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Assessing middle school student participation in online vs. face-to-face environments

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ASSESSING MIDDLE SCHOOL STUDENT PARTICIPATION
IN ONLINE VS. FACE-TO-FACE ENVIRONMENTS

A dissertation presented
by

Cathleen L. Oravetz

to
The College of Professional Studies

In partial fulfillment of the requirements for the degree of
Doctor of Education

in the field of

Educational Leadership

Northeastern University
Boston, Massachusetts
June, 2011

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ABSTRACT OF DISSERTATION

Submitted in partial fulfillment of the requirements
For the degree of Doctor of Education in Educational Leadership
In the College of Professional Studies
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ABSTRACT

Educators have observed reluctance in middle school students to vocally engage in small group learning tasks, the result of which could be a decrease in student learning. The same students have been observed collaborating with peers outside of the classroom when using technology. The purpose of this study is to determine if technology provides a means to increase participation in the classroom, which in turn may increase student learning. Social constructivism and developmental theories guided this study. Eighty eighth-grade middle school students participated in a mixed-method, between-subject quasi-experiment to determine whether there was a difference in participation amount and content by students in small-group, learning-centered discussions using online vs. face-to-face environments. Students in groups of four used either an online chat tool or face-to-face discussion during a four-part activity. Data was coded, guided by Cohen's Kappa inter-rater reliability. The data was analyzed using independent sample t-tests, Fisher exact tests, relative percentage comparisons, Gini Coefficient comparisons, and Mann-Whitney-Wilcoxon testing. Significant findings ($p < .05$, $p < .01$) were demonstrated in participation amount, participation content, male participation amount, male participation content, and female participation content. Technology has the ability to enhance educational systems in order to prepare students to effectively and efficiently communicate and collaborate in today's high-tech environment. Accessing Web 2.0 tools in the classroom is a good first step as students can integrate their current out-of-school technological lifestyle and place it into the hands of educators to mold and form into quality 21st century life skills.

Keywords: online, face-to-face, participation amount, participation content, student learning, content analysis, technology, web 2.0, chat, focus groups.

DEDICATION

Dedicated with love and gratitude to my husband

David M. Oravetz

For valuing education and recognizing its impact on individuals and families

For supporting me and believing in my abilities

And for proudly standing beside me as I earned my

Bachelor's, Master's, and Doctoral Degrees

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TABLE OF CONTENTS

ABSTRACT.....	3
DEDICATION.....	4
ACKNOWLEDGEMENTS.....	5
TABLE OF CONTENTS.....	7
LIST OF TABLES.....	9
CHAPTER 1: INTRODUCTION.....	13
Purpose of the Study.....	13
Statement of the Problem.....	13
Problem Significance.....	14
Research Questions.....	15
Theoretical Framework.....	16
CHAPTER 2: LITERATURE REVIEW.....	26
Student Collaboration and Student Learning.....	27
Student Learning Assistance in Collaborative Sessions.....	27
The Role of Culture, Language, and Learning Styles in Student Learning.....	28
Discourse Analysis and Content Analysis.....	33
Web 2.0 Tools Available to Enhance Student Learning.....	34
Previous Methods Used to Study the Effects of Collaboration on Student Learning.....	37
Literature Review Conclusion.....	44
CHAPTER 3: RESEARCH DESIGN.....	45
Methodology.....	45
Protection of Human Subjects.....	73
CHAPTER 4: REPORT OF RESEARCH FINDINGS.....	75
Research Question #1.....	76
Research Question #2.....	86
Research Question #3.....	98
Research Question #4.....	103
Focus Group Results.....	106
Summary of Research Findings.....	131

CHAPTER 5: DISCUSSION OF FINDINGS, CONNECTING THEORY TO KEY FINDINGS, AND CONCLUSION	133
Discussion of Findings.....	134
Connecting Theory to Key Findings.....	154
Conclusion	157
References	163
Appendixes	176
Appendix A.....	176
Appendix B.....	181
Appendix C.....	182
Appendix D.....	183
Appendix E.....	184
Appendix F.....	185
Appendix G.....	186
Appendix H.....	188
Appendix I.....	189
Appendix J.....	190
Appendix K.....	191
Appendix L.....	192
Appendix M.....	194
Appendix N.....	195
Appendix O.....	196
Appendix P.....	198

LIST OF TABLES

Table 1: Cohen’s Kappa Statistical Measure.....	59
Table 2: Participation Amount (Independent Sample T-test).....	77
Table 3: Number of Online and F2F students taking More than and Less than or Equal to the Median Number of Total Turns across both Groups (Median = 16; Fisher exact test).....	77
Table 4: Number of Online and F2F students partaking in More than and Less than or Equal to the Median Group Discussion Time across both Groups (Median = 14:33; Fisher exact test)	78
Table 5: Number of Online and F2F students contributing More than and Less than or Equal to the Median Word Count across both Groups (Median = 177; Fisher exact test).....	78
Table 6: Participation Content (Independent Sample T-test).....	80
Table 7: Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of On-task Comments across both Groups (Median = 13; Fisher exact test).....	81
Table 8: Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of Off-task Comments across both Groups (Median = 0; Fisher exact test).....	81
Table 9: Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of Affirming Comments across both Groups (Median = 3; Fisher exact test).....	82
Table 10: Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of Opposing Comments across both Groups (Median = 1; Fisher exact test).....	82
Table 11: Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of Correcting Comments across both Groups (Median = 0; Fisher exact test).....	82
Table 12: Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of Questioning Comments across both Groups (Median = 1; Fisher exact test).....	83

Table 13: Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of Managing Comments across both Groups (Median = 1; Fisher exact test).....	83
Table 14: Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of New Information Comments across both Groups (Median = 7; Fisher exact test).....	84
Table 15: Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of Answering Comments across both Groups (Median = 0.5; Fisher exact test).....	84
Table 16: Online Compared to Face-to-Face Comments (Relative Percentage Comparison)	85
Table 17: Male and Female Participation (Independent Sample T-test)	88
Table 18: Results of the Shapiro-Wilk Test for Normal Population Distribution (Total Turns and Word Count).....	89
Table 19: Number of Online and F2F Male students contributing More than and Less than or Equal to the Median Number of On-task Comments across both Groups (Median = 11; Fisher exact test).....	90
Table 20: Number of Online and F2F Male students contributing More than and Less than or Equal to the Median Number of Off-task Comments across both Groups (Median = 0; Fisher exact test).....	91
Table 21: Number of Online and F2F Female students contributing More than and Less than or Equal to the Median Number of Off-task Comments across both Groups (Median = 0; Fisher exact test).....	91
Table 22: Number of Online and F2F Female students contributing More than and Less than or Equal to the Median Number of Affirming Comments across both Groups (Median = 3; Fisher exact test).....	92
Table 23: Number of Online and F2F Female students contributing More than and Less than or Equal to the Median Number of Opposing Comments across both Groups (Median = 1; Fisher exact test).....	92
Table 24: Number of Online and F2F Female students contributing More than and Less than or Equal to the Median Number of Correcting Comments across both Groups (Median = 1; Fisher exact test).....	92

Table 25: Online Comment Comparison: Males to Females (Relative Percentage Comparison)	94
Table 26: Face-to-Face Comment Comparison: Males to Females (Relative Percentage Comparison)	95
Table 27: Male Comment Comparison: Online to Face to Face (Relative Percentage Comparison)	96
Table 28: Female Comment Comparison: Online to Face to Face (Relative Percentage Comparison)	97
Table 29: Variability across Individuals and within each Section Group using Total Turns (Gini Coefficient Comparison)	100
Table 30: Variability across Individuals and within each Section Group using Word Count (Gini Coefficient Comparison)	101
Table 31: Difference in Student Learning (Four-Point Rubric, Wilcoxon-Mann-Whitney test)	105
Table 32: Focus Group Responses to Increased Student Involvement via Student Enjoyment	108
Table 33: Focus Group Responses to Shy Students Engaging in Small-group Discussions.....	109
Table 34: Focus Group Responses to Teacher Presence in Online and Face-to-face Environments.....	111
Table 35: Focus Group Responses to Advantages and Disadvantages of Online and Face-to-face Discussions	114
Table 36: Focus Group Responses to Aggression and Emotion during Student Discussions.....	116
Table 37: Focus Group Responses to Student Learning Increased as a Result of Discussions ..	118
Table 38: Focus Group Responses to Student Discussion Group Preference	120
Table 39: Focus Group Responses to Treatment Preference.....	122
Table 40: Focus Group Responses to Typing Challenges	123
Table 41: Focus Group Responses to Male/Female Discussion Group Interactions	125

Table 42: Focus Group Responses to Recognition of Communication and Socialization Skills.....	127
Table 43: Focus Group Responses to Request for both Online and Face-to-face Discussions.....	128

Chapter 1: Introduction

Mondale and Patton (2001) describe public schools in the 1900s as “one of the most treasured public institutions in the United States” (p. 64). With the inception of tax-supported free schools, students could develop their minds and talents in order to prepare themselves for later life. John Dewey, known for his “learning by doing” approach, believed students in school learn best when actively partaking in studies of interest to them (p. 67). As a result, student participation in schools was believed to be a premise of student learning.

Purpose of the Study

Research suggests student participation is paramount to student learning (Ross & Frey, 2009). Yet observations made in middle schools depict some students to be timid, shying away from opportunities to converse with their peers and teachers. Technology may be a means to increase participation as it has been found these same students, outside of the classroom, actively participate in discussions using technology (texting on their cell phones, instant messaging, and social networking). Therefore, the purpose of this study is to determine if technology provides a means to increase participation in the classroom, which in turn may result in increased student learning.

Statement of the Problem

It has been judged by the investigator that participation in today’s middle schools has diminished due to students’ reluctance to vocally engage in small group learning tasks. When given the opportunity to work together, some students do not readily participate due to their reticent nature to vocalize their thinking and ideas with their peers or the teacher. As a consequence, their tentativeness may result in incomplete student learning. In my seven-year

tenure as a teacher in a middle school, many observations were made where students avoided collaboration with others, denying themselves opportunities to increase knowledge.

Recent observations have been made by many teachers where students are capable of collaborating with one another outside of the classroom when using technology. There is a natural surge of technological participation among the students as they utilize social networking sites and text and Twitter on their cell phones. Andone, Dron and Pemberton (2009) remind us that today's students are digital as they integrate technology as a daily feature of their lives.

By taking advantage of this practice, there are those who believe teachers who find innovative ways to incorporate technology into their classrooms will see an increase in student performance (Harris & Rea, 2009). Technology elicits powerful means for students to interact and reflect, resulting in enhanced participation during small-group conversations. Although utilizing Web 2.0 tools could help eliminate the current problem of practice, many teachers do not seize the opportunity to use them.

Problem Significance

Moylan (2008) speaks of a significant gap between the knowledge and skills needed for success in life and the current skills obtained by secondary school students. Among the 21st century skills reported by Moylan are communication and collaboration. This statement supports the investigator's beliefs that if the deficiency in small-group participation by middle school students is left unattended, these students may lack the 21st century communication and collaboration skills needed, both in educational environments and as productive members of society.

Ramdass and Zimmerman (2008) state students, while in middle school, should work to succeed as well as believe they can succeed. Through shared experiences in a participative environment, amplified confidence during discussions will result in increased student learning (Woodworth & Applin, 2007). Research also depicts a poor education will not only block students from future educational opportunities, but will fail them in their daily struggle to survive (Mellow & Katopes, 2009). These individuals who lack the willingness to collaborate will negatively affect their ability to be active, contributing members of the general public. As our students take steps to prepare for lifelong learning and interaction in the population, technology may be the key to increasing student participation resulting in prepared 21st century students.

Research Questions

Differences in student participation, discussion content, and student learning in the context of students' participation in a small-group, learning-centered discussion in online vs. face-to-face settings is the focus of this research. Through comparisons of the above online and face-to-face settings, the research questions seek to determine whether today's students might benefit when exposed to an online collaboration environment:

1. How does the amount and content of participation in small-group, learning-centered discussions compare in online and face-to-face environments?
2. How does the amount and content of participation in small-group, learning-centered discussions differ between males and females in online and face-to-face environments?
3. To what degree is there equitable distribution in the amount of participation across individuals within each group in the online and face-to-face environments, and is there a

difference in equitable participation by group members in online and face-to-face environments?

4. What is the difference in student learning as an outcome of small-group, learning-centered discussions in online and face-to-face environments as determined by a teacher-prepared rubric evaluating students' responses to a discussion-related writing prompt?

Theoretical Framework

Two theoretical strands guide my review of literature and serve as a framework for my research. Online Educational Theory, with particular focus on social constructivism, is the foundation for discussion-based collaboration within both online and face-to-face environments. It drives my study to define student participation tendencies and the differences between the discussion-based collaborative environments. Cognitive theory, as part of developmental theory, assists in my research of student learning, and the online tools that foster learning.

The evolution of societal constructivism and developmental theories. The concepts of social constructivism and developmental theory originated with theorists Vygotsky and Piaget. Vygotsky believed social interaction was an integral part of learning, along with cognitive dialogue, culture, inner speech, and the zone of proximal development. Building classrooms where interaction was prominent was the foundation to effective educational experiences. Through awareness of the zone of proximal development, it was discovered processes do not automatically become part of the student's actual development level (Hagerty, Smith & Goodwin, 2010). Students must internalize a concept before it becomes part of their knowledge bank. Vygotsky believed, "internalization occurs more effectively when there is social interaction" (Powell & Kalina, 2009, p.244). This theory will be pivotal as collaboration is

introduced in the study and found to be a determinate to greater student participation and learning.

Piaget's main focus on constructivism was the methods used by individuals to construct knowledge (Powell & Kalina, 2009). Actively constructing knowledge rather than passively receiving information from the environment is the essence to learning. Through assimilation, the process of fitting reality into one's current cognitive organization, people apply what they know in order to understand or interpret experiences. It is through this theory online tools will be integrated to meet the demands of 21st century learning while focusing on the communication trends of today's students (Miller, 2002).

Kop and Hill (2008) remind us that past theories do not die, yet are the basis for new developments and theories that adapt to changing times. Educators find they must become knowledgeable in past teaching practices in order to create a new vision. With the onset of online education, the concepts promoted by Vygotsky and Piaget prove to serve as a foundation as teaching and learning advance into online environments.

Supporting student learning through student collaboration and participation.

Vygotsky contends that the relationship between external and internal knowledge environments is the formulation of social constructivism (Kop & Hill, 2008). Teachers, providing external knowledge, need to take the first step to promote critical thinking, understanding, and learning practices through various methods of faculty-student collaboration opportunities (Barker, 2003; Powell & Kalina, 2009). Constructivism will fail if teachers do not know how to properly engage students. A student's internal knowledge plays an important part in constructing new knowledge when students actively participate in a collaborative setting (Chu Chih & Ju Chen, 2010).

Because children many times have difficulty seeing a solution other than their own, by working with partners, students learn to persevere rather than to give up when a task becomes difficult. Carefully pairing students during collaboration exercises is critical as this choice in relationship can affect whether or not students participate, and whether or not the partnered students meet with success (Schmitz & Winskel, 2008).

One of the many benefits of utilizing online learning with students is its collaborative platform. A learner's misconceptions or lack of knowledge is identified through participation, and corrected through the collaborative assistance of others (Mayes, 2006). Understanding the importance of collaboration in education is paramount as we come to realize the value of proficient thinking and intricate communication skills (Dede, 2007).

Online methods provide an innovative way to encourage participation practices within the classroom. It provides increased quality in student responses as well as time flexibility (Barker, 2003). It also provides students with a wait-time period in order to formulate their thoughts and provide a reflective response. Online participation can meet the needs of today's students by means of diverse online lessons and student engagement (Ally, 2008).

Increasing student learning through instructional scaffolding. Discussion and interaction provide a venue for instructional scaffolding, resulting in greater learning and enhanced communication skills (Barker, 2003; Schmitz & Winskel, 2008). Instructional scaffolding is a necessary part of learning as it assists students to break down complex problems, through self-talk, in order to succeed and learn (Kop & Hill, 2008).

Through interactive participation, the capabilities of a child are enhanced by providing instructional scaffolding for learning (Schmitz & Winskel, 2008). During the process of

discussion, students are able to offer and receive the support needed to gain an understanding of the material presented. As students gain an understanding of the information, the need for support for the student lessens (Gnadinger, 2008).

During the instructional scaffolding process, students actively participate as guides through a peer review process (Peterson & Caverly, 2005). All members are viewed as valuable contributors as scaffolding among the participants can occur in three ways: to refocus and stay on task, to assist in procedural ways to clarify explanations, and to understand academic content. The process is provided by the peers through questioning tactics, feedback, and instruction. Studies have shown when students are permitted to pose questions and provide feedback to their peers during collaborative sessions they assist in establishing instruction for others in the zone of proximal development (Gnadinger, 2008).

Learning through the zone of proximal development. Vygotski's social learning theory describes how social interaction leads to cognitive development through the point at which a learner cannot proceed independently with a task without support from a guide (Peterson & Caverly, 2005). The concept is pivotal in determining the extent to which students may increase their comprehension with knowledgeable assistance. By recognizing and utilizing the zone of proximal development, a child can move just beyond their existing abilities (Schmitz & Winskel, 2008; Tudge, 1992).

Vygotsky believed development occurs when two participants, whether adult or peer, who differ in terms of their initial level of competence, work collaboratively on a skill or task and come to a shared understanding (Gnadinger, 2008; Peterson & Caverly, 2005; Tudge, 1992). Tudge also reminds us the zone is the difference between what a child is able to accomplish

independently as compared to what the child could accomplish in conjunction with another more competent person. In past studies, problems were posed beyond the students' zone. Benefits were found to be greater when high-level children were paired with low-level children during learning activities (Hagerty et al., 2010). It has been found through an oral display of conflict and negotiation, concept understanding increases (Schmitz & Winskel, 2008; Tudge).

As a result of utilizing the zone of proximal development, a child's competent thinking or performance during the collaboration process should be internalized for use in a subsequent individual performance (Tudge, 1992). Vygotsky believed, "what a person can do with help today, they will be able to do independently tomorrow" (Gnadinger, 2008, p. 130).

The importance of culture in student learning. Through the beliefs of Piaget, Miller (2002) describes student development as a combination of physical maturation, physical environment experiences, equilibration, and social experiences. Physical maturation, including the nervous and muscular systems, is required for cognitive growth. The physical environment describes how one looks at actions on objects rather than the objects themselves. Equilibration describes the method in which the cognitive system reaches a higher level each time it experiences a state of disequilibrium. For a student, each of the aforementioned occurs in succession. Yet it is with social experience, better known as the student's cultural environment, where Miller reminds us that development may not occur in the same sequence in all cultures.

Culture includes viewpoints, principles, knowledge, customs and socialization practices (Miller, 2002), all which may be shared through participative practices. It is through cognitive theory and a magnification of the beliefs of socioculturalists that we find a focus on the importance socialization and collaborative activities play in student learning. Chu Chih and Ju

Chen (2010) remind us the primary difference between Vygotsky and Piaget was the importance of culture on the development of the mind. Culture, Miller states, cannot be considered a separate unit as it is found everywhere. Through activities driven by participation, students find a means to break down the barriers of cultural diversity, resulting in greater student learning.

The role of language in student learning. Language is a learning tool within the classroom that permits students to share cultural experiences while creating a joint understanding of a learning task. In addition, it promotes understanding through assistance from others (Schmitz & Winskel, 2008). Language usage in the classroom is a key to the process of social constructivism (Powell & Kalina, 2009). It serves as a tool used by students to develop their comprehension abilities. Having a conversation (external dialog) with others assists us in learning the value of talking through a problem; it is at that time the value of internal dialog becomes evident (Miller, 2002). At times, students have difficulty seeing a point of view other than their own; it is through language interaction, Schmitz and Winskel remind us, that students are able to modify their thinking to incorporate the ideas of others.

Schmitz and Winskel (2008) contend teachers need to be aware of different types of talk that may result from discussions. Disputation talk appears when students voice their point without considering the other student's ideas. Cumulative talk occurs when ideas are affirmed with little constructive criticism (repeating of each other's words only). And exploratory talk is apparent when partners are able to disagree with one another's ideas while suggesting a positive alternative solution. It has been found that children who use exploratory talk demonstrate higher test scores than children who do not experience this form of communication. Through teacher

assistance, students can experience growth in learning when collaborative language is positively directed.

