroom discussion (Kim et al, 2007) and that open-ended iPad apps can encourage higher quality of peer talk and engagement, while more complex apps encourage higher level independent engagement (Kucirkova et al, 2014). While these three focal areas are differentiated from each other in Major and Warwick's 2018 meta-analysis (upon which this subsection is organized), one can see also a considerable

amount of overlap of findings across these areas among research on the learning environment, due to the multiple uses and benefits that educational technology can provide. These uses, or *affordances*, are expanded upon below.

Affordances. Finally, the third sub-theme identified by Warwick and Major is that of affordances and constraints. The term "affordances" used to describe interrelations between a subject and object was coined by Maurice Merleau-Ponty (1973) and was subsequently adapted to apply specifically to the relationship between an agent (in this case, a learner) and the tools in its environment (in this case, a computer or other technology) by psychologist James Gibson (1986[3]). In studies of discourse and dialogue, affordances generally refer to the potential uses or interpretations of concrete tools and objects by people (Linell, 2009). More specifically, in CSCL, technological affordances generally describe opportunities for dialogue that are made possible by digital technologies (Major & Warwick, 2020). The most frequently recurring themes in the study of technological affordances for CSCL include the creation of shared dialogic space, accessibility and versatility, and representation of content. Creation of a shared dialogic space can mean piloting or experimenting with technological platforms in an educational setting to encourage dialogue among learners, as in Nikolaidou's 2012 work with ComPLuS for collaborative music composition; Looi, Chen, and Ng's (2010) use of GroupScribbles for collaboration in science class; Kerawala, Petrou, and Scanlon's 2012 application of Talk Factory in an elementary school science plenary.

[3] Some scholars attribute the original creation of the noun "affordances" to Gibson, including Gibson himself, stating in his 1979 *The ecological approach to visual perception*: "The verb to afford is found in the dictionary, but the noun *affordance* is not. I have made it up" (p. 127)

The concept of affordances arises often in studies of computer-supported collaborative learning, as the collaboration is inevitably influenced by the platform on which dialogue takes place. Manovich (2013) reminds us that learning management systems such as Blackboard or Brightspace are not merely tools for course content delivery, but classroom environments that shape the encounters among participants just as a physical classroom does. Making note of the affordances offered (or not offered) to participants by the LMS, then, clarifies to users the ways in which the platform guides and limits the discourse that happens on it (Manovich, 2013).

Discourse

It is nearly impossible to discuss research on communication or identity without invoking discourse. Due to its broad nature, several different fields of study bring various perspectives to discourse; in this section, I clarify the perspectives and approach which this study is built upon.

Group Interaction. As the researcher of discourse as a function of group interaction, I must trace the lineage of literature that has influenced this work back to Austin (1962) and Searle (1969, 1975). There were certainly western theories of speech and language that predate Austin and Searle, whose influence upon the former remain contested; but such theories were predominantly the territory of philosophers inspired by Aristotle and as such dealt with intrapersonal thought and the nature of speech as representations of ideas, rather than focusing on interpersonal communication and relationships (Smith, 1990). So for the purposes of the current study, I will begin in the 1960s. Austin's 1962 "How to do things with words," a collection of his 1955 Harvard lectures on perlocution, provided linguists with a taxonomy for classifying and describing

communication into various "speech acts," allowing future work – including this dissertation – to analyze discourse by analyzing, or speculating on, each utterance's functional move; in other words, we can categorize and label utterances to assign a purpose to them. A few years later, moving beyond this taxonomic framework, Searle's *Speech Acts* (1969) "mov[es] beyond this cataloguing stage and providing a theoretical framework within which the three dimensions of utterance, meaning and action involved in speech acts could be seen as being unified together" (Smith, 2003 p. 8). In this sense, Searle introduced the social constructivist nature of language to Austin's existing speech act theory by contrasting "brute facts" (undeniable, collectively agreed-upon truths) with "institutional facts" (social constructions that contribute towards a productive and functional society). As Jeff Stickney (2006) notes,

> John Searle [engaged in] consideration of how we go about constructing social reality (e.g. how money or marriage have meaning only within the background context of our social practices and language). As Nelson Goodman once remarked, the stars do exist, but it is we who make the constellations.

In the move from a post-positivist, scientifically informed study of discourse to a more constructivist lens, then, Searle guided the study of group interaction towards a more critical stance suitable for the sociolinguistic angle taken up in this dissertation.

Discourse Analysis. While discourse analysis is utilized as both a theoretical framework and methodology in anthropology, critical race theory, and other critical theories (Gill, 2000), this dissertation takes a sociolinguistic approach to discourse

analysis. Jan Blommaert (2005) reminds us: "In short, discourse is what transforms our environment into a socially and culturally meaningful one. But this kind of meaning-construction does not develop *in vacuo*, it does so under rather strict conditions that are both linguistic … and sociocultural."

A sociolinguistic approach refers to a discourse analysis which focuses on the implicit positioning and intentions behind individuals' discursive moves in an interaction, relative to others involved in the interaction. Sociolinguistic discourse analysts take up a constructivist approach, defining interaction as a process of ongoing negotiation and mediated actions (Gumperz, 2001; Scollon, 2004). Gill (2000) identifies three features of sociolinguistic discourse analysis that differentiate it from these other fields: 1) a social (rather than cognitive psychological) orientation, and corresponding consideration of discourse as a process for socialization rather than strictly of expressing spontaneously conceived individual ideas and cognitive processes (Antaki et al, 2003); 2) the underlying acknowledgment of the influence of perspective and identity – that is, that various actors involved in a discourse will view the situation, and each action, differently, as will any researchers or analysts observing the discourse (Gee, 2014); and 3) a focus on interaction (van Dijk, 1997; 2014). In fact, Gee (2014) defines identity by the way one presents oneself via interaction with others in a given context: "as discourse analysts, we do not care whether there is really a core self or exactly what it is. We care about how people express their sense of who they are and their multiple other identities through language" (p. 112).

Gill (2000) categorizes the "field" of discourse analysis slightly differently, into three traditions: critical linguistics/social semiotics; speech-act theory/conversation

analysis; and poststructuralism. In Gill's framework, this dissertation lies within the second camp – drawing upon the historical literature of speech act theory to include conversation analysis, which I explore in further detail in the next chapter.

Classroom Discourse. To understand the application of discourse analysis in this study, it is first important to establish: Why involve discourse at all when researching knowledge construction and learning? What is the connection between social interaction and learning, and is this connection relevant to online spaces? After all, Howe and Abedin (2013) report that "students do not necessarily regard dialogue as a vehicle for learning, perhaps even viewing it as a distraction from the main business of classrooms" (p. 341). Prior to the 1970s, little empirical research in education focused on classroom dialogue or discourse (Edwards & Westgate, 1994). It was educational psychologist Lev Vygotsky's (1978) claims regarding the social influence of learning that laid the groundwork for modern theories of social constructivism (Newman & Holzman, 1993/2013; Spratt & Florian, 2015; Trent, Artiles, & Englert, 1998) which remains heavily influential in educational research. For one, Shulman's (1986; 2004) foundational work on pedagogy and content knowledge in teacher education has trended, over time, towards concepts of community and peer learning (emphasis mine):

> In our earlier studies of teacher learning, one of us (LSS) employed constructs that were strictly cognitive and individual, such as *pedagogical content knowledge* and *pedagogical reasoning and action* … But neither of these conceptions seemed comprehensive enough to account for what we were encountering. Rather than attempt to repair our older models, we approached the challenge of developing a new conceptual scheme from a

> fresh starting point. For our work on 'Fostering Communities of Teachers as Learners' (FCTL), as we dubbed our part of the larger initiative, we recognized the need to frame a more comprehensive conception of teacher learning and development **within communities and contexts** (2004, p. 258-259).

Shulman is not alone in his refocus towards the importance of community in teacher learning; Wenger's (1998) Communities of Practice framework has emerged to define "participation" in learning as dialogic exchanges in interpersonal contexts, and Bakhtin (1981) reminds us that "[t]he importance of struggling with another's discourse, its influence in the history of an individual's coming to ideological consciousness, is enormous" (p. 348). Given this social, discourse-based definition of learning, I have chosen a framework of classroom discourse to characterize students' learning, an approach supported by applied linguist Courtney Cazden:

> Classroom discourse happens *among* students and teacher. But arguably the most important goal of education is change *within* each student that we call learning. How do the words spoken in classrooms affect this learning? How does the observable classroom discourse affect the unobservable thinking of each of the students, and thereby the nature of what they learn? (2001, p. 60).

Historically, most work on classroom discourse has presumed that such discourse is taking place face-to-face in the physical campus classroom. However, with the increasing prevalence of online learning, more recent research has expanded to include "classroom" discourse of online courses, in addition to raising philosophical questions of what

constitutes a classroom, and indeed, how computer-mediated discourse can be considered discourse at all.

