THE NETWORKED CLASSROOM

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Gina Gibbs
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ABSTRACT

THE NETWORKED CLASSROOM

by

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Master of Fine Arts in English

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Many first-year composition (FYC) instructors aim to create a student-centered classroom. However, there is often not enough student influence for the classroom to be truly student-centered. Often, instructors have difficulty in constructing opportunities for students to direct the path of the course. This study aims to combat the lack of student influence present in classrooms by making visible the network that is involved in student-centered classrooms.

Informed by Activity Theory (AT), Network Theory (NT), and Actor Network Theory (ANT), this study analyzes the construction of a class that promoted the visibility of a network. AT is a conceptual framework that examines human activity and the historical, cultural, and institutional contexts that influence the participation within the activity. ANT, a branch of Network Theory, is interested in the influence of both human and non-human participants in the activity. Employing these frames, this study highlights
the importance of several components in a network that influence a “networked classroom,” such as shifting centers, hubs, protocols, and boundary objects.

I analyze the class activities, assignments, and student interaction that take place in the first quarter of the semester. I demonstrate the ways that the network was constructed by the instructor and students. Further, a network approach made the visibility of student agency more readily apparent to students from the first day of class to the first major writing assignment. I claim that using a network and social learning overlay in the classroom, students were able to influence the overall movement of the networked classroom, which led to meaningful learning in the practice of academic writing.
CHAPTER I

INTRODUCTION

Identifying Student-Centered Classrooms

The idea of researching the networked classroom started in fall 2011, my first semester as a graduate student in the class Literacy as Distributed Cognition with Dr. Judith Rodby. We had an extensive reading list we tackled that semester, including several books that greatly influenced my notions of learning in an institution. The most notable readings included: *Understanding Practice: Perspectives on Activity and Context*, edited by Seth Chaiklin; *Situated Learning*, written by Jean Lave and Etienne Wenger; *Distributed Cognitions*, edited by Gavriel Solomon; *Mind and Society*, inspired from the notes that Lev Vygotsky left behind after his death; and lastly, *Communities of Practice*, written by Etienne Wenger. These readings helped me to begin to understand that cognition does not reside in the heads of individuals, but rather, it is dispersed through the different resources that are available to us. I also came to believe that learning is not an individual process, but a social process.

When it came time to write our seminar paper for the class, one article in particular continued to pique my interest and I decided to further investigate the ideas set forth by D. N. Perkins in his article “Person-Plus” found in the *Distributed Cognitions* book. I thought that Perkins call for reform in institutions—from a person working solo to a person working with resources—was inspiring and I was not ready to put his ideas
aside. Perkins makes the case that for most learning encounters inside an institution, the learner is not able to work in collaboration; in other words, the learner is working person-solo. Perkins also adds that in most institutional learning situations, when the learner is able to work person-plus, it is typically person-plus pencil, rather than working with a meaningful resource.

In addition to Perkins’ person-plus idea, Vygotsky’s theory of Zone of Proximal Development resonated with me. Vygotsky says that when assessing a learner’s level of ability, it is more indicative of the learner’s ability when they are able to work with a more capable peer, as opposed to working alone. Vygotsky acknowledges that learning is a social activity and that a learner is able to achieve more when working in collaboration.

Out of these two authors came my seminar paper, “Person as Tool,” where I asked the questions: “Why don’t students use each other as tools in class?” “Will the learning be different if a student uses both human and non-human resources around them, rather than relying solely on the teacher?” “How does the unique personal experience of every student make him/her an expert in varying activities?” This paper was a way for me to experiment with theories for allowing students to create meaning by using each other as the main resource and shifting the instructor to the role of mediator, rather than the traditional role of authority.

Moving forward to beginning my thesis, I was expecting to continue with my thoughts on “Person as Tool” by applying the different secondary research that I found in my seminar paper to the English 130 class that I instructed the following semester. This, however, changed when I entered the new semester enrolled in the class Rhetoric,
Networks, and Memes instructed by Dr. Tom Fox. I found, immediately, that networks fit with my on-going ideas in Person as Tool. Through Network Theory, I found a language for talking about the interconnectivity that is involved in social learning; similarly to social learning atmospheres, in networks the work is distributed, negotiated, and collaborated. During my time in Dr. Fox’s class, new questions began to emerge. Who is the center in a social learning environment? How do hubs change the learning environment? How does the instructor use effective protocols for connecting students to assignments?

During my time as a teaching assistant in other English 130 classes, I saw the emphasis that teachers placed on having a student-centered classroom. They wanted students to take authority over their learning through inquiry-based research papers and class discussions on subjects that were relatable to the lives of the students. I wanted to take this student-centered classroom that had been modeled to me by mentoring professors and make the power of the students more visible earlier in the semester. In other words, I wanted students to immediately realize the agency that they possess over the learning that takes place.

One semester, I assisted in two classes that were only an hour apart and I noticed that the classes differed greatly from each other. I saw that it was impossible to have the same conversation in two different classes because the body of students is different in each class. Students have different histories and experiences that make each class incomparable to another class, each if they have the same syllabus and instructor. Something that was successful in one class could easily leave many students confused.
and frustrated in another class. For these reasons, I wanted to understand the conceptual frameworks that could expose the messy and unpredictable nature of classrooms.

To figure this out, I designed my syllabus for the first-year Academic Writing class to promote the visibility of a network that is present in social learning classrooms. Social learning classrooms tend to value modeling and observational learning; students, in these classrooms, are influenced by their surrounding environment. I built my syllabus to promote this in several ways. First, I encouraged students to see themselves as experts in varying activities. Different students became the center or authority in the classroom, depending on the activity or conversations that were occurring at the time and the different level of interest that each student had. I wanted to show the ways that the instructor is only a weak link (weak links happen when a node is loosely connected to another node) to the work that is happening during certain activities in the class and the ways that students will take over as the authority or center when they are given the chance. All of my assignments built off of each other and students needed to take part in the network in order to finish an assignment. Students put each formal assignment into their own words. After the assignment was completed, students created the rubric that the assignment grade would be based on. Students became more invested in their learning and in the classroom because they had the opportunity to help create the networked classroom.

This thesis is a study of my classroom using the frameworks of Activity Theory, Network Theory, and the Network Theory subsection—Actor Network Theory. These theories laid the groundwork for a network approach to a first-year Academic Writing classroom. I applied a network overlay to my classroom by treating all aspects of
the classroom (students, instructor, assignments, technology) as nodes in the network—all equally capable of influencing the entire network. In order to understand this influence, however, I had to pay extra attention to the subtle effects of these other nodes in the network and I had to adapt my teaching.

My first finding shows that often times the meaning of nodes within the network will differ for the instructor and student. Instructors will typically present new material or introduce an assignment from his or her perspective, but in a network, nodes (students or instructors) often interpret the meanings of other nodes differently (assignments, new material, and other activities). Therefore, students need to be able to present material or explain an assignment from their perspective.

Second, my findings show that both human and non-human nodes in the network have the potential to influence the network. Non-human nodes, such as assignment sheets, will prove to hold the same amount of power in the network as the human actants who are using them. Non-human nodes, like technology, held a great amount of power in the network by shaping the way that students approached assignments.

Through the power or influence that both human and non-human nodes have in the network, comes my third finding—that the instructor is not necessarily the constant center of the classroom. There are shifting centers and hubs that arise as the network becomes more visible to students. In fact, the instructor will prove to become a weak link to much of the work that takes place in the classroom, meaning that the instructor will not be directly involved with the activities, placing a new center or hubs to other nodes.
The Review of the Literature weaves together aspects of Activity Theory and Network Theory, and Actor Network Theory in order to provide a conceptual frame for my study. From Activity Theory, I borrow ideas about social learning. Activity Theory points out that students are more capable of completing difficult tasks when they are allowed to collaborate. Activity Theory emphasizes that the history, culture, and institutional experiences make each student dynamic and unique which shape the ways that collaboration and learning take place.

From Network Theory, I was able to understand the ways that shifting centers, hubs, protocols, boundary objects, and other minor network components appear and influence the network. These four components were most useful in describing students’ interactions in the classroom. In addition to these components of Network Theory, Actor-Network Theory offers ways to explain how both human and non-human nodes carry influence and power over the entire network. Actor-Network Theory examines how power is exerted in a network through political and rhetorical moves that occur in the network. This is seen through the different “allies” and “traitors” that a network exposes.

This study relies on classroom descriptions to expose the visibility and workings of the network. Through the examination of my classroom from the first day until the first major writing assignment, alongside the use of three particularly illustrative students, I aim to show the ways that the network created a positive environment from students to think and learn deeply.

The conclusion highlights key parts of the networked classroom, my goals for constructing a networked classroom and the shifts that these goals took throughout the semester. I discuss the differences between the power and authority distribution in a
network and in a classroom. I reflect on changes that I will make in my data collection when continuing this research. I explain my future plans for continuing the development of this research. Lastly, I include notes to other instructors who are interested in using a network layout in their classroom.
CHAPTER II

ACTIVITY THEORY, ACTOR-NETWORK THEORY, AND NETWORK THEORY

The review of the literature weaves together several theoretical frameworks in order to examine the networked classroom. The first, Activity Theory (AT), is a conceptual framework that examines human activity and the historical, cultural, and institutional contexts that influence the participation within the activity. Activity Theory looks at the cultural and historical contexts in which the activity is taking place in relation to the cultural and historical contexts of the person who is interacting with the activity. The second, Actor-Network Theory (ANT), focuses less on the cultural and historical influences of participating in an activity, but rather is interested in the influence of both human and non-human participants in the activity. According to ANT, non-human objects also carry weight in the understanding and participation of an activity. These frameworks, however, are not mutually exclusive, despite some important differences; upon my deeper examination I show that these frameworks inform each other.

One of the goals of the networked classroom is to have a fully self-mediating classroom with a constantly shifting center that empowers authentic student engagement with learning. When students and resources are transformed into nodes of a network, they can mediate the work that happens in the network, enabling each other to complete complex and difficult tasks that would otherwise be unsuccessful without the assistance of the
network. Clay Spinuzzi, associate professor at the University of Texas- Austin and author of *Network: Theorizing Knowledge in Telecommunication*, points out:

> [. . .] mediation involves controlling one’s own behavior ‘from the outside’, as it were, through physical and psychological tools. This self-regulative work is transformed: by mediating their own work, human beings transform themselves, finding that they can do things that they could not do in an unmediated way. (21)

A networked classroom uses the mediation of other students to achieve goals that students would otherwise find difficult, if not impossible, without the help of others. The networked classroom relies on the different knowledge and experiences that each student brings with them to help make meaning and contribute to the learning that happens in the network. Several components of Network Theory, including Actor Network Theory, alongside Activity Theory, illuminate the idea that students learning together, within a network, will contribute to meaningful and authentic learning in transformational ways.

**Activity Theory**

Activity Theory (AT), also known as Cultural Historical Activity Theory (CHAT), is prominently taken up by Scandinavian researchers, most notably Yrjö Engeström. Activity Theory was inspired from the early research of Lev Vygotsky, a Russian psychologist who studied the developmental stages of children. The three themes that are culled from Vygotsky's research that inform Activity Theory are: 1) a reliance on genetic, or developmental, analysis; 2) the claim that higher mental functioning in the individual derives from social life; and 3) the claim that human action, on both the social and individual planes, is mediated by tools and signs (Wertsch 19). Activity Theory heavily takes up Vygotsky’s emphasis on the social aspect of learning that is often
neglected in institutions and is often used as a heuristic framework for studying individuals in activity.

One of Vygotsky's most influential theories, the Zone of Proximal Development (ZOPD), defines the distance between the person’s "actual developmental level as determined by independent problem solving" and the higher level of "potential development determined through problem solving under adult guidance or in collaboration with a more capable peer" (Vygotsky qtd. in Wertsch 28). Vygotsky’s work with ZOPD shows that a more complete indication of a student’s ability level is when working in collaboration, not alone. Therefore, in the networked classroom, it is crucial that instructors develop structures that encourage students to work in collaboration with others, rather than alone.

