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Amalgamating Critical Thinking and Online Communication

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in partial fulfillment of the requirements for the degree
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Abstract

Critical thinking as a product of student work involves analysis, interpretation, and problem solving to create new thought. There are gradations of critical thinking that score higher than others, though we consider all of them to be important towards development. The purpose of this study was to investigate the relationship among reading, writing, discourse, and reflection, and its impact on critical thinking. The researcher analyzed processes where students participated in activities that allowed for the development and demonstration of critical thinking skills.

This mixed methods study was conducted in a Mid-western school district with eighth grade students for the duration of one school year. It examined how students engaged in critical thinking through online written discourse. Students shared their ideas about a topic in synchronous formats. Data sources included typed online student conversations, surveys, rubric scores, and interviews with students.

Based upon the data collected from the study, this research recommends providing students with opportunities to research, analyze, interpret, and share their understandings of what they study. Furthermore, student participation --as a part of the design process within learning opportunities-- is essential for developing critical thought.

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Chapter 1: Introduction to the Study

Introduction

Critical thinking is the process involved in developing original thought. Although the outcome from the process can appear in a variety of forms, it requires analysis of an issue, reflection on that analysis, and then further refinement, or readjustment, in how one thinks about the topic. How is critical thinking identified? Where is this type of thinking most prevalent? How do educators promote critical thinking? Where and how do they recognize critical thinking when demonstrated by a student? McPeck (1981) explains that critical thinking does not take place in isolation and must be connected with thinking about something, another topic, or discipline (McPeck, 1981). Learners develop critical thinking skills through the discipline where “the problem arises, not by taking courses in problem solving, critical thinking, or logic” (McPeck, 1981, p. 17). Nevertheless, one of the most notable characteristics of critical thinking “involves a certain skepticism, or suspension of assent towards a given statement, established norm or mode of doing things” (McPeck, 1981, p. 6).

The design for the 21st Century Skills (2011) lists “Learning and Innovation Skills” as a major category in preparing learners for a future beyond school. “Learning and innovation skills are what separate students who are prepared for the increasingly complex life and work environments in today’s world and those who are not” (p. 2). The Learning and Innovation skills category includes such descriptors as creativity, innovation, critical thinking, problem solving, communication and collaboration (21st Century Skills, 2011). The Common Core Standards makes central the use of critical thinking skills and identifies levels at which students are

able to demonstrate them. The C3 State Standards (2013) explain that innovative skills are those that allow people to successfully move through the differing environments of academics, work, and public life (C3 State Standards, 2013). By the end of grade twelve, the C3 Framework for Social Studies State Standards explains that students should be able to “gather relevant information from multiple sources representing a wide range of views while using the origin, authority, structure, context, and corroborative value of the sources to guide the selection” (p. 55).

One method of cultivating the skills required for critical thinking is through writing. Harasim (1990) explains that learners see writing as an activity that is a more reflective form of interaction than talking in person or speaking on the telephone. When writing in an interactive setting, it requires a different set of cognitive skills that benefit learners (Harasim, 1990). One of the goals of this study is to identify critical thinking experiences where students consider numerous possibilities that are developed from a variety of resources and from the ideas offered by other students. Another goal is to discover if an online format for communication helps students to develop claims and counterclaims using evidence. Online communication provides an opportunity for students to reflect and organize their thoughts through writing, collaboratively sharing ideas in a give-and-take process, and communicating a more nuanced understanding of the topic as a result of this participatory interaction (Harasim, 1990).

Problem Statement

The College Career & Civic Life C3 Framework for Social Studies is a program designed by “representatives from a group of state education agencies and

from the leading organizations in social studies and its individual disciplines collaborated to create a Framework to provide states with voluntary guidance for upgrading existing social studies standards” (C3 Framework, 2013, p. 6). The goal of the Framework is to guide states in their efforts to create standards in social studies curriculum, “that prepare young people for effective and successful participation in college, careers, and civil life” (p. 6).

In the “Developing Claims and Using Evidence” dimension from the C3 Framework for Social Studies (2013), Readiness Table 26 asserts that by the time students complete high school they should demonstrate an ability to, “Identify evidence that draws information directly and substantively from multiple sources to detect inconsistencies in evidence in order to revise or strengthen claims” (C3 State Standards, 2013, p. 55). This is exactly the type of thinking in which the participating students, in collaboration with one another, have an opportunity to engage.

Through the use of Ebackpack, an online communication forum, students share their ideas in response to historical texts. Participants are only able to enter the conversation through an invitation from the researcher. Through invitations students are able to participate by writing contributing thoughts. The program provides a forum structure in a closed setting where students can participate in the conversation.

As students participate, a written record builds that allows for the development of thought based upon what each student contributes by typing their thoughts into the shared discussion. Student participants can further the conversation by reviewing, reflecting, and responding to the record of previous written contributions made by students within the same class participating in the same

conversation. Students have the opportunity to develop their ideas based upon the design of the classroom online conversation, the reading assignments, and the ideas that fellow classmates share with one another in the common online communication space.

Critical thinking in the form of evidence-based claims and counterclaims is an essential element to this study. Observing and analyzing how students engage in the process of critical thinking provides educators with an opportunity to develop a fuller understanding of how students form ideas, and to investigate what it takes for people who are participating in a dialogue to reconsider ideas. According to McPeck (1981) Critical thinking manifests itself through skepticism. The withholding of belief that is an essential part of skepticism serves the purpose of moving towards solving a problem. Skepticism allows for stakeholders to consider alternative ideas that move the action towards an improved version of resolution (McPeck, 1981).

How do students share their ideas while also considering the contributions that their fellow classmates bring to the conversation to help form understandings about the topic of study? “New technologies introduce powerful environments to enhance social and intellectual connectivities” (Harasim, 1990, p. 39). Harasim (1990) explains that educators are left to wonder whether or not utilizing computers for learners as a resource to conference about ideas enables people to improve their social and intellectual skills (Harasim, 1990).

Purpose of the Study

The purpose of this study is to discover how eighth grade social studies students explore the history of the United States of America while engaging in the

process of critical thinking and while constructing meaning through online communication.

Research Questions

The research questions within the study include the following:

1. Does participation in an online written conversation help students construct meaning?
2. How and when do learners alter their understanding of ideas while participating in online written conversations?
3. How does participation in online written conversations influence the way that students make meaning?
4. How do students demonstrate critical thinking when participating in online written discussions?
5. How does the structure of a conversation influence the type of critical thinking in which students engage?
6. When students participate in online discussions that are followed up with rubric-based assessments -such as Likert scales and reflective writing- do they show improvement?
7. What do students reveal about learning from reflecting on their participation in online written conversations?

Delimitations / Scope of Study

The study participants include eighth grade students enrolled in a social studies class that explores the history of the United States of America from 1865 to the present. The study focuses on how these students interact through online

communication while utilizing critical thinking skills. The study quantitatively measures student performance regarding the use of evidence within online transcribed conversations as students offer claims and counterclaims.

There are 18 eighth grade students participating in this study. The researcher has taught 10 of these participants in previous grade levels and for other classes. Because of this, it is possible that some of the participants may already be familiar with the process of communicating online as a classroom activity. These students have experience with the vocabulary and the expectations from the researcher on the type of thinking and communicating that this study identifies.

The focus of the study is on how students form knowledge through gathering evidence and participating in an online written conversation. These online conversations serve as the tool for students to form knowledge and to explain their understandings of the topics. The role of the computer in online conversation serves to “augment rather than automate human intellect and interaction” (Harasim, 1990, p. 40). In facilitating online conversation, the computer offers the learner a way to actively develop knowledge by producing concepts and organizing and clarifying these concepts through the act of writing thoughts into words. The concepts are further developed and refined through sharing, reading and thinking about the reactions of others and crafting responses (Bouton & Garth, 1983).

Definition of Terms

Claims: “Statements of belief or opinion rooted in factual knowledge and evidence that result from analysis of sources in an inquiry” (NCSS, 2013, p. 97).

Counterclaims: “Statements that challenge or respond to claims, using evidence that contradicts a claim” (NCSS, 2013, p. 97).

Critical Thinking: “The art of thinking about your thinking while you are thinking in order to make your thinking better: more clear, more accurate, or more defensible” (Paul, 1992, p. 243).

Deep Learning: “Learning that is integrative, self-reflective, experiential, self-assuring and engages different dimensions of the learner and promotes growth of the whole person” (Majeski & Stover, 2007, p. 172).

Ebackpack: An online software classroom management tool. It allows for classroom students to participate in closed online written conversation through its forum feature.

Evidence: Information taken during an analysis of a source that is then used to support a claim made in response to an inquiry question (NCSS, 2013, p. 99).

Interactivity: Communication between learners that “demonstrates critical thinking and application of important course concepts to cases and their own lives” (Majeski & Stover, 2007, p. 176).

Sense of Community: A phenomenon that develops when people share a common environment or interest (Rovai, 2002).

Social Learning Theory: Learning takes place through engagement in actions and interactions in communities of practice. For learning to happen, the concepts of participation (the notion of taking part in both action and connection with others) and reification the idea of turning our experiences into “thingness” (Wenger, 1998, p. 58), are viewed to be very central (Wenger, 1998).

Social Presence Theory: Immediacy enhances social presence, which in turn enhances interactions (Wenger, 1998).

Transactional Approach to Distance Learning: The teacher assumes the role of a facilitator of learning rather than a dispenser of knowledge. The role of the teacher is to design and implement strategies that assist in allowing the teacher to assume this role (Care, 1997).

Significance of the Study

In this study, students interact with texts, collaborate with peers, and write about their reactions to both the texts and the thoughts of their peers. According to Johnson (1979), exploring issues as a group may result in cognitive growth (Johnson, 1979). The interaction may take the form of controversy, debate, brainstorming, or problem solving. “Students who experience conceptual conflict resulting from controversy are better able to generalize the principles they learn to a wider variety of situations than are students who do not experience such conceptual conflict” (Johnson, 1979, p. 67). Harasim (1990) explains that peer interaction is an important characteristic in bringing about change in the way that people think about an issue. It allows for participants to process information through reorganizing and prioritization. By working through this continual process as individuals and as a group, it can change attitudes (Harasim, 1990). This study provides the researcher with an opportunity to see this process in detail. This includes the design of the discussion to the words that students use to interact with one another in written text.

The forum, on which students write, is the collective record of the conversation that participants can refer back to at any point. It serves as the collective

thought in terms of memory, conscience, and evolution of ideas that the learners have shared with one another and as a “shared file” (p. 45), that “holds the individual members of the group together and enables a ‘conversation’ to take place” (Harasim, 1990, p. 45). The study is significant in that it allows the researcher to analyze how these conversations develop.

Harasim (1990) explains the theory behind collaborative learning is a process where a group is connected as its members continuously clarify their statements for each other, alter their earlier responses where they agree and disagree, and refine each other’s ideas. While they are participating in this process, participants introduce new ideas and discover connections that they had not seen beforehand. The result of this collaborative process is that knowledge advances (Harasim, 1990).

The primary reason for educators to encourage students to engage in critical thinking is to help students improve their thinking skills. This study provides the researcher with an opportunity to view, analyze, and describe the manner in which learners engage in critical thinking through interaction with peers and the writing process. The act of formulating thoughts into a written format, “requires what might be called deliberate semantics – deliberate structuring of the web of meaning” (McGinley and Tierney, 1989, pp. 99-100). Writing is a part of the thinking process that requires people to hold their thoughts, organize their thoughts, and present their thoughts in a manner that they can share so that others are able to derive meaning from what is written. It is during the writing process “that we discover what we think” (Tierney, 1989, p. 24).

Introduction to Theories in Practice

Several theories help the researcher analyze the data from the online conversation. Social Learning Theory explores how individuals participate in their communities to create meaning and identity. It understands participation as a crucial element in acquiring information, making sense of the environment, and applying knowledge. The online conversation allows for students to create, share, and respond to their fellow classmate's thoughts. Social Presence Theory focuses on the act of writing as a part of the process in forming knowledge. By writing in the online conversation, learners are able to observe, reflect, and alter their understandings in a manner that is both participatory and recursive. As students type their thoughts into the online conversation, they are able to observe how their ideas transform throughout the course of the conversation. An online conversation provides students (and the researcher) with a written record where they are able to review, reflect, and respond to without having to try and recall what was previously stated from memory alone. In reviewing the earlier statements within the conversation, students are able to build direct connections that allow for the conversation to evolve.

Sense of Community is the focus on how the facilitator creates a functioning classroom environment. The facilitator accomplishes this by communicating the goals, expectations, and the processes of the classroom. Trust, respect, and the quality of the online conversations are characteristics that the researcher communicates to the participants through feedback in the form of journals, rubrics, and verbal acknowledgement. Finally, in the Transactional Approach to Learning, the teacher assumes the role of a person who supports and motivates students in their online

communication. The teacher identifies the technology that best suits the goals of the curriculum, provides timely feedback, and provides the structure for the online conversation. In this study, the teacher is familiar with the curriculum to select the topics for the conversations, with the technology to facilitate the conversation, and communicates the purpose and design of the conversation so that students are able to participate in critical thought.

Pillars of learning

The act of participating in an online written conversation might serve as four pillars to learning required for an educational system to realize success. These four phrases and their brief descriptions are essential understandings about learning.

- “Learning to Know” is about acquiring the instruments of understanding.
- “Learning to Do” describes the knowledge of how to behave in a particular environment.
- “Learning to Live Together” refers to people cooperatively working with others in human activities.
- “Learning to Be” is about people discovering and acting on their potential through varied dimensions so that individuals can achieve a sense of fulfillment (Nanzhao, 2000, p. 3).

With worldwide economies becoming increasingly more globalized, people will need to work with technology seamlessly to communicate without having a physical presence. At the same time, students must be required to make sense of data, solve problems, and think critically in a cooperative manner. The lack of physical presence

with someone else will not serve as a reason for not being able to use these skills (Nanzhao, 2011).

Social learning theory

Wenger (1998) defines the social theory as social participation in a process of being active participants in the practices of social communities and constructing identities in relation to communities. Social theory takes into account that participation must be a part of the learning process. Learning is something that takes place in the actions and the interactions that one has in relation to the community. As learners participate, they are both taking part in actions and connecting with other people. The learning process evolves from participation and continues through with the development “reification” (Wenger, 1998, p. 58), where the learner takes the participatory experiences and transforms them into “thingness” (p. 58), or something that the learner can take, understand, and apply to their existence. According to Wenger (1998), “forms of participation and reification continually converge and diverge in moments of negotiation of meaning that come into contact and affect each other” (p. 58). The participatory process is what allows the learner to integrate and make knowledge into something that is useful and operational. It is the process of acquiring new knowledge, making sense of that knowledge, and applying the knowledge to their known environment (Wenger, 1998).

Social learning theory identifies that the learner is at the center of the educational process. The goal is for the learner to integrate and make meaning of the information through active participation. This participation is essential for “individual development of cognition” (Sorenson, Takle, & Moser, 2006, p. 243). Through

participation, learners develop voice and identity and in turn this process promotes “development and socialization of learners to become democratically oriented global citizens” (p. 243). Majeski (2007) explains this development occurs when students are able to interact within the classroom collaboratively. It allows for students to respond to one another so that they are able to combine critical thinking, the application of core course concepts, and experiences within their lives (Majeski, 2007).

Social Presence Theory

Social presence theory places an emphasis on the immediacy of interactions between people. The fact that people respond to one another in a relatively short amount of time helps to create both individual and collective understanding. It enhances social presence, which in turn enhances interactions and allows participants to form knowledge. This idea is similar to that of immediate feedback that a teacher provides to a student about his or her writing or understanding of an idea (Zhang & Ge, 2006).

The social presence theory, combined with the fact that students are to write about their understanding as well as respond to the ideas of others, contributes to their learning because they are processing their thoughts by converting abstract ideas into concrete expressions. Students articulate their thinking through the writing process. There is the added benefit to the classroom discussion in that “collaboration enhances connectivity and socio-emotional engagement to the learning process, as well as creating an intellectual climate that encourages participation” (Harasim, 1990, p. 54). At the same time, students are actively improving their writing skills. Their writing

and thinking in the process of participating in an online conversation is described by McGinley and Tierney (1989):

Writing is thinking made tangible, thinking that can be examined because it is on the page and not in the head invisibly floating around. Writing is thinking that can be stopped and tinkered with. It is a way of holding thought still enough to examine its structure, its flaws. The road to clearer understanding of one's thoughts is travelled on paper. It is through an attempt to find words for ourselves in which to express related ideas that we often discover what we think (p. 24).

In order for the online classroom conversation to work effectively, students must be able to express their thoughts clearly, and it requires that students possess strong written communication skills. Even if students are able to write and communicate effectively, one must expect that they will experience growth in their ability to use technology to communicate, and as a tool for learning (Carey & Dorn 1998; Miller & Lu, 2003). Technology combined with student interaction, provides students with a sense that they learn "something from the discussion" (Swan & Shih, 2005, p. 127) and that the learning was due "to their interactions with classmates" (p. 127).

Sense of Community

Sense of community is where the teacher or facilitator has the responsibility to build understanding among students in the classroom. Any time people share a common interest there is a community. This does not mean that a community is

without differences or disagreements, but that the ties that bind the people together are still stronger than those that drive them apart, and thus keep the group working together for a shared interest. Understanding takes place among learners as information is exchanged. It is important to create a “classroom community... defined in terms of spirit, trust, interaction, and commonality of expectation and goals” (Rovai, 2002, p. 4). The quality of an online conversation is strongly influenced by the tone of that conversation. When the classroom culture understands the common goals and expectations that everyone shares, the quality, focus, and respect that take place during the conversation support the development of a dialogue where students critically think about the ideas based upon textual evidence.

Designing the conversation is only one part of the process in making sure that students develop and engage in critical thinking. The other part takes place during the conversation in the form of feedback. As much as the focus is on the learner in social learning theory, the teacher still maintains a vital role in the learning process. Majeski (2007) explains that educators ought to continuously show their presence in the classroom conversations by encouraging students to refer to the text, asking about the understandings that they are taking away from fellow students, and elaborating on the contributions published by fellow participants. Also, the instructor should encourage students to post provocative questions that cause the group to think more deeply about the topic (Majeski, 2007).

Teachers are able to design classroom conversations so that students are able to participate and think about topics critically. Majeski (2007) identifies four types questions to foster critical discussions. The first is the guided discussion. This is

where an instructor posts a set of questions where students respond by applying their knowledge critically. A second is the inquiry question. This is where students work through a set of questions that show a relationship or explain a concept. A third question is the reflective question. Here the questions are published so that students increase their awareness of the learning process. The fourth type of question is exploratory. In this type of question, students respond to a scenario that allows participants to develop alternative perspectives and explanations to resolving a problem (Majeski, 2007).

Transactional Approach to Learning

In the transactional approach to distance learning, the learner takes the center stage in the learning process while the teacher assumes the role “of reinforcer, clarifier, encourager, organizer, facilitator, reassurer, praiser, supporter, confidence builder, and evaluator” (Care, 1996, p. 2). Through the use of three main strategies--group discussions, journal writing, and learning contracts--for engaging students in online dialogue, the teacher plans and implements educational strategies and activities to promote learning. In terms of providing a structure for the online learning environment through the transactional approach to distance learning, the teacher is responsible for making regular contact with students, having the class meet face-to-face for purposes of networking and support, and selecting the technological tools that support the objectives of the class. The ability for the teacher to provide prompt feedback to students is also an important feature of whichever technological tools are selected by the teacher (Care, 1996).

Summary

This study explores and analyzes how students create meaning through critical thinking while using online discussions. The extant literature is limited, in part because of the emerging technology available to facilitate such discussions. A study of how technology is used so that students create meaning and engage in critical thinking is rare.

This study affords an opportunity to understand how students engage in critical thinking and how the structure of the conversation influences the type of thinking. Also, the writing process plays a pivotal role as an agent for change in how students think about a subject. The online discussions require students to write out their ideas, which provide insight into how the learners create meaning through communicating with one another, analyzing evidence, interpreting information, and sharing understandings.

Chapter 2: Review of the Related Literature

Introduction

Critical thinking is the gold that educators attempt to mine when working with learners. Understanding facts and content is important for anyone. Learning how to think about information, how to use the information to create new understandings, and how to solve problems makes learning into an enlightening experience. What is the value of acquiring content knowledge, if learners are not able to manipulate its parts into an experience that provides for a deeper understanding? Critical thinking and metacognition are siblings, participating in a cycle of conflict, reconciliation, and evolving understandings. Each phase is important to the advancement of knowledge and understanding.