Discourse Analysis in the Virtual "Classroom." Online classes need not be mere locations for content curation and assignment submission; rather, they can be lively virtual classroom spaces in which students may engage with instructors and peers. Warschauer (1997) was among the first to advance a framework for computer-based collaborative learning and introduced five features of online learning: text-based interaction, many-to-many communication, time-and-place-independence (now called asynchronous learning), long-distance exchanges, and hypermedia links. These first two – the ability to interact via text, and to communicate with many peers at once – remain valuable features of online learning. Anagnostopoulos, Basmadjian, & McCrory (2005) posit that virtual classrooms allow for social spaces that are not only student-centered, but student-controlled – a "democratized discourse" (p. 1703). It is this democratized, student-controlled context that allows students to co-construct knowledge and foster positive interdependence, which Dennen and Wieland (2007) examined using discourse analysis of an online undergraduate writing class. "In order to engage in meaningful online discourse that supports social learning processes," they conclude, "students need to be focused on a shared mission" (p. 295). Collectively, the focus of discourse analyses of online classes on text-based interaction, many-to-many communication, democratized discourse, and shared mission suggest that the function of peer discourse plays a strong role in online class participation and learning.

Theoretical framework

While many theoretical frameworks have been forwarded in computer-supported collaborative learning, few have demonstrated reliability and feasibility beyond the context of their original construction. It was important to me that the framework I chose would not only be of good quality in accordance with the above criteria, but also would be a good enough fit for my specific case that its application would yield meaningful themes. As Lincoln and Guba again remind us, "that theory is most useful which lends itself most easily to meaningful local adaptations" (2013, p. 201).

Weinberger and Fischer's (2005) framework to analyze argumentative knowledge construction in computer-supported collaborative learning is one of the most recent contributions to the body of knowledge related to argumentative knowledge construction, and the most relevant to this case study. The example discourse used in Weinberger and Fischer's application of the framework was discussion of "problem cases" – classroom-based case studies – in an online discussion board for undergraduate education students. This context closely resembles the class and assignments in this case study. The authors describe the framework as "a multi-dimensional approach to analyze argumentative knowledge construction in CSCL from sampling and segmentation of the discourse corpora to the analysis of four process dimensions (participation, epistemic, argumentative, social mode)" (Weinberger & Fischer, 2005, p. 3). This process is conducted via systematic coding of the corpora, in this case one corpus comprising all discussion board posts, to identify all cases of each of the dimensions.

Methods

I utilized a qualitative design because of my process-oriented and iterative approach to analyze students' interactions and knowledge co-construction throughout a

semester of a discussion-based class. As this study is highly context-bound, qualitative methods are more appropriate for providing rich description and relevant contextual information important for understanding findings. Additionally, despite the natural fit of qualitative methods to the topic at hand, the application of such methods in studies of online courses is underrepresented in the field of online education research.

Participants

Undergraduate Students. 35 students were enrolled in the diversity course, all of whom participated in the discussion boards and reflections. All participants were undergraduates of traditional college student ages, ranging from 18 to 23; 3 were first-years, 15 sophomores, 9 juniors, and 8 seniors. 14 of the 35 were education majors; of the remaining 10, no more than 2 shared the same major. The high number of non-education majors in this teacher education course is likely due to several factors: 1) its introductory level, requiring no prerequisites for enrollment; 2) its fulfillment of the university-wide diversity requirement; and 3) the accessibility of the asynchronous online format.

Data Collection

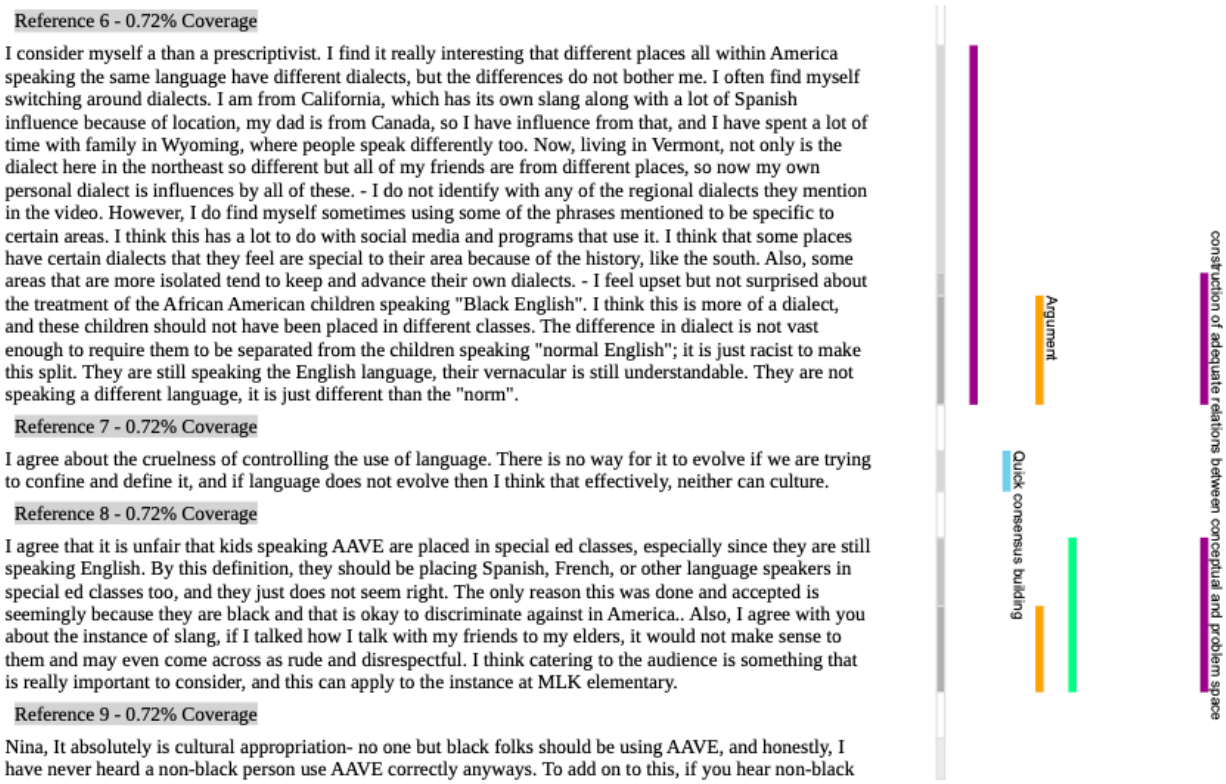
The data I collected for this study included student-produced discourse within the course platform. This plethora of text-based data provides the opportunity for several levels of units of analysis. Units of text are often analyzed at one of three levels: *syntactical* (individual words or sentences) (Fahy et al, 2001); *paragraph* or *message* (in this case, a forum post) (Gunawardena et al, 1997); or *thematic* (Henri, 1992). While syntactical units are of fixed, objective scope, and therefore provide the benefit of high reliability, delimitation of discourse by syntactical rules does not always make practical, meaningful sense (Rourke, 2001).

I included all discussion board posts (including initial reflections and peer responses) resulted in 702 units of analysis, each containing up to 300 words, so content analysis was a necessary first step to crystallize meaningful themes from that pool of data.

A screenshot of one reflection with accompanying peer responses, and the codes from various dimensions that were applied to excerpts within the discussion, is shown in Figure 2. These dimensions are explicated in further depth below.

Figure 2

Example Application of Codes from the Four Dimensions of Weinberger & Fisher's Framework



Participation Dimension. The participation dimension identifies two facets of participants' role in the discourse: 1) individual quantity (e.g. how much did each participant engage?) and 2) the heterogeneity (e.g. what was the range in quantity of participation among all participants?). This is the simplest dimension to analyze, as it consists of only two variables, both of which are numerical and therefore can be identified via tabulation. Patterns gleaned from the participation dimension will inform the overall findings in two ways. First, it will show us whether or not a participant's scores in the other dimensions are a factor of their overall participation. For example, if Felix makes no argumentative moves, is that because he tends to make moves in other dimensions instead, or simply because he does not participate in discussions at all? Second, the heterogeneity of participation will show how equal or variable participation was from participant to participant. For example, if Kylie makes twice as many argumentative moves as Felix, is that because Kylie engages in a more argumentative interaction style? Or is it simply because Kylie contributed twice as many posts as Felix did?

Epistemic Dimension. The epistemic dimension identifies how participants engage with the course material. It includes discourse focused on an assigned task, knowledge construction and negotiation working towards solving a given problem, and other "on-task" discussion. Codes within the epistemic dimension identify textual moves to define the problem, to define the related concepts, and to draw relationships between concept and problem.

Argument Dimension. Argumentative knowledge construction is a process that has previously been defined in the literature and is applied here by Weinberger & Fischer

as the way in which participants construct arguments and make argumentative moves. Argumentative moves may consist of the construction of a single argument by making a claim, or contributing to any portion of an argument sequence, such as making a counterargument or reply to a preceding claim.

Social Dimension. The social dimension identifies how, and to what extent, participants refer to their peers. Codes within the social dimension include elicitation, in which participants ask questions of one another; and consensus building, in which participants attempt to integrate multiple perspectives.

Findings

Content Analysis

First-round content analysis revealed few patterns among participants and the dimensions of their posts. Due to the large quantity of data, I created a code frequency spreadsheet to more easily identify the patterns (Table 5). Each participant's total number of epistemic, argumentative, and social codes, in addition to their participation by word count, was categorized as "high," "medium," or "low" in comparison with their peers. For example, the number of moves that were coded in the social dimension ranged from 6 to 19 per participant. This means that, of the 35 participants included in the analysis, the one who made the fewest social moves still did so 6 times, whereas the participant who made the most social moves did so 19 times. This resulted in the following categories.