The importance that ZOPD, and in turn Activity Theory, places on collaboration when problem solving is part of the power of the networked classroom. The networked classroom promotes student collaboration with all available resource nodes. Different nodes within any given network are always informing each other. Since everything in the networked classroom is a node (student, assignment, rubric, and others), the student is never working in isolation. Students as nodes within the large network of the classroom will always be closely connected to the other available nodes (other students or resources) that surround them. Albert- László Barabási, a Romanian born, Hungarian physicist known for his research in Network Theory, makes a compelling parallel in his book, Linked, between a network and a business firm that can be applied to the networked classroom. Barabási comments:
The result, in a successful firm, is a continual swirl of problem-solving activity and ever shifting interaction between the problem-solvers, each of whom has information relevant to the solutions of a particular problem but none of whom knows enough to act in isolation. Nor does any one person know precisely who knows what; hence, problem-solving is a matter not just of forming the necessary combination of resources, but of searching for and discovering those resources in the first place. (269)

When examining the ways that a successful firm executes problem solving, it is clear that collaboration between the problem-solvers is valued. Several nodes hold part of the solution, but the nodes do not know who holds which information. Illustrated here is that it is crucial that collaboration happens frequently in order to find which node knows part of the solution. Since this method of problem solving is used in “real world” situations, it follows that collaboration should be more lauded in institutional classrooms. ZOPD and Activity Theory recognize that learning and problem solving is best accomplished socially. Within any network, there is a combination of nodes that impact each other through the information that each node possesses. In the networked classroom, each node carries part of the information needed to solve the problem: the assignment sheet carries information, each student carries information, different classroom resources carry information, and so forth.

James Wertsch, Activity Theorist, defines Activity Theory as an “[. . . ] account of human mental processes that recognizes the essential relationship between these processes and their cultural, historical, and institutional settings” (6). In a classroom, it is hard to deny that the variety of culture and historical influences have an impact in the learning that takes place within the classroom. Wertsch, citing Shweder, explains: “cultural traditions and social practices regulate, express, transform, and permute the human psyche, resulting less in psychic unity for humankind than in ethnic
divergences in mind, self, and emotion” (Shweder qtd. in Wertsch 7). This shows that in any given classroom, students do not think in the same way because they inhabit a diversity of cultures and histories. These cultural traditions and social practices shape the learning that happens in the classroom.

The culture that a student carries goes much deeper than the ethnic group or hometown; students’ culture forms their identity. Michael Cole and Yrjö Engestrom, noted CHAT theorists, emphasizes that culture is not simply defined as traditions or customs, but rather, “[. . .] plans, recipes, rules, instructions (what computer engineers call ‘programs’)—for governing behavior” (16). In the anecdote about the successful firm discussed by Barabási, Activity Theory explains that each of the nodes in the network has a portion of the answer to contribute. Activity Theory recognizes that each node within any network has a cultural, historical, and institutional history that influence the very existence of that node, therefore making the contribution of each node unique and different. Recognizing and acknowledging the cultural, historical, and institutional influence that is cast over each node within the networked classroom is the very thing that makes social problem solving possible. Each node has its own set of historical, cultural, and institutional influences that allow students to contribute different information to the collaboration in order to learn or problem solve socially. In the networked classroom, part of my first challenge was to begin the students in thinking this way.

Activity theory encourages students to use their cultural, historical, and institutional influences to negotiate with each other until a mutual understanding is
reached. This negotiation is achieved through “communicative action.” “Communicative action” is defined as:

[. . . ] the interaction of at least two subjects capable of speech and action who establish interpersonal relations (whether by verbal or extraverbal means). The actors seek to reach an understanding about the action situation and their plans of action in order to coordinate their actions by way of agreement [. . . ] communicative action is judged according to the criterion of reaching understanding. (Wertsch 11)

When considering the networked classroom, “communicative action” is a common practice. Each student is considered to be a node. It is important that the nodes create this common understanding around the action situation if genuine learning is to occur. A network needs to develop a common understanding in order to function properly. Wertsch points out that in Activity Theory, “human action typically employs ‘mediational means’ such as tools and language, and that these mediational means shape the action in essential ways” (12). Activity Theory is showing that knowledge is a combination of cognition and resources working together; that knowledge does not only reside in our heads, but rather it is expressed through our experiences and the resources around us. Just as in any network, there must be communicative action between nodes. It is important to note that these meditational means (resources) that shape action are also nodes in a network. Nodes in a network often times find themselves changing roles, not simply from day to day, but from moment to moment.

Actor-Network Theory

Actor Network Theory (ANT), though not a learning theory, similar to Activity Theory, would understand the classroom as a social network. ANT is a methodology for retrospective examination of an activity. ANT does not differentiate
between the human and non-human influence involved in the activity. According to ANT, the non-human objects carry an equal amount of influence in the activity in which they are involved. This is examined in the networked classroom through the influence of non-human nodes, such as an assignment sheet, had on the rest of the network.

ANT differs from Activity Theory in a few crucial ways. First, ANT is interested in examining the activity retrospectively, while AT examines the participants while they are engaged in the activity. Bruno Latour, a French sociologist and anthropologist and originator of ANT, explains the reasoning for ANT’s interest in retrospection over real-time analysis: “ANT claims to be able to find order much better after having let the actors deploy the full range of controversies in which they are immersed” (23). ANT emphasizes that it cannot explain a social phenomenon while it is in progress because the outcome is always unpredictable and complex. ANT defines action in a similar way that AT defines activity in that it is to “be felt as a node, a knot, and a conglomerate of many surprising sets of agencies that have to be slowly disentangled” (Latour 44). Much like the metaphor about the successful firm that was explained in the AT section, action takes a set of agencies to complete. Additionally, ANT claims that action is necessarily done under “full control of consciousness” (Latour 44).

Second, ANT gives the title of “actor” to objects as well as humans in a network. Latour explains:

ANT is not the empty claim that objects do things ‘instead’ of human actors: it simply says that no science of the social can even begin if the question of who and what participates in the action is not first of all thoroughly explored, even though it might mean letting elements in which, for lack of a better term, we would call non-humans. (71)
Essentially, this emphasizes that ANT does not discriminate between the human and non-human actors that are involved in completing the activity. In the ANT framework, objects are recognized as having influence in an activity alongside the human counterpart. Similar to actors, action is also distributed. Latour explains that action is “[. . . ] other-taken. So that it is taken up by others and shared with the masses. It is mysteriously carried out and at the same time distributed to others” (45). For ANT, action is distributed between not only the human actants, but also the non-human actants that help us carry out the action. For example, when students write a paper, it is not only the student writing the paper. The writing of the paper is also carried out by the word processor, the spelling and grammar tools, the research articles from which the student is pulling quotes, among other things. ANT points out that there is uncertainty in who is completely responsible for the action being carried out. Similar to Vygotsky’s theory of ZOPD and Activity Theory’s emphasis on learning through social interaction, ANT also recognizes that action needs to be mediated by more than one actant whether human or non-human.

In addition to the emphasis that ANT places on non-human actants in carrying out an action, the agency of these non-humans is also recognized. Latour notes that “[. . . ] we have just seen that the most powerful insight of social sciences is that other agencies over which we have no control make us do things [. . . ] action is distributed among agents, very few of whom look like humans” (50). Essentially, ANT shows that non-human objects that are involved in the activities we complete have a significant influence over us and the ways in which we complete the activities. Latour explains:

First, agencies are always presented in an account as doing something, that is, making some difference to a state of affairs; transforming some As into Bs through trials with Cs. Without accounts, without trials, without differences, without
transformation in some state of affairs, there is no meaningful argument to be made about a given agency, no detectable form of reference. An invisible agency that makes no difference, produces no transformation, leaves no trace, and enters no account is not an agency. (52)

ANT claims that in order to understand social ties, it needs to be accepted that the continuity of any course of action will rarely consist of solely human-to-human interactions, but rather a combination of humans and objects together (Latour 75).

In addition to the recognition of the various actants and agencies that are distributed throughout an activity, ANT places emphasis on the functions of groups. ANT is interested in the ways that groups work as a whole, as well as the work of the individual actants in the group. ANT places importance on several contingencies that groups have. First, ANT claims that each group needs some sort of “spokesperson” to speak for the group’s existence. These spokespersons define for the group “[. . . ] who they are, what they should be, what they have been” (Latour 31). In the networked classroom, these spokespersons are often found after small group discussions are opened into entire class discussions. The spokespersons communicate the ideas that were formed in the small group and signal the other groups in the class whose ideas oppose or align with the ideas of their group. In addition, it is important to understand that groups are not silent, nor static (Latour 31). Groups are constantly defined and redefined by the actants within it, as well as the contradictions from the outside. Latour explains,

[. . . ] when groups are formed or redistributed, their spokesperson looks rather frantically for ways to de-fine them. Their boundaries are marked, delineated, and rendered fixed and durable [. . . ] every group formation will be accompanied by the digging out of a wide range of features, mobilized to make the group boundary hold against the contradictory pressures of all the competing anti--groups that threaten to dissolve it. (33)
In addition to the constant defining of groups, if groups are not constantly made and remade, then groups will cease to exist (Latour 35). This will become very important to recognize when examining the networked classroom. It is crucial to recognize that groups within the classroom are continually being made and remade; mostly, this is seen through the constantly shifting center within the network. It is important to note that the making and re-making of groups does not always consist of new combinations of people, the very same people can be in a group for there to be a new group formation. The shifting center that comes from the new conversations that arise out of different activities that take place in the classroom will constantly reform groups with students taking on new and different roles than they had in the last group formation.

Lastly, ANT identifies two components that the nodes within the network could take up: intermediaries and mediators. An intermediary simply transports “meaning or force without transformation [. . . .]” (Latour 39). For an intermediary, defining its inputs will define its outputs. Mediators, however, are more complicated; their input does not predict the output. The purpose of mediators is to “transform, translate, distort, and modify the meaning or the elements they are supposed to carry [. . . .]” (Latour 39). Even though a mediator may appear simple, it may become complex: “it may lead in multiple directions which will modify all the contradictory accounts attributed to its role” (Latour 39). Mediators are important to a network and to a networked classroom because they encourage students to go beyond ‘good enough’. In the networked classroom, mediators often appear to be simple; however, they help students to think more deeply or complexly about the ideas that are ongoing in the classroom.
Network Theory

Network Theory is far from a unified set of concepts; instead it is a loose set of ideas from a variety of disciplines. In addition to Latour’s ANT, this thesis is informed by concepts from Barabási’s *Linked: How Everything is Connected to Everything Else and What it Means*, Duncan Watts’ *Six Degrees of Separation*, Spinuzzi’s *Network: Theorizing Knowledge in Telecommunications*, and Alexander Galloway and Eugene Thacker’s *The Exploit: A Theory of Networks*.

Through Network Theory, I will explain the importance of several components in a network that influence a networked classroom such as: shifting centers, hubs, protocols, boundary objects, individuation, and deindividuation. These components can be viewed in relation to Activity Theory because they show that each node in the network is different and unique, offering new influences on the network. Networks are politicized; there are allying connections made in networks, as ANT argues. Additionally, ANT shows that both human and non-human objects carry influence.