Through this literature review, the reader explores the variety of methods, mediums, and pedagogical practices aimed at developing critical thinking skills. Each of the methods explores the process of developing critical thinking through interaction and participation of the learner with other learners. The researcher explores how students create meaning while participating in online discussions. The researcher also explores how learner involvement in the thinking process develops their thinking. How do students engage in a discussion that stimulates them to think critically? This study is designed so that student interaction is crucial to the development of thought, since McPeck (1981) explains that critical thinking is not a phenomenon that “manifests itself in connection with some identifiable activity or subject area and never in isolation” (p.5). Online discussions provide educators with

an opportunity to structure an environment for students to process their thoughts through writing, communicate those thoughts with peers, and refine their thoughts through feedback. Online discussion also offers opportunities for students to learn to think critically by practicing the skill of asking questions. Passamore (1967) explains that thinking critically is learning to question, and knowing the types of questions that elicit the information required to advance understanding (Passamore, 1967). The computer is a tool that allows the educator to combine the elements of writing, communicating and refining their thoughts. Di'Angelo (1971) defines critical thinking as, "the process of evaluating statements, arguments, and experiences" (p. 7). How can educators design online communication that enables students to participate in, develop, and show this type of thinking in action?

Group Thinking

One of the strongest elements in the process of developing critical thinking includes group-thinking characteristics. Critical thinking can and does take place in isolation, but it is often enhanced and more elaborate when group dynamics are a part of the process. Vaca, Lapp, and Fischer (2011) state that group work is the result of collaboration involved with class projects; students explore questions that serve to motivate, increase participation, and provoke thought through the analysis of issues. Harting, Long & Sloan (2011) explain that an example of this collaborative process can be found in literature circles. This is a learning community where students are able to choose readings from a list created by the instructor. Based upon their selections, students engage in reading, interpreting, and explaining their understandings from what they have interacted with in the reading. Literature circles

involve student engagement through interaction as students share the ideas that they have created relative to their life experience (Hearting, Long & Sloan, 2011).

Evaluating the quality and quantity of critical thinking becomes difficult when used in groups. How does an educator measure the level of critical thinking that has taken place within a group? Fischer, Lapp, & Vacca (2011) explain that collaborative projects provide students “with an opportunity to become more active participants in their work. When planning group work, it is important to design tasks that promote conversation and also allow measurement of each student’s individual and group participation” (p. 375). Through conversation, students are able to participate in the act of problem solving by viewing an issue from multiple perspectives. The participants may not have considered many of the perspectives previously, and can consider them through the conversation with others.

Critical awareness, which involves multiple perspectives, takes into account “the diversity of society and the importance of inclusion” (p. 374). An example of critical awareness from the social studies curriculum is exploring the effectiveness of a campaign poster in support of a political candidate. One could consider the possible reactions from a person living in the time period during an historical event, or the possibilities of how introducing a government policy could impact a community. Critical awareness has students consider, as a group, the possible outcomes of a hypothetical situation through the use of their collective imagination and prediction skills.

Another form of critical thinking within a group that allows students to create meaning is debate. Kuhn & Crowell (2011) designed a debate where one member of

team takes the “hot seat” to debate a counterargument from the opposing side. In the process of the debate, students of either team were able to huddle to meet with their team for up to one minute (Kuhn & Crowell, 2011). This time to confer with their teammates helped students state their point of view, either through clarification or recalling important pieces of evidence, to support their argument. The authors mention that before students were assigned to write individual essays, they performed dramatizations, and participated in whole class discussions. These offered opportunities for students to share their understanding through differing perspectives and through references to evidence, and they practiced weaving ideas into their understandings.

Critical Literacy/Argumentation

Rozansky & Aagesen, (2010) explain that although critical literacy is related to critical thinking, it is defined separately. Critical literacy studies how people are placed within society. It investigates relationships by exploring who has and doesn't have power, and how it is used to either uplift or oppress other people. Rozansky and Aageson (2010) claim that critical literacy is of a higher order than critical thinking. Four characteristics that help to define critical literacy include: 1) it promotes reflection as an agent of transformation, 2) it focuses on the problem and its complexity, 3) it adapts to the texts used, and 4) it examines multiple perspectives (Rozansky & Aagesen, 2010).

Critical literacy is the approach that researchers deem essential for participating responsibly in a democratic society. Rozansky and Aagesen (2010) provide an example where students participated in theatre to experience the text. By

participating in the interpretation of text, the meaning “both shaped the text...and was shaped by this process of creating it” (p. 70). The example of critical literacy through theatrical performance and interpretation supports and further develops the idea as explained by Knickerbocker & Rycik (2006) that the use of varied texts does not ensure that readers do develop a respect for cultural differences. Critical Literacy is the process that guides students through reflection, discussion, and writing about their thoughts. This process allows for literature to serve as tool for enlightening students about the relationships that surround their environment (Knickerbocker & Rycik, 2006). The researcher investigates an environment that is similar to theatre. The setting will be an online conversation. During the online classroom conversations, students experience opportunities to participate and share their unique understandings in a manner that allows for them to recursively shape meaning. The researcher assigns students to write responses to prompts based on assigned readings, interpret the meaning of what they read in relationship to the prompts and responses from classmates.

One of the main points of critical literacy, and a focus of this study, is to investigate how students understand the connecting relationships in society. Through participating in online written conversation, students read, write and communicate their evolving understandings so that they are part of a process that allows them to make meaning. While critical thinking involves the understanding that students make personal connections within the text through their own personal experiences, critical literacy works differently. Knickerbocker & Rycik (2006) explain that interpretation is a process where social and cultural factors cannot be separated from practice.

Students are asked questions about what a text means from the standpoint that they are of a different gender, race, or ethnicity. The goal of the questions in the critical literacy approach is to show that literary texts have multiple meanings that require input from differing perspectives to reveal their fuller meanings (Knickerbocker & Rycik, 2006). This understanding and use of critical literacy for students to explore the different perspectives of a text is comparable to Rozansky and Aageson's (2010) explanation that creating experiences for students to participate in theatre engages them in the skill of critical literacy. Theatre transforms the learning experience "into an effective tool for the comprehension of social and personal problems and the search for their solutions" (Rozansky & Aagesen, 2010, 460). Online discussions offer a setting for discussions to include elements of critical literacy. In this study, students write in responses to texts and to facilitator-generated prompts. How do students bring their unique perspectives to how they understand the issues within the discussion? How does sharing their perspectives shape the understandings that their fellow students take away from the discussion? The online discussion provides opportunities for all students to share, to be read from, and to shape a collective understanding of where participants may or may not agree. It serves as a common basis of experiences, examples, and thoughts from which they are able to develop understandings.

Critical Thinking as a Process

Another aspect of critical thinking involves processing how students make meaning from the information. Holdren (2012) explains how high school juniors combined details from a reading, personal experience, and metaphors to interpret the meanings

within the text (Holden, 2012). The design of Holdren's study was based upon research from journals and books that used evidence to support the effectiveness of using the visual arts for students to create meaning. One example is that "art education theorists such as Arnheim Corwin and Eisner and Efland, have established a clear link between the brain's cognitive processes and art activities. Specifically, research connects experiences in the arts to higher level thinking and problem solving skills" (p. 700).

Connor (2003) uses reader response theory to investigate the use of paintings to engage students in critical thinking about the historical event known as the Middle Passage where people were brought from Africa and sold into slavery in the Americas. One of the main goals was "an effort to extend class discussion" (Connor, 2003, p. 240). As the students read and viewed the paintings in the book, they were to monitor their emotional responses. The idea behind the process was to "build upon the transaction between reader and text to encourage students to identify explanations, form opinions, and create meanings based upon their individual reading of a text" (p. 241). The focus of reader response theory is to build this connection between the reader and the text. Though the book of paintings was the main source of information, students also read from slave narratives, watched documentaries, and participated in discussions about the institution of slavery. In using the Middle Passage as a context to centralize the discussion, the point was to extend students' understandings through responding to the narrative within the text (Connor, 2003).

These studies show evidence of students participating in critical thinking through communication. In the "White Ships Black Cargo" study of paintings about

the Middle Passage, students were able to develop different perspectives of their knowledge about the historical event. Connor (2003) explains that students made comments that shared the thoughts and feelings of those who travelled on the slave ships. Also revealed through their comments, students explored the lives of people before slavery, the inhumanity of slavery, how the institution of slavery may have affected the spirit of people, and the strength of will for people to endure life under slavery (Connor, 2003).

Connor's (2003) findings on the varied ways in which students demonstrated critical thinking in the passage show an understanding for cause and effect relationships in terms of what the institution of slavery did to change the lives of individuals and communities, and the differing conditions of the people involved in the slave trade. Students used their imagination to think about what life might have been like before people were captured and placed into a permanent system of involuntary servitude. Connor explains that students' "responses overwhelmingly indicate that reading *The Middle Passage* allowed them to think more critically" (p. 246).

Holdren (2012) explains that student commentary serves as an important part of the evaluation process for understanding. When students identify connections, create metaphorical connections, and synthesize information in a way that requires a clear understanding of the concepts within reading, it shows advanced understanding. Holdren (2012) further explains with an example where researchers guided students by presenting works that presented slides challenging students' understandings of art. The researcher encouraged students to identify works of art in the form of sculptures

and traditional modes of art for their projects. From the student comments, it became clear that many held narrow understandings of art. As those definitions began to break down through conversation, the students reconsidered their ideas (Holdren, 2012).

By challenging one another's understandings, students were able to think more freely about their choices in relation to how they applied the concept of symbolism. In this manner, students employed critical thinking with the use of discussion and writing to create symbols within their own projects and have their audience think about a topic differently. Holdren (2012) explains an example from the findings:

Ashton, who read Robert Penn Warren's *All the King's Men*, painted a "tower of power" to represent "power's relationship to good versus evil." As the tower ascended, the windows darkened, showing that "with the rise of power, you're gonna be corrupt, even if you try to stay on the good side, you still get darker. (p. 698)

Developing the critical thinking skills within students is not limited to the uses of metaphors and similes. It also includes problem solving opportunities as a part of the process of creating student projects; each decision that students made demonstrated how best to create, display and show meaning through their art projects.

In whatever students ended up creating, the researcher emphasized they were to interpret, rather than simply illustrate. Interpretations served as the best evidence of how and whether or not students were making meaning. Despite these instructions "some simply could not move past their literal view of the text" (p. 700). Even

though not all students demonstrated interpretative skills, it does not mean that they did not participate in critical thinking activities, or did not think critically: “When the researcher used art projects to assess reading comprehension in this study, students enjoyed higher levels of engagement with the text, collaborative problem solving, and increased thinking stamina” (p. 703).

The examples of how students engage in critical thinking through artistic work offers a look into how the researcher predicts that students engage in the online classroom conversations. As students engage in an online conversational environment that allows for open participation, and as the conversation takes on a life of its own with students responding to one another’s initial thoughts, how do students engage in critical thought?

Inquiry Model

Another model for the development of critical thinking is the inquiry model, which places the emphasis on the development of questions that lead to deeper understanding. This approach is in contrast to what many understand as the more widely used model of teaching and learning that focuses on searching for answers to specific content.

Ciardiello (2003) explains that, “there are questions that have no answers. You still ask them. You want to know even though you can’t know but you still want to find out” (p. 230). This search for questions is the manner in which students can achieve discovery. Question finding is defined as “an inquiry strategy in which a discrepant event is presented by the teacher to inspire curiosity and wonder in students” (Ciardiello, 2003, p. 230). Through the inquiry process, learners make

meaning of the information they encounter. By asking more questions from the new information, students participate in a metacognitive process where they become aware of the knowledge they are lacking and begin taking corrective action to fill or complete the deficits. Students become more aware of what they need in order to achieve a more complete understanding.

Lampert (2006) explains that, “developing critical thinking skills and dispositions in young people afford them the means to make thoughtful choices” (Lampert, 2006, p. 2). Lampert (2006) asserts that a curriculum based in inquiry is one that forces students to develop higher order thinking skills, where students are able to apply thinking and reasoning skills in areas of study other than the one where a learner first acquired those skills. This describes a two-fold benefit where one is the skill and the other is the ability to transfer that skill. In developing critical thinking skills, students are able to reflect when they work with “complex, open ended problems, whether those problems are related to aesthetic or social issues. Creative inquiry supports the development of valuable life skills in students” (p. 2).

Students developed critical thinking skills through the interpretation of artwork. This is a practice that allows for the explanation of symbols with more than one interpretation. Lampert (2006) explains that observations about a particular study from different perspectives can produce multiple meanings according to what learners use to support the explanations of their understandings. “This cognitive challenge encourages students to look closely at the work and to think carefully about their reactions to it” (Lampert, 2006, p. 3). One example of how this model is placed into practice works on the foundation of three strategies where learners first exchange

observations and opinions, then students compare and contrast their related understandings, and finally students reflect on the different meanings. These personal responses to a particular study serve as the starting point in the process. The next step, which is perhaps the most crucial, is for students to participate in multiple readings. One of the readings should include a primary source. In terms of social studies and American History, this would be a source from the time period and connected to the specific event that we are studying. A second reading would include the reactions students have made from interacting with the primary source document. A third reading might involve students reading one another's reactions that students have made from the responses of their classmates' observations and findings. Comparing these readings with their own thoughts can show students how the same piece of work can be understood in both similar and different contexts. At the same time, students have done the groundwork for synthesizing the information that includes different perspectives of the same topic to influence and alter their understandings. Their evolved understandings do not necessarily result in conclusions, but may in fact lead to more, and deeper, questions.

Isseks (2012) explains that one of the ways that students are able to explore questions is through class notes. When the notes are generated from discussion then the focus is on discovery. Rather than loading presentations with factual knowledge to provide answers, they should include images, videos, political cartoons, charts and diagrams so that they elicit thought-provoking questions (Isseks, 2012). Even when educators present information to learners, the goal should focus on both the presentation of information, and the manner that stimulates students to think by

evoking questions, rather than simply requiring the absorption of knowledge. In the act of inquiry, finding the answers to the questions is secondary to the most important element of learning, which is for students to discover through the exploration of the questions that are generating the discussion.

Discussion

Online communication offers another path of exploration to develop critical thinking in learners. Maurino (2007) explains that the available technology for students to participate online communication has the ability to develop critical thinking skills and deep learning (Maurino, 2007). This has only been considered recently, since much of the technology and the ideas on how to apply technology in order to enhance learning are relatively new. Educational technologies allow for students to communicate in the classroom or away from its confines. Wherever the communication, researchers are highly interested in how educators employ the technologies, what pedagogical skills are used with the technologies, and how these two factors work with one another to develop critical thinking.

Two types of discussions –synchronous and asynchronous- can take place within an online format. In the synchronous format, participants are communicating at the same time, while in asynchronous participants are able to delay their conversation for hours, days, weeks, or an indefinite amount of time. Asynchronous conversations offer the possibility of being more thoughtful, since participants are able to reflect or acquire more information through research before returning to the conversation. In the asynchronous format, there is time to read and think carefully about one's own postings and those of others. On the other hand, synchronous

conversations have a dynamic energy that is often not present in an asynchronous format. In this type of communication, there is energy to a discussion that is difficult to muster in the asynchronous format (Maurino, 2007).

Other characteristics of online conversations that influence thinking, when compared to those that take place in person, are the absence of facial and tonal expressions and the possibility of anonymity. Though there is little research on how these aspects of a conversation impact thinking and expression, it would be interesting to see how these parts that are absent from online communication affect conversation. For instance, might people be more honest, open and participatory in their statements because participants cannot see how others express their feelings? How is the connection between emotion and thinking altered with an online discussion about a topic as opposed to one that takes place face-to-face (Maurino, 2006)?

Another factor that can affect the quality of an online discussion in the development and expression of critical thinking, is the skill that students bring to the discussion. If students do not have previous experience discussing controversial or ethical issues, then it may take more time for an educator to foster critical thinking within learners so that they are able to express their deeper understandings. Critical thinking is a skill that takes practice, time, and coaching before educators might observe students demonstrate critical thinking abilities (Maurino, 2007).

Debate

Debates serve as an example of a pedagogical tool that can effectively develop critical thinking. Scott (2008) explains that by participating in debates, students can

improve their critical thinking skills. Also, through research, argumentation, analyzing ideas, assessment of positions, questioning, and interaction skills, students can refine how they communicate their thinking (Scott, 2008).

What Scott describes is metacognition. Students are processing how they go about the process of learning and making sense of the information by researching, organizing, and writing, and in the process then form their arguments and positions. Scott (2008) explains that “the very process of debate allows students to recognize the assumptions, that underline their thoughts and actions” (p. 40). The process of preparing for a debate is a practice of skill building for not only the debate, but also metacognition, mastery of content, and collaboration. It is the nexus in which critical thinking and the formation of deeper understanding takes place. Collaboration allows individuals to retain knowledge for a longer period of time and the opportunity to engage in discussion and shared learning. In mastery of content, the debate “incorporates critical thinking and a plethora of other skills that include, listening, researching, problem solving, reasoning, questioning, and communicating” (p. 41).

Another form of discussion –the Socratic Seminar- allows learner participants to think about the topic of discussion so they are open to new ideas to influencing their own thoughts about a topic. The Socratic seminar serves as an option for students to think critically with openness to other viewpoints, rather than simply countering an idea alone.

Socratic Seminar

Researchers have shown that the Socratic seminar can create a positive impact on class discussions in that the seminars help to develop the critical thinking

processes through a democratic approach using discussion. The three steps for creating a productive Socratic seminar experience for learners include reading, formulating questions, and philosophical dialogue within a community of inquiry. The second step requires that students invest themselves in the learning process by reflecting about what they read, and then acting on their reflection by developing questions. This is considered the central piece of the Socratic seminar process and it is important that students understand that they are responsible for their own learning by being prepared and having spent time thinking about the topic on schedule for class discussion. The third step, according Daniel et al. (2005), is “to hold a dialogue, so that together, within a ‘community of inquiry,’ they can find elements of answers relevant to the questions” (p. 335).

Can the tenants of the Socratic seminar be applied to a technological classroom? The goal is to meld the technology with the thinking. Just as a kitchen knife enables the chef to carve and prepare a meal, technology offers the same opportunities for educators in their quest to enhance student understanding, thinking, and production of knowledge. Before diving into the uses of technology for classroom learning, it is useful to review quality teaching through the concepts of collaboration and participation that are a part of discourse. The next step is to investigate how educators can modify the classroom environment by introducing technology to either replicate or improve upon -what in the past has been proven through research- effective methods to develop critical thinking.

Though students may not all demonstrate the same levels of critical thinking that educators envision, the process is as important. In using technological tools to

develop critical thinking, educators are providing opportunities for students to practice thinking skills that lead to the product that they imagine for their students. Research shows the value of focusing on the process, collaboration, debate, and Socratic seminar in bringing about critical thought. This study looks to advance understandings on how educators can utilize technological assets in facilitating the type of online communication where students participate in critical thinking and make meaning through conversation.

Summary

Through technology, the online written conversations offer learners the opportunity to participate in critical thinking in a different format than a verbal classroom conversation. By participating in an online written conversation whether that conversation involves group thinking, critical literacy, argumentation, discussion, inquiry, debate, or Socratic seminar, students participate in a process that requires them to process their ideas through the act of writing, sharing, and evaluating the responses of their peers' perspectives. These elements of online written communication through an online forum possess the potential to lead students towards deeper and more nuanced understandings as their knowledge continuously evolves. The potential outcomes from participating in an online written conversation include learners considering the role of power in relationships, inspiring curiosity and wonder, and practicing in the development higher order thinking skills. Increased awareness and metacognitive process are other potential outcomes. With teacher guidance and instruction, the online written conversation format offers students an

opportunity to use reason in making claims and counterclaims with the use of evidence gathered from resources through research.

This mixed methods study includes quantitative and qualitative data. The quantitative data is nested into the qualitative aspects of the study. Each of the types of data serves to enlighten the meaning within one another and reveal greater meanings to the findings that come from the study.

Chapter 3: Methods and Procedures

Introduction

The purpose of this mixed methods study is to describe how students' participation in online conversations influences their ability to make meaning. Several research questions guide this study:

1. Does participation in an online written conversation help students construct meaning?
2. How and when do learners alter their understanding of ideas as a result of sharing their ideas?
3. Does participation in a social action activity through the writing, reading, and response processes influence the manner in which students make meaning?
4. How do students demonstrate critical thinking through analysis, evaluation, interpretation, or synthesis when participating in online discussions?
5. How does the structure of a conversation influence the type of critical thinking in which students engage?
6. When students participate in online discussions that are followed up with rubric-based assessments -using Likert scales and reflective writing- do they show improvement?
7. What do students reveal about learning from reflecting on their participation in online written conversations?