Table 5

Coding Frequency Results of Content Analysis

	# of codes				
Di		range	high	medium	low
me	Social*	6-19	15-19	10-14	6-9
nsi	Epistemic*	1-7	5-7	3-4	1-2
on	Argumentative*	2-10	8-10	5-7	2-4
	Participation**	1623-4363	3000-4363	2100-2999	1623-2099

* # of instances (moves) ** # of words

Following the determination of what frequency constituted high, medium, or low for each dimension, intra-participant patterns were sought out by comparing frequencies across dimensions. This was done to determine whether correlations could be found among dimensions within one participant's posting style; for example, whether a high frequency of argumentative moves corresponded with a low number of social moves, which may indicate a preference among some participants to make specific types of contributions. This comparison can be found in Table 6. Only two significant patterns were found in this analysis.

Table 6

Matrix of Theme Co-Occurrence by Participant

	Social						Epistemic			
	Externalization	Elicitation	Quick consensus building	Conflict oriented consensus building	Integration oriented consensus building	Social total	Construction of problem space	Construction of conceptual space	Construction of adequate relations between conceptual and problem space	Construction of relations between prior knowledge and problem space
Adeline Bass	10	0	4	0	3	17	0	1	1	0
Ariel Spears	4	1	1	2	2	10	2	0	1	2
Audrey Zebrowski	5	0	5	0	2	12	2	0	1	1
Bella Glasser	5	2	1	1	5	14	2	2	2	1
Caitlyn Mack	5	0	5	0	4	14	0	0	0	2
Chloe McDaniel	5	0	2	0	7	14	3	1	0	1
Christine Brooks	5	0	6	2	2	15	2	1	0	2
Claire Green	4	0	0	1	4	9	2	1	1	1
Crosby Keene	5	0	0	2	0	7	1	2	2	0
David Ziegler	4	0	6	0	0	10	2	0	0	0
Elliot Klein	4	1	5	0	0	10	1	1	0	0
Elsa Richter										
Erica Chavez	5	1	2	1	3	12	2	1	0	0
Felix Bishop	5	0	1	2	2	10	0	3	2	0
Fiona Goss	5	0	0	1	0	8	2	0	0	0
Hannah Nowak	4	0	2	0	1	8	1	2	2	1
Hazel Shulman	7	1	1	0	4	13	0	2	0	1
Indra Ward	7	0	2	0	3	12	1	0	0	0
Isaac Montgomery	3	1	3	1	1	9	1	2	0	0
Jacob Francis	5	0	0	0	5	10	1	2	1	1
Jenny Chen	5	0	3	0	10	18	0	0	2	1
Karina Bennett	5	0	3	1	7	16	1	2	0	0
Kelly Horst	5	0	6	0	1	12	2	0	0	1
Kylie Eaton	5	0	3	2	1	11	1	1	1	1
Nathan Hauser	5	0	5	0	0	10	0	1	0	0
Nina Coffey	4	0	0	0	4	8	0	1	1	1
Neva Henderson	3	0	6	0	7	21	3	0	0	2
Olivia Patrick	4	0	1	0	3	8	1	0	2	0
Penny Alexander	3	0	3	0	0	6	1	0	1	0
Peter Simons	5	2	4	2	1	14	1	1	0	0
Sam Danner	7	0	2	1	0	10	0	0	1	0
Samantha Dorsey	7	0	1	0	0	8	1	1	2	2
Savannah Perry	4	0	3	0	1	8	2	0	1	0
Suzannah Castillo	5	0	1	2	4	12	1	1	1	3
Vivian Lewis	5	1	6	0	1	13	1	0	0	0
Zach Reed	4	0	4	1	1	10	0	0	0	0

			Argumentative					Participation	Social	Epistemic	Argumentative	Participation
Classification of inadequate relations between conceptual and problem space	Non-epistemic activities	Epistemic total	Argument	Counterargument	Integration	Non-argumentative moves	Argumentative total	Quantity				
0	2		3	0	0	2	5	2340	high	low	low	medium
0	5		4	2	2	2	8	2360	medium	high	high	medium
0	4		7	1	0	1	9	2469	medium	medium	high	medium
0	7		9	1	0	0	10	8220	medium	high	high	high
0	2		3	0	1	0	4	2647	medium	low	low	medium
1	6		7	0	1	0	8	2868	medium	high	high	medium
0	5		5	3	0	0	8	2844	medium	high	high	medium
0	5		6	0	1	2	7	2593	low	high	medium	medium
1	6		3	1	0	0	4	1729	low	high	low	low
0	2		3	0	0	1	3	2089	medium	low	low	low
0	2		3	1	0	0	4	1558	medium	low	low	low
								8524				
0	3		3	1	0	2	4	2358	medium	medium	low	medium
0	5		5	2	1	1	8	3060	medium	high	high	high
0	2		4	0	1	0	5	2391	low	low	medium	medium
0	6		4	1	0	1	6	2614	low	high	medium	medium
0	3		4	1	1	0	6	2283	medium	medium	medium	medium
0	1		5	1	1	1	7	2612	medium	low	high	medium
0	3		3	0	0	1	3	1061	low	medium	low	low
0	5		4	0	3	0	7	3318	medium	high	medium	high
0	5		5	0	1	1	6	3376	high	high	medium	high
0	3		6	1	1	0	7	3100	high	medium	high	high
0	3		5	0	0	0	5	2541	medium	medium	medium	medium
0	6		6	2	0	0	8	3205	high	medium	high	high
0	1		4	0	0	1	4	2075	medium	low	medium	low
0	3		3	0	0	1	3	1363	low	medium	low	high
0	5		7	1	0	2	8	2470	high	high	high	medium
0	3		4	0	0	1	4	4275	low	medium	medium	high
0	2		2	0	0	0	2	1900	low	low	low	low
0	2		4	1	1	4	6	2389	high	low	high	medium
0	1		4	2	2	0	8	3126	medium	low	high	high
0	6		5	1	1	0	7	2547	low	high	medium	medium
0	3		2	0	0	0	2	5078	low	medium	low	high
0	6		7	0	0	0	7	2822	medium	high	high	medium
0	1		3	0	0	0	3	1799	medium	low	low	low
0	0		3	0	0	1	3	1629	medium	low	low	low

The first pattern that emerged from the content analysis was the positive relationship between social and argumentative dimensions. The higher a participant's frequency of social-dimension moves, the higher their frequency of argumentative-dimension moves as well. This suggests that posters who engage in argumentative moves, which include argument, counterargument, and integration, are likely to also engage in social moves such as elicitation and consensus-building.

The second pattern that emerged was the positive relationship between epistemic and argumentative dimensions. This suggests that posters who engage in the argumentative moves are also likely to engage in epistemic moves such as construction of problem space, conceptual space, and relations between these spaces, as well as engaging prior knowledge.

Despite the connection between argumentative moves with both social and epistemic dimensions, there was no such relationship between social and epistemic dimensions directly. Some participants made a high frequency of argumentative and social moves, but a medium or low frequency of epistemic moves (the social butterflies). Others made a high frequency of argumentative and epistemic moves, but a low frequency of social moves (the debaters). There also appeared to be some participants who engaged in a high level of consensus-building activity (a social dimension) but showed low levels of other dimensions (the mediators). Finally, some participants showed a low frequency of moves across all dimensions (the lurkers).

Interestingly, there was no relationship between the participation dimension and any other dimension. This means that neither the quantity nor the length of posts had any correlation with the presence of meaningful content, as identified via the applied

framework. While some participants, such as Felix, Jenny, Kylie, and Karina, showed a high level of participation and also high levels of at least two other dimensions, and others (David, Elliot, Isaac, Penny, Vivian, and Zach) showed low levels of participation that were also reflected in at least two other dimensions, there were also participants who showed a high word count, but low levels of the other dimensions (Nina & Savannah). There were, however, no participants with low participation levels who also demonstrated high levels of other dimensions. Medium or high levels of participation, then, appear to be a necessary but insufficient factor for achieving high levels of any other dimension.