Networks, themselves, are difficult to talk about because they are constantly moving and shifting. In the most simplistic sense, networks are “nothing more than a collection of objects connected to each other in some fashion” (Watts 27). This, of course, is not enough to think about the networked classroom. Watts, describes a set of basic conditions that make a network, despite our previous notions of it in the past. He says:

The crux of the matter is that in the past, networks have been viewed as objects of pure structure whose properties are fixed in time. Neither of these assumptions could be further from the truth. First, real networks represent populations of individual components that are actually doing something—generating power, sending data, or even making decisions [. . .] Second, networks are dynamic objects
not just because things happen in networked systems, but because the networks themselves are evolving and changing in time, driven by the activities or decisions of those very components. In the connected age, therefore, what happens and how it happens depend on the network. And the network, in turn, depends on what has happened previously. (28)

When the defining of a network is placed under these conditions, constructing a network becomes more difficult. First, as emphasized by Watts, networks are not fixed in time or static. For a group or cluster to be considered a network, there needs to be action. In the networked classroom students, assignments, activities, and discussions are constantly “doing something”: producing work, creating meaning, negotiating, and several other activities. Expanding on the second condition that Watts sets forth, that networks are dynamic because they are evolving and changing over time. Furthermore, the network drives those very changes that are constantly happening in the network.

I connect this network definition back to Activity Theory and ANT because each node within the network (both human and non-human) mediates each other. Within the networked classroom, the different nodes are constantly changing and evolving through their participation in the network. Students are changing/evolving through the learning and collaboration that happens in the classroom. The work that students produce is changing/evolving as they become more immersed within the network. My notion of the networked classroom fits into Watts’ conditions that a network must follow in order to be considered a network: the various nodes within the network are continually doing some sort of action (e.g. writing, presenting, discussing, and producing work) and each node within the network is changing and evolving. The change of these nodes in the network will be further discussed in Chapter 4.
Hubs and Centers

This mediation between nodes is not always through humans and it is always shifting in several ways. The mediating nodes that will be examined in the networked classroom fall under the Network Theory frameworks of hubs and the shifting center. Hubs have a crucial role in networks; they are the nodes that have a large amount of connections to other nodes. Hubs are special in networks because they are highly visible in the network (Barabási 58). Hubs serve as the spokesperson that is so prized in ANT, voicing the desires of the network; leading negotiations within the network; and constantly defining and redefining the network. Most importantly, hubs create shorter pathways between any two nodes in the network (Barabási 64). In the networked classroom, just as described by ANT, hubs can and will be both human and non-human. Lastly, once a node is established as a hub, the node does not always need to remain a hub during its time in the network. Just as with the rise and fall of the hub of Myspace, unless the hub continues to have enough traffic to remain a hub, it will return to a node with a smaller number of links.

Alongside hubs is the debate over the existence of a center. While hubs provide a short cut for the connecting of links, the center differs in that it is location of the power and authority of the network. The center is typically the node with the most links in the entire network.

It is controversial among several Network Theorists as to whether centers exist. For instance, Barabási makes the claim that there is no center in a network, but rather a hierarchy of hubs and nodes. He continues by arguing that there is “no meticulous design behind these networks either. Real networks are self-organized. They
offer a vivid example of how the independent actions of millions or nodes and links lead to spectacular emergent behavior” (221). This, however, may be more complicated in a networked classroom. Students are not trained to see themselves in a network; rather, they are trained to consider themselves to be independent of each other. In the beginning of a semester, the instructor is the only center and it is only the instructor that can design a syllabus in a way that allows for a network to emerge. Essentially, every classroom is meticulously designed and contains a center, but a classroom is not a networked classroom, according to Barabási’s definition of a network, until there is no more center, but rather a hierarchy of hubs.

Watts differs from Barabási on his notion of the center. His definition of the role a center plays in a network is much more fitting for the networked classroom. Watts believes that there is a center, but it is constantly shifting. He explains that the center arises from the event that calls for a center to emerge: “[. . . ] in such cases, the network centrality of individuals, or any centrality for that matter, would tell us little or nothing about the outcome, because the center emerges only as a consequence of the event itself” (53). Essentially, Watts says that networks do not need centers until an event happens in which a center needs to emerge and it is the event that will decide which node becomes the center. This notion of center fits more accurately with the framework of a networked classroom, especially since the networked classroom that I am constructing is so deeply influenced by AT and ANT. As mentioned before, each node within the network is unique because of their cultural, historical, and institutional influences, and therefore, it will not be known which node will show to be the expert on the subject until the event occurs where a center is needed.
Hubs differ from centers. A hub provides to nodes a shortcut for connecting with another node. When an instructor is able to offer a resource to help a student, such as an article that will help with their research paper, the instructor is acting as a hub. Centers, however, contain power and authority and emerge out of the event. When a student is knowledgeable about a subject that is being discussed in class, that student will become the center through the directing of the conversation towards that student and not towards the instructor.

Although networks have hubs and shifting centers, it is important to understand that no one person or node controls the network. The controlling of a network by a single node is prohibited by deindividuation and individuation. Individuation and deindividuation can be thought of similarly as a photomontage, where from far away the photo looks like one picture, but close up you see that the photo is actually made of thousands of tiny pictures together. Galloway and Thacker elaborate:

Networks individuate within themselves (stratifying different types of nodes, different types of users, different types of social actors) [. . . .] But these processes of individuation are always accompanied by processes of deindividuation, for each individuation is always encompassed by the ‘mass’ and aggregate quality of networks as a whole, everything broken down into stable, generic nodes, and discrete quantifiable edges. (39)

Networks have a close relationship with identity through individuation and deindividuation. A body of students may seem fairly similar from a larger perspective, but when looked at closely inside the network, each student is vastly different from the next. As discussed before, each student carries his or her own knowledge from his or her cultural, historical, and institutional influences. Although from a deindividuated stance, one student may not appear different from the next, but rather a seemingly homogeneous
body of students. From an individuated stance, it will be shown that each student is an expert in differing areas with unique contributions to the network.

Other Connections

When looking at a network, weak links are important because they allow for a node to be connected at a distance to another node. These weak links are important to the networked classroom because the link is often weak between the instructor, the body of students, and the work produced in an activity. When students are placed in small groups and asked to perform a task, such as a peer review or a discussion, the instructor is very loosely connected to the other nodes (students and work produced in activity) because the instructor is not participating in the activity. The instructor is only connected to the activity by sharing the same space as the other nodes, or by a sharing out/reporting out to the instructor about the tasks that were accomplished by the small groups during the activity.

I combine AT and ANT with Network Theory to discuss weak links within the networked classroom. AT emphasizes that the learning is social and embedded in activities. Putting activities into the networked classroom that create weak links to the teacher (among other possibilities, such as other students, nodes outside of the classroom, or other texts and software platforms) give the students opportunities to learn socially, as well as shift the center.

In respect to center shifting, protocol is an important aspect in all networks because nodes in the network need ways to connect to other nodes. Protocols are the ways that a node is able to connect to another node. Returning back to Activity Theory,
protocols are the accepted patterns of communicative action (where communication is used to reach an understanding of an action situation) in a network that allow nodes to connect to each other. The actual protocol will be different in each network and even between each node because the protocols need to be agreed upon in order to make the connection. Simply put, protocols are “[…] the rules that make sure the connections [from node to node] actually work” (Galloway & Thacker 29). Even in a classroom that does not have a deliberate network overlay, there are protocols. A simple example of protocol in a classroom would be classroom norms and rules, but protocols are also very complex. Thacker and Galloway explain the complex nature of protocols, especially in a network:

- Protocols emerge through the complex relationships between autonomous interconnected agents.
- To function smoothly, protocological networks must be robust and flexible; they must accommodate a high degree of contingency through interoperable and heterogeneous material interfaces.
- Protocological networks are inclusive rather than exclusive […]
- Protocol is the emergent property of organization and control in networks that are radically horizontal and distributed. (29)

The protocol can be thought of as the way that one node is successfully connected to another node in the network. For example, if a student (node) does an assignment (node) unsuccessfully, then the protocol for connecting that student to the assignment needs to be changed. The different protocols in a networked classroom must be directly correlated to the needs of the students. If the protocol used by the instructor to introduce an assignment led to students’ confusion about the assignment, then the protocol was not successful. For an instructor, unsuccessful protocols are not necessarily negative in a networked classroom because their lack of success can illustrate a lot about the
characteristics of the network. In the networked classroom, when instructors can recognize that a protocol is unsuccessful, the instructor is able to engage in a reflective teaching process through analyzing the characteristics of the network and attempting a new protocol for reconnecting the nodes together successfully.

In order to understand successful protocols, it is important to also understand boundary objects because it is important for instructors to understand that nodes carry different meanings in a network. In her article “This is Not a Boundary Object,” Susan Leigh explains the structure of a boundary object:

First, there is the aspect of interpretive flexibility, as there is in any object [. . .] a road map may point the way to a campground for one group, a place for recreation. For another group, this ‘same’ map may follow a series of geological sites of importance, or animal habitats, for scientists. Such maps may resemble each other, overlap, and even seem indistinguishable to an outsider’s eye. Their difference depends on the use and interpretation of the object. (602)

Essentially, boundary objects are “things” that have different meanings to the various nodes in the network. As shown in the example above, the map held different meanings to the various users. For one user, the map served as the directions to the camping site; for another user, the map illustrated several sites of geological importance. The various users interpreted the purpose of the map differently. It is important, especially for the instructor, to recognize that nodes can be boundary objects when using a certain protocol for connecting several nodes together. In the networked classroom, when the instructor is constructing a protocol, the protocol needs to be done in a way that takes into consideration that nodes (such as assignments) may have different meanings to the students that you are attempting to connect them to.
Nodes possessing different meanings to the other various other nodes in the network can be seen through any assignment, no matter how simple the assignment may appear. An example of this could be when an instructor assigns a short reading response to the class before opening a class discussion; this reading response is going to mean different things to the nodes in the network. For the node that is the instructor, the assignment could be an easy way to check if the students did the assigned reading; it could be a place for students to gather their thoughts before a class discussion; or even the way that the instructor will take role for the day. For a student, however, this assignment may mean an opportunity to recap on the assigned reading before a class discussion; connect the assigned reading to his/her personal life; or even just time to doodle on paper because the assignment means nothing to him/her. Similarly to the way that ANT illustrated the uncertainty that arises out of the doing of an activity, boundary objects point out the uncertainty of the meaning that a node may possess to students and instructor. The point here is that the reading response was robust enough to maintain its genre, but the meaning of the assignment differs from node to node.

When a hub such as the instructor uses protocols to connect a node to another node (such as student and assignment), boundary objects need to be taken into consideration. As a hub, it is important to understand that the meaning or use of an object is not consistent throughout the network. Returning to the reading response assignment example, when the instructor uses a protocol that does not let the students know the meaning of the assignment within the network, then students are going to guess in their interpretation of the assignment. However, if the instructor uses a protocol that allows the students to know the meaning of the assignment within the network, then the students
will be more likely to take up the assignment with the same meaning as the instructor intended. Of course, as this study will highlight, there will be times when allowing students to make their own meaning about an object or node will be more beneficial than disclosing the meaning to them because it shows the diversity in the network.

Taking all of these frameworks together, this Review of the Literature builds the important concepts that are needed to understand the ways that a network overlay can be successfully applied to a classroom. Activity Theory helps to emphasize the uniqueness of nodes in the network. Actor Network Theory shows the influence of human and non-human objects. Network Theory explains some of the key components involved in networks that will become visible in Chapter 4.
CHAPTER III

METHODOLOGY

In the fall semester of 2012, I instructed a first-year composition class, English 130, also called Academic Writing. During the semester, thirty-one students enrolled in my class, thirty first-semester freshmen and one senior. When constructing my syllabus, which contained all class activities and assignments, I aimed to create a networked classroom. Influenced by Gavriel Salomon, educational psychologist and editor of Distributed Cognitions, who points out that cognition is not something that only resides in our heads, I set out to create a classroom that attended to the social, cultural, and technological influences of knowledge construction. Knowing that in the world people use the resources available to them, I created a space and time for students to collaborate with other nodes in our networked classroom in order to learn about the diverse practices of writing in the university. Sometimes the node that students connected with was myself (the instructor), but often times the node was an available surrounding resource, such as another student or their computer.