Research Design

This study focuses on eighth grade social studies students' online conversations within the classroom. This mixed methods phenomenological study

focuses on outcomes from online conversations whereby students are able to converse with one another in synchronous and asynchronous formats. Students are able to both participate in conversations and follow the conversations of others. Students are able to branch off and begin a conversation with a slightly different angle or focus, but each response is connected to the whole class conversation. In each of the conversations, the teacher structures the original guiding questions and prompts, and provide the texts the students use as sources of information for drawing original conclusions.

The mixed methods form of the research design provides the researcher with an opportunity to combine the quantitative and qualitative research data to better understand how theory and method interact. The quantitative aspect of the study captures specific types of evidence as they relate to ordinal data. The qualitative feature of the study gathers data so that the researcher is able to identify the distinctive gradations of critical thinking that students display through their participation in the conversations. Quantitative and qualitative data gathered from this mixed methods study capture the complexity of critical thinking in an online conversation. These data include the text of the conversations as well as the students' demonstrated abilities to use evidence to make claims and counterclaims (Creswell et al 2012).

Creswell (2012) explains that mixed methods research involves collecting and combining the strengths from varied manifestations of quantitative and qualitative evidence to explore the outcomes of the research questions (Creswell, 2012). Roberts (2010) reveals that the quantitative method of the study utilizes data that is gathered

from facts in measurable instruments such as tests, surveys and experiments, while the qualitative method collects information as it is revealed through peoples' experiences and reflection on the varied forms of perspectives, opinions, and feelings (Roberts, 2010).

While the quantitative data is interpreted from statistical data collected from Likert surveys and tabulations on the number of evidence based claims and counterclaims that occur in each of the typed online conversations, the qualitative data is interpreted from thematic elements derived from the students' online conversations. Students make comments and respond to the comments of their fellow students structuring a collective understanding of the study.

In this study, the qualitative data serves as the dominant form of data in which the quantitative data will be nested. The students' collective conversations are analyzed qualitatively for evidence of critical thinking based from a rubric. The rubric serves as an instrument to be utilized by researchers to analyze student writings. There is an effort to create inter-rater reliability (Creswell, 2003). This requires the researcher to give pieces of the conversation to another person with a rubric to rate the performance of their levels of critical thought.

While this study functions as a mixed methods study involving both inductive and deductive findings, there are phenomenological aspects to the qualitative portion of the study that focus on "the basic structure of experience" (Merriam, 2009, p. 25). The researcher identifies students' participation in online conversations where critical thinking develops based upon the use of evidence to support claims and counterclaims in the process of making meaning. By making meaning, the researcher

is referring to the development of an evolved understanding about a topic, event, or concept within the historical discipline. The online conversation provides the researcher with an opportunity to discover phenomenological occurrences that are deductive. The researcher understands the online conversations serve as examples of situations where students share a common experience. These experiences are, “analyzed, and compared to identify the essences of the phenomenon” (Patton, 2002, p.106). The students involved in this study already share the same grade level, school, classroom, teacher, and discussion topics. The phenomenon that the researcher wishes to capture is the engagement in and production of critical thinking. The common experience in which learners are engaging is the discussion. The typed transcript of the discussion is the qualitative data. The researcher engages the data in the process of horizontalization. Merriam (2009) explains that horizontalization requires the “laying out of all the data for examination and treating the data as having equal weight; that is all pieces of the data have equal value at the initial data analysis stage” (Merriam, 2009, p. 26).

As students participate in the online conversation, they are connecting the study of the discipline, their personal experience, and combining it with the ideas of others who are involved in the classroom discussion. All aspects are involved in the development of critical thinking in the online discussion. Moustakas (1994) describes the phenomenological experience as one that “combines an interweaving of person, conscious experience, and phenomenon” (p. 96). This trilogy presents itself to students in their participation in an online conversation.

During some of the conversations, the teacher may have to refocus the conversation by proposing a new statement or a clarifying question. In each case, the new or clarifying questions will be based on the original question or statement. The teacher's role in the course of each conversation will be limited to asking questions or proposing statements to elicit student response, but the teacher will not participate in responding to any of the questions. The setting for each of the synchronous conversations takes place in the classroom of the teacher who is conducting the study.

Population and Sample

The students in a eighth grade social studies class together are invited to participate in the study. Most of the students come from families of middle class income while others are from lower middle class, middle-middle class, and upper middle class range. At the starting point of the study, the students are either thirteen or fourteen years of age. In order to protect student confidentiality, each student is assigned a research name in the form of a code that the researcher uses to identify the student during the course of study. Only data from students whose parents signed the informed consent forms and students who signed assent forms will be included in the research results.

Sampling Procedures

This population is selected as a form of purposeful sampling. The classes chosen for the study are those that represent a wide array of reading capabilities within the eighth grade population according to the district MCAP reading test that all students are required to take several times during the school year. The researcher understands eighth grade students as having potential to provide an information rich

source of how students who are in the thirteen to fourteen year age-range engage in critical thinking through online conversation. Also, this study aims to discover whether or not critical thinking contributions from students, in terms of amount and quality, in online discussion increases with each successive opportunity to participate. The researcher measures the scores with rubrics. The researcher assesses student participation and students review their contributions and self-asses. Students have an opportunity to compare and contrast the researcher and self-assessments for further analysis.

The subcategory of purposeful sampling is emergent sampling in that the study is looking for specific evidence and conversation pathways that show evidence of critical thinking. Guba & Lincoln (1985) explain emergent sampling to be when the researcher follows new leads during the course of fieldwork and focuses on the emerging outcomes related to the study. Emergent sampling offers the researcher the flexibility to pursue the most valuable information. As the conversations develop during the course of the study, the researcher will hyper-focus on the gradations of critical thinking as defined by the rubric in the appendix.

Students who engaged in level four gradation of critical thinking, making meaning through the use evidence to make claims and counterclaims, were asked to participate in a semi-structured interview. During the course of the interview, the researcher attempts to identify the thought process of students that helped them to reach their sophisticated contributions to the online conversation. It is likely these examples evolve from instances where students participate in an intense form of close reading as well as the use of evidence to support claims and counterclaims made

during the discussion. With guidance in the skill development of close reading, students see patterns emerge from facts and phrases contained within the reading. In carrying the information from these patterns to the brain, students generate ideas that lead to clearer understandings (Lehman & Roberts, 2014). This prediction is in line with Guba and Lincoln (1985) who established that in emergent sampling “while it is certainly true that many elements of what will finally be seen as the design cannot be foretold (the future is in principle unpredictable), it does not follow that nothing can be foretold” (Guba & Lincoln, 1985, p. 250).

The study includes 19 students enrolled in a middle school. These students volunteered to participate in the study. The middle school is located in the mid-western part of the United States of America. Most of the students live in the community where the school is located. There are two other subgroups of students who attend the school and live in neighboring cities. There are two geographical subgroups of students attending the school outside of the host school district zoning borders. These students voluntarily participate in a program that offers students an opportunity to attend a different school district rather than the school district zone in which they live.

Purposeful sampling was used to identify the school that would participate in the study based upon the following criteria:

1. The school adopted the College, Career & Civic Life C3 Framework for Social Studies Standards, which focuses on argumentation by guiding and assessing students based on their ability to develop claims and counterclaims using supporting evidence.

2. The school is focusing on critical thinking and has developed a professional learning community of teachers within the school based on this topic.
3. The school was willing to participate in the study.

The rationale for the above criteria is that the school recently decided to participate in a one to one technology program, where each student received an iPad mini as part of an initiative to help students prepare for a technologically oriented society. The iPad mini allows each student to write in the form of type and have access to the Internet forums that the researcher uses for the study. This is extremely important for the purpose of participating in an online conversation that serves as a part of the requirements for this study. Also, the online conversation provides the researcher with an opportunity to understand how students might develop critical thinking skills. The conversations are recorded in a written format that allows the researcher to review and study its contents.

The iPad minis that each student receives from the school district provides them with the ability to access the “Ebackpack” forum page, which is necessary for students to participate in the online communication activities during the course of the study. Ebackpack is a classroom management software tool supplied by the district where the study is taking place. Ebackpack has a feature that allows for students to participate in closed written online classroom conversations through a forum.

The second criterion provides greater support to the first in that the teacher and school building are making a conscious effort to enhance critical thinking among students. The third criterion demonstrates the willingness of the school and district administration to engage in the process.

Instrumentation

The researcher presents students with a description of critical thinking, argumentation, claims and counterclaims. Students complete a Likert scale questionnaire at the start of the study, in which they self-assess their ability to use evidence in making claims and counterclaims. Included in this survey, students self-assess their ability to think critically. Students complete this survey three times during the course of the study. Each time the students complete the survey, the researcher reviews the meanings of the terms critical thinking, argumentation, and claims and counterclaims. The definitions of each of these terms come from the glossary of the College, Career, & Civic Life C3 Framework for Social Studies State Standards, and educational literature in the form of professional journals and books.

The researcher piloted the use of the forms before officially conducting the study for the purpose of modifying and improving the instruments. The researcher collects the data of how students engage in critical thinking through online conversations using the district sponsored Ebackpack forum. The program records the conversations conducted by the teacher with all student responses. The researcher reviews the conversations for evidence of critical thinking through evidence based claims and counterclaims.

Data Collection Procedures

The data collection began in September 2015 and was completed by January 2016. In February 2015, a letter will be sent to both the assistant principal and the principal of the school and the assistant superintendent and the superintendent of the school district requesting permission for the study to officially begin. The letter will

describe the purpose of the research. The respondents will be informed that the identities of the research participants will be kept confidential and that the identity of the school will not be released. Those who do not respond to the letter will receive a follow up phone call from the researcher.

Data Analysis

The quantitative portion of the study is based on survey results. Students self-assess their capability to make claims and counterclaims with the use of evidence and their ability to engage in critical thinking. An additional aspect of this study involves measuring the frequency with which the students engage in critical thinking through evidence based claims and counterclaims. The data is examined for indications of increased student use of evidence to make claims and counterclaims during the online conversations. Finally, the self-assessment indicates the level of confidence with which students use evidence in making claims and counterclaims. Likert scales are a form of instrumentation that researchers find valuable for measuring attitudes for the purpose of data analysis (Boone & Boone, 2012). This is accomplished by providing a range of responses to specific questions and/or statements (Jamieson, 2004).

The qualitative aspect of the data involves coding portions of the typed conversations. In coding the data, the researcher utilizes the process from Tesch (1990):

1. The researcher will read the transcripts from the typed conversations on either the Edline forum or Today's Meet.
2. Reviewing the documents, the researcher will identify what students have written and write thoughts regarding the transcript.

3. The researcher will identify the areas where students used text-based claims and counterclaims.
4. The researcher will review the conversation to track its evolution from proposed question to the evidence based claims and counterclaims discovering how students arrived to the point where they provided evidence based claims and counterclaims.
5. The researcher will review the samples of evidence-based claims and counterclaims written by students and create a concept web to show visually the evolution of the ideas as students are in the process of making meaning. This will show how meaning changes throughout the conversation as a result of sharing ideas.
6. The researcher organizes the data into categories.
7. Once organized, the researcher analyzes the organized data.
8. The researcher reviews the data and makes necessary adjustments to how the data is organized (Tesch, 1990, p. 142-145).

Quantitative analyses involves processing the information recorded from the Likert survey responses. This provides the researcher with an opportunity to measure student attitudes regarding their own development in using evidence to make claims and counterclaims. The researcher compares student attitudes with the findings from the student created qualitative data within the online written conversations. These measures “will serve as a reliability and validity of measure of cognition” (Colton & Colvert, 2007, p. 262). The researcher is able to see how the participants verbalize thoughts about the use of evidence in claims and counterclaims and how they acted

and performed when provided with the opportunity to demonstrate this skill. After gathering and organizing the data, the researcher analyzes the ordinal data according to the following procedures:

1. Enter the data into a Microsoft Excel spreadsheet from each item for each of the three separate conversations.
2. Use statistical software for conducting an item analysis to determine the mean average of each item for each of three separate conversations.
3. Identify the items where students were able to experience growth over the course of the three conversations.
4. Create a data table showing the item analysis.

Sample Data Table

Level of Contribution According to Conversation	Calculation for the Decreasing Trend of Level 1 and 2 Contributions for Each Conversation.	Calculation for the Increasing Trend of Level 3 and 4 Contributions for Each Conversation.
Conversation	Number of level 1 and 2 contributions per conversation / Total number of contributions per conversation = % X 100 = Percentage of contributions below expectation.	Number of level 3 and 4 contributions per conversation / Total number of contributions per conversation = % X 100 = Percentage of contributions meeting or above expectation.

Validating the Findings

Multiple strategies are used to validate the findings. The researcher triangulates the data through several data sources that include surveys, journal entries, observations, and recordings of written conversations, questionnaires, and self-assessments.

Sources of Data Collection

Type of Source	Student Survey	Online Forum Conversation (Edline, Todaysmeet, Kdocs)	Open Ended Interviews	Journal Notes	Research Journal Notes
Source	Student	Student	Student	Student	Researcher

Limitations

There are several limitations to the study. First of all, the population is small. The study includes 19 students. This is a portion of the eighth grade population and is too small to represent all people within the age group, and much less within the school. A second limitation is the length of the study. With the study scheduled for little over a year's length of time, will it serve as enough time to measure growth for all the students who are participating? This may not be enough time to fully take into account how well students think of themselves as critical thinkers from the start to the end of the study.

Summary

The guiding questions that surround the structure of the study involve the level of participation and the quality of critical thinking contributions to student conversations. Though it is designed as a mixed methods study, the qualitative aspect of the study involves phenomenological aspects. Student participants and the researcher have an opportunity to assess the quality of conversation contributions and the ability to make connections to how ideas contributed to the conversation. Student interviews serve as another tool that help develop this information.

The study takes place in a mid-western public middle school that already has a focus on critical thinking through a professional learning community. The institution is a willing participant to the study and is involved in a technology initiative that provides students with individual devices allowing them access to the online forums that serve as an essential tool for conducting this study. The qualitative and quantitative data collected from the study is analyzed first separately and then together. The qualitative data is analyzed through inter-rater reliability and gathered through researcher and student self-assessed rubrics and Likert scales. The limitations include the fact that the study may not last long enough to measure growth for all participating students. Finally, the population in the study does not include all of the eighth grade students within the school population.

Chapter 4: Results

Introduction

How is critical thinking identified? Where is this type of thinking most prevalent? How do educators promote critical thinking? Where and how do they recognize when students demonstrate critical thinking? The problem associated with this study involves how educators are able to identify and promote critical thought within the classroom. This chapter is organized by seven research questions stated earlier within Chapter One. This chapter examines the research questions in context to the study and then report the data that reveal how participation in online written conversations within the classroom reveal critical thinking.

Students participating in the study were all in the thirteen to fourteen year age group and all were in the eighth grade. In total, eighteen students volunteered to take part in the study. Three of the students in the study were boys and fifteen were girls. Two students have Individualized Education Plans. One student is considered minority status. No gifted students were involved with the study. Student quotes have been edited for grammar, punctuation, and spelling for reader clarity, but are otherwise cited verbatim.

The research questions involved in this study utilize several data resources. First is the conversation itself. Students participated in three online classroom conversations (Student Conversation-SC) where they wrote their responses to an initial question and then responded to online postings made by one another. The researcher analyzed the contributions to the conversation based on a rubric that measured the level of critical thinking. For each contribution to the conversation, the

researcher measured a score of one, two, three, or four. A one represented the most basic level of critical thinking, while a four represented the most complex. A separate individual, who does not know the students, also scored a sample of the conversations for inter-rater reliability. In cross-referencing the scores made by the researcher with that of the independent scorer, there was a measurement agreement of seventy-eight percent regarding student critical thinking contributions. Since the independent scorer scored a sample of the data, and the researcher used data gathered from the whole study, the researcher used the researcher-based scores as measurements to communicate the findings in the study.

Following each classroom conversation students scored themselves on their performance based upon a rubric (Student Individual Assessment Rubric-SIA). The researcher also completed a rubric that assessed the performance of each student (Researcher Individual Assessment Rubric –RIA). Several students from each online classroom conversation experience were asked to participate in an interview (Student Interview – SI) that allowed the researcher to further explore the research questions through the student experience. Another data resource is the student survey that students completed after each conversation. This survey analyzed their thoughts and experiences before, during, and after each conversation. This chapter utilizes a combination of these data sources to help illuminate how educators might identify and cultivate critical thought in the classroom.

Findings for Research Question One

Does participation in an online written conversation help students construct meaning?

Table 1

Guide to Data Utilized for Research Question 1.

Quantitative Data	Qualitative Data
<p>A) Quantity of Responses based on the Researcher Assessment Rubric by score.</p> <p>B) Average scores of the Individual Assessments by the Researcher.</p>	<p>1) Level one, two, three, and four contributions by conversation as assessed by the Researcher through the Individual Assessment Rubrics</p> <p>Student Conversation One (SC-1)</p> <p>Student Conversation Seven (SC-7)</p> <p>2) Student Conversation Eleven (SC-11)</p> <p>3) Student Interview One (SI-1)</p> <p>4) Student Interview Two (SI-2)</p> <p>4) Student Interview Four (SI-4)</p> <p>6) Student Interview Six (SI-6)</p>

In marking through each of the three conversations and marking the contributions as level one, two, three, or four contributions according to the Individual Assessment Rubrics, the researcher was able to tabulate the number of contributions according to each level.

The first research question dealt with whether participating in an online written conversation helped students to construct meaning, and if so, how? The data supported this assumption. Based on the assessment rubric there was an increase in the number of level three and four scores of contributions to the conversation. In the first conversation, levels one and two relative to levels three and four regarding depth of knowledge contributions numbered 87 to 37.

In the second conversation the relative number of levels one and two compared to levels three and four regarding depth of knowledge contributions to the online conversations moved to 65 to 61. This is closer to an even ratio.

In the third conversation, this ratio moved once again and was weighted more towards the levels three and four regarding depth of knowledge contributions. In this third conversation, levels one and two contributions to the conversation numbered thirty-two, while the number of levels three and four regarding depth of knowledge contributions numbered 87.

Table 2

Level one, two, three, and four contributions by conversation as assessed by the Researcher through the Individual Assessment Rubrics.

	1) Quantity of Level One "Depth of Knowledge"	2) Quantity of Level Two "Depth of Knowledge"	3) Quantity of Level Three "Depth of Knowledge"	4) Quantity of Level Four "Depth of Knowledge"	5) Total number of contributions	6) Statistical Average for each conv.
Conv 1	47	36	24	13	120	2.025
Conv 2	36	29	34	27	126	2.412
Conv 3	5	27	21	67	120	3.25

Assuming a baseline level of three, the null hypothesis is that an increase in the ratio of scores was not expected during the course of study. The sums of level one and level two columns serve as the numerator for each conversation.

In analyzing the quantitative data from the written statements during the online written conversations, the sums of the total number of contributions for each conversation serve as the denominator for each conversation.

Based on the fact that there was a decrease in the amount of level one and two critical thinking contributions and an increase in the amount of level three and four critical thinking contributions over the course of the three conversations throughout the study, the process of the conversation suggests that the participation in the online written conversations is improving the critical thinking skills of the participants. Rather than remain constant, the scores increase. The data from the research leads the researcher to reject the null hypothesis.

Table 3

Progression for “Depth of Knowledge” contributions according to each conversation.

Conversation #	Downward Progression of Level One and Two Contributions	Upward Progression of Level Three and Four Contributions
Conversation 1)	$83/120 = 0.692 \times 100 = \% 69.2$	$37/120 = 0.308 \times 100 = \% 30.8$
Conversation 2)	$65/126 = 0.516 \times 100 = \% 51.6$	$61/126 = 0.484 \times 100 = \% 48.4$
Conversation 3)	$32/120 = 0.264 \times 100 = \% 26.4$	$88/120 = 0.733 \times 100 = \% 73.3$

The Depth of Level findings within each conversation is further supported by the Researcher Individual Assessment Rubrics that the researcher completed for each

student after each conversation. The rubrics scored students on the quality of their participation on a scale of one to four. In the first conversation, 3.64 measured as the average student score. In the second conversation, this average increased to 3.78. In the third conversation, the average measure increased yet again to 3.97. The rubric score also included feedback on how students could improve their participation and their overall score on the following conversation through the use of specific strategies. Students were able to review their participation as well as the feedback from the researcher on how they might improve. The data suggests that students considered and employed the information in subsequent conversations.