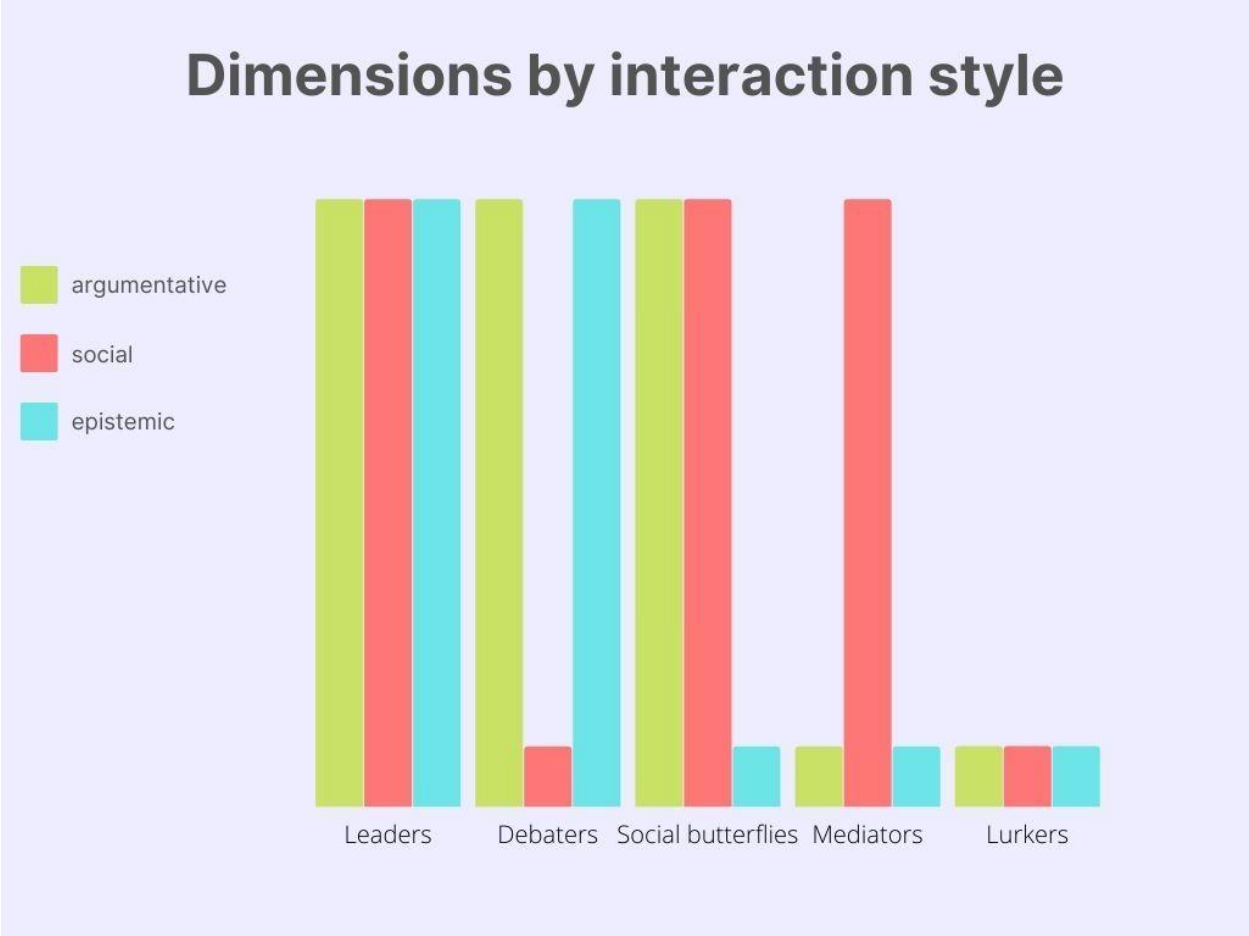
Discourse Analysis

After the content analysis revealed several patterns in the types of moves that participants tended to make, I classified these patterns into six groups of interaction styles. To qualify as an interaction style, there needed to be a consistent pattern of high, medium, or low number of moves in each of the four dimensions, and there needed to be multiple participants displaying the same pattern. Once an interaction style was identified, excerpts from those participants' posts were collected to analyze one group at a time, in the hopes of illuminating further characteristics of each interaction style. I have intentionally labeled these groups *interaction styles* rather than any label invoking personality profiles, as this is an analysis of the ways in which participants co-construct knowledge with each other, and not an analysis of the ways in which participants present themselves individually. Following the description of each style, I present a selection of quotes which were pulled from the collection of excerpts that were classified by interaction style. They exemplify the language employed by participants using that style

and demonstrate the ways in which the participants engaged in knowledge co-construction.

Figure 3

Dimensions by Interaction Style



Interaction Styles

The Leader. Leaders demonstrated high levels of argumentative, social, and epistemic dimensions. Leaders engaged their peers often in posts, using vocatives (addressing peers by name) and using more words of encouragement and calls to action than the other styles. When responding to peers' posts, Leaders tended to either respond

positively via statement of agreement or congratulations (e.g. “Great post!”) or utilized counterargument, often couched with a vocative or a “positive sandwich” (e.g. “Benjamin, I don’t think there’s much of a valid argument in favor of the teachers and administration…”).

Selected quotes:

“Your job sounds really fun!”

“I hope one day I can be a teacher like you!”

“You go girl! Always be proud of who you are.”

“ALWAYS STAND UP FOR WHAT YOU BELIEVE IN!”

The Lurker. Lurkers demonstrated low levels of argumentative, social, and epistemic dimensions. In addition to their comparative lack of presence in discussions, Lurkers demonstrated a more casual register in their posts than other styles. Lurkers were the only participants to use emoticons and to display an absence of punctuation and capitalization, which is typical of textspeak or other nonacademic conversational written discourse. Apart from these stylistic choices, there were no obvious patterns in the content of Lurkers’ posts as a collective group, due to the low quantity of data that each Lurker produced. Despite the lack of similarities across participants, individual Lurkers did show strategies of engagement that were consistent across posts. For example, David often integrated quotations from peers’ posts in his own responses of agreement, possibly in an attempt to maximize word count. In the first excerpt listed in the below list of quotes, for example, David apparently attempted to highlight a peer’s statement, but did

not copy and paste the entire sentence, omitting important information and thereby rendering his own statement nonsensical. Whether intentional or not, the effect of this strategy resulted in demonstrating low levels of all dimensions since David did not use these posts to forward his own original thoughts.

Despite the low levels of meaningful engagement, some Lurkers elicited a fair number of responses to their few or brief posts. This further contributes to the emerging pattern that the participation dimension is not particularly useful for determining discourse quality or quantity, as initially observed in the content analysis. One effective strategy employed across multiple instances by Lurkers was to ask clarifying or elaboration questions, which prompted responses and therefore further discourse among peers.

Selected quotes:

"I agree with you 100% and I really liked this point 'it would be a progressive move to not only teach students about language diversity and the struggles of non english speaking students'.*[sic]"*

"Some people get joy in belittling other people :("

"This book looks really inclusive and shows people from broad demographics"

"Digging the bow tie Jacob."

The Social Butterfly. Social butterflies demonstrated high levels in the social and argumentative dimension, and low levels in the epistemic dimension. Social butterflies, like Leaders, often began their posts with vocatives to address their peers directly, and

asked many questions of each other. Social butterflies were also more likely than other profiles to "sign" their posts by adding their name at the end, thereby bookending their statements with names – a vocative at the beginning and a signature at the end, like a letter. Karina and Peter were especially frequent users of these "bookends," often utilizing them to sandwich statements of agreement: "Jacob, I agreed with your post. I personally also believe language is constantly changing and evolving, I do not see that changing anytime soon. Pete." However, social butterflies like Karina did not shy away from also using this strategy to directly address peers with disagreement and counterarguments: "Nina, It absolutely is cultural appropriation- no one but black folks should be using AAVE…. To add on to this, if you hear non-black folks using AAVE, there should definitely be a conversation surrounding it because far too often that burden falls on black people, which is unfair. … -Karina."

Selected quotes:

"Nathan, I think the principle *[sic]* did step out of bounds when he approached the mother and daughter after school. ... What do you think you would have done about this?"

"Vivian, Great post! ... What do you think you would do if you were the teacher and your kid didn't stand for the pledge? Is there really anything you can do? Pete"

"Fiona, I also did this case study, how do you think you would have liked to of seen this case get worked out? *[sic]"*

"I loved the Dr. Seuss books when I was younger! Did you have a particular Dr. Seuss book? Mine was Green Eggs and Ham, personally."

The Debater. Debaters demonstrated a high number of moves in the argumentative and epistemic dimensions and a low number of moves in the social dimension. Debaters frequently engaged their peers with elicitations, such as "Christine… what (besides physical aspects) makes you a woman?" and "I'm curious—what are some of the biggest differences you've noticed between California English and Vermont English?" Debaters often forwarded new arguments with statements of belief that were introduced with "I think" and "I do not think." When Debaters did opt for quick consensus-building, they tended to elaborate on their reason for agreement more than other participants.

Selected quotes:

"I believe that to a certain extent we must preserve the language because it is a part of our history…"

"I don't love grammar rules and I don't think there is a certain way to speak English."

"I think it's obscene to let some various dialect be excused and others not be."

"I don't think that's feasible."

"I also think it's awful that the boys were put in special education classes."

"It is ridiculous to mandate that everyone speaks English."

"I liked the ideas you talked about but I did want to point out that the case never specified the outcome of the vote and many members had yet to give their opinions."

The Mediator. Mediators demonstrated high engagement in the social dimension, and low engagement in the argumentative and epistemic dimensions. Despite showing high social levels, mediators differ from social butterflies in that they made few argumentative claims, and their use of the social dimension was generally limited to consensus-building. Mediators tended to use very few vocatives or elicitations, engaging in their peers' claims minimally other than to hedge their opinions and respond with agreement. In fact, Mediators and Lurkers contribute in similar ways; the only difference between a mediator and a lurker is a slight difference in word count. This suggests that participants may utilize quick consensus building as an approachable or easier move for a reluctant participant to engage in.

Selected quotes:

"To say the evening was a success I don't believe to be true. I do however believe it was a step in the right direction."

"I can see both sides of this argument and understand both of them."

"[I]n academia, we tend to look down upon linguistic diversity, and how certain accents are less important, and less professional than others. However, it is easy

for me, a New Englander, to be a 'fair weather liberal' when it comes to progressive causes, especially language barriers."