Both the teacher and student must steer their language toward conversation rather than procedural confusion (Peterson & Caverly, 2005). In support, it has been found that a child's social interaction with others formulates private speech in a child. This language must take the presence of instructional scaffolding where discussion and self-talk serves as a means by which learners work through complex problems by externalizing them in a form of self-guidance and self-direction (Kop & Hill, 2008).

Schmitz and Winskel (2008) remind us, language within the classroom increases collaboration success. It permits students to discuss the curriculum topic in a non-competitive environment, and allows the partners of the students to share their knowledge within a friendly, non-abrasive experience. As discussion rules are set, all students have an opportunity to share in the understanding of the task at hand.

The importance of attending to student learning styles in student learning. Social constructivist theory guides my study of student learning styles in relation to a student's desire and ability to collaborate. This theory provides information on ways collaboration may be facilitated among or between students and their teachers. Constructivists are not those who simply assimilate information that has been communicated by the educator (Dede, 2007). They are active learners, using their senses to interpret, process, and construct knowledge (Ally, 2008). This theory, Dede tells us, provides a lens to examine learners who are able to reflect as well as seek the opinions of others; these learners then utilize this new-found knowledge to perform new

tasks. According to the social constructivist theory, the needs of students who possess these learning styles could be met through collaborative efforts.

Chu Chih and Ju Chen (2010) remind us that it is the teacher's responsibility to facilitate information and organize activities so that students may discover their own learning. It is also the role of the teacher to identify diversity within the classroom in order to utilize the students' differences in a productive and advantageous manner (Powell & Kalina, 2009).

Responsibility for learning also falls upon the students as the paradigm shift from faculty teaching to student learning evolves in the 21st century classroom (Barker, 2003). Learning in a constructivists' classroom involves constructing, inventing, and developing one's own knowledge and meaning. Thus learners do not passively duplicate information delivered by the teacher, but demonstrate their learning through critical questioning and original summarizations (Chu Chih & Ju Chen, 2010).

Students bring a variety of learning styles, needs, and experiences to the classroom. Through observation of student interaction with the content and with one another, the teacher can provide formal and informal feedback to capture the knowledge that surfaces within each learning style (Barker, 2003). Today's teachers must not only be aware of the learning styles present in the classrooms, but must know how to utilize collaboration in both an online and face-to-face environment to best foster learning by students who fall in the behaviorist, cognitivist, and constructivist learning categories.

Behaviorist learning is based on experience, utilizing a repetitive content and procedure that will alter a student's behavior over time (Dede, 2007). Strategies within this learning style

include utilizing facts and explicit outcomes, testing, sequencing of materials, and feedback in order to foster knowledge in students (Ally, 2008).

Cognitivists believe learning involves both student experiences and cognition. Therefore, instruction should center on developing interrelated intellectual images to form the basis for student knowledge and skills (Dede, 2007). Strategies to reach the cognitivist learner include chunking information (grouping information into manageable pieces), accommodating individual differences, presenting information in different methods, and using real-time simulations. This will help to develop the student's processes and principles and move these from short-term to long-term memory (Ally, 2008).

Constructivist learners use activities to create meaning from experiences in order to foster knowledge. Creating one's own knowledge is dependent on the interactions and shared experiences with others (Dede, 2007). Strategies are needed to induce higher-order thinking skills. Activities involving interactive processes, collaboration, cooperation, and reflection are necessary for the constructivist learner. Individual meaning must occur for each student in order to foster growth in knowledge (Ally, 2008).

Learning can be achieved by all types of learners through a variety of tools (Ally, 2008; Dede, 2007). It is through the use of these tools in a collaborative environment that learners share ideas, grow in their understanding of concepts, and increase their knowledge.

The potential of online tools. Social constructivist and cognitivist theories will both be utilized when determining if technology is needed to increase collaboration skills within a middle school environment. The ability to connect with others from around the globe leads to the possibilities of collaboration and shared ideas (Ally, 2008). As a result, educators do not need to

be in the same location in order to instruct their students; teaching and learning may occur in separate places (Miller, 2002). Successful online instruction is dependent on the correct choice of online tools and the successful integration of these tools into a curriculum.

Mayes (2006) believes technology adds value to education when learners interact with concepts, tasks, and people. When a learner is provided feedback on their work, a matching of new information (content) to existing knowledge becomes apparent. By testing conceptualizations through meaningful tasks with others, learners are able to activate their zone of proximal development. And through conversations with others, learners are able to test their conceptions, learning more effectively as a result of the collaboration process.

Through the adoption of a computer management system, (Blackboard), Peterson and Caverly (2005) reported many schools have adopted online interaction as it provides a social presence, cognitive presence, and teaching presence. Social presence is evident as both students and teachers present themselves as real people, communicating with others based upon their unique personality. Technology provides cognitive presence as online tools encourage a student's preferred method of sustained collaboration and communication. Teaching presence is evident through peer and teacher feedback as well as through conversation eliciting positive results.

Online tools promote independent learning strategies. Woodworth and Applin (2007) describe several advantages of using technology in the classroom including student flexibility on time as a result of using both synchronous and asynchronous tools. Collaboration experiences with partners and teams encourage a learner-centered approach and afford the student to have more control over their own learning.

Summary of theoretical framework. Online Educational Theory, along with Cognitive Theory, serves as a framework for this research as the importance of collaboration and participation in a learning environment is studied. Researchers have developed an increased awareness of the ways instructional scaffolding, zone of proximal development, culture, language, and learning styles have enhanced discussion-based collaborative environments. Because of these findings, educators may now turn towards online tools to enrich their students' learning.

Chapter 2: Literature Review

A thorough literature review provides insight into what is known in the areas of student participation and collaboration within online and face-to-face environments. While much has been written about previous studies involving participants in higher education, less information is readily available in the areas of middle school studies on collaboration practices. While the use of technology in an educational setting is not new, few middle school students have been studied using online collaborative tools. My study proposes an investigation of how the amount and content of participation in a middle school setting affects student learning in small-group, learning-centered discussions.

The following questions were used as a guide during the literature review:

1. What is student collaboration and student learning?
2. How does participation in collaborative sessions assist student learning?
3. What roles do culture, language, and learning styles play in student learning?
4. How does discourse analysis differ from content analysis?
5. What collaborative Web 2.0 tools are available to enhance student learning?

6. What previous research methods were used to study the effects of participation and collaboration on student learning?

Student Collaboration and Student Learning

Collaboration is the process of communication between two or more individuals who share similar interests and goals and who, through shared knowledge, seek to facilitate change in order to foster success (Schneider, 2007; Tulbert, 2000; Ungerer, 2005). This form of knowledge sharing, Schneider reminds us, may be informal or systematic. Although success may be for the sake of individual self-interests, Tulbert and Ungerer report, it is best for those involved if the process serves the group. As for collaboration in school environments, Schneider believes it fosters an increase in collegiality, learning, and risk-taking for students.

Learning has been defined as change that may be unnoticeable or dramatic and may occur immediately or over a period of time (Alexander, Schallert & Reynolds, 2009). This change may be represented as a movement of knowledge from an internal to an external state (Azeem et al., 2009; Shulman, 1999). As presented by Boyatzis and Kolb (1991), student learning may be a mastery of a skill, an increase in knowledge, or a gained experience. With the assistance of teachers, students react to change positively in an effort to reach their educational goals and standards. Alexander et al. state that student learning is both a process and a product, is framed by humanness, and is interactional as a result of collaboration with students and staff.

Student Learning Assistance in Collaborative Sessions

Literature has demonstrated a direct connection between student participation and success in the classroom. Vintere and Maĭinovska (2009) state that students gain a deeper understanding of presented materials through the sharing of information. Other literature discusses how learners

support an educational environment where they are engaged in the process (Atici & Bati, 2010). Students who are actively involved in questioning, reasoning, and argumentative activities find a greater sense of understanding and learning within the classroom (Forbes & McCloughan, 2010).

Collaboration is a group interactive process between or among students (Atici & Bati, 2010; Vintere & Maļinovska, 2009). It is an essential component to learning as it helps to create new meaning from previously gained knowledge, providing students with increased motivation and feelings of success (Kumar, 2009; Lim, 2004; Miller & Benz, 2008). Others, too, have found collaboration stimulates the decision-making process as well as intellectual and social development (Barbera, 2009; Graham & Graham, 1997; Ross & Frey, 2009). It helps students conceptualize, construct, and initialize procedures and knowledge, reports Vintere and Maļinovska, resulting in increased learning.

In a search of literature on the disadvantages of student participation in a classroom, little was found. Challenges, though, surrounding the integration of participation within an online environment have been reported. Lockyer, Sargeant, Curran and Fleet (2006) report, without proper facilitation, time, and opportunities for collaboration in online structures, students are finding participation in virtual classrooms non-existent.

The Role of Culture, Language, and Learning Styles in Student Learning

Culture in education refers to a set of common values, attitudes, and beliefs for a sector of the school population (Collis, 1999; Vintere & Maļinovska, 2009). Collis reports culture defines how an identifiable group shares, identifies, and interprets information within an educational environment, and defines and clarifies what is and is not important. Vintere and Maļinovska remind us culture is learned not inherited, and is shared with people who live within the same

social environment holding similar values and behaviors. There are several reasons why culture is constantly changing in educational environments. New developments and information, economic trends, and student demographics all play a part in shifting school cultures.

With a possibility of multiple cultures within a classroom, educators need to be aware of the multiple values and perspectives for their students (Collis, 1999; Gerbic, 2006). To combat this situation, reports Collis, attention must first be paid to the educator's cultural background. Lim (2004) believes educators need to create an awareness of and learn from others' ways of learning in order to create an equitable classroom. As reported by Vintere and Maļinovska (2009) and Collis, it is the role of the educator to promote diversity in the classroom, which can be accomplished through a practice of flexibility and a variety of learning experiences.

Through consistent communication habits, educators are capable of building a relationship with students (Lim, 2004). Gerbic (2006) states through trust with their students and a shared vision for learning, a strong relationship results for both students and educators. For students coming from a different cultural background, this connection is imperative. These students normally lack the pre-defined knowledge of the new culture and rely on the educator for assistance prior to their adaptation (Collis, 1999).

With the assistance of culture and language practices, student skills are developed in a classroom environment (Coldwell, Craig, Paterson, & Mustard, 2008). Language involves differences in tone and style of communication as well as in understanding inferences (Collis, 1999). It has been documented that those who share the same culture share the same common language practice (Vintere & Maļinovska, 2009).

Collis (1999) reports, students learn by communicating with others. She further explains for some international students, this communication may be recognized in a horizontal practice (student to student) or vertical fashion (student to teacher). Some international students find it difficult to learn a new language in a standard literacy format. Because of a change in their learning practices, these students need time to adapt their language expectations to their new surroundings (Gerbic, 2006).

For students from a foreign country entering a new culture and language environment, development may not occur in the same sequence (Coldwell et al., 2008; Miller, 2002). Where students in Western countries communicate freely with their educators, students from other countries utilize one-way communication only. With a strong hierarchical relationship between students and teacher, some students are hesitant to ask questions, express opinions, or challenge concepts in the classroom (Naxin & McDougall, 2008).

Language barriers also serve as a roadblock to integration as foreign students often do not recognize the English version of some words, finding it difficult to understand in the classroom. Their lack of understanding for theories, concepts, and humor of the Western society, and their understanding of only literal meanings of words and not figurative, result in difficulties. To combat these obstacles, educators should be aware that students learn more through reading (Collis, 1999) and writing (Gerbic, 2006; Naxin & McDougall, 2008). Because differences exist among cultures, motivating students through familiar practices will directly affect learning achievement (Lim, 2004).

As a result of schools developing into multi-cultural learning environments, we find technology now plays a vital role in bridging cultural diversity (Coldwell et al., 2008; Lim,

2004). Gerbic (2006) and Lim agree, collaboration online provides both educators and students an opportunity to apply one's own learning experiences, cultures, and practices to the learning environment. Educators still need to be diligent to create a diverse learning online environment as culture awareness is integral to its success.

In order for educators to develop pedagogy to enrich and heighten student learning, they must be aware of student learning styles. As students today seek control of their own learning, educators must react instinctively to prepare materials and match their teaching styles to promote optimal learning (Atici & Bati, 2010; Hargis & Wilcox, 2008; Mayes, 2006). By examining three learning styles (behaviorists, cognitivists, and constructivist), awareness of the needs of all students assists educators to develop exemplar lessons.

Ally (2008) describes students using a behaviorist style as those who demonstrate learning through actions. Dede (2007) reminds us to induce learning, and emphasizes it should be placed on a repetitive process providing a result of factual knowledge. Online methods, Ally states, would promote learning in behaviorists through posted lesson outcomes, sequenced materials, and consistent feedback.

Cognitivists, according to Ally (2008), use the concepts of memory, motivation, and thinking in order to achieve learning. Dede (2007) adds to this list a development of thought processes, namely reflection. Students with a cognitivist learning style welcome online tools as they provide methods for organization, simulations, instructional scaffolding, differentiated learning and feedback. Ally believes through developed strategies to maximize sensations (site attributes, information pacing, and delivery of information), online methods can meet the needs of this type of learner.

Constructivists may be described as learner-centered and active. These students acquire information through a method of personalization by observing, processing, and interpreting (Ally, 2008). Dede (2007) reports this learning style motivates students during challenges, curiosity, fantasy, and social recognition through an instructional scaffolding process and a development of skills (from simpler to more complex). This interaction, Ally reminds us, can be derived at three levels: self interaction with resources, learner-human interaction with peers, and learner-instruction interaction with educators. Each of these may be met through online methods.

Researchers have found students who were taught with instructional resources and practices that matched their learning preferences demonstrated an increase in performance, attitude, and achievement (Dunn et al., 1990; Farkas, 2003). Therefore, it is the educator's goal to recognize these learning preferences in order to unlock curriculum in the classroom. Technology may hold the key.

As student mobility continues, educators must continually find ways to accommodate diverse learning styles (Collis, 1999). With the knowledge that technology is changing learner styles, strengths, and preferences, and learning styles are considered a valid predictor of success, e-learning is being assessed for its effectiveness (Dede, 2007). Research has found technology aids collaboration efforts as it provides the benefit of time and convenience, allowing discussions to be synchronous or asynchronous. This helps the learner and educator as they identify concepts that may have been misunderstood or deficient (Ally, 2008; Mayes, 2006). Ally reminds us, careful design of online components by educators, accounting for student learning styles, will ensure student success in today's classrooms.

Discourse Analysis and Content Analysis

Analysis of data, obtained from student discussions, will assist in determining participation type. Hegngi (1997) states discourse analysis is a link between language and learning. She used discourse analysis in her study to determine what others learned in the classroom and to reveal factors such as access and organization of lessons. Bower (2009) used discourse analysis in a study to learn how people derive meaning from context, permitting a greater understanding of communication patterns. Pang (2009) used discourse analysis to discover the relevance of online tools in a face-to-face classroom and in online teaching. In each of these studies, discourse was examined to determine what had been learned as a result of treatments.

Content analysis, according to Winegar (2002), is a “systematic and replicable method of extracting and categorizing large quantities of text through explicit coding into meaningful context” (p. 48). In his study to determine identifiable language styles, Winegar makes a distinction between manifest content (surface information which can be observed and counted) and latent content (deep information which is not observable). Yang (2008) states content analysis is a “systematic process to study the particular aspects of the information contained in a sentence, paragraph, or whole document” (p. 3). Used to focus on group learning through interaction with other participants, Yang utilized manifest content to obtain a quantitative description of the participants’ patterns of communication. Pifarré and Cobos (2009) agree stating content analysis assisted in their investigation of collaborative learning in an online environment as they examined student annotations within a peer review process. With a concern

for reliability, both Yang and Pifarré, and Cobos recognized the need to keep the number of codes to a minimum.

In order to determine the amount and content of participation by participants, an examination of oral and written responses need to occur to determine communication findings. Content analysis permits the investigator to quantify information allowing for a statistical analysis of communication content and amount between students engaged in discussions online vs. face to face. Whereby communication by participants is not being examined for the meaning of spoken and written discussion (discourse analysis), content analysis is employed to categorize the words, phrases, and sentences of the students in order to determine the type of oral and written response shared with others. In addition, content analysis is in keeping with more recent methodologies for assessing and analyzing student discussions online.

Web 2.0 Tools Available to Enhance Student Learning

As discussed in Beldarrain's (2006) article, the first generation web tools included the discussion board and chat, serving as an initial means for communication over the Internet. Web 2.0 tools were introduced in the mid-1990s with the advent of blogs and wikis. Created to promote participation, these tools continue to assist users to connect, collaborate, share, and develop ideas (Thomas & Qing, 2008).

According to Vygotsky, learning occurs through students' social interactions (Bliss & Lawrence, 2009). This engagement can be captured during the use of discussion boards as students engage socially, leading to a developed sense of community as well as socially constructed knowledge. Discussion boards, known as one of the oldest online communication tools, have been found to hold both advantages and disadvantages in the classroom (Suler, 2004).

The online environment steers away from the typical classroom setting where the teacher stood center stage and directed all conversation. Today's instructors, acting as good facilitators, need to encourage students to participate; otherwise the discussion board falters in its intention to foster collaboration. Martinez (2010) explains how schools can adapt to the different ways students learn through the use of technology, utilizing the discussion board as a means of collecting questions to be discussed in subsequent class sessions.

Chat sessions were initially created as a forum for student questions, and were found to be a tool students enjoyed and valued the most (Thomas & Qing, 2008). As many instructors took advantage of the chat feature on their learning management systems, the tool proved to also be advantageous for one-on-one or small group tutoring (Beldarrain, 2006). Chat rooms were found to foster interdependence in group projects and active learning among students (Eastman & Swift, 2002). An additional advantage to utilizing a chat in the classroom is it allows students who are less comfortable speaking in class to have an opportunity to share their thoughts (Böhlke, 2003; Stewart, 2009). Böhlke also reports chat rooms provide an advantage to students who are speech impaired. This tool most closely resembles face-to-face discussions as the participant experiences the chat in real time as it unfolds on the screen (Stahl, 2006).

To expose the benefits of chats and discussion boards as collaboration tools, Eastman and Swift (2002) explain four common problems instructors have identified concerning students during group work: failure to work together effectively, failure to coordinate efforts or talents effectively, unequal contributions by all members of a group, and lack of cooperative skills. Through the use of technology, Eastman and Swift believe these problems may be solved leaving

instructors to address three learning goals: empowering students, improving student communication skills, and developing students' collaborative work ethics.

Educators have also found both blogs and wikis create engaging learning environments for students (Beldarrain, 2006). Shiang-Kwei and Hui-Yin (2008) report learning becomes more meaningful when students have the capability to share ideas. As documented by Beldarrain, both blogs and wikis produce better learner control as well as knowledge construction.

In recent years there has been a growing interest in blogs for educational use as they are proving to promote an effective teaching and learning environment (Shiang-Kwei & Hui-Yin, 2008; Wang, 2008). It has been reported the use of blogs promotes reflection through writing (Beldarrain, 2006; Duplichan, 2009), encouraging an enhanced articulation of ideas compared to verbal communication in an educational setting. Thomas and Qing (2008) remind us education is becoming less textbook driven and more collaborative; therefore, blogs are finding a home in classrooms as interactive, collaborative methods of learning (Shiang-Kwei & Hui-Yin, 2008). As blogging activities are integrated, engagement increases for all students including those who tend to shy away from active participation (Duplichan, 2009). As compared to discussion boards that are removed after a specified period of time, blogs can produce a history of activity which may be permanently placed on the web for future reference (Shiang-Kwei & Hui-Yin; Wang, 2008). The potential for learning becomes greater as learners review and reflect on past conversations.

Wikis, too, offer students a means for collaboration as a unified effort is created to complete a structured task (Beldarrain, 2006; Thomas & Qing, 2008). An advantage to using wikis, reports Beldarrain, is its promotion of relationships among learners. Wikis may be instructor or student managed as they serve as a means to collect, revise, and report information.

In comparing wikis and blogs for educational means, blogs have been found to have greater emphasis. Defined as a collection of writings, Beldarrain (2006) promotes blogs as they induce and enhance student writing as a result of an audience. In addition, Wang (2008) explains blogs, as a collaborative tool, may incorporate audio, video, or photos to encourage learning. Because of the advantages afforded, describes Wang, the term *edublogs* has now become synonymous with educational communication as it motivates students to share work collaboratively with peers and teachers.

Previous Methods Used to Study the Effects of Collaboration on Student Learning

Fifteen research studies were closely examined to shed light on best practices. This information proved valuable as the current study was proposed and completed.