Prior to the start of the semester, this research was approved by the Chico State Office of Graduate Studies as a study of human subjects. All participants signed a form that allowed all of their work and interactions in the semester to be eligible for use in my thesis. I decided to focus on three students, whom I interviewed at length. These students had highlighted themselves as useful nodes, and often times hubs and centers,
within the networked classroom. In this study, all responses are direct quotes from the students. Each of the three illustrative students have similarities in the ways that they viewed participating within the network, however, the places in which they differ reveals how networked classrooms function.

Research Questions and Data Collection

This study seeks to understand the following questions:

1. How can Network Theory inform the design of the classroom?
2. How does an understanding of Network Theory assist instructors in connecting students and activity together to support productive learning?
3. How can a Network Theory framework support student agency, creating structures that allow the students to emerge as the center?

Using a semi-structured interview protocol (see Appendix A), I interviewed three students to determine their understanding of the networked classroom. These interviews took place in the middle of the semester after the first major writing assignment was due. I chose this time frame because students noticed the network that was forming in the classroom. I did not want to conduct the interviews too far into the semester because I wanted the beginning of the semester to be fresh in their minds. I wanted the students that I interviewed to be able to reflect on the visibility of the network and their part in influencing the network.

This first large writing assignment was titled “Survey of the Field/Research Proposal” and asked students to take the accumulation of the seven research sources (previously gathered), synthesize them, and begin to create the claims that they want to
make about their subject. The second part of this essay asks the student to reflect on the claims that their research already allowed them to make and point out directions for continued research. Additionally, students plan out the way that they could imagine the final research paper to look; more specifically, they identify the potential audience and structure of final paper. My choice in interviewing after this assignment was because this assignment was a part of a network of assignments. This assignment was built from the class readings, student research, and writing practices that we had been working on throughout the semester. At this point in the semester, it was evident that the classroom network and the assignment network were visible to students.

Upon completing this “Survey of the Field/Research Proposal” paper, I created a list of interview questions that I gave to the three students and allowed them several days to think about potential answers to the interview questions. These interviews were digitally recorded so that I could transcribe and analyze them. During my analysis of the interviews, I was able to note many similarities and differences in the classroom interactions between the three students. They seemed to be able to point out times that there was a shifting center or when a student became a hub. The illustrative students, however, had different notions about participation which I will explain in the following chapter.

After transcribing the recordings, I went through each interview and highlighted in yellow the areas that were particularly interesting to my study. I looked for places in the interviews where students varied in their ideas about a certain activity or places or where all three students agreed and disagreed in order to gauge the roles that the different class activities and assignments had on the constructing of a networked
classroom. There were a few instances where students seemed to describe a term, like participation, but were never quite able to find the actual word to use.

The three illustrative students differed from each other in the ways that they functioned as nodes, or even hubs, within the networked classroom. All three students found their way to be a hub in the network in almost every class. Andrew\(^1\) was a student who often was a hub in the network; he frequently communicated the wants, needs, or desires of the classroom. He was constantly on the forefront of classroom negotiations, trying to help find the best way to accomplish an activity in the classroom. As a brief example, in one class period there were a lot of students who were frustrated with their place in the research assignment and would have liked to push back the due date of an upcoming paper. Students approached Andrew to explain their frustrations and their desire for a later due date. After that, Andrew asked other students about their place in the research process and gathered that it was a general consensus that a later due date for the paper would benefit most of the students in the class. From there, Andrew acted as the spokesperson for the class’ plea of a later due date. He explained the frustrations that the students were having with the research process and negotiated with me possible activities to help students with their research as well as a new due date for their paper. Here, Andrew was the hub that created a shortcut for me to connect with the rest of the class and their desire to push back the due date of the paper.

Daniel was the hub that other students turn to for help. Daniel was identified as a leader in the classroom because he tended to receive good grades and contributed thoughtful commentary to class discussions. Students often turned to Daniel for approval

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\(^1\) All student names are pseudonyms.
of their work. One example of Daniel as a hub is when a student was having a hard time with the protocol (protocols are the ways that nodes are able to connect to other nodes) that was used to introduce an assignment. When this happened, I called on Daniel for help and he often offered a different protocol to connect students to the assignment. Daniel was often successful in connecting students to an assignment that they had previously not understood.

Ken was the node who constantly asks questions. He was a very successful student, but it was only because he constantly asked questions for clarification, either for himself or for classmates. Classmates would often come to him to rally the rest of the class to find an answer for a question or to figure out something together as a group. Ken was excellent at expressing the confusion that arose in the classroom and crowd sourcing (using the students around him as a resource) for a solution. Many students were unfamiliar with some of the technology that I introduced in the class. One of the technologies that students struggled with was the blogging platform, Tumblr. Although Ken was often one of the students who needed a lot of help using technologies, he was excellent at gathering all the students who also needed help and they worked together to find a solution. For these reasons, these three students were chosen as illustrative examples to represent the movement within the networked classroom.

The analysis chapter that follows will show to the reader the building of the network from the first assignment of the semester to the final draft of the first large writing assignment, the Survey of the Field/ Research Proposal. Information from the interviews helps to make the case for the usefulness of the networked classroom.
Process of Analysis

When examining my data, I looked for evidence that illustrated the ways in which Network Theories created the learning environment of my classroom. To do this, I highlighted parts of the interviews where students showed that they used other students as a resource for learning or building understanding. I looked for places in the interviews where both human and non-human objects carried knowledge or influence in the network. Lastly, I looked for language that pointed to the different networking component being exposed in the network, such as protocols, shifting centers, hubs, or boundary objects.

The following chapter examines the affordances of a networked classroom for students. It will highlight the ways that students take on (or do not take on) agency and authority in the classroom when there is a center that is constantly shifting, as opposed to a classroom that is centered solely on the wants of the teacher. I argue that a networked classroom gives students a voice while promoting productive learning practices.
CHAPTER IV

DATA ANALYSIS

This chapter aims to make the network within the classroom visible through outlining and analyzing the work that occurred throughout the first five weeks of the semester, leading up to the first large writing assignment. Drawing from the frameworks discussed in Chapter 2, I illustrate the class activities that contributed to the building of the networked classroom, and ultimately to engaged learning through participation in the network. Further, I organized this chapter chronologically to illustrate that the assignment sequence builds upon itself in a network-like fashion. Since each assignment informs the next, it is difficult to move to the next assignment without completing the prior assignment. I tried to model my assignment sequence similarly to the interactions that I hoped would take place in the classroom between students; that students would inform each other and that it would be difficult to complete work in the class without the collaboration of others. This work demonstrates the importance of paying attention to how shifting centers, hubs, protocols, and boundary objects contribute to student success.

One goal that I had in constructing my classroom with a network overlay was to counter the private nature of writing. In a network, it is difficult for anything to be private because all of the nodes in the network are connected and influence each other. Spinuzzi, in his discussion of Latour, points out that:
All actants in the network—both human and non-human—simultaneously mediate each other. This mediation is carried out partially through translation, the way in which actants in a network delegate actions to each other and how that delegation changes the shared action of the actor-network. (22)

This stressed the importance to me that the first obstacle that I needed to work around was getting the students to believe that they are actants in a network and have the power to influence the entire network. This idea of student influence was unfamiliar to students and it was skeptically accepted.

**Constructing the Networked Classroom**

To begin uniting the class to create a visible network, my first tactic was to employ communicative action to create a classroom derived definition of Digital Culture. Communicative action was described in Chapter 2 as:

> [. . . ] the interaction of at least two subjects capable of speech and action who establish interpersonal relations (whether by verbal or extraverbal means). The actors seek to reach an understanding about the action situation and their plans of action in order to coordinate their actions by way of agreement [. . . ] communicative action is judged according to the criterion of reaching understanding. (Wertsch 11)

The first two weeks involved assigned readings and videos followed by class discussions. The goal was to begin to build an understanding of the theme of the class, Digital Culture, while proving to students that they did have the power to influence the entire network. I began to prove this to students through the creation of a purely network-generated definition of Digital Culture. Shaped from a combination of class readings and students’ own personal experiences and opinions, communicative action was illustrated by the classroom in producing our own definition of Digital Culture. This definition that the class mutual agreed upon of Digital Culture was constantly referred to throughout the
semester during class discussions, class brainstorms, and various other activities. Students were able to feel empowered early in the semester by this production and usage of our own definition of Digital Culture, as opposed to using a definition that was made by someone outside of our network.

Once students began to see themselves as influences in the network, my next challenge was to help make this network more visible to students. The network components that become visible through my illustrations of small group discussions and large class discussions are: shifting centers, boundary objects, hubs, weak ties and mediators. The first visible component when small groups are formed is a weak link and multiple hubs. Typically before a class discussion, I would ask students to get into small groups to discuss the reading and delegate a person as the note taker. When students form small groups, a weak link is formed between the instructor and each small group; this weak link made the instructor less visible and promoted the small groups to form hubs. Although the instructor may have given a task for the small group to perform, the instructor is not directly connected to the conversations that take place in the small groups. The roles that are delegated in the small group are through the students.

The second shift that happens in the network when students are performing a task in small groups is that the center is moved. The instructor is no longer the power center of the classroom, but rather the power is distributed through little clusters of students. Typically in the small groups, one student takes on the role of authority by delegating, prompting questions, and so forth. Placing students in small groups early and frequently in the semester helped tremendously in making visible the networked classroom because these groups promoted the building of a community. Engstrom and
Cole, in their article “A Cultural-Historical Approach to Distributed Cognition,” define communities as “[. . . ] a ‘division of labor’, the continuously negotiated distribution of tasks, powers, and responsibilities among the participants of the activity system” (7). When students are given the power and authority to distribute powers and responsibilities, they will form a community and begin to trust each other, thus combating the private nature of writing and making more visible the networked classroom.

The work that the students perform in the first few weeks consists of many boundary objects—that is, the relationship that students will have with another node in the networked classroom, such as a Reading Response to an assigned reading, may be different than the relationship between the instructor and that same node. Latour explains that this is a normal aspect of networks: “[. . . ] actors do not see the whole picture but remain only ‘informants.’ This is why they have to be taught what is the context ‘in which’ they are situated and ‘of which’ they see only a tiny part[. . . ]” (32). Latour emphasizes that nodes need to be told the context for each activity that they are involved doing.

The first illustration of boundary objects in the network appeared when the students were asked to read a series of articles and watch short videos that involved Digital Culture. Students may only understand these readings as a way to introduce the notion of Digital Culture to the class as well as to give our class material to discuss. My goal, however, was to have students begin to critically think and form opinions on a subject that is not foreign to their lives as well as begin to make visible the influences that students have in the network. In this case, most students understand a different context
for doing the assigned reading and the Reading Responses from the instructor. When students are placed in small groups to have a discussion about the assigned reading, the context for the connection between the students and the readings is vastly different for the student from the instructor, creating another boundary object. The small groups have a different purpose for the students and the instructor. The context for the instructor’s design of small groups differs from the ways that the students inhabit them.

As mentioned earlier, the small groups are meant to be a space that is free from the instructor’s authority, where students begin to form communities. Hubs are shown from the movement into the small groups. Small groups create a place where students can freely discuss their ideas and opinions without the direct influence of the instructor. Students can get their ideas validated by a small group of peers before speaking out in the entire class discussion. These small groups became short cuts in connecting students’ ideas and the class readings. On the other hand, the small groups have a different role for the instructor. As the instructor, I use this time to get ready for our large group conversations. I recognize that there is “a deliverable” that is made in small group discussions but not in large class discussions. I am listening in, from a distance, on these small group conversations for the different ideas being discussed in a way that is unique to small groups. From this, I was able to see that a hub, such as a small group discussion, can also be a boundary object.