"I remember this book! I think regardless of the lack of diversity, it has a motivational message for all children that would be beneficial in a classroom."

Data Visualization

All discussion board interactions were organized in NVivo such that every post was identified as either an initial post or a reply. Initial posts were defined as the first (or only) in a thread. Replies were defined as any subsequent post in a thread, made using the Blackboard forum's "reply" function. All replies were identified with both an author (of the reply) and the recipient (the author of the initial post under which the reply was nested). Every reply constituted a unidirectional relationship, originating with the replier and ending with the recipient. All relationships identified, then, included two participants. If a thread contained multiple replies, the author of the initial post was considered to be the recipient of each reply, unless the reply was specifically nested underneath a different reply rather than the initial post.

Figure 4

A Sample Excerpt of Data Displaying Relationships Between Post Authors and Their Recipients.

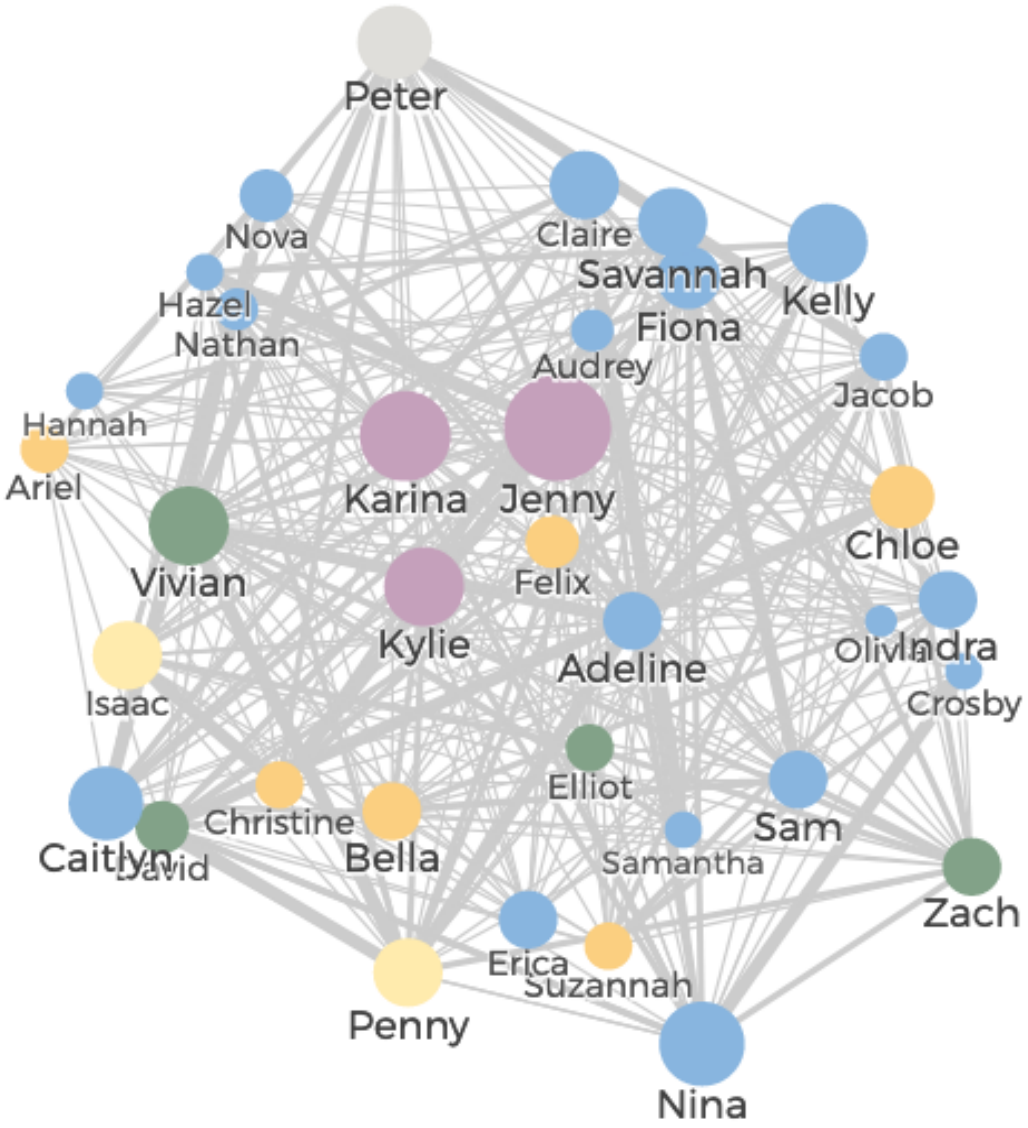
1	Author	Replying to	Content
133	Savannah Perry		Hi everyone! My name is Savannah Perry and I am a sophomore from Colchester, VT. I have been studying nursing for the past year and a half, but made the decision to switch to elementary education this past fall! In my free time I like to spend time with my friends and travel!
134	Savannah Perry	Olivia Patrick	Hi Olivia, I also just switched into elementary education from nursing and I think it was a good change for me as well! I also just transferred from a local community college here last Fall!
135	Savannah Perry	Elliot Klein	Hi Elliot, I also work at a summer camp and this will be my third summer working it!
136	Suzannah Castillo		Hi everyone! My name is Suzannah and I am a Sophomore majoring in Business Administration with a minor in dance and mathematics. I was going to be a secondary education major this semester but wasn't confident with my decision so I decided to stick with business for a little longer. I am a member of the cheerleading team here and I teach dance in my free time!
137	Suzannah Castillo	Jenny Chen	Hi Jenny! I think that major and what you want to do is so exciting! I am very familiar with Wells River because I am from Saint Johnsbury and a lot of my good friends live around that area! I like all those same shows as well!
138	Suzannah Castillo	Savannah Perry	Hi Savannah! I think it is super awesome you made the switch to education. Making a decision to switch majors can be tough but I hope you find happiness in your new career path! You will do great!

Once all relationships were recorded in NVivo, a network sociogram was generated to visually represent every interaction that all participants had had with each other throughout the semester (Figure 5).

The network sociogram revealed communication patterns between and within interaction styles. Each node (circle) on the sociogram represents a participant, and each edge (line) represents a one-way relationship, indicating that the participant at the origin of the edge replied to the participant at the end of it. The width of each edge represents the frequency with which participants communicated; the thicker the edge, the more often the two participants it connects replied to each other. So, a node that radiates many thin edges represents a participant who responded to many different participants, but only once each; a node that radiates only a few thick edges indicates a participant who tended to reply to the same people each week.

Figure 5

Network Sociogram of All Participants.

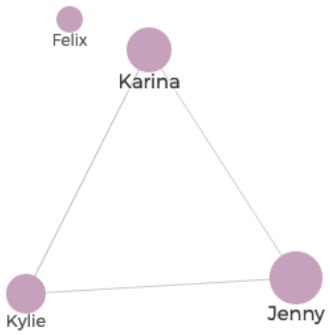


Leader Debater no identified style Mediator Social butterfly Lurker

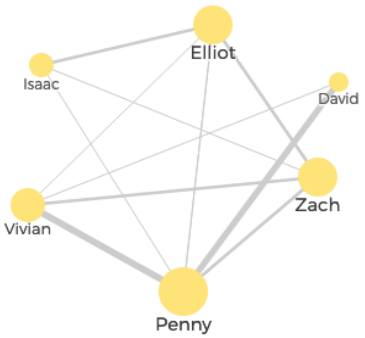
Figure 5 visualizes all interactions among all posts in the data set. It reveals a high-density network, meaning there are many edges connecting nodes all throughout the graph, yielding a dense knot of connections, similar to a ball of yarn that must be unraveled in order to follow the lines. This suggests a highly connected group, in which participants interacted with a variety of their peers rather than breaking off into small cliques or interacting with only one or two people. If we are to believe that exposure to a variety of ideas and perspectives is an essential factor in knowledge creation, high density is a desirable characteristic for a class in which knowledge co-creation is an objective. While Figure 4 suggests that a high level of interconnectedness was achieved in this class, it is in fact too dense to visually extract any more meaningful information about these connections. This type of sociogram – in which the number of connections is too high or too dense to reveal meaningful patterns – is called a *hairball*, and is not useful for identifying relationships (Healy, 2018). So, after conducting the visual analysis of all participants, nodes were then separated by interaction style, to disentangle and reveal the frequency and type of interactions that each participant made with their peers who demonstrated similar and different interaction styles.

Figure 6

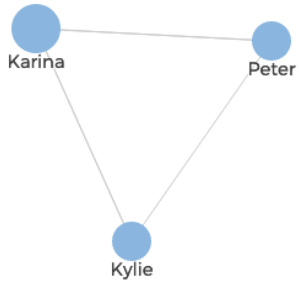
Network Sociogram of Intra-Group Communication.