Theoretical framework. Of the studies examined in depth, thirteen held roots in cognitive theory and/or social constructivism. In each of these studies the researchers sought to discover the value of online tools within student collaboration and learning practices. Arnold, Ducate, Lomicka and Lord (2009) researched the process of student engagement during an online collaborative assignment. Studies of online collaborative learning processes were also conducted in five other studies. Jackson and Helms (2008), along with Leh (2002) and Lin (2008) studied hybrid courses and student learning perceptions. Online versus face-to-face collaboration using various online tools served as the focus for the four remaining studies in this group.

Two studies grounded in online learning theory were added to this discovery. Both of these studies reviewed online methods of instruction in either blended or web-based courses. Andone et al. (2009) focused on the use of wikis, while Skelton (2008) examined the advantages,

disadvantages, and student perceptions of online/blended modes of instruction. These studies were chosen for review to add depth to online tools and student perception of online coursework.

Research methods. A variety of practice-based research methods were utilized in the studies. Two gathered data using a mixed method (both quantitative and qualitative data), and chose action research as their research method. Action research is an approach to investigate an array of solutions to an everyday localized problem (Stringer, 2007). In both studies, multiple tools were used to evaluate online learning. Action research proved fruitful to Leh (2002) as it permitted a change in online tool use during the research period of three semesters.

Case study using qualitative only or mixed methods was used in five of the research studies. In-depth inquiries on a specific activity over a specified period of time mark the characteristics of this type of research (Creswell, 2009). Three of these studies observed the actions taken by students during online practices (Arnold et al., 2009; Persico, Pozzi & Sarti, 2010; Yipping & MacGregor, 2004). Lin (2008) chose case study to evaluate the perception of pre-service teachers using a learning management system (Blackboard) in a hybrid environment. Results of this study proved positive as participants experienced time and location flexibility while balancing home and school life. Scagnoli, Buki and Johnson (2009), sought in their case study to determine if previous online teaching experience influenced classroom teaching practices. In using this practice-based research method, it was determined online teaching experience influences the perception and understanding of online pedagogical strategies.

Quantitative data was gathered in the four survey research studies examined. When using survey research, a sample of the population is polled to describe trends, attitudes, or opinions of a population (Creswell, 2009). The nature of the data (quantitative) often lends itself to

positive/negative or yes/no results. Jackson and Helms (2008) used survey research for their study to ask whether a hybrid format met student expectations. Thirunarayanan and Perez-Prado (2001) inquired whether achievement level increases in an online as compared to a face-to-face environment. The remaining two studies using survey research followed this inquisition trend.

Evaluation research is the remaining method within the group of fifteen studies reviewed. Researchers choose evaluation research to assess the effects of a program or policy (Larusso, 2008). Two of the studies reviewed and evaluated student use of online tools (Andone et al., 2009; Pang, 2009), while two others evaluated students' use of an online learning environment (Pifarré & Cobos, 2009; Skelton, 2008). In each of these studies, student discussions (during online tool use) served as the focus of the evaluation.

Skelton (2008) gathered both quantitative and qualitative data in a combined survey research and evaluation study approach to investigate the learning environment of a blended course. By utilizing a mixed method (surveys and discussion content analysis), the researcher confidently concluded a blended approach superseded the value of online-only learning.

Quasi-experimental. As described above, many of the studies reviewed involved an aspect of evaluation through experimental measures. As most studies realized a foundation in the social and behavioral sciences, their subjects were not randomly assigned. As stated by Creswell (2009), intact groups, which define a quasi-experiment, are made available to the researcher. In a true experiment, the researcher chooses the treatment, selects the subjects, assigns subjects to groups, and assigns treatments to groups. But as Locke, Silverman and Spirduso (2010) explain, the quasi-experimental researcher does not control one or more of the critical variables and may be unable to use random selection procedures. There are times intact groups created by events or

natural processes, and in the field of education where experiments take place in classroom settings, this is frequently done.

Sample size. All of the studies reviewed incorporated either students or staff members from educational institutions in research. Arnold et al. (2009) chose a sample size of four classes of graduate teaching assistants, while Leh (2002) incorporated the students of twelve hybrid courses at two campuses. Four other studies integrated two or more class groups into their sample size to provide diversity in the process (Lin, 2008; Skelton, 2008; Thirunarayanan & Perez-Prado, 2001; Yiping & MacGregor, 2004).

Only four studies revealed the age of the participants, which provided a clearer picture of the study. Yu (2009) incorporated teens (ages 17 and 18), while Arnold et al. (2009) included participants in their 20s. Participants in the Jackson and Helms (2008) study ranged in age from 25 and under to over 35. Although most of the participants in the studies reviewed were in their early 20s, the ages of the Thirunarayanan and Perez-Prado (2001) study was 21 to 47.

Grouping was limited in the studies researched. Two studies used multiple groups of six to seven participants (Andone et al., 2009; Arnold et al., 2009), while two studies used multiple groups of eighteen or more participants (Lin, 2008; Yiping & MacGregor, 2004). In his study of online and face-to-face collaboration, Böhlke (2003) found the four-person group lead to less stress during collaborative discussions, less aggression in student speech, and reduced teacher dominance. Böhlke also believes with a four-member group, students have a greater chance to be heard during discussions. Insight into results in correlation to group size was more prevalent in these studies than in studies where group size information was not included.

Only three studies chose to include male and female demographics. Yu (2009) used a balance of 20 men and 21 women in a study. Two other studies revealed an unequal distribution of sexes in the groups. Jackson and Helms (2008) included 20 men and 38 women, while Thirunarayanan and Perez-Prado (2001) included in one group 30 females and one male. Dependent on the type of study, an equal or near equal distribution of males and females may be a determinant to the significance of the study.

Only one study mentioned the ethnicity of the participants. Yu (2009) chose to state three Asian Americans, seven Blacks, and 31 Whites participated in the study. In review of the study's focal point, the researcher used action research to seek information on student discussions in online and face-to-face environments. Therefore, distinguishing ethnicity deemed essential.

Sample strategies. Sampling strategies for the studies researched included both quota and convenience. Scagnoli et al. (2009) chose quota sampling in order to acquire the three specific participants needed for the study. Instructors taking part needed to have at least three years higher education teaching experience, taught at least one graduate-level course online, taught at least one graduate-level course equivalent to the online course, and had taught a face-to-face course before and after the online course (which was part of a degree program). Convenience sampling, as described by Creswell (2009) as choosing participants as a result of naturally-formed groups, was used by the remaining fourteen studies. A few of these studies provided reasons why the participants were chosen: Arnold et al. (2009) selected participants who incorporated the three universities taking part in the research; Leh (2002) chose participants who had little experience with hybrid courses; Namvar, Naderi, Shariatmadari, and Seifnaraghi (2009) chose participants who were taking the same course with the same teacher; and

Thirunarayanan and Perez-Prado (2001) chose participants who had previously taught the researched course.

Research locations. Nearly all of the studies researched were conducted in a post-secondary institution. Only one study reviewed was conducted in a high school environment (Yu, 2009). This finding supports a claim that insufficient research has been completed on student participation and learning using online and face-to-face collaboration methods in a secondary school environment.

Research processes and results. Several of the studies reviewed compared face-to-face to online discussion methods seeking to determine the most effective way to engage students in collaboration. Three studies supported the use of online tools declaring a hybrid method was superior to face-to-face discussions due to greater participation (Skelton, 2008; Yu, 2009) and higher test scores (Thirunarayanan & Perez-Prado, 2001; Yu, 2009). Two found equal results between the two methods (Jackson & Helms, 2008; Miller & Benz, 2008). All methods used a learning management system (Blackboard) to conduct their studies.

Leh (2002) conducted a study to review online discussion boards in order to evaluate hybrid courses. The results showed that although students and instructors were in favor of hybrid courses due to the flexibility of access, social contact was lacking.

Three of the studies assessed online collaboration within a hybrid environment. Pifarré and Cobos (2009) chose to review asynchronous discussion and face-to-face meetings among the participants along with discussion-assigned projects. Results demonstrated an increase in metacognitive knowledge. Lin (2008) and Yiping and MacGregor (2004) investigated online

dialog in a hybrid environment. Lin reported time flexibility as an advantage to participants; Yiping and MacGregor reported both cognitive and motivational benefits.

Scagnoli et al. (2009) chose to investigate the instructor's use of online tools. Results depicted teaching experience influences an instructor's teaching style and tool satisfaction.

Three studies incorporated either blogs or wikis to determine if collaboration is benefited by online tools. Andone et al. (2009) found blogs were popular, lending to greater engagement in the students' learning process. They also utilized wikis determining it was the group members who controlled collaboration success. Blogs were found to positively affect teaching and learning in Pang's (2009) study. In addition, Namvar et al. (2009) added blogs to their research to promote an aspect of student reflective thinking.

Limitations. In reviewing the fifteen studies, several areas of concern promote possible limitations in the research. In four of the studies the researcher served as the instructor or monitor of the participants, potentially causing biased results (Andone et al., 2009; Lin, 2008; Pang, 2009; Yu, 2009). Arnold et al. (2009) used an uncontrolled environment as participants had accessibility to additional forms of communication for collaboration not monitored in the study. Miller and Benz (2008) permitted teacher influence during discussion with the absence of discussion and interview guides; in contrast, guides were used by Scagnoli et al. (2009) to ensure a more controlled research environment.

Sample sizes were an additional limitation to the studies. Three studies used an unequal sample of males and females during collaborative experiments. Thirunarayanan and Perez-Prado (2001) engaged 55 females and five males in their study, while Yiping and MacGregor's (2004)

participants included an unequal distribution of 30 women to six men. Jackson and Helms (2008) solicited nearly twice as many women as men for the 58-person study.

Literature Review Conclusion

Gaps in the literature are evident in regards to the age group proposed (middle school-aged students) for a study on collaboration. No studies were found to mirror an examination of participation and student learning in comparable online and face-to-face environments. The fifteen studies described above provide reasonable belief that online methods of collaboration may induce participation and student learning, but it remains inconclusive for middle school students.

As a result of the literature review, it has been determined a focus needs to be placed on the discussion content and not on comment count alone. Pifarré and Cobos (2009) demonstrated the importance of comment content when assessing participants' conversations to determine improved development of metacognitive knowledge. Yiping and MacGregor (2004) carefully coded participant discussions to determine whether comments were task-related or socio-affective. Definitive evidence supports the need to build comment content into the findings in order to determine the breadth of participation by middle school students.

Research also indicates the need to create a non-bias research environment. This may be assisted through discussion and interview guides and limited facilitator influence.

Awareness of the construction of student discussion groups (males and females) within this age group will be added to the observations in order to discern whether the gender of the group members influenced the amount or content of participation during discussions.

Several of the studies reviewed alluded to the benefits of reflective thinking during student discussions. Today's Web 2.0 tools, including blogs, wikis, and journals, permit students to contribute, observe others, and reflect on group discussions. The result may lead to enhanced student learning. Yiping and MacGregor (2004) investigated reflective thinking and concluded at a higher-educational level participants realized both cognitive and motivational benefits. Namvar et al. (2009) found blogs promoted reflective thinking as it pertains to understanding and critical reflection. It has been documented that discussions and reflective practices are components of effective learning strategies (Persico et al., 2010). With this information, further studies would assist to determine if specific content derived from participative oral sessions triggered reflective practices, and if so, whether participation and student learning were ultimately increased.

Chapter 3: Research Design

This study is constructed to measure and compare both the amount and content of student comments during small-group, learning-centered discussions in online and face-to-face environments. It is also designed to assess whether student learning, as determined through a teacher-prepared rubric, benefits from students' participation in a small-group, learning-centered discussion online or face to face.

Methodology

The research design is both quantitative and qualitative. This mixed method research approach was chosen in order to determine whether there is a difference in the amount and content of student participation in small-group, learning-centered online vs. face-to-face discussions. Areas of comparison include:

1. Amount of students' participation in the small-group discussions.

2. Content of discussions engaged in across groups.
3. Difference, if any, in the amount of male and female participation in the small-group discussions.
4. Difference, if any, in the content of exchange by males and females during small-group discussions.
5. Difference in the distribution of participation across individuals and within each group during small-group discussions (i.e. is the amount of participation across all group members equivalent or dominated by one or two members).
6. Difference in student learning as an outcome of small-group discussions as determined by a teacher-prepared rubric.

Creswell (2009) reminds us that with mixed method studies it is not sufficient to simply gather quantitative and qualitative data; constructing assumptions and inquiries for the researched events defines the mixed approach. The primary data collection is verbal in the form of discussion transcripts. The quantitative aspect to this study is the analysis of the coded transcripts. In addition, a qualitative analysis of directed focus groups will be used to add any potential insights, affirmations, or discrepancies of the quantitative findings. A between-subject quasi-experimental design is being used; the outcomes of two groups of students participating in two different treatments is being studied and compared through an analysis of their discussions (amount of participation and content of remarks). The participants are not randomly assigned but are part of an intact group which has been made available to the investigator (Spanish classes at the middle school).

Between-subject quasi-experimental study. This between-subject quasi-experimental study was conducted to determine how the amount and content of participation in small-group, learning-centered discussions compare in online and face-to-face environments. A between-subject quasi-experimental design was chosen as there were two factors (online chat and face-to-face discussion environments) applied to two existing groups of middle school students. Creswell (2009) reports between-subject studies are designed for experiments where a comparison of two different treatments is applied to two different groups and the effects are examined separately. He also reports a quasi-experimental design defines a study where intact groups are available to the researcher (in this experiment, multiple sections of a Spanish course).

Hypotheses. It is this investigator's belief that utilizing an online collaboration tool (chat) during small-group, learning-centered discussions might alleviate the current problem of practice whereby some middle school students are reluctant to vocally engage in small group learning tasks. This intervention should increase the amount of participation and quality of content during peer discussions and, as a result, improve student learning. The following hypotheses are based upon the investigation of the problem of practice and literature review:

Hypothesis A. Students utilizing an online collaboration tool (chat) will demonstrate greater participation and superior content during the small-group, learning-centered discussions.

Hypothesis B. There will be no difference found in the amount or content of participation by males and females during face-to-face, small-group, learning-centered discussions as compared to an increase in the amount or content of participation by males and females during online small-group, learning-centered discussions.

Hypothesis C. There will be an equitable distribution in the amount of participation across individuals and within each section group during online small-group, learning-centered discussions as compared to an uneven amount of participation by individual and within each section group during face-to-face small-group, learning-centered discussions.

Hypothesis D. There will be a greater demonstration of student learning from students participating in the online small-group, learning-centered discussions as compared to students participating in the face-to-face small-group, learning-centered discussions.

Site and participants. A mid-sized middle school in the northeastern portion of the United States was the site of this study. Spanish classes were chosen due to the classes' daily meetings and routine use of class discussions. The students are comparable in their academic standing as most have taken two previous years of Spanish at a middle-school level, and are able to read and write words in Spanish. Participants included males and females who are approximately 13 to 15 years old, mostly White, Hispanic, or Black Americans, from lower-middle-class to upper-middle-class economic levels.

Seven sections of eighth grade Spanish (125 students) were eligible to participate based upon the two chosen teachers assigned to the sections. Those students who returned a signed permission form remained eligible. Students were assigned to a group by means of the return date of their permission form. Twenty groups (four students each) were created, thus yielding the convenience sample of 80. This sample is representative of forty percent (40%) of this middle school's eighth grade population, as well as most eighth grade populations of suburban districts in the Northeast United States (majority white, mixed middle-income populations). Three sections utilized online collaboration (chat), and four sections face-to-face discussion.

The two assisting teachers were chosen due to their comparable teaching approach to both classroom discussions and use of technology. Both teachers readily use a foreign language lab giving them access to technology targeted for their subject area. In addition, both utilize Smartboard technology providing them with increased technological teaching tools. With their similar educational backgrounds and teaching experience in a middle school setting, they assisted the research by means of promoting the integration of the study into their curriculum, cooperatively exposing their students to the chat feature on the district's learning management system (Blackboard Learn™) in the classroom, assisting with the preparation of the prompts and Blackboard site, administering and collecting the permission forms, and monitoring the film, collaboration, and open-response sessions.

Both teachers, who currently teach at least two eighth grade sections, instructed at least one online and one face-to-face section. Their sections were assigned as online or face-to-face by the investigator with the intent of obtaining the greatest number of student groups possible, consisting of two males and two females per group, while attempting to keep the ratio of online and face-to-face groups equal. Prior to the day of the study, an additional male and female was assigned to replace any student in each section who was absent. Both teachers monitored the section discussions.

Four additional staff members assisted the investigator on the day of student discussions by monitoring the face-to-face discussion groups.

It should be noted the relationship between the investigator and participants is one of previous teacher and students. Although the participants knew the investigator as a former

middle school computer teacher, the topic of online and face-to-face collaboration had not been previously discussed.

Identification of students in the face-to-face and online treatments. Randomly assigning students in groups of four within online and face-to-face treatments was a primary goal of the investigator. In order to be eligible for the study, students needed to return a permission slip signed by the student and his/her parents or guardians, view the film (subject of the discussion prompts), and be present on the day of discussions. Several factors guided the section and group assignment process: 1) each assisting teacher would oversee at least one section of online and one section of face-to-face students; 2) students would be assigned to groups of four with the first priority to assemble groups with two boys and two girls; 3) remaining eligible students in each section would be assigned to groups of three boys and one girl or three girls and one boy; 4) remaining eligible students in each section would be assigned to groups of four boys or four girls; 5) an equal number of online and face-to-face groups would be sought.

Of the seven sections of students eligible for the study, the investigator found an uneven amount of genders (mostly boys or mostly girls) in two of the sections. The investigator therefore designated three sections to the online treatment and four sections to the face-to-face treatment, each yielding ten groups of four students.

From a careful review of the students available across the seven sections taught by the two Spanish teachers (number and gender), groups of four were randomly developed in keeping with the above assignment structure.

Choice of online tool. Several tools were considered when planning online data collection. The learning management system available to the investigator and students in the

school, and thus used in the study, is Blackboard Learn™ which offers a discussion board, blog, wiki, and chat tool. The aim of the investigator was to choose a tool that was easy to use, fostered student discussions, could be used simultaneously by members of a discussion group, and was familiar to students. In previous teaching sessions with middle school students, the investigator observed that the discussion boards were confusing to students due to the hierarchical presence of responses. Blogs, although a new and novel approach to online communication, tended to encourage more reflective responses from student but did not foster ongoing and sustained conversations. And the wiki tool was primarily used to organize information and not viewed as a mechanism for synchronous online discussions.

As observed by the investigator and noted by others, only the chat tool provided students with an enjoyable, easy-to-use communication device for simultaneous conversation (Thomas & Qing, 2008). As noted by Stahl (2006), chat rooms provide a means for student communication most resembling face-to-face discussions. As used in their study of online and face-to-face tutoring, Siler and Van Lehn (2009) found the chat tool closely resembled oral communication. As a result of these findings, the investigator proceeded with the study utilizing Blackboard's chat feature.

Permissions and agreements secured. Permission from the building principal of the middle school to conduct the study was requested and granted; as a result, a letter to the participants' parents/guardians had been written and signed by the principal along with an IRB-approved parent/student permission form (Appendix A). Agreements with staff members willing to participate in this experiment, including the two Spanish classroom teachers, were verbally

obtained. Other staff members at the site (including members from the Guidance Department) demonstrated verbal support of the experiment and offered to assist with the study as needed.

Treatment activities. Below is an overview of the four activities completed by the participants. Each activity is further explained in the Data Collection section.

1. **Activity 1.** All students viewed the Spanish film “*Under the Same Moon.*” This film (presented in Spanish and accompanied by English subtitles) was presented to all participants during one session in its entirety. The following is a synopsis of the film, as recorded by Toby (2007):

Under the Same Moon (2008) is a film directed by Patricia Riggen, written by Ligiah Villalobos, and distributed by The Weinstein Company. This drama centers on a young boy’s journey across the US/Mexico border to be reunited with his mother. Adrian Alonso stars as Carlitos, a Mexican adolescent living with his grandmother while his mother works as a maid in the US, hoping someday to send for her child. But when the grandmother dies unexpectedly, Carlitos must sneak across the border and seek out his mother. *Under the Same Moon* premiered at the 2007 Sundance Film Festival where it received a standing-ovation.

2. **Activity 2.** Students in each section who had returned their completed permission form, viewed the movie, and were present on the day of discussions were assigned to groups of four students based on their permission form return. As many groups of two males and two females in each section were created. With those students remaining, groups of either three girls and one boy or three boys and one girl were formed. If additional students remained, groups of four boys or four girls were created. The grouped students proceeded to engage in a small-group, learning-centered discussion using two guiding questions. Each group was given no more than twenty minutes in either an online (chat) environment or a face-to-face environment to discuss the film.