Table 4

Researcher Individual Assessment Average for all Participants by conversation.

Conversation	Individual Assessment Average for all Participants as Assessed by the Researcher.
Conversation 1	3.64
Conversation 2	3.78
Conversation 3	3.97

The first conversation that students participated in was about the movement west and the decimation of the buffalo population. Students read from the journal written by Frank Mayer, a buffalo hunter in the mid to late 1800s, who wrote about what he witnessed in the changing population of buffalo over the years in which he

hunted. One question posed to the class asked the participants about the connection between the building of the railroads and the disappearance of the buffalo.

Student Kennedy initiated the conversation in stating that, “The railroads made it easier to hunt buffalo. All the buffalo disappeared from 1871 to 1878, only 7 years” (SC-1). Student Morgan responded with a question, “Can you please elaborate on how the railroads made it easier to hunt? I somewhat agree, and totally agree with the rest of your statement, just a bit confused” (SC-1). Kennedy responded, “It was easier to ship the hunted buffalo in the west than it was before the railroads were built” (SC-1). Morgan then responded again with a statement that collected the information from the earlier contributions in the conversation. Morgan stated:

I make the connection between the buffalo and the railroad that the near-elimination of the buffalo was the effect of the railroad. The railroads were shipping out buffalo hides and meat, less every year, so the products of a dead buffalo were keeping the economy intact. But as more buffalo were hunted, there were less buffalo to hunt, so the railroads started shipping less and less meat and hides. 200,000 hides shipped quickly dropped to 40,000. There weren't any left to ship after that. The sudden murder of buffalo caused for the railroads to have less goods to ship. (SC-1)

In the final contribution from student Morgan we see that she utilized information from earlier in the conversation to help make sense of the facts that were presented to her in the reading.

In the second conversation, students participated in a discussion about the Triangle Shirtwaist Factory Fire. In this discussion, students made meaning from disagreement. Student Sam began the conversation by stating that:

The Triangle Shirtwaist factory and industrialization were related to immigration because, with all the immigration the people were desperate for jobs and that allowed the business owners to create bad working conditions. The Shirtwaist factory probably contained immigrant workers, the industrial businesses were accomplished by using the workers to create their products. So overall they were highly related to immigration in terms that they forced immigrants to work under these conditions or starve, for their own business and factory.

(SC-7)

Justice responded in support, “I agree with what you are saying and the idea that the triangle shirtwaist factory benefitted from immigration” (SC-7). Landry made several connections by drawing relationships between the concepts of industrialization and immigration. Landry stated:

Industrialization is related to immigration in the way that immigration is affected by industrialization. Industrialization, in some cases, was the cause of harsh working conditions in factories and industries.

Companies wanted larger profit, so they took advantage of their workers, giving them very little pay for the amount of labor they produced. Immigrants needed a source of money to get on their feet in

America, so they were nearly forced to work at industrialized companies for little pay and in harsh conditions. (SC-7)

Sam offered a critique of Landry's contribution in stating, "I like how you added a piece of the text" (SC-7). Sam continued with commentary that offered a different scenario for industrialization under altered conditions when the student stated, "I think industrialization would have happened at a much slower rate without immigration but it would have been possible" (SC-7). Seeing Sam offer a plausible scenario, Riley was motivated to offer one also. Sam stated:

Industrialization in the United States would have been possible without immigration because the more workers you have the less you have to pay them. The companies would have their workers work shorter hours and a lot of pay. This would have prevented very long working hours and little pay. (SC-7)

Landry offered a quick voice of support in stating, "I agree" (SC-7). Though this sentence contained few words, it was important in that it offered affirmation to the participants in assuring them that they were thinking correctly about the topic. Someone has shared that they agree with what had already been said, and now this contribution to the conversation served as an impetus to move forward. Justice followed by offering the idea that:

Industrialization would still have even [been] possible because of the people making new machines and ways to make working faster but we would not have as many people working in factories. Maybe we

wouldn't have even gone as far in the industrial revolution and it would have happened a lot slower. (SC-7)

While Landry referenced and built upon the earlier contribution made by Sam, the student also synthesized contributions from earlier postings and stated:

Not all industrialization in the United States would be possible without immigration because as Sam said, the amount of people in need for a job gave business owners the opportunity to create bad working conditions, which in turn is a factor of Industrialization. With so many workers, it would take a true leader to band everybody to get together and go on strike whereas if there weren't as many (immigrants) working, it would be easier for the people to have a say in the business. If immigration was impossible at the time, there wouldn't have been as many employees so therefore, industrialization in the United States would have not fully been possible. (SC-7)

This last statement did not just answer the question of whether or not industrialization in the United States would have been possible without the use of immigrants; it built upon the ideas and contributions throughout the conversation to develop a more sophisticated thought that represented deeper understandings of how both industrialization and immigration were related concepts. This second conversation was similar to the first in how it built upon previous ideas. It was different in that in an effort to make meaning of how the two concepts were related to one another, it offered different scenarios.

In a third conversation, students responded to a question about why President Woodrow Wilson initially refused to involve the United States in World War I. Student participation revealed another method of making meaning from online written conversation.

Justice began by stating that, “If they (United States) join the war then it will disrupt their country's peace. He (Woodrow Wilson) also did not want to risk the lives of the people of America” (SC-11). Landry responded, “I agree. He was not only thinking about himself, he wanted the best for the citizens” (SC-11). Riley also included thoughts by writing, “I agree with the risk of many life for a reason Wilson did not want to go to war” (SC-11).

Sam included a quote from a speech by Woodrow Wilson followed by a personal explanation as to why the nation was staying out of the war. Sam stated, “We must (be) impartial in thought, as well as action. Meaning that we shouldn't participate in war, or choose a side that we want to win” (SC-11). Landry then expressed affirming appreciation for the manner in which Sam communicated the idea and then followed with a question. Landry stated, “I like how you explained a quote from the text. What does he mean by this?” (SC-11) Sam willingly provided clarification for Landry by stating, “Wilson says that the U.S. should stay neutral and the U.S. should not take sides” (SC-11). Landry absorbed the information from the Sam and then contributed an interpretation where the student provided elaborate supportive reasoning:

Overall, Wilson states that no matter what, even if it is tempting, the United States should remain peaceful and not take sides. Of course this

doesn't last, though, because Wilson sees a need for peace between sides. So in a way, later on, president Wilson contradicts himself. But at this point in time, Wilson is telling the citizens not to choose sides because the country will remain neutral (For a while). (SC-11)

Riley replied, "He (Woodrow Wilson) said that the US should not get involved in the war for a few reasons. He thought of WWI as a European conflict and that the United States wanted nothing to do with it. He didn't want to preserve peace" (SC-11). This explanation was a variation of what others were communicating. Here Riley explained that Wilson was not so much concerned about peace, but instead Wilson's priority was to keep the United States out of the conflict.

West followed this up by building on the ideas of previous contributions and making a comparison with the words used in Wilson's first speech in 1914 with an interpretation of what the student thought were Wilson's long-term motivations for the United States and its role in World War I. West explained that:

In Wilson's First Speech in 1914 what he says about the U.S. getting involved in the war was he said that the United States should stay neutral in their thoughts and actions in the war. Not that they should completely stay out or in the war but that they should just spectate the situation and make a couple comments but nothing that would get the U.S. in too deep. (SC-11)

What seemed crucial for students in the process of making meaning from the conversation was the recognition that evidence was an essential element in forming a coherent thought in order to communicate about a topic. Students understood that for

other people to accept that the point they were making through opinionated commentary was valid, it had to connect to evidence from the shared reading. In an interview Landry stated that:

For other people to understand your point, you have to back it up and if someone doesn't understand it, you use evidence to further back it up so that others can understand it and that way you can build off the conversation. (SI-1)

This quote suggested that there was an awareness, or an expectation, that fellow students participating in the conversation would also use evidence when responding to the comments made by others participating in the conversation.

Even before knowing that evidence would help other students understand their argument, there was indication that students understood that evidence was crucial to help form an understanding of the topic in order to effectively communicate. During an interview Alex stated that “It helped by giving facts about the topic and it kind of supported what I would say” (SI-2). By referring to how facts support what one “would say” it suggested an awareness that evidence added strength to comments contributed to a conversation. In an interview with a student talking about including evidence with supporting opinions, River stated that “It proved or disproved it. Even if you think something, you would have to use evidence to support it. It either proves you right or proves you wrong. It does influence you” (SI-2). This comment revealed that even if participant comments did not cause someone to change opinions about a topic immediately, it could cause someone to think differently about that topic. Also a contribution would more likely be taken seriously than if no evidence were connected

to the statement. In a separate interview, Emory made a similar point in using evidence in stating that “You have more support to back you than if you were to state your opinion” (SI-4). Emory further explained what would happen with a lack of evidence: “It would be less convincing and people wouldn’t be able to believe your argument as much because you don’t have anything to back it up” (SI-4).

In an interview with Tanner, the student explained the relationship between using evidence in the contribution to the conversation and its role in developing a thought that was made in the online conversation. Tanner stated:

The more from the text that I put into my statement the easier it was to come up with commentary and the easier it was to prove my point and people were able to make their point more believable too. (SI-6)

Findings for Research Question Two

How and when do learners alter their understanding of ideas while participating in online written conversations?

Table 5

Guide to the Data Utilized for Research Question 2

Quantitative Data	Qualitative Data
A) Student Survey Statement J “Writing comments while using evidence to make claims and counterclaims influenced the way that I thought about the subject.” Average of the participant responses	Student Conversation Four (SC-4) Student Conversation Eight (SC-8) Student Interview Three (SI-3)

In connection with the research question “How and when do learners alter their understanding of ideas as a result of sharing their own ideas and reading their peers’ ideas in an environment where they communicate online,” students responded to the following survey statement: Writing comments while using evidence to make claims and counterclaims influenced the way that I thought about the subject. In the first online conversation students scored an average 3.33, in the second the average score increased to 3.5, and in the third conversation the average score increased again to 3.75.

Table 6

Writing comments while using evidence to make claims and counterclaims influenced the way that I thought about the subject.

Conversation Number	Writing comments while using evidence to make claims and counterclaims influenced the way that I thought about the subject.
Conversation 1	3.33
Conversation 2	3.5
Conversation 3	3.75

How and when do participants alter their understandings within an online conversation? Evidence is central to this phenomenon. When students used evidence in online conversations, River stated that even “if you don’t agree with it, you still have to think about where they’re coming from” (SI-3). Even if the contribution of a

fellow student did not change the positions or thoughts that students held regarding a particular topic, it was still important to understand that, as River stated:

Their thoughts could influence your thoughts if it's something that you haven't thought of before. Even if you agree with them that could change your thinking, but if you disagree with them, that could also change your thinking too. It could cause you to consider their side as well. (SI-3)

The act of consideration offers the possibility of movement. Even if the result of the movement or change in thinking is not in agreement with the contribution that caused the start of the change in thought, it still served as a seminal experience that began the process leading to change.

In the conversation regarding the extermination of the buffalo on western plains, students demonstrated that they have altered their understanding of the topic as result of sharing their ideas in the online written conversation. Amari began the conversation by hypothesizing the motivation for Frank Mayer to continue hunting buffalo even though he was experiencing greater difficulty in locating animals to hunt. Amari explained:

I think he was so focused on making money that he didn't acknowledge that it was going to end. He also might've been embarrassed that the great money making system he found was going to end quickly because of what it was actually doing, which is killing living animals. (SC-4)

Emory affirmed the thoughts of Amari and added another thought. Emory stated, “I agree with you, but I also think he was just not thinking statistically” (SC-4). Devyn then offered a hypothesis, while adding more information from the text. Devyn stated, “They refused to believe the buffalo would disappear, because at the time there was thousands of Buffaloes. Like they said the Buffaloes were everywhere” (SC-4). Then Emerson altered the conversation by offering a new twist with a hypothesis that alluded to Mayer participating in denial of what was unfolding on the plains with the buffalo. Emerson stated:

I think that Frank Mayer knew deep down that the buffalo were going to disappear at some point but he didn't want to believe it. He wanted to think and believe that the buffalo were always going to be there to hunt for sport and to sell their skins. (SC-4)

This shift in the conversation was affirmed by Alex, who expressed agreement with Emerson, referred to the text for support, and responded with a comment. Alex stated, “I agree with you because he said he knew where all of the buffalo were, but I bet he didn't know where they were” (SC-4). Shay responded with a different interpretation of Frank Mayer’s motivations. This hypothesis was built on previous contributing evidence and offered questions about Mayer’s character. Shay stated:

I think he was just ignorant and chose not to see the other side of the so-called story. If the buffalo were being killed so often how did he expect them to reproduce? The buffalo could not reproduce as fast as they were being killed. Everything is going to die out if you continue

killing it so often. Frank Mayer refused to acknowledge the other side of the argument. (SC-4)

Harley explained that Shay's comments in the online written conversation had affected the way Harley thought about the topic and further elaborated on the idea that Shay began. Harley stated:

I think you made a very good point I did not consider. I was thinking he was just unable to realize there was another argument. I didn't think about the possibility that he knew there was another argument, he was just ignorant to it. (SC-4)

In the final comment regarding the topic, Emory reviewed the evidence and then offered an interpretation that seemed to both exonerate the character of Mayer and also brand him as a hunter whose motivation for making money prevented him from being able to see what was happening to the buffalo:

I think that Frank Mayer refused to believe that the vast herds of buffalo would not disappear, because he was stuck in a stationary thought that, "there are as many buffalo now as there ever were. " Mayer continued to use other things to push back the thought that the buffalo were disappearing. He even said that he thought he was hunting in the wrong spot when Jones asked him if they were getting as many as they used to. Although he conferenced with his boys about the decreasing of the buffalo, it still seemed like a good idea to him to keep the business going. As he said, he was not a statistical man, and here it shows that, because he did not think about the future. Frank

Mayer was in it for the money and great business, and that is why he was not able to accept the fact that the buffalo were in the process of destruction, and it was all due to their careless killing of what they would call, the golden goose. (SC-4)

With the use of evidence from the text, Emory explained earlier in the conversation that Frank Mayer did not see himself as a ‘statistical man’ and therefore was not able to see how the buffalo were disappearing. Even so, at that point in the conversation, Emory did not express the thought that Frank Mayer was “careless” like the student did in the second contribution to the conversation. If the ideas that other students offered during the course of the conversation did not cause Emory to change the view of Frank Mayer behaving in a manner where he denied that he knew what was happening to buffalo, it still served to alter Emory’s thinking to the point where the student expressed the understanding that Frank Mayer was careless about his actions.

While the previous conversation demonstrated an example of how students alter understanding surrounding a topic in terms of changing their view, this second conversation offered an example of students altering understanding based on priority or significance. Students participated in a discussion about the Triangle Shirtwaist Factory Fire. After learning about the tragic event, students responded to the following question: What would happen if the government allowed businesses to operate without rules and regulations today?

Harley began the conversation by making a comparison of what took place during the start of the Industrial Revolution Age with hypothetical examples that

might take place in the present if government were to allow businesses to operate without rules and regulations. Harley stated:

I think we would have a situation similar to the industrial revolution. Owners of big businesses would become greedy, buildings unsafe, and workers powerless. I think that not having regulation laws against unsafe buildings would make our society less democratic and almost like a totem pole. We would be taking 20 steps back in terms of social justice for workers in factories. (SC-8)

Harley continued with a second post that built upon the first posting. Harley stated:

The business world would become like a totem pole because the people at the bottom would be powerless, and the people at the top would be almighty and that just doesn't equal equality and it's really not fair to those hardworking individuals at the bottom of the food chain. (SC-8)

Alex continued the connection of the hypothetical present where businesses can operate without any sort of oversight by connecting with evidence from the reading on the Triangle Shirtwaist Factory Fire. Alex stated:

The businesses would be out of control. I think this because the owners would still be able to lock the doors, so if there was a fire just like at the shirtwaist factory some people would die. The text stated, "This incident has had great significance to this day because it highlights the inhumane working conditions to which industrial workers can be subjected." This quote informed me that before the

incident there were harsh working conditions and if the government didn't stop it and fix the situation, then we would have these working conditions today. The owners still wouldn't care for their workers and what happens in the harsh working conditions. (SC-8)

Emerson expressed appreciation to Alex for using the text to support and communicate thoughts. Emerson stated, "I like that you made a reference to the text that was very relevant" (SC-8). Shay followed Emerson by providing a different perspective on the hypothetical situation. Shay stated:

If the government left the industry alone I think there would be change but it would not be a huge change. Now in many big factories people are replaced by machines and robots. I doubt that there would be a big push for children to come work but I do think that owners would stop caring about pay and get lazy about keeping the place clean. (SC-8)

Emerson had taken time to gather thoughts and then express a vision of what would take place in a fashion that elaborated on the topic more significantly than Emerson's first posting on the topic. Emerson stated:

I think that the large businesses that keep our economy flowing would take over. They would begin to have a complex that they are what run our country. The large factories would once again become dangerous places but for those who have no other place to work with the country's tight job market, they would be stuck in that position of danger. The factories would lose sight of what mattered: their employees. Eventually they would only care about money and there

wouldn't be any control over the factories and their employees' safety because it wouldn't matter any more. Sometimes, the only things that keeps the factories from becoming dangerous is the owner's fear of being fined, sued, or even arrested. So, without the rules, they wouldn't have to worry about these things and all of their employees would be in danger. (SC-8)

Amari contributed an elaborative response to the question. There were several ideas that later postings referenced to build further ideas. The ideas within this posting served as catalysts for other students to alter and further develop ideas. Amari stated:

If the government were to leave industries alone then the bosses will probably make the workers work longer hours and there would be no minimum wage. Since their factories already would've been built, safety would semi be there but if you were making new buildings, which they do every day, the safety procedures would be as strict so they could save money and get the business going quicker. Also, there may be a large amount of people who lose their jobs because they instead want to hire immigrants so they could pay them even less. Not to mention a big amount of companies like oil would try and create a monopoly to make big money really fast. This will drive other business to the ground. I think overall it would be a very chaotic situation. (SC-8)

Alex offered affirmation with agreement and stated, "I agree with your ideas because the owners would probably get lazy about their workers and the companies and

factories wouldn't have safe working conditions” (SC-8). Emerson followed Alex’s posting by expressing another alteration in thinking about the topic that the student had not yet considered. Emerson used an exclamation point to express solidarity with the previous posting from Amari. Emerson also introduced the concept of the Middle Class and a hypothetical scenario of their situation under conditions where businesses have free reign from government intervention. Emerson stated:

I never even thought about the hours. Good point! I agree that they would make them work longer just to get more made so they could make a larger profit. Most of the time all the owners care about is the money they are going to make. (SC-8)

Harley also referred to Amari’s posting. Harley stated, “I like how you brought up the possibility of a monopoly. I didn't think of that but that is a very real possibility if the government ever stopped enforcing safety laws and such for businesses” (SC-8).

Devyn connected with Emerson’s statement about what would happen to the middle class. Keep in mind that this is a further development from Amari’s posting. Devyn stated:

To me the middle class in the world would have disappeared, there would only be the wealthy business owners and the poor employees, no matter how hard the employ tried try would never have enough money and the owners wouldn't be kind enough to give theme the money and the proper working condition they deserved. (SC-8)

This excerpt from the conversation offered an example in the flow of thinking.

When the conversation began, the participants were concerned about the

plight of the individual workers. As the conversation progressed, people contributed their thoughts and supported those thoughts with textual evidence from the assigned reading. By the close of the conversation the participants had altered the focus of their concern to the disappearance of the middle class.

Findings for Research Question Three

How does participation in online written conversations influence the way that students make meaning?

Table 7

Guide to the Data Utilized for Research Question 3

Quantitative Data	Qualitative Data
<p>A) Student Survey Statement J “Writing comments while using evidence to make claims and counterclaims influenced the way that I thought about the subject.” Average of the participant responses</p> <p>B) Student Survey Statement K “Reading fellow students’ evidence in their use of claims and counterclaims influenced the way I thought about the subject.” Average of the participant responses</p> <p>C) Student Survey Statement L “The act participating in an online written conversation where I used evidence to make claims and counterclaims allowed me to think about the subject more deeply than I had previously considered.” Average of the participant responses</p>	<p>Student Conversation Four (SC-4) Student Conversation Eight (SC-8) Student Interview One (SI-1) Student Interview Two (SI-2) Student Interview Five (SI-5)</p>

After each of the online written conversations, students completed a survey that measured their performance on a scale of one to four in response to a specific question or statement. In response to the statement of whether the activity of “writing comments while using evidence to make claims and counterclaims influenced the way I thought about the topic,” students averaged a 3.33 in the first conversation, a 3.5 in the second conversation, and a 3.75 in the third conversation. This suggested that students saw the level and quality in which they were able to communicate meaningful contributions to the classroom conversation increase with each opportunity to participate in the activity.