I found it to be very important to give students numerous opportunities for them to share ideas with each other, especially while I was still trying to make the network visible to students. The next visible network component that emerged was that my grouping of students in small groups stems from ANT. “Allies” and “traitors” became
visible in the network through the various discussions that took place in small groups and entire class conversations. Spinuzzi expands more on the forming of allies and traitors in groups:

The actor-network continually finds ways to strengthen existing alliances and make new ones. Actants continually convince their allies to support them in their aims and form enough alliances that they can work around traitors. The actor-network, that is, constantly engages in a project that is essentially political and rhetorical and that involves both consolidation and expansion. Actor-networks expand through intersecting, enrolling, and translating other actants. They consolidate through ties that bind the ever-tightening mutual enrollment of intersected actants. (41)

As explained in previous chapters, ANT is highly interested in the political and rhetorical moves that are made in a network. Throughout the beginning of the semester, students work to find their “allies” in the classroom, that is, students who are agreeable in their opinions. Students aim to form communities and make connections with other students who would be good allies.

In the interview, Ken demonstrates the ways that “allies” and “traitors” appear in small group discussions.

Ken: We will listen to one person’s idea and if we like it, we will put it on the post and if not we will be like “I don’t know, rethink that and then come back.” So we will like… if we don’t like the idea, we will skip it and then come back after we have completed it.

Here, Ken’s small group decides that the ideas or opinions that are not agreeable to the majority of the members do not get written down in the notes that a group member is taking during the conversation. This does not mean that the student cannot voice his or her opinion during the entire class discussion and reach out to find allies outside of the small group. This simply means that this student’s idea will not be written down in the posted notes that represent this small group’s conversation. Galloway and Thacker
emphasize, “To have a network, one needs a multiplicity of ‘nodes.’ Yet the mere existence of this multiplicity of nodes in no way implies an inherently democratic, ecumenical, or egalitarian order. Quite the opposite” (13). Essentially, Ken is illustrating that the decision of the small group to ‘conspire’ against one member and leave out his or her contribution is a part of creating a network.

Students are able to share their opinions on the assigned readings in the small group conversations, not only to validate their opinions and collect allies, but also to find ideas that had not already occurred to them. Salomon, in his article “No Distribution Without Individuals’ Cognition: A Dynamic Interactional View,” emphasizes that when we engage with others for learning, everyone involved becomes more intelligent. He says:

We have to consider the possibility that, while cognitions can be distributed, they need a few ‘sources’ for this distribution such that they can operate conjointly. We also have to consider the possibility that each of these so-called resources, or intellectual partners, can also grow such that each subsequent joining of partners will become more intelligent. (Salomon 111)

This distribution, this sharing of “authority, language, experiences, tasks and cultural heritage,” (Salomon 111) makes all nodes involved in the conversation more intelligent. Students gain more knowledge when they are able to work in small groups together to create ideas. In the open interview with Daniel, he explains that collaborating with students in a small group setting allowed for him to think deeply about the subject, as well as gain different perspectives on the subject from the other students with whom he collaborated.

Gina: What to you is the value of participating in class, other than getting the information that you need? Is there some sort of value of participating in class? Is it a necessity?
Daniel: I think so. I see that everyone has questions that need to be answered so, um, I believe that beside clarifying goals or besides clarifying information that’s being taught, participation helps students to become more personally invested in the class and learning. They learn better since there is more meaning to what they are doing in the class\(^2\).

Gina: What are some of the advantages of learning from your peers?
Daniel: I think that, um like, learning from other students in the class is, ummm . . . they don’t put it in different terms, but I think that after they learned it themselves, and they like tell me about it, I get more refined information. It also helps me to bounce things off of other people and them bouncing things off of me, just helps to start to draw associations between umm the different chunks of information that I have. It makes one coherent understanding sort of built elaboration.

Without the instructor as a hub or center, the students in the small groups turn towards the student community and build a network with each other through different conversations about a difficult subject. Daniel felt that, after learning from the instructor and having the information discussed in a small group atmosphere, he could refine the information through collaborating with other students. As pointed out, students tend to get a more “refined” understanding of the subject when they are able to freely discuss it with other students. When students help each other learn, rather than learning solely from the instructor, they gain a deeper understanding of the material.

Once students had an opportunity to discuss the assigned reading, the conversation opened up to a large class discussion. During some class discussions, our network was able to reach a consensus on the subject, but in other discussions there were contradictory opinions. The center of the network moved again when the large classroom conversation is opened from small groups, also new groups were formed. As the instructor, I took on the role of mediator; I tried to complicate student responses and ensure respectfulness in the conversation. My role as mediator was to try to push students

\(^2\) Emphasis this author.
to think deeper about the topics that are being discussed through prodding questions. I tried to not take on the role of center, but rather let the center arise from the event of our conversation.

The node or nodes that took on the role of the center of the network arises always out of the conversation. As mentioned in Chapter 2, Watts discusses the ways that the center can emerge from an event, “Rather than leaders determining the events, quite the reverse might have been true, with the particular sequence of events and the peculiarities of their timing determines who it was that emerged as leaders” (54). This was seen in the different contributions that students were able to give during activities, because of their cultural, historical, and institutional influences. Students found themselves becoming the center during a class period because they were experts in the activity that was taking place in class. One way this was seen was during a particularly interesting conversation about cyberbullying. The majority of the class had little to no experience with the subject; all they were able to contribute was their opinions on the subject. One student emerged as the center of the network because she has been a victim of cyberbullying and was able to act as the expert during the class conversation. She became the person that other students directed their contributions towards, rather than the instructor. The center node was able to guide the conversation and push students to think very carefully and deeply about this serious subject. She offered her experience of cyberbullying and corrected any misconceptions about the matter. In this case, the event of our conversation created this young woman as the center of the network because of her expert knowledge on the subject.
As mentioned in Chapter 2, Latour says, “Groups are not silent things, but rather the provisional product of a constant uproar made by the millions of contradictory voices about what is a group and who pertains to what” (31). This was observed in the shift from small group discussions to the large class discussion. Students who found their opinion contradicting others in their small group, such as in Ken’s small group that was previously examined, formed an alliance with students that had similar opinions in the large class discussion. Although in the large class discussion, students did not physically move to mark their new alliance with a new node away from their original small group, an invisible new connection was made between the two allying nodes.

As mentioned earlier, class discussion produced different centers because different students were invested in the different subjects, opinions, or discussions. In other words, the event of the larger class discussion brought about a new center and differing allies, depending on the subject matter of the conversation. This was highlighted in one class discussion when students discussed the role of flashmobs in society and whether their purpose remains the same when a flashmob is viewed online rather than in person. To further our understanding of the ways that flashmobs operated in society, I suggested that our class conducted participatory observations and perform a flashmob. We had a long discussion to decide the type of flashmob we should perform and the way that we were going to perform our flashmob. The different opinions and ideas for the performance of the flashmob brought about several nodes competing to be the center in the classroom. Andrew was one of the nodes that were competing to be the center because he wanted his flashmob idea to be the one that was chosen to preform. Here, Andrew reflects on this discussion in our interview.
Andrew: Like when we did the flashmob. My idea ended up being chosen just because I threw it out there as one of the first ideas. You know, I put myself out there initially and then people were like, “Oh, that’s not a bad idea.” Then I had people who backed me and that’s how that got chosen. So I mean, in terms of that, I suppose that would be a leadership thing.

Here, Andrew recognized that his role as the center emerged out of the situation in the classroom. Similarly, students where beginning to see the network become more and more visible through the allies that were formed in voting for the flashmob idea. Students who wanted to be the center and have their flashmob idea be chosen began to recruit allies to make them the center. When the idea to perform a flashmob was presented to the class, Andrew found himself personally interested by the event, so consequently, he participated in the conversation. His participation in the conversation led to him becoming the center in the networked classroom. He competed for the position of center with other students, but he gained the most allies in the network. By the end of the class period, Andrew had gained enough allies to have his idea for the flashmob performance to be the chosen idea and he won the role of center. He had the authority over the decisions for preforming the flashmob and all inquiries and suggestions were directed to him, rather than the instructor.

The Network is a Resource

Once students had an appropriate handle on the notion of Digital Culture, it was time to begin their own investigations into Digital Culture. The class began this investigation through a class brainstorm. The goal of this activity was to give students an opportunity to discover their own areas of interest in Digital Culture that they would like to take up in the upcoming research paper assignment.
I used brainstorming activities to highlight that networks are a conglomerate of varying ideas and opinions. In networks, the nodes influence each other. Using several large pages of butcher paper taped to the walls of the classroom, students placed themselves into small groups and began to brainstorm. I asked the students to either consider different areas of Digital Culture that our class had not yet discussed or to elaborate on an area of Digital Culture that our class had already discussed, but in a new direction. Most of the class period was spent with the students brainstorming while I took notes on the interactions. After the brainstorming session, our class conducted a “Gallery Walk,” where the groups went around to look at the other posters. Students took pictures of the different groups’ posters with their Smartphones and asked questions to the group members.

This brainstorming activity allowed students to leave the classroom with at least one idea that they would like to investigate in a research paper because they socially constructed their knowledge of Digital Culture through the brainstorming activity. Pea, in *Distributed Cognitions*, argues that “Knowledge is commonly socially constructed, through collaborative efforts toward shared objects or by dialogues and challenges brought by differences in persons’ perspectives” (48). This brainstorming activity was successful in aiding students to find their own area of interest in Digital Culture because of the different perspectives that each node in the network brought. Spinuzzi reminds us:

> Workers move from one functional area to another and they pick up values and social languages from those areas as well as from other activities in which they take part. We have to talk about nets as well as knots; agency, competence, expertise, and cognition are distributed across the entire network. (48)
Students engaging with other students, presenting differing ideas and opinions on Digital Culture in a collaborative effort, led to a successful outlet for students to situate their interest in Digital Culture.

Similar to the constant making and re-making of groups mentioned earlier, another shift in the network that caused students to re-make groups, and therefore form new allies, is illustrated when students began to work on their own research projects. This caused a new shift in the networks because students seemed to place themselves in new groups according to the areas of interest in Digital Culture that they wanted to investigate further. Students found themselves making new allies and redefining their new group’s purpose. Alongside the need for networks to be continually formed and reformed, Galloway and Thacker explain the inclusionary nature of networks. They say:

While networks can be individuated and identified quite easily, networks are also always ‘more than one.’ Networks are multiplicities, not because they are constructed of numerous parts but because they are organized around the principle of perpetual inclusion. It is a question of formal arrangement, not finite count. This not only means that networks can and must grow (adding nodes and edges) [. . . .] (60)

This was the fourth regrouping for students and this would not be the last regrouping that the students would undergo. Students in the networked classroom were now involved in several groups and had several differing allies. Students were not asked to form new groups based on their areas of inquiry for their research project, they sought out these new allies on their own. This inclusionary arrangement of groups in the network holds true to the characteristic inclusionary aspect of networks: that they are always including and they are always shifting.
Since conducting research through the CSUC library database was a new task for them, the students turned to other students in their new groups for help. Pea says that this kind of distributing of intelligence is typical when people have similar desires. He says, “When talking about distributed intelligence, then, I mean that resources in the world are used, or come together in use, to shape and direct a possible activity emerging from desire” (49). Students posted their articles on a social bookmarking site called Diigo and helped each other find different articles on similar subjects. They promoted the sharing of information and distributed the load of research through collaboration. Students immediately saw the value of working together and distributing the intelligence in order to share this load.