3. **Activity 3.** Within two days of participating in the online or face-to-face discussions, each student was asked to compose an answer to an open-response writing prompt demonstrating student learning as a result of the film and group discussion session.
4. **Activity 4.** A sample of students having participated in the online and face-to-face discussions was identified and requested to participate in a focus group regarding 1) their experience in the treatments, and 2) their participant-based evaluation of any outcome differences as assessed after an analysis of the data.

Timeline. Letters requesting parental permission for the students to participate in the study were sent home with the students approximately two weeks prior to the start of the experiment (February, 2011).

This quasi-experimental study encompassed four participant activities. The first three activities (film, small-group, learning-centered discussions, and open-response writing prompt) occurred during three consecutive days in February, 2011. The fourth activity (focus groups) occurred approximately ten days later.

Data collection procedures. The following procedures were used by the researcher to collect data during the experiment:

Day 1: Viewing the film. All participants gathered in the auditorium of the middle school during one afternoon to view the Spanish film “*Under the Same Moon*.” A document guide (Appendix B) was read to the students by one of the Spanish teachers to introduce the film. At the film’s conclusion, the teacher completed the reading on the document guide, previewing the next day’s discussion questions for the students.

Attendance was taken during this activity. Students who did not view the film were no longer eligible to participate in the study.

Day 2: Online and face-to-face small-group, learning-centered discussions. On the second day of the experiment (the day immediately after viewing the film), participants met in the school's media center during their regular Spanish class session to engage in the small-group, learning-centered discussions. Prior to the start of the activities, the investigator read the Review of Student Consent (Appendix C) to provide students an opportunity to leave the study if they chose to do so. Based upon the number of students who had returned a signed permission form, viewed the film, and chose to continue to be a study participant, groups were formed (based on the permission form return date).

Participants assigned to engage in the online (chat) activity entered the school's learning management system, Blackboard Learn™ and entered their respective Blackboard group chat room. Students could visibly see a staff member was the first to enter the chat room. A document guide (Appendix D) was then used by the staff member to verbally introduce the activity and provide instructions (a twenty-minute student discussion time limit and the action to be taken by the student when discussion was completed). A printed card at each computer station (Appendix E) identified the two discussion prompts and the action to be taken by the student when discussion was completed. Discussion was permitted to begin after the staff member completed reading the two discussion prompts aloud (Appendix F). Discussion continued until either all members had indicated they were finished (completion time electronically recorded) or twenty minutes had been exhausted.

Participants assigned to engage in the face-to-face activity utilized conference areas with a microphone/laptop setup. Audacity was used to capture the audio. A document guide (Appendix G) was then used by the staff member to verbally introduce the activity and provide instructions (a twenty-minute discussion time limit and the action to be taken by the student when discussion was completed). As part of this process, students were asked to read a brief statement for transcription identity. A printed card (Appendix H) was placed on the table at each student position identifying the two discussion prompts and the signal for completion. Discussion was permitted to begin after the staff member completed reading the two discussion prompts aloud (Appendix F). Discussion would continue until either all members had indicated they were finished (completion time recorded) or twenty minutes had been exhausted.

Day 3: Open-response writing prompt. The day immediately following the small-group, learning-centered discussions, participants of the study completed the open-response writing prompt. A document guide was used by the staff member to introduce the activity and provide instructions (Appendix I). Participants used Microsoft Word to compose a response to the writing prompt. Participants had twenty minutes to complete a response that referenced both the film and group discussion. Completed work was printed by the students. A label containing a non-name student identifier was affixed to the printed copy by a staff member.

It should be noted that three students who had taken part in the small group discussions were absent on this activity day. Two of the students returned to school the following day and completed their open-response prompt. The third student was absent for a second day and therefore did not participate in this activity.

Day 4: Focus groups. Three boys and three girls were randomly selected from the class sections and asked to participate in one of four focus groups (two online and two face-to-face groups). Ottewill and Brown (1999) describe the concept of a focus group as a carefully-planned discussion among a small group of individuals whose objective is to share their perceptions of a defined area of interest in a non-threatening environment. Each focus group in this study held six students. The four focus group meetings took place in a designated room approximately ten days after the three-day experiment concluded. Prior to the start of discussion, the investigator read the Review of Student Consent (Appendix J) describing the purpose of the focus group and the process of collecting data, and providing the students with the opportunity to leave the activity if they wished to do so.

Each focus group session was audio taped using Audacity. No student identifying information was requested; the audio tape was being used for ease of transcribing the data only.

A Focus Group Interview Guide for Students (Appendix K) was printed on a card and given to each student to read and reflect upon prior to the start of the activity. This interview guide held the first five questions to be used during the focus group meeting and was used in order to promote participation by all group members. Questions pertained to the online or face-to-face small-group, learning-centered discussions as well as the open-response writing prompt activity.

A Focus Group Interview Guide for the Investigator (Appendix L) was printed on a card and used by the investigator during the focus group activity. This guide contained the same five questions provided to the students; in addition, the card contained eight additional guiding questions to be used during discussions.

The purpose of the focus groups was to gather additional information from the students to clarify data previously obtained through the small-group, learning-centered discussions and the open-response writing prompt.

Data collection models and coding. The following data collection models and coding were utilized in this study:

Student identifiers. During all phases of data collection, students were identified with a designated student number identifier. This mix of letters and numbers incorporated the teacher's name, section, discussion group, and student school identification number.

Discussion collection. Online discussion group data was collected through the school's Blackboard Learn™ chat option. Each group's chat session was recorded by the investigator. Session transcripts were printed in preparation for coding. Face-to-face discussion group data was collected through the use of Audacity software. The audio file was transcribed by the investigator using Microsoft Word and printed in preparation for coding.

Participation amount determination. Participation amounts per each group member, males, and females were determined by the amount of participant comment turns, participant's word count, and group discussion time.

- An online comment turn is defined by the investigator as “beginning with typed text and ending when the participant presses the ‘Enter’ key posting the comment to the chat session.”
- A face-to-face comment turn is defined by the investigator as “the start of a participant's comment and ending when another participant speaks.”

- Male participation amount is determined by the number of comment turns for male participants during the discussion session.
- Female participation amount is determined by the number of comment turns for female participants during the discussion session.
- Word count was determined through the use of the Word Count feature of Microsoft Word.
- Discussion time was determined by converting the amount of discussion time to minutes and seconds.

Coder criteria. The content of participation was determined for both online and face-to-face discussions through a coding process. Two individuals, chosen to serve as coders for this experiment, met the following established criteria:

- One male and one female coder, providing diverse insight on student discussions.
- College educated.
- Used a form of chat professionally, providing understanding of online conversations.
- Participated in face-to-face discussions daily in their professional career.
- Engaged in a non-educational profession.
- Independently viewed the film (as part of student Activity #1) prior to the start of the coding process.

The two coders were trained in order to reach inter-rater reliability. Cohen's Kappa, a common reliability measure among human coders, was used as codes were assigned to the transcribed remarks. According to McKlin (2004), the strength of agreement is based on the following Kappa statistical measure:

Table 1

Cohen's Kappa Statistical Measure

Kappa statistic	Strength of agreement
0.00	Poor
0.00 – 0.20	Slight
0.21 – 0.40	Fair
0.41 – 0.60	Moderate
0.61 – 0.80	Substantial
0.81 – 1.00	Almost perfect

The steps for coding were established as follows: 1) the two raters would reach agreement with every comment in the initial group of transcribed remarks and where deemed necessary, the coding framework would be refined for greater clarity between the two coders and investigator; 2) the raters would then code a second group of transcribed remarks with the refined coding framework independently seeking to secure no less than a *Substantial* rating; 3) if strength of agreement was *Substantial*, the two coders would proceed to code the remaining remarks separately; if the rating fell below the *Substantial* level, the coders would work with the investigator to again review and refine the coding framework for greater reliability and determine the final code for the data reviewed ; 4) the process of coding a new group's remarks would again take place seeking the *Substantial* or higher rating (if the rating again fell below *Substantial*, the raters and investigator would again confer); 5) once the *Substantial* level was achieved, the coders would independently code the remaining transcribed remarks.

Participation content determination. Prior to the initial meeting with the coders, the investigator met with two independent sources to review the proposed coding scheme. One new code was added, two codes were renamed, and several revisions were made to the initial code

definitions. It was further determined particular segments of remarks would be disallowed in both participation count and participation content (Appendix M).

Coding process. The two coders were presented with identical copies of the transcribed remarks. The investigator reviewed three documents with the coders: Small-Group, Learning-Centered Discussion Prompts (Appendix F), Chat Abbreviations Used during Discussions (Appendix N), and the updated copy of the Comment Codes as discussed in the Pre-Coding Process.

The two coders read and discussed each turn in the initial group of transcribed remarks with the investigator in order to achieve clarity between the two coders and investigator. As a result of the collaborative event, the coding framework was refined to reflect clarity in definitions as well as an additional comment code. The coders proceeded to code a second group of transcribed remarks with the refined coding framework independently seeking to secure no less than a *Substantial* rating using the Kappa Statistic Table (Table 1).

Using Cohen's Kappa online inter-rater reliability measures, results were reported for the second group of transcribed remarks. The strength of agreement with the Opposing comments failed to reach the *Substantial* rating. Therefore the two coders proceeded to work with the investigator to once again reach inter-rater reliability. The coders proceeded to code a third group of transcribed remarks; in calculating inter-rater reliability, it was found the coders were successful in reaching a *Substantial* rating or higher for all categories. Using Cohen's Kappa online inter-rater reliability measures, Kappa statistic results were reported for the following comments: on-task/off-task, (98%); affirming, (90%); opposing, (73%); correcting, (91%); questioning, (96%); managing, (88%); new information, (92%); and answering, (87%). As a

result of reaching a *Substantial* or higher rating (Table 1), the coders independently coded the remaining transcribed remarks using the final framework (Appendix O).

To summarize, each comment turn was categorized as either an on-task comment or an off-task comment. Each on-task comment turn was reviewed and categorized using one or more of the following remarks: affirming, opposing, correcting, questioning, managing, new information, or answering. Male participation content was determined by the total count of on-task and off-task remarks for the males within both online and face-to-face discussion groups. Female participation content was determined by the total count of on-task and off-task remarks for the females within both online and face-to-face discussion groups. The coded transcripts were tallied according to participant and category, and sorted by individual participants, groups, total males, total females, total online environment, and total face-to-face environment in order to prepare for data analysis.

Open-response prompt answers. The participants' open-response prompt answers were completed using Microsoft Word. Typed answers from all students having participated in the discussion groups, both online and face-to-face, were blindly coded in random order using a teacher-prepared rubric to determine a student learning score (Appendix O). Two coders were trained in order to reach inter-rater reliability. Both coders were presented with identical copies of the typed student open-response answers. The investigator reviewed the discussion prompt with the coders. Both coders had a copy of the prompt for reference during coding. The investigator reviewed the initial teacher-prepared rubric with the coders. Both coders had a copy of the rubric for reference during coding. The two coders read each typed response in the first group (ten responses) in order to achieve clarity between the two coders and investigator. As a

result of the collaborative event, the coding framework was refined. The coders then reviewed ten additional typed responses independently seeking to secure no less than a Kappa *Substantial* rating. By using an Online Kappa Calculator, the investigator sought to determine inter-rater reliability values for the second group of responses.

The ratings for three of the five categories were classified as *Substantial* or *Almost Perfect*. Two categories (indirect reference to the film and quality and coherence of argument) fell within the *Moderate* category. As a result, the rubric was refined. The coders then reviewed ten additional typed responses. In calculating inter-rater reliability for the third group of typed responses, it was found the coders were successful in reaching a *Substantial* rating or higher for all categories. Using Cohen's Kappa online inter-rater reliability measures, Kappa statistic results were reported for the following rubric categories: effort to make a case, (87%); direct reference to film, (87%); direct reference to discussions, (100%); indirect reference to film or discussions, (73%); and quality and coherence of argument, (73%). As a result of reaching a *Substantial* or higher rating (Table 1), the coders independently coded the remaining typed open responses.

Focus groups. An interview guide was used by the investigator during the focus group process (Appendix L). A Focus Group Interview Guide for Students (Appendix K) was given to the participants at the start of the session for reflective purposes. Audacity was used to capture the oral discussions. The transcripts were manually transcribed by the investigator and used as qualitative data to support data analysis.

Participant confidentiality. Confidentiality was enforced as quantitative and qualitative data, along with audio tapings, were collected. Information gathered was transcribed by the

investigator, word for word, shortly after the discussion sessions. The audio transcripts were destroyed once the data had been collected, coded, sorted, analyzed, and prepared for reporting.

Data Analysis. The following methods for data analysis were used by the investigator in order to achieve reportable results:

Independent sample T-test. Salkind (2010) reports a t-test for independent means is used to determine if there is a difference in one or more variables between two groups that are independent of one another (not related in any way). This test is used when each of the participants is tested only once. Independent sample t-tests were used to compute a difference between online and face-to-face participation amount and content for the sample, and online and face-to-face participation amount for males and females.

Fisher exact test. As defined by Ayebo (2010), a Fisher exact test is a “non-parametric statistic that is used to determine if there are non-random associations between two categorical variables” (p. 71). For this study, a two-tailed test was used, and a significance level of $p < .05$ was sought demonstrating a less than five percent (5%) chance difference between populations due to an unknown reason other than the hypothesized difference. As reported by Beard (2003) the Fisher exact test, designed to be used with two-by-two contingency tables, computes exact probability levels when comparing small sample sizes. This test was used in the current study to compute aspects of participation amount and content through comparisons of the median (less than/equal to or greater than the median).

Relative percentage comparison. A relative percentage was determined by taking the value for a specific unit and dividing it by the sum of all units. A relative percentage was found for total comments (on-task, off-task, affirming, opposing, correcting, questioning, managing,

new information, and answering) for the sample size, as well as for male and female comments. The investigator chose to use relative percentage in order to determine the rank position of a student in conjunction with participation content.

Two-factor ANOVA. An analysis of variance without replication is used as a tool to test the effects of two factors (Salkind, 2010). As stated, when using without replication, there is only one observation per treatment combination (Larget, 2003). In this study, total turns and word count were examined when testing the effects of the treatment (online or face-to-face), the gender (male or female), and the treatment and gender (combined).

Gini Coefficient. Warschauer (1996) reports that the Gini coefficient sums, over all the group members, the deviations of each group members' contribution from equal participation, normalized by the maximum possible value of this deviation. The coefficient thus takes values between 0 and 1, where 0 indicates the greatest possible equitable distribution of contributions (e.g., 25% by each group member of four participants), and 1 indicates the least equitable distribution of contributions of group members (e.g. only one of any size group contributes to a discussion).

By means of an online Gini calculator (Wessa, 2011), the investigator analyzed the equitable distribution of discussion contributions by group members within each group using total turns and word count.

Mann-Whitney-Wilcoxon. The Mann-Whitney-Wilcoxon test is a non-parametric means to test the identity of two independent populations. This method is based on data from two independent random samples, one from population 1 and another from population 2 (Statistics, 2011). By means of Statistics Online Computational Resource (2011), the Mann-Whitney-

Wilcoxon test was used to determine student learning as a result of student's viewing the film and participating in small-group, learning-centered discussions.

Validity and credibility. Locke et al., (2010) reports a valid study is one that is represented as true. Creswell (2009) states validity focuses on whether the researcher can conclude the intervention affected the outcome, or whether another factor was the cause. Validity in quantitative research is reported to share two types of threats: internal and external. Creswell reminds us it is the researcher's responsibility to identify potential threats and design the study to minimize their likelihood.

Internal validity. Threats to internal validity focus on the research design; will the data being gathered match the questions being asked (Locke et al., 2010). Attention to the experimental procedures, treatments, or experiences of the participants needs to be extended in order for the researcher to extract correct inferences from the data about the population of the experiment (Creswell, 2009). Six areas of internal validity, namely history, selection, mortality, diffusion of treatment, additive, and interactive effect, need to be reported for this study involving small-group, learning-centered discussions in a middle school environment.

History. It has been stated that because time passes during an experiment, events can occur that unduly influence the outcome beyond the experimental treatment (Creswell, 2009). For this experiment, it was determined data collection would need to be completed over a period of several days. First, to combat a possible threat to validity, all students took part in viewing the film together. Second, all students took part in their respective small-group, learning-centered discussions on the same day during their regularly-scheduled Spanish class. Third, data collected through the open-response writing prompt was gathered within two days of the small-group,

learning-centered discussions during the participants' respective class block. And fourth, data collected during the focus groups was gathered in one day during the regular Spanish class blocks. During the data-collection period, the investigator sought to complete each activity in the planned time to avoid outside influence beyond the experimental treatment.

Selection. Creswell (2009) states an internal validity threat occurs when participants, who have certain characteristics that predispose them to have certain outcomes, are selected for a study. To avoid the possibility of this threat, care was taken to accept participants into the study in as random a selection process as possible. The study was announced to all students on the same day. Each student had equal opportunity to return their completed permission form; students were assigned to groups within their class sections based on this return. No special formation of groups (ability and/or ethnicity) was conducted for this study in order to avoid the threat of internal validity.

Mortality. As a result of participants dropping out of an experiment for various reasons, their outcomes are unknown creating an internal validity threat (Creswell, 2009). To combat this threat the sample size was open to as many participants (groups of four) as possible. Experimental procedures were conducted in consecutive days to avoid the lost of participants' data through absenteeism. As a result of precautions, only one participant failed to complete the third task (open-response prompt) in the experiment. Data collected from the remaining sample clearly denotes the missing data would not have affected the outcome of this portion of the study.

Diffusion of treatment. Creswell (2009) reminds us in order to avoid this internal validity threat participants in both groups should avoid communication with each other during the experiment so as to not influence the outcome. Steps were taken in this study to separate the two

groups during the second day of experimentation (small-group, learning-centered discussions) so as to not place the participants in an opportunity for communication. Separate rooms/areas were used for the face-to-face discussions; online participants utilized an adjacent area with computer stations.

Additive effect. Brogan (2011) defines additive effect as an act of one group of participants responding differently to an external event or measuring in a more sensitive manner by a method of instrumentation. This experiment includes a measurement of participation amount and content via online vs. face-to-face environments. Although the tool used in the online treatment (chat) is comparatively different than routine student discussions, preventive methods were undertaken by the investigator to align the activities preceding the discussion (including the use of document and interview guides) for both environments. In addition, the chat method of discussion was used prior to the experiment with all students to assist in normalizing the process of online discussion in a classroom environment.

Interactive effect. Edmondson (2007) reports an interactive threat surfaces when two or more threats interact. He provides an example with a selection-maturation interaction whereby the differences between ages of groups could cause groups to change at different rates. In this example a group of younger people may show more improvement in a test in comparison to the older participants due to faster brain development at a younger age.

In the present experiment the internal validity threat of selection (participants have a predisposed outcome based on applied treatment), and additive (two different treatments used by the same student sample) poses a threat to internal validity. Throughout the experiment the

investigator sought to assign participants to the treatments randomly while proposing to use the online tool in a relatively routine procedure for the students.

External validity. Threats to external validity focuses on whether the results of a study will remain truthful when applied outside of the original investigation, or in other words, can the findings be generalized (Locke et al., 2010). Seven areas of external validity threat to report in this study are in the areas of compensatory/resentful demoralization, interaction of selection and treatment, interaction of setting and treatment, ecological validity, temporal validity, outcome validity, and population validity.

Compensatory/resentful demoralization. Creswell (2009) reports the benefits of an experiment may be unequal or resented when only one group receives a treatment. To combat this threat, prior to the experiment all students took part in an online chat activity. This action not only served as an opportunity to check each student's ability to operate the hardware/software correctly, but provided all participants with an opportunity to partake in this procedure.

Interaction of selection and treatment. An external validity threat exists when the researcher generalizes results whereby the participants of the general population may not hold the same set of narrow characteristics of those participants in the study. To avoid this threat, the investigator will restrict claims to non-study groups to which the results cannot be generalized.

Interaction of setting and treatment. Creswell (2009) reports, due to the characteristics of the setting of participants in a study, the researcher cannot generalize to individuals in other settings. Information as to the study's site and the characteristics of the participants were shared in the methodology section of this report. To avoid this external validity threat, the investigator

would need to conduct additional experiments in new settings to see if the same results occur as in the initial setting.