Table 8

Writing comments while using evidence to make claims and counterclaims influenced the way that I thought about the subject.

Conversation Number	Writing comments while using evidence to make claims and counterclaims influenced the way that I thought about the subject.
Conversation 1	3.33
Conversation 2	3.5
Conversation 3	3.75

In a separate statement about whether “reading fellow students’ evidence in their use of claims and counterclaims affected the way that that I thought about the subject,” the average score of students increased. In the first conversation, the average

student measurements were a 3.42, in the second conversation this score slipped slightly downward to 3.39, and in the third conversation there was an increase to 3.72. From the first to the third conversation there was a difference of three tenths in the average that students scored in response to this statement.

Table 9

Reading fellow students' evidence in their use of claims and counterclaims affected the way that I thought about subject.

Conversation	Reading fellow students' evidence in their use of claims and counterclaims affected the way that I thought about subject.
Conversation 1	3.42
Conversation 2	3.39
Conversation 3	3.72

A third survey question that connected to this research question was whether the “Act of participating in an online written conversation where I used evidence to make claims and counterclaims allowed me to think about the subject more deeply than I had previously considered.” Once again the average score of student measurements in response to this survey question showed an increase. The average of the first conversation is 3.4 followed by the second with 3.5 and then 3.83 for the third conversation.

Table 10

The act of participating in an online written conversation where I used evidence to make claims and counterclaims allowed me to think about the subject more deeply than I had previously considered.

Conversation Number	The act of participating in an online written conversation where I used evidence to make claims and counterclaims allowed me to think about the subject more deeply than I had previously considered.
Conversation 1	3.44
Conversation 2	3.5
Conversation 3	3.83

When asked about how the online conversation facilitated in the development of meaning, Landry stated that after the first conversation “Everyone was kind of the same on what they thought about the buffalo being killed off, but there were different ideas on how the buffalo and railroad went together” (SI-1). Landry continued the thought process about what the conversation meant to the understanding in that “It kind of built off of what I already thought” (SI-1). Alex shared a similar experience, but also included the complexity of the situation. Alex stated, “It’s a lot harder to respond to someone else’s comments if their idea is the same idea as yours because there is nothing to disagree” (SI-2).

Even though students may have found it difficult to have a conversation where people agreed on how they understood or perceived a topic, the conversation still served a purpose. Landry stated, “It confirmed what I was already thinking and that my ideas weren’t so far fetched and that others could understand them, so it was confirmation that you were on the right path” (SI-2).

Harley shared the experience of what participation in the online conversation meant to the process of making meaning in that “It helped me understand what we were learning, like how to have a deeper understanding of it” (SI-5). This was the result of several different dynamics that took place within the conversation. Harley stated that:

Some people didn’t have opposing views, but had slightly different views than my own that I didn’t think about before, so seeing their thoughts and their thought process helps me to understand possibly another side of what someone else was thinking. (SI-5)

According to Harley, an essential part of this process was that it included the act of “making claims and counterclaims,” which, “gave me a deeper understanding” (SI-5).

In returning the conversation about the connection to the disappearance of the buffalo to the railroads, Devyn explained a realization that people made while migrating westward. Devyn stated, “By building the railroads, they start to realize how many Buffaloes there was. It wasn't until the railroad that people started to kill the buffalo” (SC-4). Emory responded with affirmation and a connection to those who were building the railroad with the need to keep the workers fed. Emory stated, “I agree, but I believe it also was, because the railroad workers needed fresh meat”

(SC-4). Alex then combined the postings of the previous two participants to connect the ideas to one another. Alex stated, “I agree with this. They started to kill the buffalo because the companies hired hunters to kill the buffalo, so the workers had fresh meat to eat” (SC-4).

In this excerpt, the conversation built upon itself. Students read the previous postings, used the ideas explained by fellow participants to shape their thoughts, and then responded with thoughts that continued to build on shared ideas. It began by recognizing the people who travelled west becoming aware of the enormous herds of buffalo. The next participant directly connected the buffalo to those who worked on the construction of the western railroad. The contribution explained that the buffalo were a food source that helped to make the construction of the railroad possible. The third participant explained the connection explicitly, thus providing the finishing contribution that revealed the meaningfulness of what the three participants were able to discover due to the interaction with one another about the topic. This was only the midpoint of the conversation.

Shay continued to develop the thought from previous postings. Shay explained why the situation for a sustainable buffalo population was not possible.

Shay stated:

As more railroad was laid the less buffalo there was. They needed more and more meat for the workers. Assuming that there were at least a few buffalo consumed a day and there were many being killed in a day by the time the railroad was finished there wouldn't be any left.

They could not keep up with the amount of meat being needed. (SC-4)

Harley provided an affirming responsive contribution to Emory's post and then introduced the concept of supply and demand into the conversation. Shay began the process by describing the relationship; Harley described it further by adding judgment and including economic terms to explain the relationship. Harley stated, "I agree with you, I think it was a combination of the hunters' irresponsibility and the demand going up and supply going down drastically" (SC-4). Emory took the thoughts to another level by first summarizing and then describing the transcontinental trade networks that were set in motion from the triangular relationship connecting the phenomenon that was the disappearance of the buffalo, the action of building the railroad, and the demand for products made from buffalo. Emory explained how all three contributed to the destruction of the buffalo. Emory stated:

The connection that I can make between the railroad and the buffalo is that one thing led to another. The construction of the railroad led to the destruction of the buffalo. While the Transcontinental Railroad was being made, the railroad companies hired buffalo hunters to fetch fresh meat for their workers. This soon led to the trade in buffalo hides and bones to make sure that the business stayed alive. Over time, the slaughtering of buffalo led to their destruction. It all started with the railroad workers' need for meat causing buffalo hunters to be hired in the first place. (SC-4)

In another conversation related to this research question, students clarified meaning through interaction. The process allowed for students to discover the meaningfulness of how two concepts can have an impact on one another. Harley

began the conversation about the relationship between industrialization and immigration by stating:

I think industrialization would have been possible it just would have progressed much slower. Many immigrants were willing to do the back breaking work because they didn't have any other job opportunities. There were many immigrants looking for jobs so that was great for mass production. We are in the middle of technological revolution and we don't really need more people to make it happen.

(SC-8)

Emory affirmed that the posting from Harley had sparked a thought that the student had not previously considered. Emory stated, "That is a very interesting idea. I didn't think about it progressing slower like you said. I like your idea" (SC-8). Alex then combined the thoughts of Harley and Emory and revealed how they were processing the relationship between the two concepts. Alex stated:

I think it would, but not as intense as it is today. I believe this because some workers have helped contribute to make industrialization possible. I also think that it would still be kind of the same because I don't think that immigrants would make up of the population of our workers to make the idea of industrialization true. (SC-8)

Shay also processed the ideas expressed in the previous postings and then continued to build. Shay began with stating a claim and then elaborately explaining the background within the relationship between industrialization and immigration in the form of an argument. This effectively supported the claim made by Shay and

demonstrated how the student used the ideas from earlier posting to establish the thought. Shay stated:

Industrialization probably would not have happened without immigrants. The immigrants in the triangle shirtwaist factory did most of the work, they sewed shirts and dyed cloth ect. Yes they assisted the machines like the sewing machine but they still did a lot of work. (SC-8)

Emory followed the post made by Shay. The post by Emory had some similarities with Shay. While Shay stated the claim in the posting as a possibility, Emory stated the similar idea with greater firmness of position. Emory stated:

Industrialization would not have been possible without immigrants, because many of the more risky, unsafe and unfair jobs, were given to them. The owners of sweatshops like the Triangle Shirtwaist Factory relied on immigrants such as what they were getting to get the job done and not expect more than what they were given. (SC-8)

In the conversation, the position expressed by the contributors altered. In the beginning, the participants explored the possibilities of the relationship. As participants read the posts from one another, wrote, and published their responses, the idea built upon itself. Initially, the claim was made as a possibility and then fulfilled as a firm statement with supporting evidence. The result was that, at the end of the conversation, meaning was made about the relationship between industrialization and immigration that was not as clear or as established as at the start of the conversation.

Findings for Research Question Four

How do students demonstrate critical thinking when participating in online written discussions?

Table 11

Guide to the Data Utilized for Research Question 4

Quantitative Data	Qualitative Data
<p>A) Student Survey Statement E “Students who responded to my comments and to the comments of others, used evidence to make claims and counterclaims during the course of the online written conversation.” Average of the participant responses</p> <p>B) Student Survey Statement G “I understood the claims that people made during the course of the online written conversation.” Average of the participant responses</p> <p>C) Student Survey Statement H “I understood the counterclaims that people make to my claims during the course of the online written conversation.” Average of the participant responses</p>	<p>Student Conversation Three (SC-3) Student Conversation Six (SC-6) Student Conversation Nine (SC-9)</p>

In reference to the research question about whether students demonstrate critical thinking through analysis, evaluation, interpretation, or synthesis when participating in an online discussion, there are several survey responses that connect. One survey statement that students responded to was whether “Students who responded to my comments, and to the comments of others, used evidence to make

claims and counterclaims during the course of the online written conversation.” In the first conversation students scored an average of 3.19, in the second conversation the average score increased to 3.67, and the third conversation still remained higher than the average of the initial conversation with a score of 3.47.

Table 12

Students who responded to my comments, and to the comments of others, used evidence to make claims and counterclaims during the course of the online written conversation.

Conversation Number	Students who responded to my comments, and to the comments of others, used evidence to make claims and counterclaims during the course of the online written conversation.
Conversation 1	3.19
Conversation 2	3.67
Conversation 3	3.47

The second statement that students responded to in connection with this research was whether “I understood the claims that people made during the course of the online written conversation.” In the first conversation students scored an average of 3.58, in the second a score of 3.69 and in the third the average rose again with a score of 3.83.

Table 13

I understood the claims that people made during the course of the online written conversation.

Conversation Number	I understood the claims that people made during the course of the online written conversation.
Conversation 1	3.58
Conversation 2	3.69
Conversation 3	3.83

The third survey statement that students responded to that connected to the research question was “I understood the counterclaims that people made to my claims during the course of the online written conversation.” In the first conversation students scored an average of 3.22 in response to this statement. In the second conversation the average score of the responses increased to 3.39, and in the third conversation the average score increased again to 3.61.

Table 14

I understood the counterclaims that people made to my claims during the course of the online written conversation.

Conversation Number	I understood the counterclaims that people made to my claims during the course of the online written conversation.
Conversation 1	3.22
Conversation 2	3.39
Conversation 3	3.61

In the conversation about the disappearance of buffalo, Landry set a foundation for an argument with details and then ended the post with a belief statement based on evidence gathered and organized from the reading. In the process Landry evaluated and synthesized the information, then followed it up with an interpretation. Landry stated:

Those wanting to make money went to work on the railroad. Some of those same people wanting to make money also were buffalo 'runners'. I think the near extinction of the buffalo and the building of the railroad happened because the people wanted to make money. If the railroad workers weren't paid as well, the railroad could not have even been built, the workers could not work under those conditions with little pay. With the buffalo, if those who shot the buffalo did not make as much money as they did, would the population of the buffalo

remain the same. I believe the connection between the railroad and the buffalo was the citizens' desire for money. (SC-3)

Justice recognized the impactful analysis by Landry of the situation. Justice stated, "I agree and like what you said about how if things didn't have a good pay then us as humans wouldn't do it" (SC-3). Sam then included an analysis of the situation based upon the consideration of the time period and how that might have influenced the behaviors that buffalo hunters exhibited. Sam stated, "I think that buffalo hunters had different views on natural resources then us because they saw millions of buffalo and didn't realize how fast their numbers could dwindle down" (SC-3). Landry responded with an affirmative response and a thoughtful question, "You are right. How did we realize that and they didn't at the time?" (SC-3).

Justice then synthesized the thoughts from Sam and Justice and provided an interpretation. Justice stated, "I think that they might have realized it but didn't want to because it was so easy and such good pay" (SC-3). This interpretation was similar to the original with an addition to the ease at which the hunters were to make money from their activities. From participating in the online written conversation where students thought critically about the topic and shared their thoughts with one another, Landry was able to produce a more nuanced interpretation about the topic.

In a question about whether or not the owners of the Triangle Shirtwaist Factory were responsible for the deaths of the workers in a fire, students participated in a conversation where they had an opportunity to evaluate, synthesize and interpret the information to form an opinion on the matter, Peyton began the conversation by making a claim and supporting it with evidence, "They were very responsible for the

deaths of the people because if they won't have locked the door they would have been able to get out to safety but instead that people died from the fire” (SC-6). Taylor responded by supporting the argument made by Peyton and then adding more details to the conversation. Taylor stated:

They deserved a worse punishment for what had happened. Even if they did not know the door was locked that day, they had locked it before which would prevent escape for any day. If a fire had started the day they knew they locked the door, who says they would have even unlocked it? They didn't care enough to send someone to warn the female workers about the fire, they had escaped to save their own skin. They treated the girls like dogs almost. They work room was their cage and they even kept it locked which prevented escape no matter what the day. (SC-6)

Peyton responded with affirmation followed by a question. Peyton stated, “I agree but what kind of punishment do you think they would deserve?” (SC-6). After participating with Peyton in an evaluation of the details surrounding the tragedy, Taylor followed with an interpretation of the form of punishment that was reasonable for the factory owners. Taylor stated, “Imprisonment for a longer time than what they had- if they even had it. They were set free, even with being charged of manslaughter they only were forced to close the factory” (SC-6). Tanner offered a hypothetical situation and then followed with a question to Taylor:

Taylor, do you think that if someone had been sent down to tell the women any lives would have been saved? Personally, I feel like it

could have saved many lives, but the fire had already begun to spread at that time. I am wondering if it really would have done any good.

Opinions? (SC-6)

River responded to the hypothetical situation offered by Tanner and then referred back to the details from the reading about the spread of the fire. Even though River thought that someone else introduced the details about the fire spreading quickly, River was the first person to introduce this information into the conversation. River stated:

I honestly don't know how much good it would have done to try and warn the girls about the fire. Like you said it had already begun to spread so it might not have made any difference. Although the person warning the girls would have to unlock the door to tell them, so maybe it would have saved more people. Regardless if warning them would have saved lives or not, it would make the factory owners look better in court. (SC-6)

River further evaluated the hypothetical situation by expanding on the possibilities and interpreting what those possibilities would have meant in revealing the motives and priorities for the owners of the factories. River stated:

The owners of the triangle shirtwaist factory were 100% responsible. It comes down to 2 simple facts. They locked the doors so no one could get out and whether or not the thought of a fire ever crossed their mind is unimportant; they were putting the laborers in unsafe working conditions. To piggyback onto that, the factory itself was not up-to-

date. It had flammable things lying all over the sewing room. With the conditions the owners created one might even say they were asking for a fire to happen. (SC-6)

Taylor affirmed the post from River and then included and evaluated more information from the reading. Taylor stated, "I agree, they even said the building was fireproof, which was in fact a lie" (SC-6). River, after participating in the conversation where the student had explored several details included throughout, made a final interpretation on the subject stating:

The owners were somewhat responsible because they kept their factory in the condition that it was. It was obviously dangerous and certainly not fireproof like they claimed it was. Also, they locked the workers in the place. They most likely knew that was against the law, but still did it anyway. Nobody ever thinks a fire will happen but there's always a chance it will, so locking those doors made them responsible for the deaths. (SC-6)

In this final post from River about the topic, there was evidence of how the student accumulated and evaluated information throughout the conversation, synthesized that information and interpreted that information, and then rendered meaning in the form of a judgment on the responsibility of the factory owners for the death of the employees. River was not the only participant to engage in this process, but the completeness with which the student utilized information throughout the whole conversation provided the strongest example.

In another conversation about the United States' entry into World War I, students discussed the differences between sources in explaining why the United States became involved in World War I. Students compared a textbook reading with that of a text by Howard Zinn, a historian. Morgan began the conversation by contrasting the two sources stating:

These don't completely match up. The textbook's explanation makes it sound like the United States only joined the war because they were in danger, while Wilson's explanation makes it sound like he had only the good of the world's peace in mind. (SC-9)

Kennedy then further evaluated the situation by including information from the textbook into the conversation about German activities that affected the United States:

The Germans sank a lot of ships and a lot of American lives were lost and taken. And the neutrality that Woodrow Wilson was talking about, he said that was no longer possible. He said that the world must be made safe for democracy. (SC-9)

Morgan followed the evaluation by Kennedy with an analysis of the reading by Howard Zinn and stated:

Howard Zinn does not make a convincing argument because it is slightly unclear of his belief of the cause for America's war entrance, and also he does not have very many supporting details that would convince a reader of the United State's motivation. (SC-9)

Kennedy disagreed with the statement from Morgan regarding the reading by Howard Zinn. Kennedy stated, “He did make a convincing argument because he explains everything from why the U.S. was going to war, how they were doing it, and what they did” (SC-9). Morgan then expressed her disagreement with Kennedy and evaluated the information from Howard with a different focus. Morgan stated, “Zinn does explain things well, but it is a bit unclear his exact reasoning, which makes it difficult to follow along with his explanation. His reasoning seems to have more of an involvement with money” (SC-9).

In the effort to defend or to explain an understanding of the texts that were used to establish the conversation, students evaluated the information in the readings, synthesized the evidence, and then shared how and why they disagreed with one another’s interpretations.

Findings for Research Question Five

How does the structure of a conversation influence the type of critical thinking in which students engage?

Table 15

Guide to the Data Utilized for Research Question 5

Quantitative Data	Qualitative Data
A) Average of the Individual Assessment Rubrics scored by the Researcher	Student Conversation Five (SC-5) Student Conversation Six (SC-6)

Table 16

Student Individual Assessment

Conversation	Student Individual Assessment
Conversation 1	3.4
Conversation 2	3.5
Conversation 3	3.5

In a conversation about the Triangle Shirtwaist Factory Fire where students were asked about the relationship between immigration and industrialization, Kennedy began the conversation by proposing a connection between the workers and language.

Kennedy stated:

Many women and girls that worked at the Triangle Shirtwaist Factory were immigrants. They were hoping to have a better life, but instead faced the challenge of learning a new language and culture. They must have known English to keep their jobs. (SC-5)

Morgan responded to Kennedy with an affirming statement recognizing that the post introduced a new thought. Morgan stated, "I liked what you said, Kennedy, about them having to learn the new culture and language. I didn't think about that aspect of it" (SC-5). Morgan then posted another contribution to the conversation. When a

student connected the industrial age, working conditions, and immigration, Morgan stated:

Industrialization is related to immigration because people from other countries came to America searching for new lives, but they instead got the poor conditions that came along with the Industrial Age. The Triangle Shirtwaist factory is related to immigration because most of the workers there were immigrants, and the Shirtwaist Factory was their only source of income. People were immigrating to America because of the Industrial Age and because business was booming. (SC-5)

Kennedy utilized the information from the post made by Morgan along with the information from the reading to make comparison in the form of interpretation for the status of the workers. This was the result of synthesizing the details and sharing thoughts about the topic. Kennedy stated:

Well said. All of the machinery was a new and hot thing in the country and New York was filled with people all over the world. What wasn't "hot" was the conditions the workers (more like slaves) faced, like not being allowed to leave your seat, even to get a drink or use the restroom. (SC-5)

Later, in the same conversation about the Triangle Shirtwaist Factory Fire, but responding to a different question, Kennedy and Morgan made a prediction. This was in response to a question about what would happen in society if government were not involved in making rules for how businesses operate. Morgan stated:

If governments stopped making/having rules for industry today, then companies and businesses would be like a bunch of toddlers with no adults around: complete chaos. Sure, wages could improve and the workforce could be treated better, but how realistic is that? Businesses could make more money, but that doesn't necessarily mean that they will pay their workers more. Without rules, pollution could increase and the safety of products could decrease. Although something like the Triangle Shirtwaist fire most likely will not happen today, without rules, businesses would be free to do anything that they think could benefit them. (SC-5)

Morgan followed up this post with more predictions, stating, “Businesses don't necessarily want to tell the truth; if they care about money and being the best, then without rules, (and even with a few rules) business owners could lie to get their product sold” (SC-5). Kennedy responded with affirmation and more predictions. With three exclamation marks concluding the post, Kennedy impassionedly stated, “Well said. Things would be very dangerous if the government left industry alone today. Fires and disasters would be more common and that would be sad!!!” (SC-5).