Sharing the intelligence load happens, also, in the connecting of nodes. As pointed out earlier boundary objects and protocols play a key role in the connecting to nodes. Boundary objects are connections that hold different meanings to various nodes. Boundary objects are “[. . .] plastic enough to adapt to local needs [. . .] yet robust enough to maintain a constant identity across sites” (Spinuzzi 20-21). These are important in a network, especially in the networked classroom, because the boundary object will often hold a different meaning for the instructor and the students. Lastly, protocol is the way that two nodes are able to connect. When a protocol is unsuccessful, the two nodes will not connect. Protocols are “[. . .] the rules that make sure the connections [from node to node] actually work” (Galloway & Thacker 29). Both of these terms will be extremely important for examining the unsuccessful and successful connections of students to the first part of the writing assignment, the Annotated Bibliography.
Protocols and Assignments

When introducing an assignment to a class, instructors must select their protocol for approaching the introduction of the assignment to the student. In my introducing of each assignment to my class, protocol and the influence that a boundary object will have on a protocol is highlighted. In the first assignment, the Annotated Bibliography (see Appendix C), I illustrate an unsuccessful protocol and the influence that boundary objects had in making this an unsuccessful protocol. For each research source that students found, I asked them to make an annotation, which would be compiled into an annotated bibliography. The purpose for students creating annotations was to help them begin to organize the large amount of research that this project required. Below is the assignment sheet that is given to students.

When introducing the annotations into the network, I did not take enough time to set up the relationship that the students should have with this node in the network. This assignment was a boundary object and a hub in the network. My relationship with the annotations was radically different from the relationship between student and annotation. I was not directly involved in the writing of the annotations, so a weak link was formed between the annotations and myself. I did not recognize, at the time that the assignment was introduced using a protocol that would connect an instructor to the assignment, but not a student. In other words, my protocol was not connecting the students to the new node (the Annotated Bibliography) effectively. Galloway and Thacker stress that protocol is less about management and more about control:

As we shall see, protological control brings into existence a certain contradiction, at once distributing agencies in a complex manner while at the same time concentrating rigid forms of management and control. This means that protocol is
less about power (confinement, discipline, normativity) and more about control (modulation, distribution, flexibility). (31)

I explained the exact way that I would grade this assignment, without giving students a model for them to flexibly adapt to their inquiry. I recognize that I was more interested in power than control. Essentially, I tried to introduce the assignment through management and discipline, rather than by distributing the assignment in a flexible manner through the network.

With the first round of annotations that were submitted to me, I was surprised to see that several students did not take up the assignment in the way that I wanted. Many of the annotations would not prove to be an effective way to keep track of the research that the students were conducting, which was the ultimate goal of this assignment. I realized that in the introduction of this assignment sequence, my protocol was interested in norming the students on the structure and requirements of the assignment rather than modeling the assignment and distributing the relationship of the assignment throughout the network.

In reflecting on the paper, one student commented, “I’m satisfied by how Ms. Gibbs introduced the annotation section. The only problem was the first few, [sic] we didn’t know what she was expecting from the annotations so it took a little bit to figure out. After she went into further detail about what she wanted us to write about it got a lot easier.” Most students were able to situate the relationship between themselves and the annotations by the third annotation, but there were a few students who still had problems.

Andrew happened to be one of the students who had problems understanding his relationship with the annotations in the network. Because my protocol was
unsuccessful, I decided that the best way to help Andrew would be to direct him to Daniel. This time, I used a control approach to help connect Andrew to the annotations through modeling and distributing. Andrew commented on the help from Daniel:

Andrew: As to whether I learn from other people, it’s a yes and no. Um, when I had the problems with my first couple annotations, you, uhhh, directed my towards [Daniel] and I got to see what he was doing and I got to model what I was doing after him and that gave me the perfect example for what I needed to finish those annotations. So, in that situation, I learned a lot from [Daniel].

Daniel had proven that he was a more capable peer through his consistent excellent work in the class and so I asked him to model for Andrew his interpretation of the annotation assignment; Andrew was able to understand the ways that he should approach his own annotations after working with Daniel. My first attempt to connect Andrew to the annotation node was unsuccessful because it was through a power protocol, where I was more concerned with normativity and confining the students within the assignment requirements. My second approach in connecting Andrew to the annotation node was steeped in a control protocol. The protocol became assigned to Daniel; Daniel was able to model his connection to the annotation node for Andrew and show Andrew his relationship with this boundary object. This made the annotation node flexible to fit the research needs of Andrew.

The protocol used in introducing the next assignment, the Survey of the Field/Research Proposal, will illustrate my awareness of the boundary object and my successful protocol. After the students had completed seven of the ten assigned annotations, I began to introduce this assignment. The Survey of the Field/Research Proposal was directly built from the Annotated Bibliography. Students would be unable to complete the Survey
of the Field/Research Proposal assignment without finishing the Annotated Bibliography prior.

This assignment asked students to reflect on the work that they had done so far; begin to form claims out of the research that they had conducted in the first seven annotations; and lastly, make a plan for the rest of the research that was still needed in the last three annotations, as well as begin to visualize the actual final research paper (see Appendix D). I decided that I wanted to approach the writing of a research proposal paper in sections because students had reported that they had not previously encountered this genre, and those who had encountered this genre reported that they had not encountered it on the large scale that this class was requiring.

My protocol for introducing this new node into the network was much different from the introduction of the Annotated Bibliography. For the Annotated Bibliography, I explained to the students my expectations for this assignment, but did not help the students to connect to the assignment, because of this students had a difficult time understanding how to place the node into the network. For this new node (the Survey of the Field/ Research Proposal), I used a control protocol where I distributed the node from the very beginning to allow students to define their relationship with the node. For my introduction of this new assignment, I took advantage of the ways that networks individuate and deindividuate. As discussed in Chapter 2, these two terms are similar to looking at a photomontage, where far away appears one picture (deindividuation), but when looked at closely there are thousands of small pictures creating the one picture (individuation).
To begin introducing the assignment, I asked the students to arrange themselves into small groups. Taking students out of the rows that they tend to form and cluster the classroom into the small groups helped to begin to distribute the authority in the classroom. When students are clustered, they are not facing forward with their attention solely on the instructor. I pulled up the assignment sheet on the projector and students had their own copy of the assignment sheet as well. I asked the students to read individually through the assignment and then take a few moments to think about the requirements on the assignment sheet and the ways that their inquiry fits into these requirements. After the students spent a little time individuating the assignment, I asked the students to talk to each other about areas of the assignment that sounded confusing or needed clarification. Students immediately began having conversations and debates with each other about the meaning of the assignment.

After students had the opportunity to think about the assignment, I opened a blank Word document side by side with the assignment sheet on the projector. For the rest of the class period, the class worked together to put my assignment sheet into their own words. The Class Perspective in Appendix D is the assignment sheet that the class created. I typed their words verbatim.

After making the bulleted list of the assignment requirements, we put together a sample-formatted paper for the students to use (see Model Assignment in Appendix D). This sample-formatted paper was put together directly from the class discussions.

The class moved through the assignment sheet and created a new assignment sheet that restated the assignment, but in the words of the students. Allowing the network to define the assignment together and then rewrite the assignment helped this boundary
object to hold the same meaning across the network through communicative action. In Galloway and Thacker’s terms, the class deindividuated the assignment to fit generally into the network. The different nodes available in the network—such as the assignment sheet, annotations, and students—gave the students the means necessary to adapt the assignment requirements to create a protocol that would help all students link productively with the node. Over the next few weeks, students took the deindividuated assignment sheet and once again individuated the assignment to fit their specific project.

One student reflected on the benefits of restating the assignment into new words:

I absolutely loved being able to put the assignment into the own words of our class. I think that helped amazingly. I liked how the assignment was first introduced academically and professionally, but then we were able to hash it out as a class and make it easier to understand and comprehend. By far the most helpful thing was putting the assignment in our won [sic] words together. That made it so much easier to understand and think about. It was also really nice that we took a very good amount of time introducing the assignment, We were not rushed into it, and were given a very good amount of time to process and think about the paper and what exactly was being asked of us.

Because of the struggles that students had in adapting to the requirements of the Annotated Bibliography, I felt that slowing down the introduction and allowing the network to negotiate the Survey of the Field/Research Proposal requirements through communicative actions would lead to a more successful adaption to the assignment. When I felt that the students had an understanding of the ‘big picture,’ that is, they knew what was going to be expected in the Survey of the Field/Research Proposal, we began to work on the more specific aspects of the assignment sheet. My work in individuating the sections of the Survey of the Field/Research Proposal illustrates the use of Activity Theory’s social learning.
Synthesis was the first element that we began to tackle. I introduced synthesis early in the semester, but I did not bring it directly to the students’ attention that I was beginning to work with synthesis. I had hoped that by slowly incorporating synthesis early in the classroom without giving this type of reasoning a name or any rules, the students would organically start to incorporate synthesis type reasoning into their writing and conversations. An example of my early synthesis incorporation can be seen through Reading Response 2, which was assigned in the second week of the semester. Reading Response 2 asked students to reflect on the first assigned reading, a video available on Youtube, *An Anthropological Introduction to YouTube*, presented by anthropologist Michael Wesch and to compare the ideas with the second assigned reading, “Is Google Making Us Stupid?” written by Nicolas Carr. Figure 1 is the writing prompt for the second reading response:

**Response 2 Prompt:** In Tumblr, post in no less than 250 words, compare and contrast the messages of the authors Carr and Wesch. Which author do you agree with? Possibly you agree with parts of each author? In your personal experience, where do you think that these authors are correct/not correct? What was most interesting to you about Carr’s article? **Incorporate two quotations** from both Carr and Wesch into your response. **Include two questions.**

Fig. 1. Reading Response 2.

I wanted students to practice synthesis in their writing, so I included a prompt for several Reading Responses that asked students to attempt to incorporate the ideas from several authors with the ideas that were in the newest assigned reading. In addition to incorporating synthesis into their writing, during large class discussions, I would frequently ask questions to promote synthesis into the conversations. Daniel reflects on
the different large class conversations and the influence that they had on the growth of his writing.

Gina: Do you think that you would have done as well on your paper if you didn’t participate as much in class?
Daniel: I am inclined to say yes. When we have discussions and you would ask questions like “What would this author say about this author’s work?” It made me, you know, I started to think hard about that because I was thinking about the authors and their ideas and that helped me write my paper. You aren’t just saying something in an isolated factor; you are saying something with other people. I really felt like that mindset and approach would not be there if I had not participated in class.

In my past experience as a teaching assistant in other English 130 classes, I saw that learning synthesis was a constant struggle. I was fortunate to have witnessed the difficulty that more experienced professors had with introducing the notion of synthesis and wanted to combat it. I am pleased that Daniel and many other classmates were able to understand the concept of synthesis rather easily because of my prompting questions early in the semester that asked the students to think beyond the assigned reading by connecting the different readings together in new ways. Here, I relied on Activity Theory to begin to connect the node of synthesis into the network by using the social aspect of the classroom. By prompting whole class conversations with questions to promote synthesis, the students began to engage in a series of conversation that entailed synthesis. They used each other, in a social atmosphere, to work through synthesizing different ideas.

My second move in working with students on their understanding of synthesis illustrates the influence that non-human objects have in a network. During the introduction of synthesis, I gave my students the first and only worksheet that was handed out in the class. It is a modified version of a worksheet that one of my mentoring
professors used in his English 130 class several years ago. This purpose of this worksheet (Appendix B) was to help students synthesize their own research. Students found this worksheet to be extremely helpful because it allowed them to place the ideas from all seven annotations onto one single page. It allowed for students to individuate the notion of synthesis to fit into their inquiry. ANT reminds us that non-human objects can carry just as much weight in carrying out an action as actual humans:

> All actants in the network—both human and nonhuman—simultaneously mediate each other. This mediation is carried out partially through translation, the way in which actants in a network delegate to each other and not that delegation changes the shared action of the actor-network. (Spinuzzi 22)

Since the students’ research was too individuated to receive help through whole class or small group conversations, it seemed only appropriate that the instructor should offer the network a resource that each student can shape to be as individuated as their research.