Ecological validity. Shuttleworth (2009) describes ecological validity as a type of external validity which examines the testing environment of an experiment to determine how it may influence behavior. Abrahams (1997) adds ecological validity is the extent to which the results of an experiment can be generalized from the environmental conditions, both natural and researcher created. The current study utilized an experimental environment familiar with the students, namely the school's media center. Both the computer section and reading/conference rooms had been used by the students on several occasions prior to the study. The investigator took steps to ensure use of a familiar site so as to not solicit adverse behavior or concern from the participating students.

Temporal validity. Simons and Holve (2010) define temporal validity as the ability to generalize results of a study across time. This study, incorporating small-group, learning-centered discussions to reveal participation amount and content by middle school students, focuses on the use of an online tool (chat) at a time when web 2.0 tools are emerging into the classrooms. With the current trend of students using more and more electronic tools to communicate (e.g. texting and instant messaging) this study is timely in consideration of the potential benefit to schools. Had the study been conducted ten years prior, or ten years in the future, most likely the findings would be different.

Outcome validity. Onwuegbuzie et al., (2007) describe outcome validity as the meaning of scores and the intended and unintended consequences of using the defined instrument. In the current study, each of the comment code definitions were carefully worded, and as a result of

inter-rater reliability, were defined in agreement by the coders. The intended use of the comment codes were to measure participation amount and content by the participants. The investigator sought to minimize unintended consequences by using the codes only for the defined purpose of categorizing student responses.

Population validity. As a measurement of external validity, population validity describes how well the sample used in an experiment can be extrapolated to a population as a whole (Shuttleworth, 2009). Representation of the entire population and an acceptable sampling method is essential. Shuttleworth states that in an educational environment, population validity can be strengthened using several statistical techniques along with a good research design to ensure the subset is as representative as possible.

The current experiment included the planned 80 participants gathered from seven sections of the eighth grade class. The methodology for the study was developed to include several statistical tests and comparisons of the data. In addition, the study was developed to include a random assignment of students to groups across several sections of complementary classes with the intent to collect data from a cross-representative sample of the school's student population.

Threats of bias and reactivity. Maxwell (2005) clearly states validity threats, in a qualitative study, correlate to a way the researcher may be incorrect. Steps need to be taken to rule out these threats after the research has begun. Avoiding plausible alternatives and threats to the interpretation and explanation of the findings is imperative. Bias entails selecting data that fits the researcher's existing theory. Reactivity is the influence of the researcher that is conveyed

on the setting or individuals of the study. To avoid these threats, the following strategies were employed:

- Data collection was detailed and varied in order to provide a full picture of the similarities and differences between online and face-to-face environments. All parts of the experiment utilized document guides in order to refrain from any attempts to bias the participants during the experiment. A recording option on the online chat was utilized in order to capture all comments made by the participants. Audacity was used to capture all verbal comments during both the small-group, learning-centered discussions and the focus groups. The audio recordings were transcribed to electronic text format, word-for-word by the investigator, in order to capture all data accurately. In addition, investigator notes were gathered to describe various actions taken by the participants and staff members during the experiment that would not be captured by the recording devices. These notes will be used to support or contradict the findings of the participants' data.
- Focus groups were conducted in order to systematically solicit feedback from the participants in reference to the data collected and their reactions to the study. The purpose of the focus groups was to rule out the possibility of misinterpretations of the data (what the participants said during the discussion period) and to gather data on participants thoughts not shared during the experimental procedures. Interview guides were used in the four focus groups in order to uniformly question the participants.
- The practice of limited intervention by the investigator was observed as to not bias the results of the study. Two teachers (Spanish sections) along with several staff members monitored the face-to-face discussion groups. In addition, the two assisting teachers

monitored the opening activity (viewing the film) and the open-response activity, interacting with the students to answer questions.

- Data in the form of participation amount, participation content, participation differences, student learning scores, and focus group comments were collected in a variety of formats (recorded online chats, recorded face-to-face discussions, typed open-response answers, and focus group interviews). Stringer (2007) reminds us the credibility of a study is enhanced when multiple sources of data are incorporated. Although this process does not automatically increase validity, triangulation of data does secure a better understanding of the issues under investigation (Maxwell, 2005). In this study, it was not only participant data that was collected, but also an analysis by the investigator of the activities that took place during the experimental activities.

Potential confounding factors. Blatchford, Goldstein, Martin and Browne (2002) describe confounding factors as the association between variables in a study that may either conceal an actual relationship or falsely demonstrate an obvious connection where one does not exist. If the factors are not considered, bias may compromise the study's conclusions. In this study of small-group, learning-centered discussions, several possible confounding factors were addressed:

- The students' keyboarding skill level may or may not have hampered their ability to participate often and at length during the chat session. Although students had been provided keyboarding instruction as part of their middle school curriculum, variances in proficiency did exist. To minimize the possibility of biased results, students were randomly assigned to the online or face-to-face groups.

- The students' prior experience with audio-taped segments may have altered their participation during the study. In conversation with the instructors it was discovered one of the instructors had video/audio taped student presentations during one classroom activity. To minimize the possibility of biased results in the study, only two of the seven sections participating in the study were those students who had been previously audio-taped.
- The students' prior experience with the chat tool may have varied their online participation. To minimize the possibility of biased results, students were randomly assigned to the online or face-to-face groups.
- The students' personal connection to the topic of immigration may have lead to possible advantaged discussions and enriched prompt answers. To minimize the possibility of biased results in this area, students were randomly assigned to the online or face-to-face groups.
- The instructors' use of the chat feature within their classes prior to the experiment could have lead to biased results. In conversation with the instructors, the chat feature on Blackboard was introduced and equally used within their classes (jointly-prepared student activity) prior to the experiment.

Protection of Human Subjects

Ethical challenges. No student was purposefully excluded from the class groupings. Students did not suffer negative consequences if they chose not to take part in the research study. Students who chose not to participate were moved to a designated silent reading area.

Possible risks. No psychological harm, financial, social, or legal damages, or physical risks were incurred by the participants during this study. Those who monitored the collaboration and focus group sessions were experienced educators and aware of the signs of anxiety in middle school students. Additional support was available, but not needed, through the Guidance Department of this middle school.

Fairness of inquiry, findings, and interpretations. The investigator conducted all research activities at the same middle school and recruited all participants for the study. Parents/guardians of the participating students were notified of the study via correspondence initiated by the building principal and investigator. The letter described the purpose of the study and the activities (both regular classroom and research) to be included. A second enclosed document (requesting signed consent) depicted the place and time of the experiment, the lack of foreseeable risks to the students, and the steps taken for confidentiality of documentation. Contact information was provided if parents/guardians had questions pertaining to the study.

Preparation of document and interview guides, chat areas on Blackboard, and the open-response writing prompt were completed by the investigator. Focus groups were conducted by the investigator. Both the investigator and facilitating teachers were on hand to answer student questions and clarify research methods during the film, discussion sessions, and open-response writing prompt sessions.

The open-response writing prompt answers were identified (by student code), assessed using a teacher-created rubric by two evaluators, and analyzed by the investigator. Data collected through the online chat sessions was student identified by a computerized username; data collected through the face-to-face discussions was assigned student codes. These name

identifiers were deleted after the information was reported. Identifiable documentation was destroyed after the information was reported. Audio tapes were student coded and transcribed immediately after acquired. Audio tapes were destroyed after information had been prepared for reporting. Those having access to the data during the collection process were the investigator and assisting teachers. Two individuals were asked to code the data from the discussion sessions as well as score the open-response prompt answers. The need for confidentiality throughout the research process was discussed, understood, and followed by all individuals. All consent documentation (letters, forms, etc. from the principal/ investigator to the parents/guardians of the students) will be retained by the investigator for three years following the end of the study.

Chapter 4: Report of Research Findings

Differences in student participation, discussion content, and student learning in the context of students' participation in a small-group, learning-centered discussion online vs. face-to-face, is the focus of this research. Through comparisons of the above outcomes in relationship to students participation in small group discussions online and face-to-face, the research questions sought to determine whether today's students might benefit when exposed to an online collaboration environment.

The data describes the results of a diverse discussion environment (two boys and two girls, three boys and one girl, three girls and one boy, all girls, and all boys, N = 80). Where applicable, inferences have been stated as a result of an imbalance of boys and girls in the discussion groups.

Research Question #1

The first research question is as follows: How does the amount and content of participation in small-group, learning-centered discussions compare in online and face-to-face environments? Prior to the investigation, the researcher's hypothesis was: *Students utilizing an online collaboration tool (chat) will demonstrate greater participation and superior content during the small-group, learning-centered discussions.*

Participation amount. Total turns, word count, and discussion time were used to analyze the amount of participation.

Findings. As shown in Table 2, online students on average took more turns ($M = 24.3$ vs. 14.1 , t -test, $p < .01$) and engaged in significantly longer discussions ($M = 16:06$ vs. $9:30$, t -test, $p < .01$) than students engaged in discussions face-to-face. On the other hand, face-to-face students contributed on average more words ($M = 318.6$ vs. 194.6 , t -test, $p < .05$) than the online students.

Table 2

Participation Amount (Independent Sample T-test)

	Online			F2F			<i>p</i> -value
	N	M	SD	N	M	SD	
Total turns	40	24.3	17	40	14.1	16	.007**
Word count	40	194.6	112	40	318.6	284	.013*
Time	40	16:06	207	40	9:30	368	.008**

Note: N = number of participants; M = mean; SD = standard deviation; Time = discussion time in minutes/seconds.

p* < .05, *p* < .01.

Using a Fisher exact test, the data in Table 3 further validates this finding as online students contributed more total turns than the median number of total turns for both groups (Mdn = 16, Fisher exact test, *p* = .002).

Table 3

Number of Online and F2F students taking More than and Less than or Equal to the Median Number of Total Turns across both Groups (Median = 16; Fisher exact test)

	≤16	>16	<i>p</i> -value = .002**
	Total turns	Total turns	
Online	14	26	
F2F	29	11	

Note: N = 80 (number of participants); Mdn = 16 (median).

p* < .05, *p* < .01.

In addition, Table 4 depicts 8 of the 10 online groups discussed for a greater length of time than the median for both groups (Mdn = 14:33) while only 2 of the 10 face-to-face groups discussed for a greater length of time than this median (Fisher exact test, *p* = .023).

Table 4

Number of Online and F2F students partaking in More than and Less than or Equal to the Median Group Discussion Time across both Groups (Median = 14:33; Fisher exact test)

	$\leq 14:33$ Discussion time	$> 14:33$ Discussion time	
Online	2	8	p -value = .023*
F2F	8	2	

Note: N = 20 (number of groups); Mdn = 14:33 (median).

Group discussion time reported in minutes/seconds.

* $p < .05$.

Alternatively, Table 5 depicts 24 out of the 40 face-to-face students contributed a greater number of words than the median for both groups (Mdn = 177) while only 16 of the 40 online participants contributed a greater number of words than this median; however, using a Fisher exact test, this finding was not significant.

Table 5

Number of Online and F2F students contributing More than and Less than or Equal to the Median Word Count across both Groups (Median = 177; Fisher exact test)

	≤ 177 Word count	> 177 Word count	
Online	24	16	p -value = .117
F2F	16	24	

Note: N = 80 (number of participants); Mdn = 177 (median).

* $p < .05$.

Analysis. In reviewing the transcripts from across both groups, it was found online students discussed more as demonstrated by their total turns. Transcripts from the discussions show face-to-face participants spoke less often demonstrating a reporting style rather than a discussion style of speech. Online turns appeared to be short and succinct. Although this resulted

in fewer words said by the participants, the coders reported the method of discussion was in most cases more collaborative in the online environment. The greater amount of discussion time by the online environment, as compared to face to face, supports the belief that students using online methods stayed engaged in the discussion for longer periods of time. In summary, participation amount in relation to total turns and discussion time was at a higher level in the online environment, even though face-to-face students contributed a greater word count.

Participation content. Participant comments were initially analyzed and coded as either on-task or off-task. On-task comments (Appendix P) were further coded as one or more of the following: affirming, opposing, correcting, questioning, managing, new information, and answering.

Findings. As shown in Table 6, online students on average made more on-task comments ($M = 19.5$ vs. 13.3 , t-test, $p < .05$) and more off-task comments ($M = 4.8$ vs. 1.0 , t-test, $p < .01$) than face-to-face students, resulting in significant findings (t-test, $p < .01$, $p < .05$). In addition, online students on average made more affirming comments ($M = 4.7$ vs. 2.5 , t-test, $p < .01$), opposing comments ($M = 3.6$ vs. 1.4 , t-test, $p < .05$), and correcting comments ($M = 1.4$ vs. 0.5 , t-test, $p < .01$) than face-to-face students, resulting in significant findings.

Table 6

Participation Content (Independent Sample T-test)

	Online			F2F			<i>p</i> -value
	N	M	SD	N	M	SD	
On-task	40	19.5	11.7	40	13.3	14.8	.041*
Off-task	40	4.8	8.7	40	1.0	2.4	.009**
Affirming	40	4.7	3.8	40	2.5	2.8	.004**
Opposing	40	3.6	4.7	40	1.4	2.4	.0105*
Correcting	40	1.4	2.0	40	0.5	0.9	.008**
Questioning	40	1.8	1.9	40	1.8	2.8	.963
Managing	40	1.4	1.6	40	1.0	1.1	.122
New information	40	10	6.2	40	8.6	9.2	.581
Answering	40	1.0	1.1	40	1.3	2.3	.422

Note: N = number of participants; M = mean; SD = standard deviation.

* $p < .05$, ** $p < .01$.

Validating this finding, Table 7 demonstrates 26 of the 40 online students vs. only 13 of the 40 face-to-face students contributed more on-task comments than the median number of on-task comments for both groups (Mdn = 13, Fisher exact test, $p = .007$). Table 8 demonstrates 28 of the 40 online students vs. only 10 of the 40 face-to-face students contributed more off-task comments than the median number of off-task comments for both groups (Mdn = 0, Fisher exact test, $p < .01$).

Table 7

Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of On-task Comments across both Groups (Median = 13; Fisher exact test)

	≤ 13 On-task comments	> 13 On-task comments	
Online	14	26	p -value = .007**
F2F	27	13	

Note: N = 80 (number of participants); Mdn = 13 (median).

* $p < .05$, ** $p < .01$.

Table 8

Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of Off-task Comments across both Groups (Median = 0; Fisher exact test)

	≤ 0 Off-task comments	> 0 Off-task comments	
Online	12	28	p -value < .001**
F2F	30	10	

Note: N = 80 (number of participants); Mdn = 0 (median).

* $p < .05$, ** $p < .01$.

In addition, a statistically significant difference (Fisher exact test, $p < .05$) was found in three areas of the comment codes. Table 9 depicts 22 of the 40 online students vs. only 12 of the 40 face-to-face students contributed more affirming comments than the median number of affirming comments for both groups (Mdn = 3, Fisher exact test, $p = .041$). Table 10 depicts 21 of the 40 online students vs. only 11 of the 40 face-to-face students contributed more opposing comments than the median number of opposing comments for both groups (Mdn = 1, Fisher exact test, $p = .039$). Table 11 depicts 21 of the 40 online students vs. only 11 of the 40 face-to-

face students contributed more correcting comments than the median number of correcting comments for both groups (Mdn = 0, Fisher exact test, $p = .039$).

Table 9

Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of Affirming Comments across both Groups (Median = 3; Fisher exact test)

	≤ 3 Affirming comments	> 3 Affirming comments	p -value = .041*
Online	18	22	
F2F	28	12	

Note: N = 80 (number of participants); Mdn = 3 (median).

* $p < .05$.

Table 10

Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of Opposing Comments across both Groups (Median = 1; Fisher exact test)

	≤ 1 Opposing comments	> 1 Opposing comments	p -value = .039*
Online	19	21	
F2F	29	11	

Note: N = 80 (number of participants); Mdn = 1 (median).

* $p < .05$.

Table 11

Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of Correcting Comments across both Groups (Median = 0; Fisher exact test)

	≤ 0 Correcting comments	> 0 Correcting comments	p -value = .039*
Online	19	21	
F2F	29	11	

Note: N = 80 (number of participants); Mdn = 0 (median).

* $p < .05$.

Although an analysis (Fisher exact test) of the remaining comment code areas (questioning, managing, new information, and answering) demonstrated more online comments in each area as compared to face-to-face activity, as depicted in Tables 12-15, these findings were not significant.

Table 12

Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of Questioning Comments across both Groups (Median = 1; Fisher exact test)

	≤ 1 Questioning comments	> 1 Questioning comments	
Online	23	17	p -value = .489
F2F	27	13	

Note: N = 80 (number of participants); Mdn = 1 (median).

* $p < .05$.

Table 13

Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of Managing Comments across both Groups (Median = 1; Fisher exact test)

	≤ 1 Managing comments	> 1 Managing comments	
Online	29	11	p -value = 1.000
F2F	30	10	

Note: N = 80 (number of participants); Mdn = 1 (median).

* $p < .05$.

Table 14

Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of New Information Comments across both Groups (Median = 7; Fisher exact test)

	≤ 7 New information comments	> 7 New information comments	
Online	18	22	p -value = .263
F2F	24	16	

Note: N = 80 (number of participants); Mdn = 7 (median).
* $p < .05$.

Table 15

Number of Online and F2F students contributing More than and Less than or Equal to the Median Number of Answering Comments across both Groups (Median = 0.5; Fisher exact test)

	≤ 0.5 Answering comments	> 0.5 Answering comments	
Online	16	24	p -value = .117
F2F	24	16	

Note: N = 80 (number of participants); Mdn = 0.5 (median).
* $p < .05$.

Given that the online students contributed more total turns and thus would expect to have contributed more comments (on-task, etc.), the investigator reviewed the on-task, off-task, affirming, opposing, correcting, managing, new information, and answering comments for students online and face-to-face as a percentage of total comments. Using relative percentage comparison, Table 16 depicts a percent of comment code comparison between online and face-to-face methods. Off-task comments were made nearly three times more often (19.7% vs. 6.8%) in the online environment than the face-to-face environment. Online students also contributed nearly twice as many opposing comments (15.4% vs. 8.1%) and more than double the online

correcting comments (5.9% vs. 2.7%) as compared to students in the face-to-face environment. Further review denotes a slight increase in face-to-face on-task comments (93.2% vs. 80.3%) as compared to the online comments. In addition, students in the face-to-face environment contributed more questioning comments (10.5% vs. 7.5%), new information comments (50.8% vs. 41.0%), and answering comments (7.6% vs. 4.1%) as compared to their online environment counterparts.

Table 16

Online Compared to Face-to-Face Comments (Relative Percentage Comparison)

	% of total comments		
	Online	F2F	% difference
On-task	80.3%	93.2%	-12.9%
Off-task	19.7%	6.8%	+12.9%
Affirming	20.0%	14.7%	+5.3%
Opposing	15.4%	8.1%	+7.3%
Correcting	5.9%	2.7%	+3.2%
Questioning	7.5%	10.5%	-3.0%
Managing	6.1%	5.6%	+0.5%
New information	41.0%	50.8%	-9.8%
Answering	4.1%	7.6%	-3.5%

Note: Online percentage base is 973 (on-task/off-task coded comments); F2F percentage base is 572 (on-task/off-task coded comments).

Analysis. The difference generated between the online and face-to-face environments with on-task and off-task comments may stem from the definition refined by the coders prior to examining the comment turns. As stated, a turn ends when either an individual presses Enter (on the keyboard) to submit an online comment, or the person stops talking during face-to-face discussions permitting others to engage in conversation. Most online participants produced

numerous short, succinct turns. In contrast, most face-to-face participants adopted a reporting-style turn leading to more words per turn, yet fewer turns. As a result of the refined definition by the coders and the two methods of turns, the online participants had more opportunities to increase their total comments in each category.

In discussion with the coders, it was reported those participants utilizing the chat feature incorporated their peer's remarks into their individual comments. In comparison, the coders further reported many remarks made by the participants in the face-to-face environment were disjointed from the discussion thread. Therefore, it was judged that many of the face-to-face participants demonstrated an inferior level of active listening as compared to the online participants.

Summary of findings and analysis: The first research question focused on the amount and content of participation in small-group, learning-centered discussions in online and face-to-face environments. The hypothesis stated prior to the research was as follows: *Students utilizing an online collaboration tool (chat) will demonstrate greater participation and superior content during the small-group, learning-centered discussions.* The results of the study demonstrated greater participation by online students in total turns and discussion time, and greater discussion by face-to-face students in word count. Results of the study also demonstrate online students contributed a significantly greater number of on-task, off-task, affirming, opposing, and correcting comments.