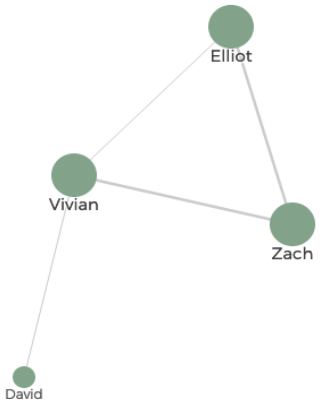
Leaders



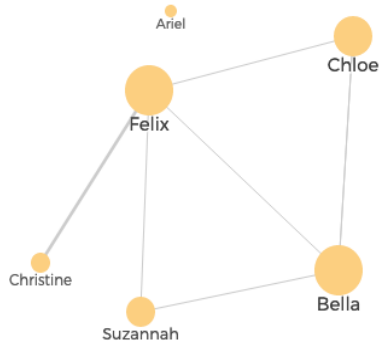
Lurkers



Social butterflies



Mediators



Debaters

These visualizations support the earlier finding that the participation dimension does not correlate with other dimensions. If, for example, a positive relationship existed between the participation and social dimensions, more and thicker edges would be apparent in the Leaders' and Social butterflies' networks compared with the Lurkers' and Mediators'. However, this was not the case. In fact, Lurkers appeared to interact with each other *more* than the Leaders interacted with each other. One particularly noticeable example of this phenomenon is Felix, whose interactions display characteristics of both a Leader and a Debater. In the Leaders' sociogram, Felix is disconnected from all other Leader nodes; this indicates that, throughout the semester, Felix never replied to any of his fellow Leaders (Jenny, Kylie, or Karina), nor did they ever reply to him. However, the Debaters' sociogram shows Felix as central to the style, interacting with 4 of the 5 other Debaters; the larger size of Felix's node indicates a higher degree of centrality, meaning that Felix had more interactions with more of his peers than his fellow Debaters (despite these interactions not including other Leaders). So, while these visualizations track each instance of communication between participants, they do not display the patterns of

qualitative codes that were applied to the discourse and therefore reveal different aspects of the participants' interactions.

In addition to examining intra-group behavior, it is relevant to analyze between-group behavior. This allows us to determine whether a certain interaction style tends to elicit replies that are rich in a specific dimension. For example, it may be possible that Social butterflies' posts, which are the most likely to pose questions of their peers, might be more likely to garner responses from Debaters, who are the most likely to forward a new argument (potentially in response to a Social Butterfly's prompt). However, the analysis of between-group interaction, also conducted by network sociogram, yielded more unexpected results.

Table 7

Frequency Matrix of Between-Group Interaction

	Leaders	**Lurkers**	**Social butterflies**	**Mediators**	**Debaters**
Leaders	**low**	**med**	**n/a**	**Low**	**med**
Lurkers	**med**	**high**	**high**	**n/a**	**med**
Social butterflies	**n/a**	**high**	**low**	**med/high**	**high**
Mediators	**low**	**n/a**	**med/high**	**Med**	**high**
Debaters	**med**	**med**	**high**	**High**	**low**

Table 7 reveals high levels of interaction among Social Butterflies, Mediators, and Debaters, with each other. It also reveals a high level of interaction between Social

Butterflies and Lurkers, and Lurkers with each other. Also notable is the fact that Leaders did not share a high level of interaction with any other group. Leaders demonstrated a low level of interaction with each other and with Mediators. Social Butterflies also showed a low level of interaction with each other, unexpectedly, as did Debaters with each other. It is possible that the low levels of intra-group interaction within the Social Butterflies and the Debaters is due to small group size; with only three participants in each group, in a class of 35, the likelihood of any participant in each group replying to another with the same interaction style is relatively low (2 out of 34, or about 6%).

While considering the number of edges connecting each node is one important component of sociogram analysis, one should also consider the number of in-degrees (the number of edges going "into" a node, i.e. the number of participants who replied to a specific person) and out-degrees (the number of edges going "out of" a node, i.e. the number of participants a specific person replied to). This is worth consideration due to the effect on the class dynamic; certainly, if each participant tends to reply to the same peers' posts, that will create a much different discussion than if each participant spread their replies out among many different peers. It was also of interest to compare the in-degrees and out-degrees across interaction styles; perhaps some styles, such as the Social Butterflies, tended to respond to more different people, resulting in a higher number of out-degrees, while others, such as the Lurkers, might prefer to stick with their own kind, resulting in fewer out-degrees.

Table 8

In-Degrees and Out-Degrees by Interaction Style.

	Mean # of out-degrees	Mean # of in-degrees
Leaders	12.25	13.3
Lurkers	8.8	11
Social butterflies	12.3	12.3
Mediators	9	10.75
Debaters	10.6	5

Not surprisingly, Leaders and Social Butterflies clearly replied to more people than participants using other styles did. Likewise, Lurkers and Mediators replied to the fewest. When it comes to the number of in-degrees – replies that were *received* by participants of each style – the only clear pattern is that Debaters' posts yielded far fewer replies than any other group. This is notable because the defining features of Debaters' posts are their high levels of argumentation and epistemic moves, which often manifest as questions, elicitations, and clear statement of argumentative claims such as "I think…" and "I do not think…", which present opportunities for agreement or disagreement. This combination of qualities would appear to make Debaters' posts especially engaging and easy to respond to. Yet despite this, more often than not the Debaters' questions were left unanswered and claims unexamined.

Discussion

The research question I explored in this dissertation was: how do students co-construct meaning in an online teacher education course? The data that I explored in this chapter primarily included discussion board posts; however, I identified students' course evaluations as an additional data stream not only to inform my self-study, but to

triangulate with the findings produced by the discourse analysis. Only 11 of the 35 participants in the class contributed qualitative comments in their end-of-semester course evaluations, making identification of relevant comments a fairly simple process. Coding was determined to be unnecessary for this stage of data analysis, and "relevant" comments were defined as any that mentioned peer discussion, whether confirmatory or disconfirming of previous findings. All of these comments are included below (all *[sic]*):

the beneficial aspects of this course was being able to communicate with other students that were taking this class even thought it was online.

The implicit tests were fun and informative, and getting to talk to other students about their viewpoints was really helpful to see multiple perspectives

I like the discussions, its interesting to see other points of view in this type of class.

This was my first online class, and it was very efficient and well organized with clear communication with our professor and our peers.

I would recommend this instructor because she is interested in her students opinions and is open to talking about difficult situations

In reviewing these comments, I was interested in any feedback that pertained to the research question or illuminated any discussion strategies or patterns identified in my discourse analysis. All of the references in the above comments to peer knowledge construction, or peer discussion of any kind, were positive. While there were no references to any particular preferred strategies or approaches to peer discussion, there does seem to be consensus that students found the discussions worthwhile and helpful for their learning. Two comments referred to "multiple perspectives" and "other points of view," which suggests that these students recognized the benefits of argumentative knowledge construction as a general practice.

References

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Weinberger, A., & Fischer, F. (2005). A framework to analyze argumentative knowledge construction in computer-supported collaborative learning. *Computers & Education, 46*(1), 71–95.

Chapter 6: Additional Findings & Discussion

While the previous chapters laid out the data analysis process and its resultant findings, additional findings and processes occurred outside of the data analysis, more related to the research process and context rather than the dataset, which warrant exploration and reporting. The purpose of this chapter is to present to the reader additional findings which are methodologically and quantitatively reflexive. As Patton (2014) states, "…the quality of reflexivity and reflectivity offered in a report is a window into the thinking processes that are the bedrock of qualitative analysis" (p. 1012). The findings outlined in this chapter fall generally into two categories: findings on reflexive research, and findings on online learning in the COVID era.

Findings on Reflexive Research: Researcher as Instrument

The path I ended up following in this dissertation diverged significantly from the path charted in my initial proposal. Such is the nature of qualitative research. In hindsight, some of these deviations were made in response to discoveries in the data; some were made in response to discoveries about my own research process as it was being conducted. This second category of discoveries concerned my preconceived assumptions or biases regarding student behavior and the classification of themes.

Evolution of a Typology

As patterns emerged during the construction of my conceptual framework, it became evident that the data was disconfirming some unchallenged assumptions I had held about the participants and their behavior. These assumptions were not intentional on my part, but the deep analysis required for this project revealed that I had been expecting certain patterns to arise that did not. My expectations and beliefs about the participants

were thus in need of examination and revision. I elaborate below on two assumptions that led to these expectations.

Instructor Perceptions of Student Behavior

In research. Instructors' perceptions of students are based on students' behavior in class, as discovered Brozo and Schmelzer (1985) and later validated by Parr and Valerius (1999) and Landrum (2011), among others. Asking questions and participation in class discussions consistently rank among the most "desirable" student behaviors from a faculty perspective. As a result, faculty tend to view students who often engage in these behaviors more favorably than students who do not. The participants in my study who engaged in these behaviors most often were Leaders and Debaters, and those who engaged in them the least were Lurkers and Mediators. As the course instructor, I must consider how my perceptions of these student behaviors influence my perception and expectations of each interaction style. Likewise, any changes I make in my own instruction, or recommendations I make to others, with the intention to maximize students' question-posing and participation in discussions, must be accompanied by the caveat that these are instructor-defined goals, based on instructor preferences; participants did not identify these as behaviors they wished to improve in themselves or their peers.

As the presence of desirable behaviors affects instructors' perceptions of students, so does the presence of undesirable behaviors. Most student behaviors that have been identified through research as "least desirable" are those that disrupt and distract class, and are less present (or even completely absent) in an online environment. For example, eating in class, talking with other students during a lecture, and sleeping in class were all

ranked among least desirable behaviors in multiple studies and had significant negative effects on instructors' perceptions of students who engaged in these behaviors (Brozo & Schmelzer, 1985; Parr & Valerius, 1999). None of these behaviors would be a priori noticed in an asynchronous online course, which may lead online instructors to hold a more positive perception of students who tend to engage in such behaviors in a face-to-face environment. It's also possible that students may make an overall more positive impression on their instructors in online courses in general, due to the lack of opportunity to engage in these least-desirable behaviors in the online environment while still having the opportunity to engage in the most-desirable ones.