In introducing the Survey of the Field/ Research Proposal, I had deindividuated the network. By this, I mean that unless a student came directly to my office hours, I treated all the nodes in the network (in respect to the Survey of the Field/Research Proposal assignment) the same. I did not individuate the students, their research, or their synthesis because it was still fairly early in the semester and I wanted to give the students time to work out their own ideas free from an “authority figure.” Most assignments and conversations that circulated around the Survey of the Field/ Research Proposal up until the first draft of the Survey of the Field/ Research Proposal were fairly low stakes because I did not want to grade their thinking-in-process. I understand that my class requires students to do many new tasks and that every student has a different learning curve. I do not grade students on their process, only their products.
Up to the first draft, my class had defined the assignment sheet, written seven research annotations, and had extensive class conversations about synthesis as well as the writing of the Survey of the Field/Research Proposal. However, I saw that students hesitated to begin writing the paper because it was a new genre of writing that none of them had previously encountered. Spinuzzi explains that history has much to do with development and that as an actor furthers into their development, activities become more complex. Spinuzzi says:

[. . .] Activity Theory understands history as development driven by contradictions that develop within and among activity systems. In this woven understanding, activities become more complex over time and forge increasingly wide networks with other activities, periodically forming and then dealing with contradictions. In dealing with these contradictions, activity systems transform themselves and their networks. (118)

Students come to their English 130 classroom with various notions about writing and the rules that are involved with writing. Some of these rules can transfer from one genre to another, but upon entering higher education these writing activities are going to become more complex and thus expose some of the contradictions of writing.

An example of one of the contradictions that was seen in students’ notions of the rules for writing was the usage of ‘I’. I asked students to write an introduction for the Survey of the Field/Research Proposal to follow more closely with the genre of a research narrative. I wanted them to use the word ‘I’ and take me on their research journey to tell me how they arrived at the claims that they were able to make in the body of the paper. This section of the Survey of the Field/Research Proposal that I thought would be the easiest to write proved to be one of the most difficult to write because it broke the “rules” that students had been taught, and thus exposed one of the many contradictions involved
in writing. Ken reflects on the ways that learning this new genre of writing was difficult for him:

Gina: So, the openness of the paper was hard for you to cope with?
Kevin: Yeah
Gina: Or the openness of the topic, I guess.
Kevin: Definitely the broadness. I prefer being instructed on what to do. If you gave me a topic, like in speech, in speech classes—the theme is government spending and that’s it government spending and so whenever you have a speech, you gotta choose your own topic. And, I mean, I did choose a topic—all of mine so far have been on foreign aid and that doesn’t necessarily interest me, I more chose it as, cuz no one else chose it. Uhhh…. I guess its because it is claim driven since it is the Survey of the Field where you have to come up with your own ideas. Like I said in our meeting, the one on one, our teacher in high school told us, “You don’t know crap, so you cant have your own ideas.” No ‘I’s’ or anything. This whole writing “I think” or “I know” or “I believe” in the Survey of the Field was definitely like jumping into a pool of cold water. Its completely new, and freezing, and shocking to you.
Gina: Ok, new writing style.

Ken explains here that writing the Survey of the Field/ Research Proposal was difficult for him because I was asking him to use the word ‘I’ in his writing; he was not used to being told to include himself into the paper. The first introduction that Ken wrote looked like a traditional introduction rather than the research narrative that I requested. Ken had a hard time, at first, believing that I was serious about students including themselves in their writing. Ken admits that this English class was the most challenging class that he took in fall 2012 because of the new genres and the contradictions:

Gina: What is your most challenging class this semester?
Kevin: Um, honestly I’d say its in English. I mean, especially with this research paper. I am not at all familiar with how we are doing it so far. So, it’s all new to me. I have to do the most work and figure to most stuff out. So..
Gina: So, is that how you kind of classify something as challenging? As something that introduces the most new…
Kevin: Yeah, new or unfamiliar subject that I have to take more time on than other stuff to understand and be able to do it.
About one week before the first draft of the Survey of the Field/ Research Proposal was due, I dedicated an entire class period toward writing the paper. Most students admitted that they needed someone or something to make them start writing the paper. They reported that being in the classroom and forced to start the paper helped them write the paper. Being inside of the network while working with several nodes of the network helped students to feel supported in beginning their paper.

Individuation is an important part of networks. When a network is viewed, it is typically viewed at a deindividuated stance; however, each node in the network is different. I illustrate the ways that the network needs to be individuated as well as deindividuated through my one-on-one meetings. The day that the first draft of the paper was due, class was canceled and replaced with thirty-minute one-on-one meetings in my office. Most of the whole class time, understandably, had emphasized the deindividuated nature of a network, suppressing the individuated. Therefore, I felt that students would benefit from individual attention. In these meetings, students needed to be either helped or validated. One student reflects on the value that students placed on the individuation that the one-on-one meetings allowed:

I think the most helpful part of the revision process was the one on one meetings. Having a personal meeting with Gina allowed for complete focus on my paper and ideas instead of the somewhat generalization needed when with the entire class. The one on ones allowed me to look at what I had done with my paper and get feedback from a knowledgeable source. At the meeting, Gina helped me with any questions I had and helped direct me in the right way.

Most of my interactions with students in the one-on-one meetings were very similar. I spent the first few minutes silently reading through the first draft of the paper. Some students had a completed first draft and some students had a working first draft
(meaning the paper was not finished, but a large chunk of the paper was completed).

Most students did not synthesize their research in the way that I had hoped; students tended to simply summarize their research rather than combining ideas from their research. As I read through each paper, I underlined sentences that seemed to be synthesizing while ignoring grammar and mechanical problems at this time. When I finished reading through the paper and making notes, I engaged in a conversation with the student about a revision plan for the paper. I pointed out the sentences that I underlined to illustrate places where the author seemed begin synthesizing and showed students the difference between summarizing the claims of other people and making their own claims that are supported by research. As seen in the reflection above, students highly valued the one-on-one meetings.

When the one-on-one meetings were finished, students had a second revision of the Survey of the Field/ Research Proposal due. The next node that came into the network was the work that happens in peer review. Introducing and facilitating peer review has always been a challenge for me as an instructor. I have received so much mixed feedback about peer review from the students; reports ranged from extremely helpful to not beneficial at all. Since I had spent so much time introducing the assignment and dedicating my office hours to one-on-one meetings, I did not think that I needed to practice conducting peer review with students. Instead, I took the class time to build the grading rubric with the students. Similarly to the introduction of the assignment, I also allowed the students to construct a network-negotiated rubric. The construction of the rubric demonstrates communicative action used to reach a mutual understanding and a control protocol in connecting the students to the rubric node.
According to the syllabus, the Survey of the Field/ Research Proposal was worth 25 points (or 25%), meaning that as a class, we had 25 point to distribute. I asked that each student take out both the formal assignment sheet and the class written assignment sheet to help create the rubric (see Rubric for Peer Review in Appendix D). Next, I asked students to start listing off different elements that went into writing the Survey of the Field/ Research Proposal. Once we had a list of the different things that this paper asked students to accomplish, we began to prioritize them. I told the students that I wanted to give them the most amount of points to the hardest parts of writing the paper, so we numbered our list to give point priority to the hardest parts of writing the paper. Below is the rubric that we constructed in class:

After the rubric was constructed students paired with each other and used the rubric to help guide the peer review process. Students wrote marginal comments and an overall comment at the end of the draft on each other’s papers. Once the peer review was completed as homework, the students were given several days to make the last revisions of their paper based on the peer review commentary before the final draft was due. I used the rubric that we constructed in class as the rubric for distributing grades. No student was surprised at the grade that they received on this Survey of the Field/ Research Proposal paper because the grading rubric and points were completely created by the students.

As shown through this study, this timeframe for examining the networked classroom was opportune because I was able to make visible the beginnings of the network up to the first major writing assignment. I was able to show the building of the network and the influence that
the human and non-human nodes have on the network. I used the class activities that assignments
to demonstrate the network components that are present in a social learning atmosphere.
CHAPTER V

CONCLUSION

The point of this study was to examine an approach to a student-centered classroom by designing the class to make visible the network characteristics that are present. By showing the students early in the semester that they are capable of influencing the network, they began to see the authority that they are able to take over their own learning. I illustrated this with my three student interviews. Andrew showed the ways that allying nodes make groups and influence the movement of the network. Ken showed the ways that students could use each other as a resource. Daniel helped to show that boundary objects exist in the classroom and that instructors need to be aware of them when deciding on their protocol for introducing an assignment.

Activity Theory highlights how social learning is a natural inclination for humans. Also, Activity Theory informs how our history, culture, and institutional experiences shape students in a way that carries into the classroom. In the small group work, students were asked to work with each other as a resource for forming definitions, analyzing class readings, conducting research, and other activities.

Actor Network Theory emphasized that both human and non-human objects carry intelligence and influence in a network. This was examined through the use of the assignment sheets. The assignment sheet for the Survey of the Field/Research Proposal was distributed to the class and then re-written by the class and put into their own words,
rather than the authoritative language of the instructor. This assignment sheet influenced
the network in the way that they took up the assignment and was re-dispersed by the
network through the class putting the assignment into their own words. The network had
two versions of the assignment, the official assignment sheet\(^3\) and the assignment sheet
that the class made, the two versions of the assignment sheet influenced the formatting
and content sections of the sample-formatting paper that was made by the class.

Lastly, several components of Network Theory were incorporated into design
of the networked classroom. The most notable components include: the shifting center,
hubs, protocols, and boundary objects. These were illustrated in the class in several ways.

The shifting center and hubs came out of the event that surrounded their
creation. When a student was particularly knowledgeable about a subject that was being
discussed in class, they tended to become the center of the network. Students would begin
to direct their conversations with the new center, rather than to the instructor. Hubs were
students that were able to help in creating a short cut for connecting two or more nodes.

Protocols were the ways that nodes connected to other nodes. There are no
right or wrong protocols, only successful ones and unsuccessful ones. This was shown in
my study through my choices in the introducing of assignments. It was shown that my
first protocol was unsuccessful in connecting students to the Annotated Bibliography
assignment and my successful protocol in connecting students to the Survey of the Field/
Research Proposal assignment. In reflecting on my introduction to the Annotated
Bibliography assignment, I realized that my protocol was unsuccessful because I
connected the assignment to the students by showing my relationship with the assignment

\(^3\) All assignment sheets are located in the appendices.
instead of showing the students’ relationship to the assignment. This is where awareness of boundary objects is important. Boundary objects were nodes in the network that carry different meanings to the other nodes in the network. I illustrated that another student had a successful protocol in connecting students to the Annotated Bibliography assignment because the boundary object carried similar meanings to these students.

There were several sections that emphasized power and authority. Networks have much to do with these two components through the shifting center that arises from the event. When there is a center in the network, that node is the one with the most power and authority, and therefore, has the most influence in the network. This functions a little differently in a classroom. Students are institutionalized to give the instructor the power and authority, usually without any negotiating or forming of allies. A combination of being in a classroom and holding the deindividuated identity of student is the event that creates the instructor as the center. Using a network overlay, the instructor needs to push back on this event and individuate the student identity to “expert in certain areas” because of each students’ own personal experiences. Individuating the student identity to allow varying “experts” to become a center out of an event distributes the power and authority throughout the network, however, the power and authority is still within boundaries. The instructor creates the assignments and the daily classroom activities, although influenced by the needs and wants of the students, are created by the instructor. It seems that in a networked classroom, although there is power and authority to be distributed throughout the network, it is distributed through agreed upon boundaries that are put in place by the institutional setting, the instructor, and the students.
Reflecting on my data collection, there is one aspect that I would have altered. Throughout my findings, I was only able to infer that this network was becoming more and more visible to the students. I gathered hints that this network was becoming visible to the students through the reflections that they wrote after each large writing assignment and the interviews with the three students. In continuing this research, I would suggest to incorporate into the student reflection assignments questions that would help to evaluate the visibility of the network. Helpful question suggestions include: How often did you draw on your own personal experiences to contribute to class discussions? When the class began the Survey of the Field/Research Proposal, did you begin to work with other students in the class with a similar topic? Why or why not? How would a student become a leader in this class? Have you had any of your ideas chosen in the class? If yes, why do you think that happened? If no, what would you do differently to have your idea chosen?