In the same type of conversation about the connections between immigration and industrialization from a different class, the students participated in explanations of the related concepts and ideas. Tanner stated:

Many of the jobs require little skill, but still needed to be completed were done by immigrants. Also, the immigrants in general helped, by being labor that was needed by several of the companies.

Industrialization might have been possible, but it would have taken a lot longer and been harder to achieve. (SC-6)

River responded with an explanation that described a different thought. River stated:

Without immigrants to work the factory jobs, no one else with a higher skill-set would want to do them. A lot of people that were born in America had some sort of skill set that could be put into a better job, so I don't think anyone with even basic skills would work under the conditions of the factory jobs. One of the reasons that immigrants couldn't get better jobs was because their skills were not desired or needed in the USA like they were back in their home countries. (SC-6)

Taylor responded with a statement of affirmation towards River and further explanation as to why immigration and industrialization were so closely linked.

Taylor stated, "I agree, but it's not like Americans had a better "skill set" but they knew English and they were probably more wealthy than immigrants meaning they didn't have to do hard labor jobs to make a living" (SC-6). River responded to the post made by Taylor with further clarification and explanation on the shared understanding, "I agree with you, that's what I was trying to imply. Not necessarily that Americans had a better skill-set, but their skills were more desired in the US, like speaking English for example" (SC-6).

Findings for Research Question Six

When students participate in online discussions that are followed up with rubric-based assessments -using Likert scales and reflective writing- do they show improvement?

Table 17

Guide to the Data Utilized for Research Question 6

Quantitative Data	Qualitative Data
<p>A) Student Comparison Contrast Survey Statement “I understand how the instructor measured my performance in the online written conversation.” Average of the participant responses</p> <p>B) Student Comparison Contrast Survey Statement “The measurement that the instructor provided is accurate feedback for how I performed during the online written conversation.” Average of the participant responses</p> <p>C) Student Comparison Contrast Survey Statement “After comparing the measurement of the instructor with my own, I see where my strengths and weaknesses are in the skill of using evidence to make claims and counterclaims.” Average of the participant responses</p> <p>D) Student Comparison Contrast Survey Statement “After comparing the measurement of the instructor with my own, I can see myself performing even better on the next online written conversation, in terms of the skill where a person uses evidence to make claims and counterclaims.” Average of the participant responses</p> <p>Student Individual Assessments One, Two and Three (SIA-1) (SIA-2) (SIA-3) Researcher Individual Assessments One, Two, and Three (RIA-1) (RIA-2) (RIA-3)</p>	<p>Student Interview One (SI-1) Student Interview Three (SI-3) Student Interview Five (SI-5) Student Interview Six (SI-6)</p>

In response to the statement, “When students participate in online discussions that are followed up with rubric-based assessments -using Likert scales and reflective writing- do they show improvement?”

To measure the effect of online discussions on how students construct meaning, we attached a score of 1 for each posting assessed as Level One, a score of 2 for a Level Two posting, 3 for a Level Three posting, and 4 for a Level Four posting. Using this scoring, the 120 postings of Conversation 1 had an average score of 2.025; the 126 postings in Conversation 2 had an average score of 2.412; and the 120 scores of Conversation Three had an average score of 3.25.

These three mean scores are strictly increasing. Moreover, when the scores were analyzed using an unmatched t-test, the difference between the mean scores of Conversation Two and Conversation One was statistically significant. The difference of the mean scores of Conversation Three and Conversation Two was statistically significant. And the difference of the mean scores of Conversation Three and Conversation One was statistically significant. All of these differences were significant at a level of $p < .01$, and the difference between Conversation Three and Conversation One (the most dramatic difference) had a p value $< .0001$. These results are a strong indication that the observed differences in the scores were highly unlikely to have been caused by random chance.

Other factors that may have had an effect on the outcome of this data include the fact students had an opportunity to practice the activity on three different occasions. Their growing familiarity over the course of the three conversations with

the researcher's expectations, the online forum software, and the comfort with explaining their thoughts openly may also have contributed to the increasing number of higher quality critical thinking contributions to each subsequent conversation.

In one survey question that stated "Before starting the online written discussion, I understood how to use evidence in making claims and counterclaims," students responded with an average score of 3.4 in relation to the first conversation, an average score of 3.5 in the second conversation, and in the third conversation the average score measured a 3.6. This suggested that after each conversation, and with practice, students felt more confident and skilled in their ability to use evidence in making the claims and counterclaims that connected to the questions within the online written conversation.

Table 18

Before starting the online discussion, I understood how to use evidence in making claims and counterclaims.

Conversation Number	Before starting the online discussion, I understood how to use evidence in making claims and counterclaims.
Conversation 1	3.4
Conversation 2	3.5
Conversation 3	3.6

One survey question that connected to this research question stated "I understand how the instructor measured my performance in the online written

conversation.” Students responded with an average score of 3.5 after the first conversation. In the second conversation students scored an average of 3.81, and in the third conversation students scored an average of 3.89.

Table 19

I understand how the instructor measured my performance in the online written conversation.

Comparison /Contrast Survey	I understand how the instructor measured my performance in the online written conversation.
Conversation 1	3.5
Conversation 2	3.81
Conversation 3	3.89

In a second survey question, “The measurement that the instructor provided is accurate feedback for how I performed during the online written conversation,” students scored an average score of 3.27 in the first conversation, an average score of 3.75 in the second conversation, and an average score of 3.78 in the third conversation.

Table 20

The measurement that the instructor provided is accurate feedback for how I performed during the online written conversation.

Comparison /Contrast Survey	The measurement that the instructor provided is accurate feedback for how I performed during the online written conversation.
Conversation 1	3.27
Conversation 2	3.75
Conversation 3	3.78

A third survey question connected with this survey stated “after comparing the measurement of the instructor with my own, I can see where my strengths and weaknesses are in the skill of using evidence to make claims and counterclaims.” In the first conversation students scored an average 3.39. In the second conversation students scored an average 3.86. What about the third conversation?

Table 21

After comparing the measurement of the instructor with my own, I see where my strengths and weaknesses are in the skill of using evidence to make claims and counterclaims.

Comparison /Contrast Survey	After comparing the measurement of the instructor with my own, I see where my strengths and weaknesses are in the skill of using evidence to make claims and counterclaims.
Conversation 1	3.39
Conversation 2	3.86
Conversation 3	3.86

A fourth survey statement to which students responded was “after comparing the measurement of the instructor with my own, I can see myself performing even better on the next online written conversation, in terms of the skill where a person uses evidence to make claims and counterclaims.” In the first conversation students scored an average 3.67 in response to this survey statement. In the second conversation students scored an average of 3.81, and in the third, students scored an average 3.86.

Table 22

After comparing the measurement of the instructor with my own, I can see myself performing even better on the next online written conversation, in terms of the skill where a person uses evidence to make claims and counterclaims.

Comparison /Contrast Survey	After comparing the measurement of the instructor with my own, I can see myself performing even better on the next online written conversation, in terms of the skill where a person uses evidence to make claims and counterclaims.
Conversation 1	3.67
Conversation 2	3.81
Conversation 3	3.86

What was the motivation to perform well in an online conversation? When asked about the role of the online conversation as an assessment Landry stated that “Well it was homework, but you also wanted people to know that you had read it because if people comment and keep commenting you’re wondering, ‘Is anybody reading this?’” (SI-1). So, yes, there was some concern in the minds of some participants that this was an assignment that would be measured, but not in all cases. When River was asked about the function of the online conversation as an assessment of motivation, the student responded, “I didn’t even think about it” (SI-3). Nevertheless, that does mean there was not any sort of motivation for student participation in the conversations. When asked about the capability to see and respond to what fellow students contributed to the online conversation, Landry stated that:

It can keep a conversation going if you reply to what other people are saying rather than staying in their own individual idea. Once the comments start a train, it makes it a little bit easier so I guess you can say that's why I felt the need to comment a little more. (SI-1)

Recognizing that individuals and the class as a whole improved with each conversation served as motivation for participant contributions to the conversation.

After comparing and contrasting the first and second conversation, River stated that:

People were a lot more open and confident about what they were saying because they had done it once before and I mean it wasn't so new. Not that it was hard, but I think that people were participating more because they knew what they were doing, or most people did.

(SI-3)

This idea of comfort in the activity extends to an understanding of the expectations, use of the software, knowledge of the content, and comfort in how to engage in a conversation so that the ideas continuously build upon one another. River compared the depth of thinking involved between the first and second online conversation and stated that the second conversation was "more thoughtful because I'm looking over the responses and they're more lengthy and they have a response written to them and then a response to that, so they were obviously thinking about it" (SI-3). River went on to say that in the second "conversation people felt more open to respond" (SI-3).

This openness to which the student referred could very well be connected to the comfort and confidence about what the student was doing.

In an interview with a student who had the opportunity to review and reflect on involvement in all three conversations, Harley stated that:

The class did improve because at first we just wanted to have a whole bunch of information and just verbatim what we annotated just for a specific part, but now it's more of our thinking and after reading the text and like digesting it and writing in down and having a conversation about it and I think that's better than our first time when we were just like verbatim everything we annotated. (SI-5)

Here the student marked a shift throughout the participation in each of the conversations. The first conversation mainly emphasized statements already made in the text and eventually transformed to the third conversation where the emphases in the conversations dealt with what participants thought about what the evidence revealed regarding the topic and how it related to the questions that propelled the conversation. Another student who had the opportunity to compare and contrast all three conversations supported this idea when asked about the differences between the first, second, and third conversations. Tanner stated "As we went on, everyone's comments in general were more supported and had more meaning behind them than in the first one" (SI-6).

Table 23

Individual and Researcher Assessment for Student West

West			West		
Student Individual Assessment 1	Student Individual Assessment 2	Student Individual Assessment 3	Researcher Individual Assessment 1	Researcher Individual Assessment 2	Researcher Individual Assessment 3
3.5	3.5	3.5	3	3.5	4

West offered an example of when a student experienced growth in each of three conversations with the researcher in the Researcher Individual Assessment while remaining the same in self-assessment.

West: I feel like I did fairly well on this assignment but wasn't at a 4 level because I wasn't as detailed as the 4 is (SIA-1).

Researcher: Pretty good work on the contributions would like to see a few more, but good work using evidence from the text (RIA-1).

West: I scored myself with a 3.5 because I say that I analyzed and explained my ideas clearly but it wasn't a four because of need for more detail (SIA-2).

Researcher: Good work on making connections to the text and referring to details within the reading. Attempt to make meaning of the information by elaborating through commentary (RIA-2).

West: I gave myself a 3.5 because I feel like my claims were clear and had good emotion but I think if I used more evidence I could have gotten a 4 (SIA-3).

Researcher: Good use of commentary to bring meaning to the details within the contributions. You read with a critical eye on some of the sources used to participate in the conversation (RIA-3).

Table 24

Individual and Researcher Assessment for Student Tanner.

Tanner			Tanner		
Student Individual Assessment 1	Student Individual Assessment 2	Student Individual Assessment 3	Researcher Individual Assessment 1	Researcher Individual Assessment 2	Researcher Individual Assessment 3
3.5	3.5	4	4	4	4

Tanner offered an example of a student who, according to the researcher, performed on a high level throughout the first, second, and third conversations. Tanner saw improvement in participation from the first to the third conversation on the student individual assessment.

Tanner: I think I deserve a 3.5 because I think my counterclaims could have had more evidence from the text (SIA-1).

Researcher: Good work on replying to the responses of fellow students, referring to the text and making connections! (RIA-1).

Tanner: I think my thoughts were clear and crisp and expressed what I wanted to say. However I think I should refer to the text more (SIA-2).

Researcher: Excellent contributions! You've included well-developed thoughts that connect ideas and analyze both the situation and the content (RIA-2).

Tanner: I think I earned a 4 because I used text quotes and asked questions (SIA-3).

Researcher: Good contributions in the conversation! Could really see that you synthesized and made sense of the information as we progressed through the conversation. Way to question and remain critical of the information throughout the

conversation. Excellent contributions! You've included well-developed thoughts that connect ideas and analyze both the situation and the content (RIA-3).

Table 25

Individual and Researcher Assessment for Student Kennedy.

Kennedy			Kennedy		
Student Individual Assessment 1	Student Individual Assessment 2	Student Individual Assessment 3	Researcher Individual Assessment 1	Researcher Individual Assessment 2	Researcher Individual Assessment 3
2.5	3	3	3	3.5	4

Kennedy is an example of a student who improved in both the student individual assessment and the Researcher individual assessment. The student's participation scores were lower than each of the scores that the researcher analyzed on participation.

Kennedy: I think that I would get a 2.5 because I need to have more evidence from the text (SIA-1).

Researcher: Good contributions for having limited contact with the reading. Use evidence from the text. Excellent contributions! (RIA-1).

Kennedy: I think I did a good job with answering the questions about the triangle shirtwaist factory fire (SIA-2).

Researcher: Good work on including information from the reading. Also, you provided interpretations. Would like to see you elaborate and expand on your thoughts a little more. Overall, good work on meaningful contributions (RIA-2).

Kennedy: I think I need to elaborate a little more on the conversation (SIA-3).

Researcher: Excellent work with the thoughtful contributions and replies to postings made by others. You've combined commentary with details from the readings that reveal meaning to the topic and discussion (RIA-3).

Table 26

Individual and Researcher Assessment for Student Emerson.

Emerson			Emerson		
Student Individual Assessment 1	Student Individual Assessment 2	Student Individual Assessment 3	Researcher Individual Assessment 1	Researcher Individual Assessment 2	Researcher Individual Assessment 3
3	4	4	3	4	4

Emerson is an example of a student who improved on each of the three conversations scored by the student and Researcher. The scores by the student and the researcher are the same for each conversation.

Emerson: I believe this is the grade I should receive because I made clear statements that described my thoughts and showed that I understood the text and what it portrayed (SIA-1).

Researcher: Good work for the limited time and contact with the reading. You have thoughtful postings. Look to use evidence from the text in your contributions (RIA-1).

Emerson: I scored myself that way because my arguments, ideas, claims, and evidence were well thought out and all were relevant to the topic and the questions asked. I also contributed to others comments with developed claims and counterclaims (SIA-2).

Researcher: Good connections between your commentary and the details that were included from the reading. You really seemed to involve yourself from the perspective of the immigrant women working in the factory all throughout the comments made in the conversation (RIA-2).

Emerson: I scored myself that way because I believe that my comments and answers were very meaningful and clearly showed my understanding of the topic (SIA-3).

Researcher: It was a real pleasure to read your thoughtful analysis of the topic as it progresses through the conversation. Your contributions to the conversation do an excellent job of adding to the understanding of the topic in relationship to the questions. This is accomplished through your commentary that is highly elaborative, clear, and shows the connections between ideas (RIA-3).

Table 27

Individual and Researcher Assessment for Student Devyn.

Devyn			Devyn		
Student Individual Assessment 1	Student Individual Assessment 2	Student Individual Assessment 3	Researcher Individual Assessment 1	Researcher Individual Assessment 2	Researcher Individual Assessment 3
3	3	3.5	3	3.5	4

Devyn improved in both the self-score on the student individual assessment and from the researcher on the Researcher individual assessment.

Devyn: I think I earned a 3 because I brought up good points, and had some details (like deer hunting limits) and asked a question (what would happen if the workers never killed the buffalo?) (SIA-1).

Researcher: Good contributions to the conversation. Would like to see you refer to the text in your contributions to the conversation (RIA-1).

Devyn: I feel like I did a good job, but I could have said a lot more because at least for me I left a lot unsaid. But I did make some comments that were okay. I think next time I will use more evidence from the reading, when I comment (SIA-2).

Researcher: Good contributions. There was a strong prediction at the end as you made a connection from the past to the present. In the next conversation look to really analyze situations like you did in the second to last comment (RIA-2).

Devyn: I think I did good. I used facts from the article to support the claims I made, but I don't think it was level 4 worthy (SIA-3).

Researcher: At the start of the conversation you included good and strong details then warmed up to thoughtful commentary about why the United States entered World War I. Also, a good critique of the argument made by Howard Zinn! (RIA-3).

Findings for Research Question Seven

What do students reveal about learning from reflecting on their participation in online written conversations?

Table 28

Average of Student Individual Assessment for each conversation.

Conversation	Student Individual Assessment
Conversation 1	3.4
Conversation 2	3.5
Conversation 3	3.5

When asked in the interview how typing affected the manner in which students participated in the conversation, Landry stated “With typing it’s here, so if you need to go back to something that’s different if you’re just listening to the conversation and have to recall what they just said” (SI-1). Alex revealed that through typing, the information was processed more effectively because “If you type it out you get a better understanding and it kind of shows that I can write it and that I know about the topic” (SI-2).

Perhaps a third student provided a clue as to why this phenomenon was possible by describing how the structure of the conversation influenced participation when comparing a verbal conversation to the online written conversation. Alex stated:

If we were listening I might not hear what someone said, but by typing I can look back over what they said and then I would have that evidence or information to help me say or type whatever I would say.

(SI-2)

The online written conversation provided a log of all the thoughts that students shared with one another. Rather than using intellectual resources to keep remembering what people have already contributed, this freed up the participants to think about the topic. It was written, and therefore there was no need to keep remembering. Students could simply review what was already shared. Landry stated, “You don’t have to have them repeat it. You can just scroll up and find it” (SI-1). Landry went on to explain that typing the conversation was related to the use of evidence in the conversation because:

With typing I feel, like, forced to refer to the text rather than if you’re just put on the spot in a conversation and you have to think of your answer right then and there. I think the typing helped people get more into the text and reply and respond to other peoples’ thoughts a lot easier. (SI-1)

River provided perspective on how typing the conversation into this format allowed for participation in a different manner than if it were verbal:

In a verbal conversation you may have to take notes if you wanted to remember something and respond to that. It’s also kind of weird to stop the conversation when its going somewhere and go back to something else because you wanted to talk about or you had a good thought. (SI-3)

According to Emory, rather than waiting for teacher directives, it also provided them with the liberty to participate in the conversation on their own terms:

It affected me a lot because it gave people more of a chance to state their opinion than as if we were talking in the classroom where we would have to raise our hands and talk at different times which would take a longer time, but if you're having an online conversation you're able to type your response people can just read and type a response when they want to and you aren't limited on what you said. (SI-4)

Continuing the theme of freedom in how students were able to participate in the online conversation, the same student expressed that there was not a sense of pressure to say what you wanted to express in a specific amount of time as there would be with a verbal conversation. Emory stated:

I think it gives people time to figure out what they want to say and their opinion without people standing over them waiting for them to finish. You kind of get time to finish what you're saying and conclude it. (SI-4)

Participants could think at their pace, take care in expressing clear thoughts, and connect their ideas to evidence that supported their thinking. Harley stated:

First of all it was quiet so I could think about what I wanted to say and I had more time to write down versus when you're talking and you have to think it up as you go. Also, I could look back at what I said earlier and doing that helped a lot - to look back and support the claims that I was making. (SI-5)

In one interview, a student did express a sense of loss with the online written conversation. Tanner stated:

If you go back to the conversation about the triangle shirtwaist factory fire, if we were to have a verbal debate over it, you could hear some of the emotion in how awful it was if you were just listening to it, but when you look through the comments in the conversation, it's a little harder to gather that feeling. (SI-6)

This student expressed the fact that one could not pick up on the tones and inflections in the voices of students during the conversation. This was important because that, too, communicated meaning, and without that information it was not as easy for the student to feel as if he were able to fully understand what other participants wanted to clearly communicate.

Kennedy began this portion of the conversation by stating the population levels of buffalo in the west before mass hunting began. Kennedy stated, "Frank Meyer thinks there are hundreds of millions of buffalo and we would not run out... But the buffalo did disappear" (SC-1). In a verbal conversation where a number of people were participating, a participant making a contribution may make a statement and when it is concluded, realize that they wished to add more to the conversation right after they have completed the original contribution. At times that can be difficult because other participants also want to share insight into the topic and that may require the student who wants to add to an initial contribution to have to wait until others have also had an opportunity to share their thoughts.

In this case Kennedy realized that to add more to an initial post, it was not necessary to wait, it could be done right away. The computer and the structure of the conversation did not require that a participant wait for others before making an

additional contribution. Kennedy stated, “He thought there were a lot of buffalo, but they all disappeared and he realized there was no more” (SC-1).