Research Question #2

The second research question is as follows: How does the amount and content of participation in small-group, learning-centered discussions differ between males and females in

online and face-to-face environments? Prior to the investigation, the researcher's hypothesis was: *There will be no difference found in the amount or content of participation by males and females during face-to-face, small-group, learning-centered discussions as compared to an increase in the amount or content of participation by males and females during online small-group, learning-centered discussions.*

Male and female participation amount. Total turns and word count were used to analyze the amount of participation for males and females.

Findings. As shown in Table 17, online male students on average took more turns ($M = 19$ vs. 10.6 , t-test, $p < .05$) than male students engaged in the face-to-face discussions. In contrast, face-to-face male students on average spoke more words ($M = 276.2$ vs. 142.6 , t-test, $p < .05$) than male students who engaged in online discussions. Although not reported statistically significant, Table 17 depicts a fifty-seven percent (57%) increase in average online total turns and a seventy-three percent (73%) increase in average face-to-face total turns by females as compared to males in the same discussion environment. Females also demonstrated a higher average online word count of seventy-seven percent (77%) and a higher average face-to-face word count of thirty-four percent (34%) as compared to the males in their respective discussion settings.

Table 17

Male and Female Participation (Independent Sample T-test)

	Online			F2F			<i>p</i> -value
	N	M	SD	N	M	SD	
Total turns							
Males	21	19	13	22	10.6	12	.027*
Females	19	30.3	20	18	18.4	20	.074
Word count							
Males	21	142.6	72	22	276.2	243	.021*
Females	19	252.1	121	18	370.4	328	.164

Note: N = number of participants; M = mean; SD = standard deviation.

* $p < .05$.

As stated in Chapter 3, a two-way ANOVA test would be used to analyze the effect treatment and gender (online and face-to-face) have on the participants' total turns and word count. Prior to conducting the ANOVA, the following four assumptions were checked to be true: 1) the samples are independent, 2) the groups have the same sample size, 3) the populations from which the samples are drawn are normally or approximately normally distributed, and 4) the variances of the populations are equal. In review of the data, the investigator found the samples to be independent and the group sizes to be approximately 20 each. In order to test the assumption of a normally distributed population, the investigator conducted a Shapiro-Wilk test for each of the following groups in relation to total turns and word count:

1. Online males
2. Online females
3. Face-to-face males
4. Face-to-face females

In conducting the Shapiro-Wilk tests, one or more results indicated the populations were not normally distributed (Table 18). In addition, the investigator reviewed the variances to determine if they were approximately equal. The data indicated the variances across groups were not equal. Therefore, the ANOVA could not be validly used to determine relative significance of treatment and gender, and their interaction in relationship to the dependent variables.

Table 18

Results of the Shapiro-Wilk Test for Normal Population Distribution (Total Turns and Word Count)

Variable & treatment	Gender	SD	df	Variance	Shapiro-Wilk	
					Skewness	Significance
Total turns						
Online	Males	12.51	21	156.60	1.169	.052
Online	Females	19.52	19	380.87	0.974	.221
F2F	Males	11.51	22	132.53	1.427	.001**
F2F	Females	19.83	18	393.19	0.980	.001**
Word count						
Online	Males	71.94	21	5175.08	0.827	.125
Online	Females	120.94	19	14627.39	0.763	.092
F2F	Males	242.58	22	58842.85	1.631	.001**
F2F	Females	328.04	18	107609.08	0.894	.017*

Note: * $p < .05$, ** $p < .01$

Analysis. In reviewing the transcripts from online and face-to-face groups for males and females, it was found that male participants preferred to speak in a reporting style of conversation when discussing face to face. In contrast, online males chose to engage in more frequent turns with short, succinct wording. This may have contributed to the higher word count by males in the face-to-face environment as compared to the online environment. The transcripts

also demonstrated greater overall participation (total turns and word count) by females as compared to males in both the online and face-to-face environments.

Male and female participation content. Participant comments were initially analyzed and coded as either on-task or off-task comments. On-task comments were further coded as one or more of the following: affirming, opposing, correcting, questioning, managing, new information, or answering.

Findings. As shown in Table 19, online male students on average made more on-task comments (14 vs. 7) than male students engaged in the face-to-face discussions (Mdn = 11, Fisher exact test, $p = .034$).

Table 19

Number of Online and F2F Male students contributing More than and Less than or Equal to the Median Number of On-task Comments across both Groups (Median = 11; Fisher exact test)

	≤11 On-task comments	>11 On-task comments	
Online	7	14	p -value = .034*
F2F	15	7	

Note: N = 43 (number of participants); Mdn = 11 (median).

* $p < .05$.

Table 20 demonstrates online male students on average made more off-task comments (15 vs. 5) than male students engaged in the face-to-face discussions (Mdn = 0, Fisher exact test, $p = .002$).

Table 20

Number of Online and F2F Male students contributing More than and Less than or Equal to the Median Number of Off-task Comments across both Groups (Median = 0; Fisher exact test)

	≤ 0 Off-task comments	> 0 Off-task comments	
Online	6	15	p -value = .002**
F2F	17	5	

Note: N = 43 (number of participants); Mdn = 0 (median).

** $p < .01$.

Table 21 demonstrates online female students on average made more off-task comments (13 vs. 5) than female students engaged in the face-to-face discussions (Mdn = 0, Fisher exact test, $p = .022$).

Table 21

Number of Online and F2F Female students contributing More than and Less than or Equal to the Median Number of Off-task Comments across both Groups (Median = 0; Fisher exact test)

	≤ 0 Off-task comments	> 0 Off-task comments	
Online	6	13	p -value = .022*
F2F	13	5	

Note: N = 37 (number of participants); Mdn = 0 (median).

* $p < .05$.

In addition, Tables 22-24 depict online females on average made more affirming (13 vs. 5, Mdn = 3, Fisher exact test, $p = .022$), opposing (12 vs. 5, Mdn = 1, Fisher exact test, $p = .049$), and correcting (10 vs. 2, Mdn = 1, Fisher exact test, $p = .013$) comments than females engaged in the face-to-face discussions.

Table 22

Number of Online and F2F Female students contributing More than and Less than or Equal to the Median Number of Affirming Comments across both Groups (Median = 3; Fisher exact test)

	≤ 3 Affirming comments	> 3 Affirming comments	
Online	6	13	p -value = .022*
F2F	13	5	

Note: N = 37 (number of participants); Mdn = 3 (median).

* $p < .05$.

Table 23

Number of Online and F2F Female students contributing More than and Less than or Equal to the Median Number of Opposing Comments across both Groups (Median = 1; Fisher exact test)

	≤ 1 Opposing comments	> 1 Opposing comments	
Online	7	12	p -value = .049*
F2F	13	5	

Note: N = 37 (number of participants); Mdn = 1 (median).

* $p < .05$.

Table 24

Number of Online and F2F Female students contributing More than and Less than or Equal to the Median Number of Correcting Comments across both Groups (Median = 1; Fisher exact test)

	≤ 1 Correcting comments	> 1 Correcting comments	
Online	9	10	p -value = .013*
F2F	16	2	

Note: N = 37 (number of participants); Mdn = 1 (median).

* $p < .05$.

No statistical significance was found when comparing male online and face-to-face participation content in the comment areas of affirming, opposing, correcting, questioning, management, new information, and answering. In addition, no statistical significance was found when comparing female online and face-to-face participation content in the comment areas of on-task, questioning, managing, new information, and answering.

Given that the online students contributed more total turns and thus would expect to have contributed more on-task and off-task comments, the investigator reviewed the on-task, off-task, and seven coded comments as a relative percentage for males and females in both the online and face-to-face environment. Table 25 demonstrates this comparison of male and female online comments. More online male comments were on-task (81.5% vs. 79.4%) as compared to online female comments. Online males also demonstrated more questioning (7.7% vs. 7.4%), managing (7.1% vs. 5.4%), new information (42.1% vs. 40.3%), and answering (4.8% vs. 3.5%) comments as compared to online female comments. Table 25 also demonstrates more online female comments were off-task (20.6% vs. 18.5%) as compared to online male comments. In addition, there were more online female affirming (20.6% vs. 19.1%), opposing (16.0% vs. 14.5%) and correcting (6.9% vs. 4.6%) comments as compared to online male comments.

Table 25

Online Comment Comparison: Males to Females (Relative Percentage Comparison)

	% of online comments		% Difference
	Males	Females	
On-task	81.5%	79.4%	+2.1%
Off-task	18.5%	20.6%	-2.1%
Affirming	19.1%	20.6%	-1.5%
Opposing	14.5%	16.0%	-1.5%
Correcting	4.6%	6.9%	-2.3%
Questioning	7.7%	7.4%	+0.3%
Managing	7.1%	5.4%	+1.7%
New information	42.1%	40.3%	+1.8%
Answering	4.8%	3.5%	+1.3%

Note: Males online coded comments = 392; Female online coded comments = 539.

As illustrated in Table 26, more face-to-face male comments were off-task (8.8% vs. 5.4%) as compared to face-to-face female comments. In addition, there were more face-to-face male affirming (16.1% vs. 13.6%), opposing (9.5% vs. 7.2%), correcting (3.2% vs. 2.3%), and managing (10.2% vs. 2.3%) comments as compared to female face-to-face comments. Table 26 also demonstrates more face-to-face female comments were on-task (94.6% vs. 91.2%) as compared to face-to-face male comments. In addition, there were more face-to-face female new information (54.9% vs. 45.3%) and answering (9.2% vs. 5.3%) comments as compared to male face-to-face comments.

Table 26

Face-to-Face Comment Comparison: Males to Females (Relative Percentage Comparison)

	% of face-to-face comments		
	Males	Females	% Difference
On-task	91.2%	94.6%	-3.4%
Off-task	8.8%	5.4%	+3.4%
Affirming	16.1%	13.6%	+2.5%
Opposing	9.5%	7.2%	+2.3%
Correcting	3.2%	2.3%	+0.9%
Questioning	10.5%	10.5%	0.0%
Managing	10.2%	2.3%	+7.9%
New information	45.3%	54.9%	-9.6%
Answering	5.3%	9.2%	-3.9%

Note: Male face-to-face coded comments = 285; Female face-to-face coded comments = 390.

As demonstrated in Table 27, males were impelled to go off-task more often online than face-to-face (18.5% vs. 8.8%). Males also demonstrated greater discussion online with affirming (19.1% vs. 16.1%), opposing (14.5% vs. 9.5%), and correcting (4.6% vs. 3.2%) comments as compared to males face-to-face. In contrast, males demonstrated a greater presence in the face-to-face environment by way of questioning (10.5% vs. 7.7%), managing (10.2% vs. 7.1%), new information (45.3% vs. 42.1%), and answering (5.3% vs. 4.8%) comments as compared to males online.

Table 27

Male Comment Comparison: Online to Face to Face (Relative Percentage Comparison)

	% of male online comments	% of male face- to-face comments	% difference
On-task	81.5%	91.2%	-9.7%
Off-task	18.8%	8.8%	+10%
Affirming	19.1%	16.1%	+3.0%
Opposing	14.5%	9.5%	+5.0%
Correcting	4.6%	3.2%	+1.4%
Questioning	7.7%	10.5%	-2.8%
Managing	7.1%	10.2%	-3.1%
New information	42.1%	45.3%	-3.2%
Answering	4.8%	5.3%	-0.5%

Note: Males online coded comments = 392; Male face-to-face coded comments = 285.

Table 28 illustrates females were impelled to go off task more often online than face-to-face (20.6% vs. 5.4%) and stay on-task more often face-to-face than online (94.6% vs. 79.4%). Females also demonstrated greater discussion online with affirming (20.6% vs. 13.6%), opposing (16.0% vs. 7.2%), correcting (6.9% vs. 2.3%), and managing (5.4% vs. 2.3%) comments as compared to females face-to-face. In contrast, females demonstrated a greater presence in the face-to-face environment in way of questioning (10.5% vs. 7.4%) new information (54.9% vs. 40.3%), and answering (9.2% vs. 3.5%) comments.

Table 28

Female Comment Comparison: Online to Face to Face (Relative Percentage Comparison)

	% of female online comments	% of female face-to-face comments	% difference
On-task	79.4%	94.6%	-15.2%
Off-task	20.6%	5.4%	+15.2%
Affirming	20.6%	13.6%	+7.0%
Opposing	16.0%	7.2%	+8.8%
Correcting	6.9%	2.3%	+4.6%
Questioning	7.4%	10.5%	-3.1%
Managing	5.4%	2.3%	+3.1%
New information	40.3%	54.9%	-14.6%
Answering	3.5%	9.2%	-5.7%

Note: Female online coded comments = 539; Female face-to-face coded comments = 390.

Analysis. As discussed previously, the difference generated between the online and face-to-face environments with on-task and off-task comments may stem from the definition created by the coders prior to examining the comment turns. Most online participants produced short, succinct, numerous turns. In contrast it was observed that most face-to-face participants adopted a reporting-style turn lending to more words per turn, yet fewer turns. As a result of the two methods and worded definition, the online participants had more opportunities to increase their total comments in each category.

The coders reported that female participants actively discussed the prompts online by interacting with the other participants (by affirming, opposing, or correcting others' typed remarks). Although males, too, took an active stand in participation and discussion, their remarks in an online setting as compared to face-to-face setting were not as pronounced as the trend found with the females' responses.

Summary of findings and analysis: The second research question focused on the amount and content of participation in small-group, learning-centered discussions in both online and face-to-face environments by males and females. The hypothesis stated prior to the research was as follows: *There will be no difference found in the amount or content of participation by males and females during face-to-face, small-group, learning-centered discussions as compared to an increase in the amount or content of participation by males and females during online small-group, learning-centered discussions.* The results of the study demonstrated a statistical significance, when analyzing males in the areas of total turns, word count, on-task, and off-task remarks. Females demonstrated a significant difference in off-task, affirming, opposing, and correcting remarks. It is believed the chat tool used by the participants helped to promote greater participation amount and content in these areas.

Other than an increase in word count, analysis of the data found no indication that the face-to-face method of small-group, learning-centered discussions proved to be greater in participation or superior in content among males and females. With male and female data gathered, the study turns to take a closer look at variability across individuals and within groups in order to answer the third research question.

Research Question #3

The third research question is as follows: To what degree is there equitable distribution in the amount of participation across individuals within each group in the online and face-to-face environments, and is there a difference in equitable participation by group members in online and face-to-face environments? Prior to the investigation, the researcher's hypothesis was: *There will be an equitable distribution in the amount of participation across individuals and within*

each section group during online small-group, learning-centered discussions as compared to an uneven amount of participation by individual and within each section group during face-to-face small-group, learning-centered discussions.

Variability across individuals and within each section group. Total turns and word count were used to analyze the equitable distribution of contributions across individuals within each group.

Findings. When determining the equitable distribution of contributions within each group using total turns, (Table 29) the Gini coefficient indicates that online participants evidenced slightly higher variability (.07 to .49, $M = .19$) as compared to face-to-face participants (.00 to .25, $M = .14$). In contrast, using word count, Table 30 demonstrates slightly higher variability within face-to-face groups (.10 to .33, $M = .21$) than online groups (.07 to .29, $M = .18$).

Table 29

Variability across Individuals and within each Section Group using Total Turns (Gini Coefficient Comparison)

	Student 1	Student 2	Student 3	Student 4	Gini coefficient
Online:					
Group 1	16.9%	19.7%	28.2%	35.2%	.16
Group 2	20.6%	21.4%	27.5%	30.5%	.09
Group 3	11.5%	20.8%	26.9%	40.8%	.24
Group 4	16.4%	18.0%	31.3%	34.4%	.17
Group 5	17.6%	18.3%	28.8%	35.3%	.16
Group 6	18.2%	27.3%	27.3%	27.3%	.07
Group 7	12.9%	22.9%	24.3%	40.0%	.21
Group 8	13.6%	27.1%	28.8%	30.5%	.13
Group 9	2.8%	5.6%	32.9%	58.7%	.49
Group 10	16.7%	21.8%	28.2%	33.3%	.14
Mean Gini coefficient for online discussion using total turns = .19					
F2F:					
Group 1	16.2%	18.9%	21.6%	43.2%	.21
Group 2	25.0%	25.0%	25.0%	25.0%	.00
Group 3	13.6%	26.5%	27.9%	32.0%	.14
Group 4	11.6%	18.8%	28.3%	41.3%	.25
Group 5	17.8%	20.0%	22.2%	40.0%	.17
Group 6	23.1%	23.1%	23.1%	30.8%	.06
Group 7	15.6%	25.0%	28.1%	31.3%	.13
Group 8	25.0%	25.0%	25.0%	25.0%	.00
Group 9	10.7%	19.1%	29.0%	41.2%	.25
Group 10	14.3%	21.4%	28.6%	35.7%	.18
Mean Gini coefficient for face-to-face discussion using total turns = .14					

Note: Percentage of participation based on student group.

Table 30

Variability across Individuals and within each Section Group using Word Count (Gini Coefficient Comparison)

	Student 1	Student 2	Student 3	Student 4	Gini coefficient
Online:					
Group 1	27.1%	8.9%	31.1%	32.8%	.19
Group 2	23.5%	21.8%	31.3%	23.4%	.07
Group 3	14.8%	17.2%	43.7%	24.4%	.23
Group 4	17.8%	19.9%	37.6%	24.7%	.16
Group 5	12.5%	17.6%	24.7%	45.3%	.26
Group 6	23.2%	8.1%	28.3%	40.4%	.26
Group 7	23.9%	25.1%	29.9%	21.1%	.07
Group 8	29.2%	14.5%	28.4%	28.0%	.11
Group 9	12.0%	12.5%	31.8%	43.7%	.29
Group 10	21.9%	19.1%	19.4%	39.6%	.16

Mean Gini coefficient for online discussion using word count = .18

F2F:					
Group 1	15.7%	19.5%	18.5%	46.3%	.23
Group 2	15.7%	17.1%	28.1%	39.0%	.20
Group 3	12.0%	18.0%	34.9%	35.0%	.21
Group 4	5.9%	19.1%	27.4%	47.7%	.33
Group 5	22.4%	17.4%	22.8%	37.5%	.15
Group 6	15.8%	27.8%	27.8%	28.6%	.10
Group 7	6.9%	26.4%	35.5%	31.2%	.23
Group 8	17.8%	25.6%	26.2%	30.4%	.10
Group 9	12.1%	19.9%	27.0%	41.1%	.24
Group 10	11.2%	16.5%	24.0%	48.3%	.30

Mean Gini coefficient for face-to-face discussion using word count = .21

Note: Percentage of participation based student group.

Analysis. When using total turns as a determinant, increased variability was recognized by the online as compared to the face-to-face participants. This may be due to the style of discussions by the participants (online—short, succinct style of remarks, and face-to-face—

reporting style). This finding may also be a result of the inhibitions of shy students to take a turn and engage in face-to-face as compared to online discussions. Further discussion of these propositions is included in the focus group results.

When using word count as a determinant, increased variability was recognized by the face-to-face participants as compared to the online participants. As stated previously, the style of discussion (reporting vs. short, succinct comments) may have played a role in variability among the two environments in this area.

Both the statistical analysis and a review of the transcripts indicated that one leader tended to emerge in most student groups. Typically, this student spoke in excess of their group members to either keep the group on task or to demonstrate a method in which to answer the prompts. In groups with a particularly strong leader, it was noted that one or two other group members tended to offer fewer remarks.

Summary of findings and analysis: The third research question focused on the variability (the equitable distribution of participants' discussion contributions) by students using the online or face-to-face discussion environments. The hypothesis stated prior to the research was as follows: *There will be an equitable distribution in the amount of participation across individuals and within each section group during online small-group, learning-centered discussions as compared to an uneven amount of participation by individual and within each section group during face-to-face small-group, learning-centered discussions.* The results of the study taken from a lens of total turns and word count demonstrate mixed results. There was more variability (less equitable distribution of discussion contributions) demonstrated by the online

students when assessed using total turns. In contrast, the data found more variability within face-to-face groups using word count as a determinate.

With participation amount, content, and variability now assessed, the fourth research question determined if an increase in participation amount and content during small-group, learning-centered discussions increased student learning.

Research Question #4

The fourth research question is as follows: What is the difference in student learning as an outcome of small-group, learning-centered discussions in online and face-to-face environments as determined by a teacher-prepared rubric evaluating students' responses to a discussion-related writing prompt? Prior to the investigation, the researcher's hypothesis was: *There will be a greater demonstration of student learning from students participating in the online small-group, learning-centered discussions as compared to students participating in the face-to-face small-group, learning-centered discussions.*

Difference in student learning. The following measures were used to determine student learning as a result of viewing the film and participating in small-group, learning-centered discussions: effort to make a case, direct reference to the film, direct reference to the discussion, indirect reference to the film or discussion, and quality and coherence of the student essay.