Additionally, in continuing with this research, I would like to compare two classes with the same syllabus and instructor for a semester. I mentioned in Chapter 2 and Chapter 4 that no network is the same as another because of the individuation of the nodes in each network. I was only able to observe, as a teaching assistant several semesters prior to my interest in networks, the phenomena that no class is the same, even if the class has the same syllabus and instructor. I have observed many times a class period that would operate successfully with student engagement in the learning, only to be a disaster in the next class period with the same instructor and same lesson plan. I would like to be able to have two classes under my instruction with the same syllabus to observe and compare. I believe that I would be able to better illustrate that all networks are different, even when put under the same conditions and another. I would be able to
analyze the success of protocols and better expose the messy and unpredictable nature of learning.

When instructors are designing a networked classroom, it is important to remember several things. First, students do not realize the ways that they can influence the network. Instructors need to demonstrate and model this for students often and early. Second, that the relationship that instructors have with nodes will almost always be different than the relationship students will have with the same node. When choosing the protocol for connecting students to an assignment, instructors need to approach the protocol with the students’ relationship to the node in mind or create structures that allow students an opportunity to share their relationship/understandings with these protocols.
WORKS CITED

Andrew. Personal Interview. 2 Nov 2012.


Daniel. Personal Interview. 2 Nov 2012.


Ken. Personal Interview. 2 Nov 2012.


INTERVIEW QUESTIONS FOR MY THESIS:

1. Tell me about your academic experience so far.
   a. What is your major?
   b. What classes have you taken?
   c. How are you doing in those classes?
   d. What are your goals or plans for your major?

2. Tell me about your participation in class.
   a. Do you participate the same amount in other classes (compare to the amount that you participate in our English class)?
   b. What influences you to participate in other classes?
   c. What influences you to participate in our class?
   d. What are the reasons that you participate in our class?

3. Tell me about leadership
   a. What constitutes a student leader in a classroom?
   b. Do you think that classes need a student to take the leadership role?
   c. What do you think that value is for having a student taking a leadership position in the classroom?
   d. Do you think that you have highlighted yourself in our class as a leader?
   e. Do you think that part of being a leader mean that you are also open to learning? Or asking for help?
   f. Do other students in our class often turn to you for help? To express frustrations? To ask for your opinion or advice?
   g. What is the dominant way in which you participate in our class (small group work, large class discussions, helping make class decisions, etc.)?
   h. In your opinion, what is the purpose or value of participating in class?

4. Networks
   a. Do you see this class as a collaborative class? Do you feel that you are learning from other people in the class as opposed to just the teacher?
   b. If so, how does that work? What do you get from learning from other students? What are the advantages?

5. I am going to ask you to talk me through your writing process in respects to the Survey of the Field/ Research Proposal paper.
   a. Tell me about how you began writing this paper. Did you start it at home, or did you wait until I forced you to start writing in class?
b. How did you work around the “hard parts” of writing this paper? Did you ask other students for help? Did you ask others to read your paper? Did you ask to read another student’s paper? Did you come directly to me?

c. What knowledge about writing did you already have and used in writing this paper? aka—I knew MLA formatting, or I was pretty good at organization before this class.

d. What did you need to learn in order to write this paper? – I don’t mean the researching part, I mean what skills did you need to learn in class before you could write this paper, like I needed to learn how to write a claim driven essay or I needed to learn how to do in-text citations.

6. Tell me about the ways that your participation in our class influences (or doesn’t) the quality of work that you produce.

   a. Do you feel that you learned about your writing by participating in our class?

   b. How much does your class participation help you improve as a writer?

   c. Do you think that you would have learned the same amount if you participated less in our class? Why?
APPENDIX B
SYNTHESIZED WORKSHEET

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<th>Title of Article</th>
<th>Brief Summary of Article</th>
<th>Arguments/ Claims Made in Article</th>
<th>Trending Ideas Between Articles</th>
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APPENDIX C
The purposes of this assignment are to organize your research and begin to ask critical questions about your area of interest. When you have decided, tentatively, on a focus or a set of questions, read and annotate ten scholarly/credible articles, videos, etc. In the academy, annotated bibliographies are the way that we sort out our ideas and our research. There are a few components to this assignment. For each scholarly article that you read, write an annotation that includes the following:

1. A summary of the article in **150 words** or more.
2. **Include one (or more) quotes** that are crucial for understanding the article. Use **MLA in-text citations** (see “Rule of Thumb” handbook for help).
3. Ask **two questions** about your subject that are fueled by the article
4. **A brief paragraph (100 words or more) that places yourself within this article.** This may take place in a number of ways. A place to start: How does this article line-up with your other readings? How has this article added to your understanding of your inquiry questions? How can you see yourself using this article in your research project?

The annotations are the backbone of your research project. State how much you agree or disagree with the points made in your sources and the reasons for your agreement/disagreement or point out the claims that are made within the artifact that you find most interesting. Go beyond summarizing the articles to make overarching judgments—about the quality of your sources; the implications of the different arguments or consequences of certain ways of thinking; the validity of the research sources for our understanding of you topic.
The purpose of this assignment is to allow you to reflect on all of the information that you have gathered and to create a plan of action for completing your research assignment. There are several parts to this paper.

1. Synthesize your sources. This means put your sources in conversation with each other. Explain the prominent questions, recurring arguments, persistent problems, and glaring gaps in the research that have so far. What seems to be the trending ideas? Does one author end where another author begins? How are your ideas being discussed? Is there any middle ground for opposing ideas? Compare and contrast your sources. You can take a concept and explain how the readings are shaping your understanding of this concept. What answers to your questions have you found?

2. In a paragraph or so, propose your research paper. What are the questions that you are asking? Why is your research important? Who is your audience? Who needs your research? Who has a stake in it?

3. Plan your research paper. Map out how you can imagine your paper to look. What questions do you still need to answer? How do you plan on finding those answers? Are there certain areas of your subject that needs more research? How do you plan on conducting that research? What needs to be done for the last two annotations?

The goal of the Research Proposal is to create a “dialogue” or scholarly conversation between the annotations you’ve done, our class readings, and class conversations. Surveys of the Field go beyond the critique of individual sources to determine the relationships among them.
CLASS PERSPECTIVE

- Figure out how to tie all your articles together and similarities. How are they common? How are they different? Do they answer your previous questions?
- Sets parameters for the focus of the paper-- what you are focusing on, what your research has told you, are there any gaps? Explain to reader.
- Who is interested in what you are talking about? Who does it effect/affect?
- Problems/ areas that still need more research
- What do you need from your last annotations?
- How are you going to find your missing information?
- Interpret your own ideas through the research
- What are the main conversations/arguments/ questions that are going on around your area of interest?
- How has your understanding of your project been shaped from your research?
- Walk the reader through your questions that brought you to where you are now in this project.
- Map out a possible layout of your paper. What claims do you see yourself making?
What sections are you going to make?
MODEL ASSIGNMENT

Survey of the Field/Research Proposal

**Introduction:**
Introduce your paper. What is your paper about? What questions did you ask to get to where you are in the paper now. How did this paper evolve to what it is now? Did you start broad, then narrow down your research? What is the main focus of your paper? What are your claims that you are going to make in your paper?

**Review of the Literature:**
This is the part of the paper that corresponds with the “number 1” part of the assignment rubric. This part of the paper should be rather lengthy. Since you are working with about 7 annotations, I am expecting this to be no less than three pages.

**Claim One:**
Obviously don't name this subsection claim one, give it a name that corresponds with your claims. Write all of the things that go with this claim.

**Claim Two:**
However many claims that you are going to make in this paper, you can make a subsection for them.

**Proposal:**
This section corresponds with the “number 2” part of the assignment. In a paragraph or so, make a proposal for your actual final research paper. If it helps, think of submitting this to a committee to be approved for a grant. You have to propose your project in a way that will make the committee want to give you money for doing your research. Point out the gaps in the research that is out there so far and continuing on with this project is important.

**Audience/Benefits:**
Who is your research paper going to be directed towards? Who has a stake in this research? For example, if you are doing your paper on the effects that texting has on our writing skills, there are several people who have big stakes in this research. The first and most obvious would be cell phone providers-- they don’t want bad publicity on their
products, so they have a large stake in your research showing that texting doesn’t have a negative effect on writing. Another population that has a stake in your project would be students in K-12 education who are still developing and refining their writing skills. Since everyone texts, the ways in which there will be a dichotomy between the language of texting and the language development of K-12 students. The parents of the students also have a stake in this research, for clear reasons. Another population that will have a less obvious stake in your research will be English teachers, especially writing teachers. Being aware of the effects that popular technology may have on the skill that they teach will help teachers be able to approach students better. Make sense?

Plan for Paper:
This is the section of the paper that corresponds to section 3.
Rubric For Peer Review

- Is there a narrative that guides the reader on the researcher’s journey that brought them to this point in their research?
  - This includes the guiding questions that were asked during this research and explaining different turns that the research took.

Not at all.........Somewhat..........Moderately................Well...............Fully
0                     .5   .5   .5   1

- Is the Review of the Literature claim driven?
  - Do they explicitly point out the claim(s) that they are making in this paper?
  - Does the claim(s) drive the sections of the paper?
  - Make sure that you are not seeing an informative paper, a lot of people needed to change their language in the paper from informative to claim driven (which is much closer to the an argumentative paper family).

Not at all.........Somewhat..........Moderately................Well...............Fully
0   .5   1   2   3

- Is there continuity to the essay?
  - Is there flow?
  - Do they use Old-to-New information flow

Not at all.........Somewhat..........Moderately................Well...............Fully
0  0  0  0  .5  1

- Does the writer use synthesis when using sources?
  - Make sure that their essay is not simply a repetition or summary of all of their sources, but rather uses the ideas that correspond to their claims.

Not at all.........Somewhat..........Moderately................Well...............Fully
0  0  0  .5  1
How does the writer use quotes?
- Makes sure that the quotes are supporting the claims and not the other way around. Make sure that there is MLA formatting after each quote.
- “Make sure that the punctuation surrounding the quote is correct too” (Gibbs 120).
- Some people were using long quotations incorrectly. If a quote is 4+ lines long, there is different formatting for it. Google OWL Purdue MLA for some help.
- Not using hanging quotes, always introducing the quote and afterwards explaining the relevance/importance of the quote to the claim of the section

Is the MLA formatting for the entire paper correct?
- Name and page number in upper right corner
- Name, date, teacher, paper title, spacing, etc.
- Using in-text citations after every quote, summary, or paraphrase
- Google OWL Purdue MLA for help

Does the writer use correct grammar and punctuation?
- Try to rewrite all sentences (not questions, obviously) that have the words what, why, and how. For example: The essay is going to talk about how the Internet is making society less intelligent. → This essay is going to explain the ways in which the Internet may be contributing to a less intelligent society.
- Are there any places that they need use a( ; ) instead of a( . ) or ( , )?
  - You use ( ; ) to combine two independent clauses that are related. It is used to show the reader that these two ideas are connected. For example: The point of using the semicolon is to connect two independent clauses; it shows the reader to pay attention because these two ideas are connected.
Do they fulfill all of the assignment requirements?
  o Intro contains the narrative journey
  o ROTL is claim driven
  o Proposal points out any holes, gaps, undeveloped areas, or new areas for research opportunities in their current research. Do you feel that they have a good idea for the ways that they are going to turn the research in this paper into the final research paper?
  o Aud/Ben section shows that they have a clear idea of who their audience will be and what their benefits will be from this research.

Not at all................Somewhat.......Moderately..........Well.................Fully
0                       0                      0                     0                   0                   3