Inquirer Bias in the Classification of Themes

Since I designed the classification system which I felt represented the data, I held the dual role of both selecting the conceptual framework and identifying the themes, while attempting not to impose patterns in my findings that did not actually exist in the data. By applying Weinberger and Fischer's framework to the data and identifying emerging patterns from the resulting content analysis, both the framework and the identified interaction styles were researcher-created. Researcher-constructed (etic) typologies are one of two methods of classification in qualitative research, the other being indigenous (emic) typologies, which allow the participants to create and define their own characteristics and classification (Headland et al, 1990). As the classification of interaction styles was done a posteriori after the conclusion of the course in which the case study took place, it was not possible to utilize participants to provide indigenous typologies. This is one reason for which researcher-constructed typologies are commonplace, although Patton (2014) cautions:

> in creating analyst-constructed typologies through inductive analysis, you take on the task of identifying and making explicit patterns that appear to exist but remain unperceived by the people studied. The danger is that analyst-constructed typologies impose a world of meaning on the participants that better reflects the observer's world than the world under study.

Another form of bias uncovered was that of gendered expectations of participants' interaction styles. This assumption that men and women would interact differently from each other was recognized by my advisor during a discussion of the data. Generally, gendered differences in computer-mediated communication mirror those of orality, in which women tend to use more cooperative or accommodating language while men are more direct and information-based, and comparatively less likely to engage in self-disclosure and affective language (Baym, 2006; Seargeant & Tagg, 2014). Knowing this tendency, I expected that my students who identified as female would display higher levels in social dimension activities, such as consensus-building, while those who identified as male would likely display higher levels in the epistemic dimension. However, gender was not a focal point of this research project, nor was it present in the research question. Furthermore, a sizable number of participants did not explicitly identify their gender. This analyst-driven assumption was thus not necessarily reflected in the data, nor was it necessary to explore to address the research question.

Disconfirmed Assumptions About Posting Behavior

Throughout much of the writing process for this study, the interaction styles were referred to as "post profiles." The use of the term "profile," while intended to describe

posts and not necessarily their authors, speaks to the potential for a false equivalency to be drawn between the two; an assumption that the content of discussion board posts reveals corresponding inherent personality traits of the author of said post.

In Chapter 2, I identified Etienne Wenger's early work with Jean Lave (1991) as an origin point of the computer-supported collaborative learning theory of education. Wenger later introduced Communities of Practice as a "social theory of learning" (p.12), which defines learner identity as a *social formation* and that learning results from active engagement with others. As my research here is rooted in the common values that underlie CSCL, discourse analysis, and other theories and methodologies that rely on a social constructivist lens, assumptions about participants' personal qualities and cognitive processes should be avoided.

Application of a social constructivist lens (as opposed to a psychological cognitive one) clarifies that, in fact, examination of participants' words in the very specific context of an online undergraduate course discussion does not necessarily represent who they are as people in any other context; really, they just represent the way a person decides to present themselves on a discussion board. This evolution of perspective is a symptom of my growth from a more positivist perspective into that of a more qualitative researcher and the analogous conceptions of identity formation. Lincoln and Guba clarify this corollary between constructivist theory and identity in their very definition of constructivism in *The Constructivist Credo* (2016): "a systematic way … of answering the four basic questions [ontology, epistemology, methodology, axiology] that start with the presupposition that social reality is relative to the individuals involved *and*

to the particular context in which they find themselves." Seargeant and Tagg bring this perspective into the specific context of computer-mediated communication, stating:

> Identity is now predominantly understood, in sociolinguistics as in other disciplines, to be not a stable, pre-determined property of an individual, but rather a set of resources which people draw upon in presenting and expressing themselves via interaction with others. … The novelty and distinctiveness of online interaction bring to the fore many of these contemporary constructivist ideas about the nature of identity. (p. 5)

Therefore, the labels in my framework evolved along with my perspective throughout the dissertation writing process, beginning with "post profiles" and eventually settling on "interaction styles," to more clearly convey that these are categories of *interactions*, pieces of dialogue, and not categories of students, or even categories of discussion board participants.

I also expected that the amount of interaction on a given post would be dependent upon the codes that were present in it; for example, posts with a high number of argumentative moves would elicit more responses than those with fewer. In fact, the only pattern that emerged was a chronological one; since posts and their responses were all due at the same time, participants tended to respond on the same visit as their main post, meaning the first posts had the most responses, steadily dropping off until the final few posts had none. Some of the most frequently responded-to posts actually showed low levels of all dimensions; the only attraction was that they were posted early. This pattern became especially apparent as the semester progressed.

Online Learning in the COVID Era

Finally, a pattern arose during the writing of this dissertation which, to be fully transparent, has made its completion consistently and unpredictably challenging. I write this chapter from a hotel room in which I have the luxury of staying for one night of alone time to work. My son, to whom I gave birth just before embarking on this dissertation journey, is now two years old and his daycare center has closed indefinitely. Due to state-level restrictions on travel and household visitors, I cannot hire a babysitter to come to my home, which is where we find ourselves nearly all of the time now that offices and academic spaces have largely shut down. 42% of the U.S. workforce, including myself, now works from home (Wong, 2020), and the northern chair at my kitchen table is my new office, where I hastily check emails while simultaneously parenting a toddler. Today, I have managed to arrange one night of childcare with a family member so that I can escape the domestic demands of single motherhood and work for a few hours on the present study. And my situation is far from unique. Faculty and students alike are experiencing the impossible confluence of demands of household management, caretaking, parenting, working, and studying, without in-person schools or daycares, without any government-subsidized social supports such as guaranteed income or healthcare in the event of Covid-related illness or job loss, and with severe limitations on socializing, schooling, and engaging in any public activities. Given the effect that a global pandemic has had on quality of life, educators need to be careful not to conflate student struggles *during* this period of online learning as a *result* of online learning. The threat of Covid has driven 97% of college students into remote modes of learning, unexpectedly and – for many – unwillingly (educationdata.org). In a *New York Times*

report from November 2020, journalist Ginia Bellafante calls the mass switch to online learning "a precarious but necessary experiment" – not exactly an ideal (or even methodologically valid) environment for exploring the merits of new methods in teaching and learning. Reflecting on my previous chapters now, in the midst of suddenly ubiquitous pandemic-induced online learning, I feel the need to clarify a few important contextual considerations, for readers of this study and for potential future studies of student engagement in online learning.

1) The entirety of this study took place pre-Covid. The class, data collection, analysis, and chapters 1 to 3 were all complete by March 2020, when U.S. schools, including my university, closed, and subsequently transitioned to a remote format. Therefore, none of the data in this dissertation was impacted by the effects of Covid.
2) Educational researchers engaging with student data collected between 2019 and 2021, and perhaps beyond, should take care not to attribute student behavior in pandemic-era online education to the online mode of education, nor to extrapolate pandemic-era online student behavior to online student behavior in general. I believe it would be difficult to overstate the impact of Covid on students' current learning experiences, regardless of modality. For example, prior to 2019, it could be assumed that students in online classes had made a voluntary choice to register for an online course, whereas there are currently few options for in-person learning. Prior to 2019, most students who enrolled in online classes at my university were living on or near campus and took a combination of online and face-to-face classes, whereas currently many students are logging into their

classes from their childhood bedroom in their parents' home, where they had not planned on living. Prior to 2019, most students could go about their daily life with the reasonable assumption that they and their loved ones would not be exposed to a deadly virus. And so on. A researcher's failure to control for these monumental changes in circumstance while studying online learning experiences during this time would paint an incredibly bleak and skewed picture of online learning in general.

3) Students' mental health is suffering significantly, and students' well-being should become a priority for instructors of Covid-era online courses. I am certain that my student participants' engagement with each other on our discussion boards, as well as their engagement with the course overall, would be quite different if the class were taking place in 2020. "Covid stress syndrome" has begun to develop among the general population and is associated with traumatic stress events such as frequent intrusive thoughts and nightmares (Taylor et al, 2020). Over the past year, our population has begun to show significantly elevated levels of depression, anxiety, stress, and post-traumatic stress (Fitzpatrick 2020). In a nationally representative sample of U.S. adults, the *mean* depression score was high enough to indicate high risk for clinical depression, and over 25% displayed moderate to severe anxiety. Since the average age of onset for mood disorders is early- to mid-20s, our college students are at a particularly vulnerable age to be experiencing such a stressful time, and even more likely than the general population to experience these symptoms. Had I taught this class during the ongoing pandemic, I would have integrated more flexible and personalized

assignments, as well as built-in opportunities for students to disengage from their choice of discussions as needed, in the event that they were overwhelmed by other life circumstances and unable to produce meaningful content that week.