Morgan was able to demonstrate both knowledge of the facts and an understanding of how the facts relate to one another to reveal meaning that is processed through thinking. Morgan stated:

I think Frank Mayer was oblivious to the idea of the elimination of buffalo because this was his living. He got his money and skill from killing buffalo, so he ignored or refused to face the possibility- and soon future- that would be the endangerment of buffalo. Frank Mayer thought that the herds of buffalo would never run out because there were "plenty to keep us going until we were old men. (SC-1)

Morgan was able to include direct information from the reading in the conversation. This was also possible during a conversation that is solely verbal, but with the online written conversation the information from the text can be written into the conversation where it best fits any time, and is not limited to fitting a timely response.

Students were responding to the question about whether or not industrialization would have been possible without the use of immigrant labor. Peyton began the conversation by explaining the basic work structure within a factory during the time period. Peyton stated, “Well I think it's related to immigration because the people working at the triangle shirtwaist factory were immigrants” (SC-6). Taylor followed the post by building on the idea of how the factory workers were made up of

a majority immigrant population and explaining the motivation and conditions for pay. Taylor explained:

Most of the workers in the factory were immigrants working to pay their families in another country or provide for a family that had recently moved to New York or the US. They weren't paid greatly but some was better than nothing. (SC-6)

River also explained the relationship between the workers in factories and immigration, but then included another relationship about how the skill level of the people working in the factories factored in determining their working conditions:

The Triangle Shirtwaist Factory is related to immigration because many of the people working at the shirtwaist factory and other industrialized places were immigrants. Immigrants usually didn't have much skill so these low paying factory jobs were all they had available to them. (SC-6)

Tanner was able to include quotations from the reading and add an excerpt to the conversation verbatim. In a verbal conversation this is also possible, but in this form, other students were able to see it included in the conversation, reflected on the meaning, and have it continuously shape the conversation. Tanner connected to the previous post in explaining how motivations for a better life brought immigrants to the United States:

The industrial revolution and the triangle shirtwaist factory are related to immigration because they both used immigrants as their primary labor source. In the reading it states, "they were for the most part,

recent Italian and European Jewish immigrants who had come to the US with their family to seek a better life. (SC-6)

Taylor explained a slightly different possibility regarding the relationship among factory workers, immigration and the industrial revolution. Taylor explained the role that Americans had in the industrial revolution that made immigrants as the primary workforce. Taylor stated:

It wouldn't have been impossible. Most of the workers in factories were immigrants. Most factories would not get far if they had only a few American workers. The owners were American, but they would probably much rather pay for other workers to do tasks for them. Few Americans would want to do hard labor with low pay when they could strive for a job of higher pay, less labor, and shorter hours. (SC-6)

The structure of the conversation allowed for time to think about the topic and for students to contribute different aspects of the relationship. In a verbal conversation where students were speaking with one another, they may feel pressure to contribute and when one participant shared an idea that was already on the mind of another student, there may be a struggle to find another way to contribute to the conversation. In an online written conversation, where silence is the norm, students did not feel same sense of awkwardness and were free to search the text and search their thoughts to find other intellectual turf to contribute to the group understanding of the topic in a unique manner. In this conversation, that was exactly what took place. Each student had contributed something unique to build upon and add to understanding. Students were able to do this because they could read the postings made by previous students

and then decide how they could make an impact to reveal a different aspect of the topic.

Chapter 5: Discussion of the Results

Introduction

Critical thinking is a process that allows for progress. It is essential that educators create an environment in the classroom where students can participate in critical thinking. This chapter provides a summary of both the study and the data presented in chapter four. It examines the implications of the results and the recommendations for future research.

Students participated in online conversations in which they wrote, shared, and responded to one another's postings. Student writing had an effect on how fellow participants thought. Students showed how the understanding of how ideas evolve as a result of the introducing of new evidence, or evidence explained in a way that had not yet been considered. The students' critical thinking skills that emerge from the discussion will be applied into their future, whether this takes place in academic pursuits or those that extend beyond formal education and into other life experiences.

Summary of the Study

Overview of the Problem

During the course of this study, students participated in three written online conversations where they wrote, shared, and responded to one another's postings. In each of these conversations, students responded to questions that were connected to assigned readings. Their shared thoughts had a recursive impact on how students shaped their ideas in relationship to a topic and to common informational texts used to develop their ideas. The activity proved empowering and motivating as students

discovered that they were able to influence how others thought about the topic of discussion and built on those ideas with contributions of their own.

Purpose Statement and Research Foci

While exploring American History, students had the opportunity to engage in critical thinking by constructing meaning in written online conversations. The research foci that guided the study were the following:

Research focus one: Constructing meaning from online written conversations.

When participating in online written conversations, students had a shared experience in making meaning of the information that they interpreted from an assigned reading. Their first shared experience involved reading and annotating the assigned text. This was the first step in making meaning as students gathered facts about the topic, found patterns in what they were reading, and then used the conversation as a tool for sharing and further developing their understanding of the text in relationship to the discussion questions (Lehman & Roberts, 2014). The online written conversation provided an opportunity for students to participate in an experience where they could take part in actions that connected them with other people (Wenger, 1998). In this study, students were assigned the task of typing their thoughts in a forum. This allowed students to participate in the collective construction of shared knowledge. Fellow participants were able to read one another's thinking. It was during these discussions that students influenced one another's thoughts and perspectives on the topic.

Students shared thoughts that others had not yet considered. This caused students to consider how others thought about the topic, and this resulted in a change in how they considered the topic. Students became aware of this phenomenon and shared that their participation in an online written conversation caused them to develop a deeper understanding. The deeper understanding that students developed about the topic was a result of their continued attempts to negotiate the understandings of what fellow students shared in the forum with their own understandings. This happened even if the views were only slightly different. The viewpoints did not have to be dramatically dissimilar in order for students to reconsider how they thought about the topic in comparison or in contrast to their own understandings.

During the time period that the online written conversations developed within the classroom, the students were motivated to respond to one another by sharing how their ideas and thoughts connected to the postings that fellow participants contributed. This is a phenomenon that the researcher was able to observe while the conversations were taking place and again when reviewing the data. Synchronous conversations are constantly changing as new ideas emerge throughout the experience from multiple participants (Maurino, 2007). Ideas built on one another and new understandings emerged. The immediacy of the conversation was an invigorating and motivating experience as students were able to see how their participation was influential in developing more nuanced understandings. When students are able to interact as collaborative learners “it encourages students to respond to each other in ways that

demonstrate critical thinking and application of important course concepts to cases and to their own lives” (Majeski, 2007, p.176).

Evidence plays an important role in developing understandings among participants. Students were aware that mere opinions were not enough to influence the conversation and had to support their contributions with evidence mined from the shared readings. Opinions were important, but they had to be informed by evidence. For students to contribute postings that were considered meaningful to developing ideas, they understood that there was a significant relationship between understanding and fact. The facts served to inform people’s understandings. Written argumentation “requires what might be called deliberate semantics – deliberate structuring of the web of meaning,” (McGinley & Tierney, 1989, pp. 99-100).

Two characteristics emerged when students intentionally included evidence in their postings. Firstly, other students were able to understand and were motivated to respond to postings. Secondly, students who used evidence were more adept at communicating the meaningfulness of what they wanted to convey. When students posted thoughts into the online written conversation that fellow participants did not fully understand, they were able to write questions asking for clarification on the matter. Whether it was through asking questions, including evidence, or responding to the ideas of fellow participants in either agreement or disagreement, students were able to advance the understanding of the topic. In the online written conversations, writing served as an essential part of the process that allowed participants to exchange ideas and further develop meaning about a topic.

Research focus two: Altered understandings through online written conversations.

During the course of the online written conversations, students were able to think about the arguments that other participants contributed to the conversation. The data showed that the participants built upon one another's ideas throughout the conversation, as they took the shared perspectives into account. Participants consistently returned to the root of the argument and considered how the understanding of the ideas progressed. When a fellow participant arrived at a particular position regarding the topic, fellow participants acknowledged its depth or newness with affirmation and then continued to add their own interpretation. The data mined from the online written conversations supports what happens when students learn through communication: "Interaction among peers seems important to internalizing attitude change. Information is processed, weighed, reorganized, and structured in this process, both by each individual and also by the group" (Harasim, 1990, p. 44-45).

Students were able to express their thoughts and observe the contributions of fellow participants over the course of the conversation. They accessed the contributions from earlier in the conversation and added more details, in terms of evidence and their own interpretation of the situation, to the collective understanding. The forum on which students wrote the online written conversations served as a tool to collect the thoughts of students. This functional characteristic of the online written conversation "holds the individual members of the group together and enables a 'conversation' to take place" (Harasim, 1990, p. 45). It also allowed for the

conversation to evolve. This does not mean that everyone left from the conversation agreeing on how they understood the issues that surrounded the topic, but it did serve as a shared space and a common experience where each member had an opportunity to participate by having access and an opportunity to influence the conversation.

As students shared their thoughts about the topics of discussion, several trigger points within the conversation communicated altered understandings. These were either signs that students were in the process of altering understandings about the topic or that they had done so already and were communicating the manner in which their thinking had already changed. The most prevalent displays of this type of phenomenon within the online written conversations were the use of hypothetical examples, analogies, and interpretive points of view. Students shared thoughts on what they thought about how society would function if government were to remove itself from regulating businesses. Another student contrasted how present-day society would reflect the excesses of the industrial revolution. In conversations about the disappearance of buffalo, students attempted to think from the perspectives of buffalo hunters, Native Americans, and even the buffalo, as they considered the dramatic changes that western settlement introduced into the environment.

Students often received feedback from fellow participants displaying agreement or praise for an idea explained. This does not mean that the students who wrote the affirming messages in response completely changed how they thought about the subject, but it does signify that the post they were responding to impacted their thoughts enough to first respond, often in the affirmative.

Research focus three: The impact of writing, reading and response on meaning.

Through entering text students could connect in a manner that allowed time to develop a clear thought and think about how to communicate that thought in way that would contribute to other participants' ideas. The "act of writing is a part of the thinking process" (Tierney, 1989, p. 24). The action of typing provided students with opportunities to connect understandings gathered from the text to the ideas that fellow participants contributed to conversation and advanced the thinking about the topic. The participants were able to make claims and counterclaims in response to what others contributed. Students self scored on surveys after each conversation and showed a measured increase in how they used evidence, made claims and counterclaims, and read the claims and counterclaims of fellow students. These served as contributing factors and caused the participants to think more deeply about the topics of discussion.

The first phase in the process was that online written conversations allowed for confirmation that the participants were thinking correctly about the topic. Students compared what they wrote to the contributions of their fellow participants. Through an interview with Landry, the student explained that the online written conversations "confirmed what I was already thinking and that my ideas weren't so far fetched and that others could understand them, so it was confirmation that you were on the right path" (SI-2).

The next phase of thinking with greater depth involved making connections among concepts. In the conversation about the disappearance of buffalo, students

explained that it was strongly connected to building the transcontinental railroad as buffalo provided a source of food for workers and then for sport as the railroad transported more people to the west and the buffalo hides to eastern markets. In the conversations about industrialization, students expressed understandings on how immigration made rapid industrialization possible in the United States. In the conversation about the reasons why the United States entered World War I, students made connections with German submarine warfare. It was through connecting concepts that participants were able to establish relationships. The student Emory offered an example in the conversation about the disappearance of the buffalo, stating, “Over time, the slaughtering of the buffalo led to their destruction. It all started with the railroad workers’ need for meat causing buffalo hunters to be hired in the first place” (SC-4).

Once students discovered connections among the concepts, they made claims regarding actions, decisions, people, or other aspects surrounding the topic. Fellow participants responded to the initial claims with counterclaims. During this process, even more evidence was shared and considered. Students engaged in the writing process to develop nuanced understandings of ideas, building upon concepts through participant interaction and allowing for new discoveries.

Research focus four: Critical thinking through analysis, interpretation, and argumentation.

Before students engaged in critical thought within the conversations, they participated in a collective process where they gathered and synthesized evidence and thoughts about how the evidence connected to the topic of discussion. From this

launching pad students were able to engage in critical thought. This involved moving beyond identifying the relationship and into the realm of explaining the significance behind the relationships. In a conversation about the disappearance of buffalo and how it connected to the railroads, student Landry explained that “the connection between the railroad and the buffalo was the citizens’ desire for money” (SC-3). This analysis involved interpreting the actions of the people who were motivated to hunt buffalo and discovering why they did not cease their activities even though there was evidence as the years progressed that fewer buffalo roamed the western plains.

Other participants also contributed hypotheses on what motivated the buffalo hunters despite their awareness of the decimation of the animal. These hypothetical examples included seeing the perspectives of the buffalo hunters. After contributing suggestions, fellow participants followed up with inquiries. In the conversation about the Triangle Shirtwaist Factory Fire where workers perished in a conflagration, students shared their thoughts on the level of responsibility that the factory owners should shoulder. During the conversation, participant Peyton responded to a statement made by a fellow participant stating, “What kind of punishment do you think they would deserve?” (SC-6). Inquiries such as these move the conversation in terms of direction and depth. It signals a shift to focus on a different aspect of the topic that requires the participants to consider and analyze evidence that pertains to the specificity of the issue related to the general topic.

From inquiry, students progressed into argumentation. This is not argumentation in the sense where people express ardent disagreement regarding the topic. Instead, students engaged in argumentation where they could craft and explain

the reasoning that supported stated claims and counterclaims. In this phase, students shared how they evaluated the evidence that constructed understanding. In the discussion about what led the United States to enter World War I, the participant, Morgan, introduced analysis of a stated position. Morgan stated that “Howard Zinn does not make a convincing argument because it is slightly unclear of his belief of the cause of America’s war entrance” (SC-9). Morgan did not stop with this introductory contribution, but went on to provide an analysis of why the position made by Zinn was suspect. Morgan argued that Zinn “does not have very many supporting details that would convince the reader of the United States’ motivation” (SC-9).

The online written conversations demonstrated that critical thinking is a process where participants first gathered and shared evidence related to the topic, synthesized the information and evaluated the significance of the information, and then moved into a process of inquiry that evolved into argumentation.

Research focus five: The influence of conversational structure in critical thought.

The teacher has an essential role in the success of how well a class communicates by serving the multiple roles of “of reinforcer, clarifier, encourager, organizer, facilitator, reassurer, praiser, supporter, confidence builder, and evaluator” (Care, 1996, p. 2). The researcher provided scored rubrics and comments that explained how well the students participated in the online written conversations. Additionally, students completed surveys in response to the scores that the researcher provided. Through the surveys, the students measured how accurately they thought the researcher scored participants on each of the three cycles of the online written

conversations. This interaction served to guide the students and gave them the opportunity to reflect on how they could improve their skills and level of participation.

Throughout the online written conversations, the researcher posed questions that strongly influenced the direction and substance of the discussion. The questions allowed for the participants to engage in different aspects of the conversation. In response, the students demonstrated analytical aspects of critical thought. In order to reveal the meaning within the question, students analyzed the evidence surrounding the topic.

In a discussion about the Triangle Shirtwaist Factory Fire, the researcher posed a question about how immigration and industrialization were related. The participants shared their background understandings that would lay the foundation for critical thought. Students discussed the hopes of immigrants when immigrating to the United States, the challenges of living in a country that utilized a different language, the low pay earned by factory workers, and the miserable working conditions they endured once finding employment. The discussion moved through a series of questions about the tragic fire that consumed the lives of immigrant factory workers, the level of responsibility held by the factory owners, and the question of what would happen today if the government were to allow businesses to operate without creating and enforcing rules.

From this point, students were able to participate in predictive analysis. Participant predictions were based upon the evidence that students had already included in the earlier foundational part of the discussion that involved connecting

immigration to industrialization. Participants made predictions about the profits that companies could earn, the motives and actions of businesses, factory conditions, and the predictions of why future workplace tragedies would be more or less likely.

The structure of the conversation in which students are able to establish a foundation of evidence about how concepts within a topic are connected to one another allows for students to participate in critical thought with questions that require analytical thought. Participants were able to contribute to the conversation by making comparisons, using predictions, and offering hypothetical examples.

Research focus six: Using assessments to identify improvement over time.

During the course of the written conversations, the goal was for students to make connections with the text using evidence from assigned readings to write claims and counterclaims in relation to the questions “to encourage students to identify explanations, form opinions, and create meanings based upon their individual reading of a text” (Connor, 2003, p. 241). In comparing the surveys where students scored themselves on how well they performed in a number of different aspects within conversations, participants indicated a perception of improved performance from the first to second and then the second to third conversation.

River, in comparing the second to the first conversation, shared the difference between the two by explaining that the second conversation was “more thoughtful” (SI-3) than the first. River explained that the responses were “more lengthy and they have a response written to them and then a response to that, so they were obviously thinking about it” (SI-3). River was referring to the fact that participants were interacting with one another in sharing evidence and making claims and

counterclaims. The online written conversations provided students with an opportunity to debate their understandings of the content with one another. In reflecting upon the facts and the multiple perspectives that each student brought to the shared conversation, it required that students utilize “critical thinking and a plethora of other skills that include, listening, researching, problem solving, reasoning, questioning, and communicating” (Scott, 2008, p. 41). The term “listening” in the previous quote refers to a debate in the traditional oral sense of the term. When adapted for an online written conversation, it refers to the ability of participants to read into, comprehend, and analyze the thoughts of fellow participants.

Then there is the comfort factor that comes with practice and familiarity.

River states:

People were a lot more open and confident about what they were saying because they had done it once before and I mean it wasn't so new. Not that it was hard, but I think that people were participating more because they knew what they were doing, or most people did.

(SI-3)

River indicated a general sense of improvement from the first to second opportunity in the online written conversation. Student Harley was interviewed after participating in all three online written conversations. Harley provided an analysis with specifics on how and why participants were able to improve over the course of the three online written conversations. Harley stated that:

The class did improve because at first we just wanted to have a whole bunch of information and just verbatim what we annotated just for a

specific part, but now its more of our thinking and after reading the text and like digesting it and writing in down and having a conversation about it and I think that's better than our first time when we were just like verbatim everything we annotated. (SI-5)

Harley's comment was similar to Lampert 's (2006) explanation that, "developing critical thinking skills and dispositions in young people afford them the means to make thoughtful choices" (Lampert, 2006, p. 2). The online written conversations provided the format and the experience where students could engage in this type of activity. In this case, the thoughtful choices are the relationship between personal experience, the assigned reading, and the understanding about the topic that participants contributed to the online written conversation.

When students self assessed through rubrics, overall the participants scored themselves higher with each succeeding online written conversation. The researcher also provided a separate rubric score along with feedback for each conversation. When participants were given the researcher's feedback, they reflected on the accuracy of the feedback with another survey. The improvement that participants experienced was the result of participation, reflection, feedback and further reflection on the researcher's feedback. These factors worked together to help participants identify where they could improve, how to facilitate that improvement, and with each following opportunity to participate in an online written conversation students had an opportunity capitalize on the information and demonstrate improvement.

Research focus seven: Student reflections on learning from participating in online written conversations.

The technological device that students used to access the conversation was the method by which participants were able to form and communicate their thoughts as well as access and respond to the thoughts of others. It was through technology that ideas were shared, built upon, and refined. Students had more time to think about their thoughts and the manner in which they would communicate their thinking to the group so that they could be clearly understood. Participants could engage in the conversation under their own volition rather than wait their turn, as they would have to do if the conversations were a more traditional classroom discussion. This allowed for the flow of ideas in a way that is different from a verbal conversation. In the online written conversations, students could review earlier parts of the discussion rather than ask for people to repeat themselves or feel awkward about going back to an earlier part of the discussion that the rest of the class may have felt was resolved.

Another freeing aspect of the online written discussions involved the amount of time it takes for students to make a comment. In a verbal conversation, there is the pressure to make a point in a respectful amount of time so that others can offer contributions. This is significant because this sense of pressure to deliver a thought in a timely manner may affect thinking and communication rendering the expressed thought less developed. In the online written conversations, students were free to take their time developing an idea, but were also free to elaborate on the ideas to the extent that they desired, without the need to feel as if they had to finish so that others could also participate.

There is also the connection between silence and thought. An online written conversation offers a setting where students are able to communicate without sound. Though sound is necessary to communicate during a traditional group discussion, this is not the case with an online written conversation. In each of the three online written conversations that took place during the course of this study, students were not allowed to speak with one another. The student, Harley, explained how this aspect of the online written conversation influenced how they thought and participated. “First of all it was quiet so I could think about what I wanted to say and I had more time to write down versus when you’re talking and you have to think it up as you go” (SI-5). Within this explanation of silence, Harley also explained how time was also a factor. There was time to gather thoughts and to “look back at what I said earlier and doing that helped a lot - to look back and support the claims that I was making” (SI-5). What Harley expressed about how online written classroom conversation affected thinking is also communicated by Tierney (1989), who describes writing as “thinking that can be stopped and tinkered with. It is a way of holding thought still enough to examine its structure, its flaws” (p. 24).