Findings. Student open-response answers were scored against a four-point rubric (Appendix O) with the results listed in Table 31. When using the Wilcoxon-Mann-Whitney test, (the nonparametric version of an independent samples t-test), the results demonstrated no significant difference ($p < .05$) between students engaged in the online compared to the face-to-face environment for the five rubric categories. All categories confirmed a positive z-score, with

the first four categories being within one standard deviation from the mean. This test demonstrated little if any difference between the online and face-to-face environments as a result of the scored rubric categories.

Table 31

Difference in Student Learning (Four-Point Rubric, Wilcoxon-Mann-Whitney test)

Category	4-point assessment		Score distribution					M	z-score	p-value
			1	2	3	4				
Effort to make a case	Three or more supporting details	Online	8	4	4	24	3.1	.039	.969	
		^a F2F	9	2	4	24	3.1			
Direct reference to the film	Three or more direct references to the film	Online	22	5	4	9	2.0	.976	.329	
		^a F2F	19	3	1	16	2.4			
Direct reference to the small-group, learning-centered discussions	Three or more direct references to the small-group, learning-centered discussions	Online	40	0	0	0	1.0	.196	.845	
		^a F2F	38	1	0	0	1.0			
Indirect reference to the film or small-group, learning-centered discussions	Three or more indirect references to the film or small-group, learning-centered discussions	Online	5	4	5	26	3.3	.260	.795	
		^a F2F	3	4	6	26	3.4			
Quality and coherence of the argument	Excellent level of understanding of the issue of immigration (provide evidence of both sides of the issue).	Online	3	6	20	11	3.0	1.157	.247	
		^a F2F	4	4	13	18	3.2			

Note: Student's case = argument to support or deny access to the United States by undocumented immigrants; M = mean; F2F = face-to-face; All means were statistically insignificant among the rubric categories using the Wilcoxon-Mann-Whitney test.

^aOne participant did not complete this portion of the study.

Analysis. In reviewing the rubric results (Table 31), it was determined the rubric (Appendix O) created by the coders did not clearly differentiate the level of student learning as based on the open-response answer. For two of the categories, the coders sought to score the students on their direct reference to the film or small-group, learning-centered discussions. Although student responses demonstrated knowledge on the subject matter, little mention of the film or discussions was made resulting in low scores.

Although the rubric failed to establish an accurate method for determining student learning, transcripts from the focus groups provide insight on the students' perception of the group discussions and their value in assisting student learning.

Summary of findings and analysis: The fourth research question focused on five student learning concepts as demonstrated by a teacher-prepared rubric assessed on a participant's open-response essay. The study sought to find differences in student learning by participants in the online environment as compared to the face-to-face environment. The hypothesis stated prior to the research was as follows: *There will be a greater demonstration of student learning from students participating in the online small-group, learning-centered discussions as compared to students participating in the face-to-face small-group, learning-centered discussions.* The results of the study demonstrated no statistical significance in student learning by the online or face-to-face environments. Therefore, the hypothesis is rejected.

Focus Group Results

Four focus groups were conducted, each with six participants, using fifteen guiding questions relating to students' discussions in the face-to-face and online environments. Each focus group contained three boys and three girls who were randomly selected from the various

sections of the study on the day of the focus group sessions. Two focus groups were comprised of face-to-face participants, while the other two were comprised of online participants. Each focus group discussion was electronically recorded using Audacity software and later transcribed by the investigator for analysis.

Key themes were identified using the following steps. Step 1: The investigator read through each transcript three times to gain familiarity across both online and face-to-face groups. Step 2: Based on this review, the investigator identified several themes that were pertinent to understanding how students perceived their online and face-to-face experience, as well as their perceptions of advantages and disadvantages to discussing the topic online vs. face-to face. Step 3: After an initial framing of these themes, the investigator once again read through each transcript, cataloging specific student phrases or comments that fell under each theme. Step 4: The investigator then reviewed the array of comments under each theme and refined the theme according to students' comments. Step 5: The investigator once again reviewed the comments under each theme to ensure their comment placement and subsequently tallied the number of comments under each theme by group (online vs. face-to-face).

As a result of the previous steps, key themes were identified as follows: student involvement and enjoyment, shy students, teacher presence, treatment advantages and disadvantages, aggression and emotion during discussions, student learning, group preference (e.g. two boys and two girls, three boys and one girl, three girls and one boy, all boys, or all girls), treatment preference (online or face to face), typing challenges, gender discussion group interaction, communication and socialization skills, and student requests for additional online discussions. As a result of this process, the following report was prepared providing general

consensus, disagreements and contradictions, as well as dissenting or minority student viewpoints.

Increased student involvement via student enjoyment. As shown in Table 32, four responses were obtained from online participants, while no responses were obtained from the face-to-face participants in regard to student involvement via student enjoyment during small-group, learning-centered discussions. Table 32 also depicts response examples obtained from the online students.

Table 32

Focus Group Responses to Increased Student Involvement via Student Enjoyment

	Online	F2F
Responses	4	0
Example #1	“They were having fun with the whole idea of being able to chat and type during school.”	
Example #2	“Chatting and IMing in school was an awesome thing to do because in school.”	
Example #3	“We started to discuss it and then it kind of got fun being online with your friends.”	

Note: Responses = number of student responses for each treatment.

Educators understand student learning is best fostered through fun and engaging activities. During the focus groups, several students remarked that the online chat activity brought appealing, out-of-school activities into the classroom, and as a result increased student involvement. Supportive comments included: “They were having fun with the whole idea of being able to chat and type during school” and “Chatting and ‘IMing’ in school was an awesome

thing to do.” Yet one student believed this novel activity would join the ranks of routine in time when writing, “If we did the IM thing a lot, it would probably lose its specialness.”

Shy students engaging in small-group discussions. Table 33 depicts five responses obtained from online participants, and 14 responses obtained from the face-to-face participants in regard to shy students engaging in small-group, learning-centered discussions. Table 33 also depicts response examples obtained from the online and face-to-face students.

Table 33

Focus Group Responses to Shy Students Engaging in Small-group Discussions

	Online	F2F
Responses	5	14
Example #1	“I think because people get nervous and afraid to talk in public in front of people so they just wouldn’t say anything.”	“Shy people don’t like to go face to face.”
Example #2	“For online you just have to type so it is probably easier for some people (shy and quiet).”	“If you don’t like talking it is easier to participate online.”
Example #3	“You feel more comfortable when on the computer because you don’t have everybody look at you when you are trying to say something or add to their conversation.”	“Maybe they don’t talk because they are shy or they are embarrassed about what they think or they didn’t really understand what was going on they wouldn’t want to say something wrong.”

Note: Responses = number of student responses for each treatment.

During the focus group meetings, more than half of the students made reference to the hardship shy students endure when required to partake in face-to-face discussions. For many, face-to-face interactions result in increased embarrassment, awkwardness, or fear of making a

mistake in speech. Comments made by students include, "I think because people get nervous and afraid to talk in public in front of people; they just wouldn't say anything" and "Shy people don't like to go face to face." Lack of comfort during public speaking exercises prompted others to comment, "For some people it is weird or awkward to talk to a group" and "They don't like it when everyone listens to them." A deficient level of confidence was added to the contention shy students endure when asked to speak to a group of peers who were not necessarily their friends in the classroom. Students commented, "They wouldn't want to feel awkward and out of the group by not agreeing" and "Some people are more shy [*sic*] and they don't have as much pride in their answers as other people do."

The opportunity for online discussion was welcomed and favored by many of the students. One student commented, "You feel more comfortable when on the computer because you don't have everybody looking at you when you are trying to say something or add to their conversation." A student who utilized the face-to-face method of discussion agreed saying, "If you don't like talking, it is easier to participate [discuss] online." Several other students agreed, with one from the face-to-face group commenting, "For shy people, I think the computer is better."

Two individuals from the face-to-face groups offered comments why students in their discussion environment may have participated only slightly. The first stated, "Perhaps the microphones made some people shy away." Although the study was designed to replicate the classroom environment as closely as possible, the use of audio equipment may have prevented the shy individuals from normal participation. In addition, a student remarked, "If it was a group of people who knew each other perhaps they would have talked more." Interestingly, these

students had met in class each day for more than five months. This comment draws attention to the social circles created by students at a middle school level, and their ability or inability to freely voice an opinion in the classroom. Supporting this concept, a student reported, “While you are online, you feel more free to say whatever you want to your friends than like with face-to-face.”

Teacher presence in online and face-to-face environments. Table 34 depicts 26 responses obtained from online participants and seven responses obtained from the face-to-face participants in regard to teacher presence in online and face-to-face environments during small-group, learning-centered discussions. Table 34 also depicts response examples obtained from the online and face-to-face students.

Table 34

Focus Group Responses to Teacher Presence in Online and Face-to-face Environments

	Online	F2F
Responses	26	7
Example #1	“If there was a teacher standing over me while I was typing that would definitely effect me but seeing that there was no teacher and it felt like there was only people from my class it was a lot more comfortable and people weren’t as serious.”	“I think they get distracted because they are looking at the person and when online they are just looking at the screen.”
Example #2	“If you have an adult setting right there and watching you and listening to everything you say it is not the easiest thing to go and start talking.”	“If the ones online didn’t have a teacher in the chat with them, they probably went off topic more.”
Example #3	“It would have made a difference in our conversation if the teacher had physically been in the chat room with us.”	“Maybe because we didn’t see a teacher in the chat room with us.”

Note: Responses = number of student responses for each treatment.

As demonstrated in Table 2, participation was statistically significant when comparing online and face-to-face environments. Yet not all comments made by the students were directly related to the discussion prompts. A closer look at on-task, off-task, and group discussion leads to the importance of teacher presence in small-group, learning-centered discussions.

Face-to-face students reported their participation when they remarked “I actively participated because I have an opinion” and “I commented.” Online students equally shared their opinion of staying on task as they welcomed the ongoing writing opportunities, stating they could “continue writing something” while others submitted their responses.

In contrast, the online students painted a much different picture when speaking of off-task moments. Comments such as “I got off topic a lot” and “Everybody participated but at times it would just get off topic” and “Between questions I would get off topic” were consistently reported. What drove them off topic was observed to be the Facebook-type environment, misspelled words, and opportunities to interject emoticons (typed smiley faces). Several students reported their efforts to bring the group back on track, offering comments such as “There were always one or two people that would bring back up the questions” and “I tried to step up and get others on task.” Only one face-to-face student offered an opinion in this area, stating “I think boys would be off topic more.” Yet as we found in the study, off-task comments were found to be statistically significant by both males (Table 20) and females (Table 21) when comparing online and face-to-face environments.

Members of both the face-to-face and online focus groups stated resoundingly that the lack of teacher presence led to the off-task remarks. One online student reported, “When you are face to face you feel like teachers can hear what you are saying so you have to stay on task; but

when you are on the computer they may not pay attention to what you are writing.” Another student in the same discussion environment added, “You feel like there is nobody watching you or controlling you.” Students in the face-to-face environment agreed with the others stating, “If the ones online didn’t have a teacher in the chat with them, they probably went off topic more.” In a quest to offer a solution, one online student remarked, “Having a picture of the teacher on the laptop could have helped” while another added, “It would have made a difference in our conversation if the teacher had physically been in the chat room with us.” The general consensus of the online group remained, “We forgot the teacher was online as soon as her name scrolled off.”

Advantages and disadvantages of online and face-to-face discussions. Table 35 depicts 17 responses obtained from online participants, and 11 responses obtained from the face-to-face participants describing advantages and disadvantages of online and face-to-face discussions. Table 35 also depicts response examples obtained from the online and face-to-face students.

Table 35

Focus Group Responses to Advantages and Disadvantages of Online and Face-to-face Discussions

	Online	F2F
Responses	17	11
Example #1	“It is also nice to be able to think through; like if you are talking to someone face to face if you don’t have an immediate response it is easier online because you can take some time to answer and put together something to go against or for their comment.”	“If you have a thought in your head, but someone else is talking, you may lose it.”
Example #2	“I focus on my writing and then hit enter.”	“If we were online we could all talk at the same time.”
Example #3	“On the computer it says everything you already said so you can go back to the topic and with face-to-face people might not remember what you were talking about.”	“I think you feel more courage online because you don’t have to be with the person.”

Note: Responses = number of student responses for each treatment.

Several advantages and disadvantages of the two methods of discussion were shared among the focus group members. One of the online advantages as reported by students is having time to reflect prior to submitting a comment for others to view. Students remarked, “It is nice to be able to think through your answer; you can put together something to go against or for their comment” and “I focused on my writing, and then hit ‘Enter’.” Students believe the reaction from members of their groups resulted in “more people commenting [placing] more ideas into the discussion.”

Online students voiced they were not afraid to share their opinion. “With online you were not afraid to say what you were planning to say” retorted one student. This feeling was shared with others when comparing to face-to-face: “You might change what you were going to say so you would be changing what you really think.”

The act of sharing simultaneously was agreed by all as a bonus in online discussions. Students remarked, “In face to face there is only one at a time talking” and “You can’t really interrupt someone online” and “If we were online we could all talk at the same time.”

Several students made reference to the added advantage of referring to previous comments made through the online practice. One stated, “On the computer it says everything you already said so you can go back to the topic and with face-to-face people might not remember what you were talking about.”

Perhaps the greatest disadvantage uncovered by the focus groups was the thinking-instead-of-listening practice conducted in the face-to-face discussions. Many of these students offered insight on the practice of thinking about what they wanted to say while others were speaking. If this was in fact the case, it sheds light on the report presented by the coders where it was believed face-to-face students chose a reporting style of discussion (not taking the opportunity to comment on other’s input), where online students chose a more interactive style of discussion. Several face-to-face students shared this finding by stating, “When someone else said something, thoughts kept running through my head” and “If you have a thought in your head, but someone else is talking, you may lose it,” and “Every time someone said something I had more ideas in my head and more opinions.” Their challenge was in the inability to instantly

share their opinions, as stated by one student, “Somebody already said something they wanted to say, so they didn’t talk.”

Aggression and emotion during student discussions. Table 36 depicts 16 responses obtained from online participants, and one response obtained from the face-to-face participants in regard to aggression and emotion during student discussions. Table 36 also depicts response examples obtained from the online students and face-to-face students.

Table 36

Focus Group Responses to Aggression and Emotion during Student Discussions

	Online	F2F
Responses	16	1
Example #1	“On the computer it is easier to not agree with somebody than right there in front of them.”	“Somebody already said something they wanted to say, so they didn’t talk.”
Example #2	“On the computer you can’t see body language so you can’t tell if they are being sarcastic or anything like that so you may take them serious when they are not being serious.”	
Example #3	“You get more pressure to get the right answer when the person is watching you.”	

Note: Responses = number of student responses for each treatment.

Online students overwhelmingly reported two aspects of online behavior not readily reviewed by their written remarks: the ability to openly state opposing comments, and the lack of emotion in student online discussions.

Students in the online environments believed their discussion actions would have been different if seated in a face-to-face environment. “On the computer it is easier to not agree with somebody than right there in front of them” was reported by one student, with another adding, “I think it was easier to have a back-and-forth discussion (argumentative) on the computer because if you don’t agree with somebody it is easier to say it over the computer because they could get mad.”

Many students agreed that the online environment fostered a lack of emotion, resulting in a hindrance in discussion, as some stated: “The computer pulls out the emotional part” and “Online takes out emotions and facial expressions” and “You can’t see a person’s personality when they are just typing.” This lack of emotion caused other students concern by their statements, “You can’t tell when someone is being serious or sarcastic when you are on the computer” and “On the computer you can’t see body language.”

Student learning increased as a result of discussions. Table 37 depicts 18 responses were obtained from online participants, and six responses obtained from the face-to-face participants in regard to increased student learning as a result of small-group, learning-centered discussions. Table 37 also depicts response examples obtained from the online students and face-to-face students.

Table 37

Focus Group Responses to Student Learning Increased as a Result of Discussions

	Online	F2F
Responses	18	6
Example #1	“I learned the positive sides of immigration and the negative sides from different people.”	“I think the discussions helped because you had more to talk about and you understood everything better after you discussed everything because you had a better look on what the movie was about and how it reflected on immigration.”
Example #2	“I didn’t know if my opinion was ok, so I think the group discussion helped me to know whether I had a good opinion. It reassured me.”	“If I didn’t agree with other people’s opinion I used their examples to explain my opinion and how it was right.”
Example #3	“People’s different opinions made me think differently.”	“I learned there were a lot of different opinions. Discussing allowed me to see it how others see it.”

Note: Responses = number of student responses for each treatment.

Both online and face-to-face participants agreed that as a result of the small-group, learning-centered discussions, the opinions of others surfaced in a manner that the information could be used as a learning tool. Gaining insight on the opinions of others proved to be a catalyst to learning. “I learned new ways of seeing it from other people’s opinion” and “Discussing allowed me to see it how others see it” was heard often in the focus groups. Students also learned more about themselves through the discussion as they had the opportunity to validate their opinion: “I didn’t know if my opinion was ok, so I think the group discussion helped me to know whether I had a good opinion. It reassured me.”

For others, the opportunity to discuss changed their initial thought process. “People’s different opinions made me think differently” and “Because of listening to other people’s point of view changed how I thought of it” was shared by focus group members as they described the change of stance incurred as a result of the discussions.

Learning was evident as some members of the focus groups shared their experience in completing the writing prompt: “I think having the discussion helped me write the open response because I learned more opinions from other people” and “Hearing other people’s opinions helped me know what I wanted to write.”

Student discussion group preference. Table 38 depicts 24 responses obtained from online participants, and nine responses obtained from the face-to-face participants in regard to student discussion group preference. Table 38 also depicts response examples obtained from the online and face-to-face students.

Table 38

Focus Group Responses to Student Discussion Group Preference

	Online	F2F
Responses	24	9
Example #1	“Two boys and two girls so that you could get both sides of the story; girls might have a different answer compared to two guys because they might see the story in a different way.”	“I think that I would want two boys and two girls because you have the perspective of a boy and a girl and I think they think differently.”
Example #2	“It depends on what person it is because a lot of people get off topic.”	“Since they think differently you can reflect off of what they think and maybe your mind would change what you think and you have more ideas and you can look at it from more than one point of view.”
Example #3	“If everybody was focused than 2 girls and 2 guys would be better to get two different sides of the story.”	“If we had chosen our own group we probably would have spoken more.”

Note: Responses = number of student responses for each treatment.

The vast majority of students voiced their preference for discussion groups to be two boys and two girls, stating two reasons: 1) different thought processes and 2) different voiced opinions.

The middle school student acknowledges males and females think differently; this finding benefits the student when seeking an answer to a problem. “I think that I would want two boys and two girls because you have the perspective of a boy and a girl and I think they think differently” was a comment shared by a face-to-face participant. One of the online participants shared her opinion: “Because girls and boys think differently, the different thoughts could add up to a conclusion of information.”

Students also believed two separate opinions would surface among the boys and girls, no matter if they had participated in the face-to-face or online activity, resulting in a better discussion. One student responded, “I think it is good to have two and two because you will see different points of view” and another added, “They may have seen different things and thought different things about the movie, so you are going to get a different outcome.”

In support of the findings, several students believed by placing four girls together discussion amount would be higher. “If girls are with girls I think they talk more then when they are with guys.” This observation led another student to believe an all-girl group would be more productive when saying, “I would choose an all-girl group because the majority of the boys didn’t take it seriously when we were discussing the topic.”

Treatment preference. Table 39 depicts seven responses obtained from online participants, and 12 responses obtained from the face-to-face participants in regard to treatment preference. Table 39 also depicts response examples obtained from the online and face-to-face students.

Table 39

Focus Group Responses to Treatment Preference

	Online	F2F
Responses	7	12
Example #1	“I would go back online if I had a different group; I think we would get a better result. But if we were in the same group I’d probably go face-to-face in order to stay on track.”	“Rather do it online because I am used to the computer and talking with people online.”
Example #2	“I really think that if you are talking with a group and the teacher is right there I believe I would probably only say a couple of things. Some things you would like think about. If you were doing it online, you probably would just start talking and be more into it.”	“I think I could have said more things faster face to face.”
Example #3	“I think talking on the telephone would be easiest because you are not face to face and are not online so you can still get your thought out there but don’t have to see the person.”	“I don’t think online would have bothered me as much.”