4) Covid is widening pre-existing inequities in educational access. Recent data from the Center for Disease Control and Prevention (2020) suggests that COVID disproportionately affects people of color, as measured by the proportion of confirmed cases by race and ethnicity. The CDC posits that existing disparities in the social determinants of health are responsible for the devastating effects of Covid on already marginalized populations. These same disparities are responsible for the dearth of access that students from marginalized populations (as well as working-class and poor students) have already had to reliable high-speed internet, increasingly unaffordable higher education, and space at predominantly white colleges and universities. Fortuna, Tolou-Shâms, Robles-Ramamurthy and Porche (2020) predict that several actions will be necessary to combat the direct and indirect effects of Covid on our students in these communities, including "positive peers, caring adults, positive community environments (including elimination of racist and xenophobic experiences), and economic opportunities for families" (p. 445). Educators can, and must, facilitate these actions by acting as caring adults and enforcing an ethic of care in the classroom to foster the presence of "positive peers" and spearhead the elimination of racism and xenophobia in their classes.

In summary, my additional findings from the research and dissertation writing process fall into the following two categories: methodological findings, based on

reflexive research; and contextual findings based on the Covid-19 pandemic. My methodological findings revealed biases that tended to favor high participation and perceive low participation as a negative behavior; gendered expectations of interaction styles; and the potential for assumptions about participants' identities to be made based on post content. My contextual findings suggest that online learning changed significantly from 2019 to 2020, that the pandemic has indirectly impacted students' academic engagement and success in ways not yet fully realized, that student mental health should be prioritized by educators and acknowledged by researchers, and that the pandemic is widening existing educational inequities and opportunity gaps that will require extra effort from educators and others to close.

Chapter 7: Conclusion

In this chapter, I briefly summarize the findings in the previous two chapters in the context of the research question, identify the limitations of the study, and explore implications of the findings for educational research, practice, and policy.

Summary

The research question guiding this study was, "how do students co-construct meaning in an online teacher education course?" I addressed this question via a qualitative instrumental case study. I examined participants' peer discourse on discussion boards and analyzed them, along with supporting data sources, via content analysis, discourse analysis, and social network analysis. Applying Weinberger and Fischer's framework to analyze argumentative knowledge construction in CSCL revealed patterns in the strategies that participants employed to co-construct knowledge, utilizing combinations of argumentative, epistemic, and social moves. These findings expand existing knowledge on students' learning processes via knowledge construction in online courses and provide new and more current knowledge on computer-supported collaborative learning, a field that is rapidly developing with technological advancement and societal needs.

My findings confirm prior research in similar contexts. Student evaluation comments expressed positive feelings about the peer discourse in the class. This is consistent with Lee et al's (2011) findings reported in my literature review, which stated that peer support was positively correlated with student satisfaction in a course. The findings of the discourse analysis also seem to support McCrory et al's (2008) assertion

that “students’ disposition to engage in constructive discourse (or not) is an important and only partly controllable factor in what happens in online discussion.”

Limitations

As noted in previous chapters, the interpretations of findings in this dissertation are entirely my own, and as such they are limited to observations of how students interacted with each other and are not intended to extend to cognitive processes or learning outcomes. Participants are no longer available for me to contact; however, member-checking findings and themes with participants would have served to strengthen trustworthiness.

Also, it is worth mentioning that, while knowledge construction among peers in the discussion boards in this course was certainly cooperative, and arguably collaborative, there was no specific task targeting positive goal interdependence. That is, participants were not provided with a motivation to invest in each other’s success and lift one another up via knowledge construction. If this study were to be replicated for the purposes of investigating peer knowledge construction as a collaborative learning practice, discussion prompts should ideally be built upon 1) clear and transparent instructional purpose, and 2) tasks requiring positive interdependence.

Implications

This study addressed an area in need of further exploration in the field of peer knowledge construction in computer-supported collaborative learning; as such, it opens up several avenues for further research, as well as implications for online course instructors and policymakers.

Implications for Research

Peer knowledge construction as a discursive classroom practice still holds promise for further research and understanding towards student learning. Scardamalia and Bereiter (1994) acknowledge that the process of Knowledge Building "only provides the best provisional answer we are aware of, while work goes on to provide a better one. A better answer almost surely depends on a deeper understanding of knowledge creation."

Scaffolding classroom discourse explored from a literacy perspective holds promise for further analysis especially in Chapter 5. In Cazden's (2001) work on classroom discourse and student learning, discourse is examined using the metaphorical term *scaffold*, which she described as "one way of thinking about complex learning environments that provide these kinds of supports" (p. 61). Understanding the role of scaffolding in classroom exchanges between the instructor and student, and the sociocultural significance of such relationships may lead to deeper understanding of supportive pedagogical online practices. A sociocultural literacy approach can also illuminate the potential for nuancing how we construct culture and learning in situated contexts such as an online classroom. Lastly, sociocultural perspectives can lead to further understanding of online learning as an *activity system* (Bang, 2015) where cognition, learning, and literacy (i.e., classroom discourse) are constitutive of dynamic, ecological processes.

Another implication relates to the use of network sociograms, which was a valuable discourse analytic tool revealing students' engagement choices. The application of network sociograms as a method of analysis holds great potential in further classroom discourse research, especially research guided by *discourse visualization theory*, which –

while not utilized in the theoretical underpinnings of this study – holds great promise as a method for extending visualizations beyond simply communicating numerical data and applying visualization as a tool for analyzing classroom discourse (Rinker, 2017).

Finally, as this was a single case study, the generalizability of the five interaction styles is unknown. In what contexts are these styles utilized? Do students tend to exhibit the same interaction style across contexts? If not, what environmental factors seem to influence interaction style? As this study is the first to identify this set of interaction styles, there is extensive opportunity for refinement and revision.

Implications for Practice

The obvious question for educators is how the findings of this study can be applied to teaching practice. The first possibility is that these interaction styles, with descriptions, could be shared with instructors and students of online courses. The participation dimension, which is measured solely by word count of students' contributions, is often the only metric by which students' online discussion participation is evaluated, with the perception that more and longer contributions correlate with a more engaged, "better" student. Knowledge of the social, epistemic, and argumentative dimensions, and the variation in the ways students utilize them, can help both students and instructors develop a more holistic view of student engagement in online courses.

Additionally, low engagement is a barrier to effective peer knowledge construction in online class discussions. Instructors may be able to leverage knowledge about the different interaction styles to scaffold more effective prompts for discussion. For example, prompts that address both the epistemic and argumentative dimension, such as "Agree or disagree with the following statement," may be more likely to yield more

responses than a prompt that addresses only one dimension, or requires self-disclosure, such as “Write about a time when you had an experience…”.

Implications for Policy

The Covid pandemic forced instructors with no prior experience or training in online pedagogy to immediately design and execute online courses without preparation or lead time. At the time this chapter is being written, several semesters have since passed, and we have the opportunity to reflect on our experiences and identify the aspects of our courses that can be modified to provide more effective learning opportunities for students. Educators and administrators responsible for online course design and management should be informed of the value and importance of collaborative knowledge creation, and all classes should provide students with space to interact with each other for this purpose, regardless of course modality. Affordances for peer discourse should be an explicit consideration when institutions are evaluating potential educational technologies for implementation, such as learning management systems.

Finally, instructors should make their students aware of the purpose of discourse opportunities that are built into their courses. Group work and discussion board posts need not be perceived as a filler activity, busywork, or an opportunity for instructors to shift responsibility off themselves onto students. Rather, instructors can explicitly communicate the objectives of these activities to students; that by engaging in the discourse itself, students are constructing knowledge, and that by contributing their own unique interaction style to the group dynamic, each student is enhancing not only their own learning, but their peers’ as well.

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Appendix A.

Codebook: Framework to Analyze Argumentative Knowledge Construction in Computer-Supported Collaborative Learning (Weinberger & Fischer, 2006)

Name	Description
Argumentative dimension	
Argument	Statement put forward in favor of a specific proposition
Counterargument	An argument opposing a preceding argument, favoring of an opposite proposition
Integration	Statement that aims to balance and to advance a preceding argument and counterargument
Non-argumentative moves	Questions, coordinating moves, and meta-statements on argumentation
Epistemic dimension	
construction of adequate relations between conceptual and problem space	Applying the relevant theoretical concepts adequately to solve a problem. Learners relate theoretical concepts to case information.
construction of conceptual space	Learners relate theoretical concepts with each other and explain theoretical principles to foster understanding of a theory. Summarizing, rephrasing, and discussing theoretical concepts and principles.
construction of inadequate relations between conceptual and problem space	Applying theoretical concepts inadequately to the case problem. Learners may select the wrong concepts or may not apply the concepts according to the principles of the given theory.
construction of problem space	Learners relate case information to case information within the problem space with the aim to foster understanding of the problem. Learners focusing on the construction of problem space at the cost of neglecting other epistemic activities may retell rather than interpret a problem.
construction of relations between prior knowledge and problem space	Applying concepts that stem from prior knowledge rather than the new theoretical concepts that are to be learned.
non-epistemic activities	Digressing off-topic
Social dimension	The social modes of co-construction describe to what extent learners refer to contributions of their learning partners.
Conflict-oriented consensus building	Disagreeing, modifying or replacing the perspectives of the learning partners
Elicitation	Questioning the learning partner or provoking a reaction from the learning partner
Externalization	Articulating thoughts to the group
Integration-oriented consensus building	Taking over, integrating and applying the perspectives of the learning partners
Quick consensus building	Accepting the contributions of the learning partners in order to move on with the task