The online written conversation allowed for discussions to take place among several people while halting time so that students could investigate their thinking while continuing to participate. In participating in online discussions, Swan & Shih (2005), explain that all students have a voice and no one, not even an instructor, can dominate the conversation” (p. 116). During this space in time they could find words to express related ideas and discover their thoughts.

This sentiment about the online written conversations is echoed by Emory, who explained that “it gives people time to figure out what they want to say and their opinion without people standing over them waiting for them to finish” (SI-4). Through the use of technology, time and thought are connected to one another. Emory explained that by participating in an online written conversation, the participants were allowed the “time to finish what you’re saying and conclude it” (SI-4). This is similar to findings by Swan & Shih (2005) who explain that “online discussion also affords participants the opportunity reflect on their classmates’ contributions while creating their own, and to reflect on their own before posting it” (p. 116).

While parts of the online written conversations were influenced through technology, there was also the pedagogical structure. In designing the written online conversations “it is important to design tasks that promote conversation and also allow measurement of each student’s individual and group participation” (Fischer et al, 2011, p. 375). Several students communicated how difficult it was to engage in a conversation where there was a significant amount of agreement. Alex stated, “It’s a lot harder to respond to someone else’s comments if their idea is the same idea as yours because there is nothing to disagree” (SI-2). In the first conversation, Landry explained that “Everyone was kind of the same on what they thought about the buffalo being killed off” (SI-2).

Students must be required to make sense of data, solve problems, and think critically in a cooperative manner. The lack of physical presence with someone else will not serve as a reason for not being able to use these skills (Nanzhao, 2011). In

order to participate in the online written conversations, students were expected to refer to the shared text, utilize information from the reading to support thoughtful contributions, and then refer to the text again to analyze and respond to the claims made by fellow participants. This type of participation prepares students for the global economy as an increasingly connected web where people are required to work with technology to communicate without their physical bodies in the same vicinity (Nanzhao, 2000).

Landry explained that typing contributions into the online written conversation required students “to refer to the text rather than if you’re just put on the spot in a conversation and you have to think of your answer right then and there” (SI-1).

In participating in the online written conversations, Landry explained that students were able to experience how, “typing helped people get more into the text and reply and respond to other peoples’ thoughts a lot easier” (SI-1). It is “to hold a dialogue, so that together, within a ‘community of inquiry,’ they can find elements of answers relevant to the questions” (Daniel et al., 2005, p.335). Two things must take place. The first is the development of an idea as a result of communicating shared thoughts about a topic, while the second involves the ability to communicate those ideas so that others are able to clearly understand what it is that the contributor to the conversation is communicating:

For other people to understand your point, you have to back it up and if someone doesn’t understand it, you use evidence to further back it

up so that others can understand it and that way you can build off the conversation. (SI-1)

This is how ideas evolve. “Life is infinitely more complex in the world of the twenty-first century, and it is important to ensure that learners are adequately equipped to deal with them” (Nanzhao, 2000, p. 4). The skills that students are able to develop that result from communicating in the online written conversations are strongly related to the skills of the twenty-first century that enable students to successfully contribute to the further development of ideas.

The dynamic energy in synchronous conversations creates an opportunity where people may participate with greater honesty and openness since participants are not able to see how others express their feelings in reaction to what others communicate (Maurino, 2006). It remains to be seen whether or not students were more honest in their participation with the online written conversations during the course of this study. In fact, the lack of physical personal interaction caused confusion according to one participant in the study. Tanner stated, “If you go back to the conversation about the triangle shirtwaist factory fire, if we were to have a verbal debate over it, you could hear some of the emotion in how awful it was if you were just listening to it, but when you look through the comments in the conversation, it’s a little harder to gather that feeling” (SI-6). How is the connection between emotion and thinking altered with an online discussion about a topic as opposed to one that takes place face-to-face? (Maurino, 2006). This is an aspect of the study that requires more examination. Online conversations are devoid of the facial and tonal

expressions and the possibility of anonymity that influence thinking, when compared to those that take place in person (Maurino, 2006).

Implications for Action

What are the implications for educators? This study revealed several essential components to developing critical thought. 1) Students must have an opportunity to participate in their own learning. Participate is a general term. Taking notes is a form of participation, but this form could be considered passive. To actively participate in learning, students must be allowed the opportunity to make meaning from an experience. 2) Students should have the opportunity to interact and share the meaning that their participation produces. This allows learners to build upon their ideas and identify the pathways that are not as fruitful for problem solving or solution finding. Interaction allows for refinement in terms of developing nuanced understandings as students are able to utilize evidence they may not have previously considered and develop reasoning they may not have acquired on their own.

Critical thinking is a skill. The significance of skill development is the ability to transfer the practices to future opportunities. When participants engage in an online written discussion, they have an opportunity to discover knowledge by using the evidence and argumentation to influence thoughts of others as well as think deeply in a manner that may very well alter their own understandings of concepts, relationships, and meaning. Online written conversations provide a setting where students can develop critical thinking skills. Participation, interaction, and feedback, are characteristics that create the opportunity to improve. Educational environments

ought to implement said characteristics so that students can experience critical thought as a process.

Recommendations for Further Research

This study was made up of volunteers. Though members of both genders were provided with an equal opportunity to participate, the majority of participants were female. It is unclear as to why girls were more enthusiastic to participate than were boys, but perhaps that is a research question in itself. Would another researcher conducting a study utilizing mostly male students find similar results?

Several times throughout the study when students found themselves in agreement on the topics, the participants remarked that they found it difficult to participate in a conversation where there was nothing controversial. Everyone agreed, though, that there were cases where people were in agreement and still found plenty to discuss. The data from this study, in terms of the number of responses, does not seem to support that students did not have much to share when participants agreed. Participants continued to explore the nuances of ideas even when they shared perspectives on the discussion topics. How much does agreement or disagreement foster critical thought? This could be in reference to how participants select, evaluate, and use evidence to make claims and counterclaims during the course of the online written conversations.

A third recommendation is for further research in feedback. This study implemented surveys, participant self-assessment rubrics, and researcher assessed rubrics. On the participant self-assessment rubrics and researcher-assessed rubrics, there was room to write comments. On the participant self-assessed rubrics, the

comments served as communication for the researcher, while on the researcher-assessed rubrics, the comments served as a method of communicating performance to the participant. Further studies may find it worthwhile to investigate how well one-on-one conferencing between the researcher and individual participants would serve to promote improvement over the course of several online written conversations within the study.

Connected with the idea of using conferences is modeling. A study that pulls models of critical thinking from earlier conversations and uses those as exemplars to demonstrate effective critical thought before the next conversation would serve as an intriguing area of study. How would modeling critical thought through repetition and practice help students improve their critical thinking skills? Models could be shared during the one-on-one conferences, with the class as a whole, or both. Though this was a practice in the form of showing exemplars to the whole class as a strategy that the researcher employed during the course of this study, its effectiveness was not measured in terms of having it as a question or statement that students could respond to on surveys. In that sense, its impact was not measurable.

Also, the researcher could share the number of level one, two, three, and four contributions to the conversation after each written online discussion. Would this motivate the participants to think through the writing process making them more motivated to write and post higher-level contributions according to the rubric scores?

Finally, What is the impact of the absence of facial and tonal expression in critical thinking? Would it allow for students to develop skills using evidence and reasoning more or less skillfully? Does this improve sensitivity to written tone? Does

a conversation without facial and tonal expression elicit different types of critical thinking than those conversations that do? A researcher could compare and contrast face-to-face verbal conversations with written online conversations to identify whether participants are more or less likely to engage in critical thought, or utilize different types of critical thought.

Concluding remarks

Written online conversations present an opportunity for students to grow more comfortable with using technology, practice the process that allows for writing to develop thinking, participate in learning interactively, and reflect on individual thought processes. As student Harley explained:

It helped me to understand what we were learning, like how to have a deeper understanding of it. Some people didn't have opposing views, but had slightly different views than my own and I didn't think about that before. So seeing their thoughts and their thought process helps me to understand possibly another side of what someone else was thinking. (SI-5)

Critical thinking is the result of a successful learning experience. A successful learning experience requires that learners participate and reflect on what they are attempting to understand and the processes that allow them to foster new understandings. This is not always apparent to the learner, and participating in a process where students can engage one another in the process of skill development is essential in bringing about that awareness.

A part of this enlightenment is that a learner does not completely understand, or has not fully developed, the extent to which the skill can be developed. When it comes to learning, the true sense of enlightenment is that one can continue to grow, that the skill can continue to be refined, and that the topic can be more deeply understood. The process is the revelation. By interacting with peers, sharing knowledge, and remaining reflective about how people engage in their thinking is what is most empowering about learning. Online written conversations are opportunities for students to investigate a topic through reading, refine thinking through writing and discussion, and reflect on their experiences using self-scoring and researcher-assessed scoring guides. This is just one way, one step, and one method, of making the phenomenon of critical thinking self-perpetuating. When students have an opportunity to share their interpretation of knowledge, they demonstrate motivation, alter their learning experience so that they contribute to further understanding, and realize that they are a part of the miracle that is the human experience where knowledge is continually building upon itself.

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Appendix A: Reading Closely for Text Evidence

Steps in the Process	Detailed instructions with Each Step
Read through lenses.	Choose specific details to gather as data. <ul style="list-style-type: none"> • What people say/think/do. • Facts • Quotes • Descriptions • Concepts in terms of examples, definitions, and/or explanations. • Relationships and/ or comparisons • Recurring topics or themes. • Time Period
<i>Use the lenses to</i> find patterns.	<ul style="list-style-type: none"> • Which details fit together? • How do they fit together?
<i>Use the patterns to</i> develop a new understanding of the text.	Look at the patterns to think about: <ul style="list-style-type: none"> • Definitions of unknown terms or concepts • Central idea of an entire text • Author's bias or point of view

Appendix B: Rubric for Close Reading of a Text

Instructions: Using the close reading process, identify the details, patterns, and theme of the assigned reading. Apply the three - step process. For the third step that involves explaining the theme, write a minimum five-sentence response elaborating the meaning of the work.

Description of the Steps	1	2	3	4
<p>Read through lenses Choose specific details to gather as data. -What people say/think/do. –</p> <p>Facts -Quotes -Descriptions -Concepts in terms of examples, definitions, and/or explanations. -Relationships and/ or comparisons -Recurring topics or themes. -Time Period</p>		-Some words that are revealing and / or recurring are highlighted, underlined, circled, or identified in a manner that is clear and distinctive from the rest of the piece, but there are more.	-Words that are revealing and / or recurring are highlighted, underlined, circled, or identified in a manner that is clear and distinctive from the rest of the piece. If less specific words, are identified, there is an explanation.	-Strong nouns and verbs that are revealing and / or recurring are highlighted, underlined, circled, or identified in a manner that is clear and distinctive from the rest of the piece. If less specific words are identified, there is an explanation.
<p><i>Use the lenses to find patterns.</i> -Which details fit together? -How do they fit together?</p>		-Symbols are used to identify places where some of the details fit together, but there is still more left in the writing to identify. -Little or no writing to help identify relationships.	-Symbols are used to identify places where details fit together. -Student writing /symbols on the side helps identify the relationships.	-Symbols and/or student writing are used to identify and explain places where details fit together. -The writing /symbols on the side of the piece clearly helps identify the relationships.

Description of the Steps Continued	1	2	3	4
<p><i>Use the patterns to develop a new understanding of the text.</i></p> <p>Look at the patterns to think about:</p> <ul style="list-style-type: none"> -Definitions of unknown terms or concepts. -Central idea of an entire text Author's bias or point of view. 		-The concepts and the patterns within the student writing are used to explain the meaning of the piece in a manner that somewhat connects to the ideas of the original author.	-The concepts and the patterns within the student writing are used to reveal the meaning of the piece in a manner that clearly connects to the ideas of the original author.	-The concepts and the patterns within the student writing are used to reveal the meaning of the piece in a unique manner, but clearly connected to the ideas that the original author wrote.

Comments:

Steps for Close Reading:

Read through lenses: Decide what you will be paying attention to while reading and collect those details.

Use the lenses to find the patterns: Look across all the details you have collected and find patterns. Details take on a significantly greater meaning when you begin to see the relationships across them.

Use the patterns to develop a new understanding of the text: consider these patterns in light of what you have already learned from the text. Put these together to develop a new understanding of the text or a deeper, evidence - based interpretation.

Appendix C: Suggestions for Marking the Text while Close Reading

Instructions: For the assigned readings, use the following information to engage with text and the information in the text. By marking the text, it helps readers to make sense of the information. In order to participate in the upcoming online class discussion, students must show that they have marked the text. I will check to see that students have “Marked the Text” before the conversation begins. Those students who have not prepared will not be able to participate in the discussion.

A. Highlight or underline the passages that reveal crucial information, show changes, or development of ideas.

B. Make notations in the margins as you react to passages that are unique or noteworthy.

C. Circle key words or phrases.

D. Underline vocabulary words you don’t know. On the reading, and near the word, write a brief definition in the margin. This is especially important if the word is critical to understanding the reading.

E. Consider marking the readings with the use of the following symbols:

Symbol Title	Symbol	Explanation for Use
Star	*	Emphasize a statement already underlined or to mark a recurring idea.
Plus Sign	+	To indicate something you want to remember
Question Mark	?	Place a question mark in the margin if you don’t understand what the passage means, or if it makes you question an idea or a thought that is expressed in the reading.
Exclamation Mark	!	Put an exclamation mark in the margin to indicate something surprising or unusual.
Happy Face or Frown Face		Use a smiling happy face shows that you agree or like and idea. Feel free to jot down a phrase that is reminder as to why you like the idea expressed in the reading or a sad frown face to show disagreement or dislike. Feel free to jot down a phrase that is reminder as to why you do or don’t like the idea in the reading.

Appendix D: Before, During, and After Conversation Survey**Student Code:****Background Information:**

Claims, Counterclaims, and Evidence

- **Claims:** Statements of belief or opinion rooted in factual knowledge and evidence that result from the analysis of sources in an inquiry.
- **Counterclaims:** Statements that challenge or respond to claims, using evidence that contradicts a claim.
- **Evidence:** Information taken during an analysis of a source that is then used to support a claim or a counterclaim.

Survey Instructions:

Circle the number that corresponds to the thought that you have in responding to each statement listed above the chart.

Part 1

A. Before participating in the online written discussion, I engaged with the reading by following through with the instructions on “Marking the Text.”

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

B. Before starting the online discussion, I understood the main ideas in the reading(s).

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

C. Before participating in the online conversation, I understood the discussion statements / questions that I was instructed to respond to in the online conversation.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

D. Before starting the online discussion, I understood how to use evidence in making claims and counterclaims.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

Part 2

Using statements “E – H”, respond to the following statements according to what you thought **while** participating in the online conversation.

E. Other students who responded to my comments, and to the comments of others, used evidence to make claims and counterclaims during the course of the online written conversation.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

F. Participating in the online written conversation where I typed my ideas and responded to the ideas of others helped me identify evidence and make claims and counterclaims.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

G. I understood the claims that people made during the course of the online written conversation.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

H. I understood the counterclaims that people make to my claims during the course of the online written conversation.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

Part 3

Using statement “I”, respond to the following statements according to what you thought **after** participating in the online conversation.

I. The writing process helped me to make sense of the ideas that I expressed during the online written conversation.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

J. Writing comments while using evidence to make claims and counterclaims influenced the way that I thought the subject.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

K. Reading fellow students’ evidence in their use of claims, and counterclaims affected the way that I thought about the subject.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

L. The act of participating in an online written conversation where I used evidence to make claims and counterclaims allowed me to think about a subject more deeply than I had previously considered.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

Appendix E: Rubric for Researcher Assessment in an Online Written**Conversation.**

Grade	0	1	2	3	4
Rubric Levels	There are no claims/ counterclaims made by the participant. Also, there are no uses of evidence from the sources.	The participant makes claims / counterclaims that are not clear. The use of evidence from sources is not clearly connected so that the reader understands their relationship.	The participant makes claims and/or counterclaims , but the use of supporting evidence is not developed enough for the reader to make a clear connection. Also, there may only be evidence of claims or counterclaims, but not both.	The participant makes clear analyses and explains understandings using both claims and counterclaims supported with evidence that is well developed so that a reader understands how they are connected.	Participants make clear claims and counterclaims using evidence that contribute to developing thoughts in the conversation as clearly explained analyses, applications, evaluation, interpretations, synthesis.
Sample Student Response		Women should have had the right to vote because it is in the constitution.	Women should have had the right to vote because men did. Women and men should be considered equal. This is what women said at the Seneca Falls Convention.	Women should have had the right to vote much earlier because when the 14 th amendment was added to the constitution it stated that all citizens have equal protection under the law.	Since women were denied the right to vote, they should not have been required to pay taxes to the federal government or to states where women lived and did not have the right to vote.

Researcher Comments: Explain why you scored yourself where you did on the rubric:

Appendix F: Rubric for Individual Self-Assessment in an Online Written**Conversation.**

Grade	0	1	2	3	4
Rubric Levels	There are no claims/ counterclaims made by the participant. Also, there are no uses of evidence from the sources.	The participant makes claims / counterclaims that are not clear. The use of evidence from sources is not clearly connected so that the reader understands their relationship.	The participant makes claims and/or counterclaims , but the use of supporting evidence is not developed enough for the reader to make a clear connection. Also, there may only be evidence of claims or counterclaims, but not both.	The participant makes clear analyses and explains understandings using both claims and counterclaims supported with evidence that is well developed so that a reader understands how they are connected.	Participants make clear claims and counterclaims using evidence that contribute to developing thoughts in the conversation as clearly explained analyses, applications, evaluation, interpretations, synthesis.
Sample Student Response		Women should have had the right to vote because it is in the constitution.	Women should have had the right to vote because men did. Women and men should be considered equal. This is what women said at the Seneca Falls Convention.	Women should have had the right to vote much earlier because when the 14 th amendment was added to the constitution it stated that all citizens have equal protection under the law.	Since women were denied the right to vote, they should not have been required to pay taxes to the federal government or to states where women lived and did not have the right to vote.

Participant Comments: Explain why you scored yourself where you did on the rubric:

Appendix G: Survey for the Rubric Measurement

A. I understand how the instructor measured my performance in the online written conversation.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

B. The measurement that the instructor provided is accurate feedback for how I performed during the online written conversation.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

C. After comparing the measurement of the instructor with my own, I see where my strengths and weaknesses are in the skill of using evidence to make claims and counterclaims.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

D. After comparing the measurement of the instructor with my own, I can see myself performing even better on the next online written conversation, in terms of the skill where a person uses evidence to make claims and counterclaims.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

Appendix H: The Semi-Structured Interview

Interview Rationale:

To surface additional information about the process students used in their online writing to propose claims, select evidence, and construct counterclaims.

Protection of the Respondent:

The researcher will use a pseudonym for students participating in the interview to identify any findings about the development of critical thinking.

Logistics:

The interviews will take place in the school library during the first twenty-five minutes of the school day. During homeroom, students read silently. This provides a time where students will not miss out on instruction in another class period. Student responses to the interview questions will be recorded through an audio device on my computer, which is password protected. No one else will have access to the raw data in the form of the recorded interview with student voices or my written responses to what the interviewer states. This is a semi-structured interview where the researcher will use these questions as a framework, but not remain restricted by asking only the questions listed. If a topic appears during the interview that is of interest to the study that the researcher had not planned on exploring, the researcher will pursue the topic with the interviewee. Also, the researcher will use the transcript from the online written conversation to refer to specific areas where students made claims and counterclaims with supporting evidence. This use of retrospective cued analysis will serve as a springboard for the student to get back into what he/she was thinking when they constructed the thought or argument.

Interview Questions:

1. When participating in online conversation that involves writing, how does using evidence in making a claim or counterclaim affect your thinking?
2. When participating in an online conversation, what is the effect of using evidence in making a claim or counterclaim on how your fellow classmates think?
3. How do you select specific evidence to support a claim or counterclaim?
4. When you read a comment made by a fellow student that explains a different idea than what you have, and they use evidence to support their claim or counterclaim, how does that affect your understanding?
5. When you read a comment made by a fellow student that explains a similar idea to what you are thinking, and they use evidence to support their claim or counterclaim, how does that affect your understanding?
6. Describe the effect of typing your ideas on your thinking processes while participating in the online written conversation with your classmates.