Note: Responses = number of student responses for each treatment.

Students in the focus group were asked their preference of discussion (online or face-to-face). The majority of face-to-face participants reported they would rather complete small-group, learning-centered discussions online. Reasons stated included, “I am used to the computer and talking with people online” and “I think I would have maybe said more.” Other face-to-face participants reiterated the safe haven of online for shy students as “I don’t think online would have bothered them as much.”

The online participants were split in their decision to return to the chat format or engage in face-to-face conversations. Several voiced they would go back online “if they had a different group.” The reason stated was the lack of teacher presence in the chat room forum. Others would choose the face-to-face format in order to get more ideas from the group. Concluding remarks on this topic suggest students preferred online discussions only if there was a greater teacher presence in the chat room.

Typing challenges. Table 40 depicts five responses obtained from online participants, and three responses obtained from the face-to-face participants in regard to typing challenges. Table 40 also depicts response examples obtained from the online and face-to-face students.

Table 40

Focus Group Responses to Typing Challenges

	Online	F2F
Responses	5	3
Example #1	“You had to write your answer real quickly.”	“I would still go face to face because typing is harder.”
Example #2	“If you are typing something longer, but the time you finished everyone else would be talking about something different. I was frustrated but would just type faster.”	“Sometimes when you are typing at the same time it is difficult to follow it.”
Example #3	“I’m a slow typist so if I was typing a long thing and then they start talking about something else that I won’t get to finish, but if you were in face-to-face you would get to finish speaking.”	“I scroll up to look at the information when online; I could go back and see what somebody said.”

Note: Responses = number of student responses for each treatment.

During the focus group discussions, the topic of typing ability repeatedly surfaced. The focus group discussions revealed that the speed at which students were capable of typing changed the style of their discussions. It has been reported that word count was higher in the face-to-face method (Table 5), yet total turns were greater in the online method (Table 3). Students clarified this finding by sharing their thoughts on typing during the online discussions. “You had to write your answer real quickly” stated one student. Reason being: “If you are typing something longer, by the time you finished everyone else would be talking about something different; this was frustrating.” As a result, online discussion turns were short and succinct, while face-to-face provided a wordy, reporting style.

Male/female discussion group interactions. Table 41 depicts 12 responses obtained from online participants, and five responses obtained from the face-to-face participants in regard to male and female discussion group interactions. Table 41 also depicts response examples obtained from the online and face-to-face students.

Table 41

Focus Group Responses to Male/Female Discussion Group Interactions

	Online	F2F
Responses	12	5
Example #1	“I think when guys are in front of just guys they feel like they have to be cool or something and so when you are discussing school stuff, I think that face-to-face is harder to look cool.”	“Males would rather discuss online because sometimes they are afraid to talk.”
Example #2	“Girls like to get their opinions out there and say what’s on their mind, no matter what.”	“I think guys care more about saying the right answer so if they say something wrong out loud in front of people I think they get more discouraged.”
Example #3	“I think if they didn’t understand it as much they didn’t want to sound like bad so they wouldn’t say anything face to face but it didn’t really matter on the chat.”	“I think guys are worried about their image.”

Note: Responses = number of student responses for each treatment.

Face-to-face and online participants alike voiced a strong opinion of males flourishing in the online environment as compared to a face-to-face setting. This information substantiated findings in the study (Table 19). Several students stated the reason as perception: “I think when guys are in front of just guys they feel like they have to be cool or something and so when you are discussing school stuff, I think that face-to-face is harder to look cool” and “I think guys are worried about their image.” Others believed it was not the shared message itself, but how it was projected: “I think guys care more about saying the right answer so if they say something wrong out loud in front of people I think they get more discouraged” and “When guys are in front of

just guys they feel like they have to be cool or something and so when you are discussing school stuff, I think that face-to-face is harder to look cool.” Data taken from the study substantiated this remark where the four boys of one face-to-face group took only one turn. This practice was repeated with a face-to-face group of two boys and two girls. Still other students made mention of males’ unwillingness to interact face-to-face by stating, “Males would rather discuss online because sometimes they are afraid to talk.” Many students agreed in stating it is not always about what is said, but “it is also about how you say something.” Reported by several focus group members, some males would rather choose to say nothing in discussions.

With a trend of word count higher for females than males (Table 17), the investigator reviewed the focus group transcripts for insight. Students believed it was the nature of a female to talk when stating, “Girls are talkative and dramatic most of the time” and “Girls like to get their opinions out there and say what’s on their mind, no matter what.” This thought carried to an examination of male interaction online when a student stated “because girls talk a lot about everything but guys don’t really want to do that because guys are shy; but when they are online they can talk about whatever they want and won’t feel weird.” A sense of the male off-task manner as a result of female participation surfaced when one student reported, “In the discussion the girls would take over the conversation, and guys would just not be on topic” and “I think males are scared of females.”

Recognition of communication and socialization skills. Table 42 depicts eight responses obtained from online participants, and no responses obtained from the face-to-face participants in regard to recognition of communication and socialization skills. Table 42 also depicts response examples obtained from the online students.

Table 42

Focus Group Responses to Recognition of Communication and Socialization Skills

	Online	F2F
Responses	8	0
Example #1	“Your social skills aren’t going to be good for you if everything is online because you would end up socially awkward and not be able to talk with people face to face.”	
Example #2	“We should do the computer now and then because the Internet is really becoming important in society but you should still know how to communicate with somebody else individually.”	
Example #3	“You would lose the courage to get up and talk in front of your class; you probably wouldn’t have the courage to talk to one person if you just stayed behind the computer all day.”	

Note: Responses = number of student responses for each treatment.

During the focus group meetings, students were asked if they would prefer all 8th grade discussions to be held online. With the data pointing in the way of greater participation amount and content in the online environment, it was surprising to find the students voiced a strong opinion not to abandon face-to-face interaction. The most-mentioned reason to split time with both environments was communication skills. Students stated, “People would forget to build communication skills and they won’t know how to talk with one another” and “You would lose the courage to get up and talk in front of your class.” For some, it was a concern for social skills

as the students reported, “If we do it [online] all the time we will be socially awkward” and “Speaking builds a person’s character.” The need for online skills, as well as communication and social skills, was recognized when a student answered, “The Internet is really becoming important in society, but you should still know how to communicate with somebody else individually.”

Request for both online and face-to-face discussions. Table 43 depicts six responses obtained from online participants, and five responses obtained from the face-to-face participants in regard to student requests for both online and face-to-face discussions. Table 43 also depicts response examples obtained from the online and the face-to-face students.

Table 43

Focus Group Responses to Request for both Online and Face-to-face Discussions

	Online	F2F
Responses	6	5
Example #1	“I think integrating more technology is a good idea.”	“I think I would get aggravated by not being able to just say it.”
Example #2	“If all the discussions were online I really wouldn’t like that. Some discussions could be personal and I wouldn’t want all of that going online.”	“It would get boring on the chat.”
Example #3	“Technology is becoming more and more part of our life.”	“Switching it up would be the best.”

Note: Responses = number of student responses for each treatment.

Students attending the focus groups were asked if online discussions should replace all face-to-face discussions. In a resounding cry for both methods, students replied, “I think it is still important to do face-to-face, but every once in a while do an online chat” and “Switching it up

would be the best.” With an acknowledgement from the students that the need for technology is increasing, students added “I think integrating more technology is a good idea” and “Technology is becoming more and more part of our life.”

Summary of focus group results. As a result of meeting with four focus groups, two from the online and two from the face-to-face environments, transcripts of the meetings revealed many insights provided by the students to substantiate or clarify the findings from the analyzed data. These findings include:

- Students enjoy the use of the chat feature, lending possibly to more learner engagement.
- Online conversations are the method of choice by shy students who find speaking in public difficult or uncomfortable.
- A greater teacher presence in an online environment may curb the tendencies of some students to go off-task during discussions.
- Student reflection during the discussion groups was viewed as an advantage by the online students as they were capable of reviewing previously-stated peer comments. In addition, students found their peer’s discussion time during the face-to-face sessions to be an opportunity for think time, resulting in an inability to comprehend the flow of the group’s discussion.
- Students’ ability to openly contradict or disagree with their peers was perceived greater in the online environment. In addition, the emotions brought forth during discussions were fewer in the online as compared to the face-to-face environment.

- Although not apparent through quantifiable data, student learning was perceived to increase as a result of the small-group, learning-centered discussions. This finding was realized by both online and face-to-face participants.
- Student preference in small-group discussions, by the majority of students interviewed, was determined to be two boys and two girls as compared to all boys or all girls. This finding was realized by both online and face-to-face participants.
- Preference of discussion by most face-to-face participants was reported to be online. In contrast, having the choice of online or face-to-face discussion was shared by the online participants due to their assigned group members during the study or lack of teacher presence resulting in off-task comments.
- Several students found the challenge of inadequate typing skills to be a deterrent to active participation in the online environment.
- The majority of focus group participants (both online and face-to-face) voiced the opinion that males prefer to discuss online due to their perceived awkwardness in front of a group, image perception concerns, and shyness in front of females. In contrast, females enjoyed the opportunity to be vocal in discussions in order to share their opinions with others.
- The majority of students recognize the need to develop communication and socialization skills. They believe this could not be accomplished with online-only discussions, but with a combination of online and face-to-face discussion sessions.

- Focus group members would like to see future discussion sessions shared between online and face-to-face environments. Although they recognize the need for increased technology skills, they also value the diverse advantages both environments offer.

Summary of Research Findings

In completing this study to determine whether technology provides a means to increase participation in the classroom, which in turn may result in increased student learning, data was gathered and analyzed resulting in quantitative and qualitative (focus group) findings. The following is a summary of the key findings.

Differences in the amount and content of discussions online vs. face to face. In reference to the first research question, a summary of the key findings for participation amount and content are as follows:

- There is greater participation in learning-centered discussions by students using the online (chat) environment than face-to-face as measured by total turns and discussion time.
- There is greater participation in learning-centered discussions by students using the face-to-face environment than online as measured by word count.
- Online students contributed a significantly greater amount of on-task, off-task, affirming, opposing, and correcting comments than face-to-face students.
- Shy students who find speaking in public difficult or uncomfortable prefer online communications.
- Teacher presence in an online environment may reduce the tendencies of some students to go off-task during discussions.

- Student reflection time may be increased in an online environment due to the opportunity to review previously-stated peer comments.
- Students' ability to openly contradict or disagree with their peers was perceived greater in the online environment.
- Inadequate typing skills is perceived to be a deterrent to active participation in the online environment.

Gender differences. In reference to the second research question, a summary of the key findings for gender differences are as follows:

- Males contributed significantly more to the small-group discussions across online as compared to face-to-face environments as measured by total turns, word count, on-task, and off-task comments.
- Females contributed significantly more to the small-group discussions across online as compared to face-to-face environments as measured by off-task, affirming, opposing, and correcting comments.
- Student preference in small-group discussions was determined to be two boys and two girls as compared to all boys or all girls.
- Males prefer to discuss online due to their perceived awkwardness in front of a group, image perception concerns, and shyness in front of females.
- Females are perceived to enjoy the opportunity to be vocal in discussions (face to face) in order to share their opinions with others.

Equitable participation. In reference to the third research question, a summary of the key findings for variability (higher variability results in a lessened equitable distribution of discussion contributions) are as follows:

- Participants in the online, as compared to the face-to-face environment, experienced higher variability as measured by total turns.
- Participants in the face-to-face, as compared to the online environment, experienced higher variability as measured by word count.

Student learning. In reference to the fourth research question, the key findings for student learning are as follows:

- There is no significant difference between online and face-to-face environments in a demonstration of student learning.
- Student learning was perceived by students to increase as a result of the small-group, learning-centered discussions.
- Development of communication and socialization skills is perceived by students to be best accomplished through a combination of online and face-to-face discussion sessions.

Chapter 5: Discussion of Findings, Connecting Theory to Key Findings, and Conclusion

The purpose of this study is to determine whether technology provides a means to increase participation in the classroom, which in turn may result in increased student learning. The design of this experiment was formed to find the answers to the following research questions:

1. How does the amount and content of participation in small-group, learning-centered discussions compare in online and face-to-face environments?

2. How does the amount and content of participation in small-group, learning-centered discussions differ between males and females in online and face-to-face environments?
3. To what degree is there equitable distribution in the amount of participation across individuals within each group in the online and face-to-face environments, and is there a difference in equitable participation by group members in online and face-to-face environments?
4. What is the difference in student learning as an outcome of small-group, learning-centered discussions in online and face-to-face environments as determined by a teacher-prepared rubric evaluating students' responses to a discussion-related writing prompt?

Discussion of Findings

Given the theoretical review, literature review, research design, and core findings from the previous chapters, the following discussion attempts to interpret the results in relationship to the theoretical framework and literature review to offer a better understanding of whether increased participation in the classroom, as a result of online tools, increases student learning. Through an examination of each answer to the research questions, this section demonstrates a connection from the study's problem statement to the research findings categorized by the following: participation amount and content; male and female participation amount and content; variability across individuals and within each group of the online and face-to-face environments; and increased student learning as assessed through a teacher-developed writing task.

Participation amount and content. Supporting the foundation of developmental theory, findings of the study indicate students' use of online tools fostered learning. To support this statement, our attention turns to the value of reflective practices and social constructivism. Piaget

believed learners should actively construct knowledge, applying what you know in order to understand or interpret experiences. Many others agree that through internal dialog and reflective practices learning may be achieved (Dede, 2007). Online tools provide this avenue through means of a wait time to formulate a reflective response (Barker, 2003). Feedback from the focus groups confirmed this belief when reporting the online chat window provided a means to review peer comments and reflect on the conversation prior to posting a new comment. Most group members applauded this process as they believed learning was enhanced through the power of reflection.

The choice of the online chat tool came from recommendations by other researchers. Harris and Rea (2009) used an online tool (chat) to determine if student performance could be increased in the classroom. Thomas and Qing (2008) report the chat tool is valued and enjoyed by most students. Eastman and Swift (2002) chose a chat tool as it empowers students while improving their communication and collaboration skills and fosters active learning among students. This tool was also chosen for the study as it most closely resembles face-to-face discussions (Stahl, 2006). Böhlke (2003) states using chat in groups of four students promotes an equalizing effect on small-group discussions providing all students with an opportunity to be heard. The choice to utilize a chat tool in the current study proved to substantiate the other findings as several students in the focus groups relayed their enjoyment while using the online chat activity while increasing their awareness of the discussion topic during the collaborative online session.

Perhaps the greatest advantage found with the chat tool, as compared to face-to-face discussions, was its ability to promote instructional scaffolding among students. As described by

Peterson and Caverly (2005), instructional scaffolding is a process where students participate in peer review sessions as they actively guide one another through discussions. By means of refocusing, clarifying, and understanding content as presented and discussed by peers, students empower one another in support of one another's learning. Perhaps one of the most effective techniques associated with instructional scaffolding among students is the question and answer sessions (Gnadinger, 2008). Students gain the ability to move a topic forward with greater depth and understanding when clarity of content is achieved. For example, one of the online transcripts included a great deal of detail regarding the border patrol and the process by which immigrants cross into the United States from Mexico. Through short questions, clarifying answers, and personal insight, students gained a greater understanding of this topic. In addition, students were better able to grasp the experiences of the child in the film while adding to their knowledge base the process for immigration. Through this process of question and answering, students are able to interact with others by sharing their ideas, knowledge, and opinions (Mayes 2006). With the assistance of technology, students may be able to more readily identify concepts missing or misunderstood (Ally 2008; Mayes 2006).

Focus group members shared their ability during the experiment to clarify events and understand the content of the film when partaking in the online environment. This finding supports Gnadinger's (2008) report that the process of posing questions and answers during collaboration establishes instruction in the zone of proximal development. For many students, feedback is an important part of the learning process (Ally, 2008). Students in the study were able to receive insight from their peers on their opinions; this process assisted in the formulation of new knowledge. Because emotion was minimized in the online setting, participants were able

to openly contradict or disagree with peers during the small-group, learning-centered discussions.

My hypothesis for the first research question pertaining to participation amount and content was as follows: *Students utilizing an online collaboration tool (chat) will demonstrate greater participation and superior content during the small-group, learning-centered discussions.* It was the researcher's belief the online environment would foster an equally-shared participative environment resulting in interaction by all students. In comparison, the researcher believed the face-to-face environment would promote participation only by those students who were comfortable vocalizing their opinions. The quantitative and qualitative findings are in keeping with this hypothesis.

One may recall there were significant findings for participation amount between those students who participated in the online small-group, learning-centered discussions and those students who completed the discussions in a face-to-face environment. Measurement for this quantitative finding was derived through a count of total turns, word count, and discussion time. The findings revealed online students demonstrated greater participation amount by their total turns and discussion time whereby face-to-face students demonstrated greater participation amount by means of word count.

As a result of the findings from four focus groups (two groups of six participants each from the online environment, and two groups of six participants each from the face-to-face environment), two findings support and one denounce participation in an online environment:

- Students enjoy the use of the chat feature, lending possibly to more learner engagement.

- Online conversation is the method of choice by shy students who find speaking in public difficult or uncomfortable.
- Several students found the challenge of inadequate typing skills to be a deterrent to active participation in the online environment.

Participation amount was also reviewed by the coders, whereby it was found online students discussed using short, succinct messages, leading to an active collaborative discussion. In contrast, the coders found face-to-face students discussed in a reporting style, leading to less interaction and subsequently less total turns and discussion time.

As previously discussed in Chapter 4, participation content findings indicate a significant difference in terms of on-task (Table 19), off-task (Tables 20 and 21), affirming (Table 22), opposing (Table 23), and correcting (Table 24) comments. Prior to categorizing the on-task comments, the coders made a distinction as to whether each verbal response made by the students was classified as an on-task or off-task remark. On-task comments were defined as making a connection to the discussion prompts whereas off-task comments did not make a connection. This is not to say off-task comments held no value. The investigator believes successful collaboration sessions will include a small amount of off-task comments (e.g. creating relationships or connections). Although some remarks were off-task and viewed as unproductive contributions to the discussion sessions, the majority of the remarks was on-task providing insight to the discussion prompts, and therefore was coded as such.

In all five areas (on-task, off-task, affirming, opposing, and correcting comments), online students demonstrated greater participation content than the face-to-face students. The difference generated between the online and face-to-face environments with on-task and off-task comments

may stem from the refined definition used by the coders to examine comment turns. Online turns were designated by the submission of a written comment, which in most cases resulted in a greater number of participant turns; in contrast, face-to-face turns were designated by the completion of a participant's spoken statement. Since many face-to-face participants spoke in a reporting-style of discussion, more words per turn resulted, yet fewer turns prevailed. As a result of the refined definition by the coders and the two methods of turns, the online participants had more opportunities to increase their total comments in each category.

In addition to statistical results, members of the focus groups provided insight to online participation content. The findings from the four focus groups reveal two supportive comments for online discussions, and one concern with participation content by students in an online environment:

- Student reflection during the discussion groups was viewed as an advantage by the online students as they were capable of reviewing previously-stated peer comments. In addition, students found peers' discussion time during the face-to-face sessions to be an opportunity for think time, resulting in an inability to comprehend the flow of the group's discussion.
- Students' ability to openly contradict or disagree with their peers was perceived greater in the online environment. In addition, the emotions brought forth during discussions were fewer in the online as compared to the face-to-face environment.
- A greater teacher presence in an online environment may curb the tendencies of some students to go off-task during discussions.

In discussion with the coders, it was reported those participants utilizing the chat feature incorporated their peer's remarks into their individual statements supporting the act of listening to other's comments. In comparison, the coders reported many remarks made by the participants in the face-to-face environment were disjointed from the discussion thread as evidence of fewer affirming and disagreeing statements. Therefore, many of the face-to-face participants demonstrated an inferior level of active listening as compared to the online participants.

Given the statistical significance of the results, and feedback from the focus group members and the coders, the problem perceived by the educators (middle school students' reluctance to vocally engage in small-group, learning-centered discussions) is valid. Our students have been termed "digital" because of their daily use of technology as an integral part of their communication and collaboration practices outside of the classroom (Andone et al., 2009). As stated previously, collaboration, which is the foundation of social constructivism, stimulates the decision-making process and intellectual and social development (Barbera 2009; Graham & Graham, 1997; Ross & Frey, 2009). By making means for collaboration available in digital format, students may naturally move from communicating to collaborating, resulting in increased learning (Atici & Bati, 2010). With the integration of online collaboration, this study found students who increased their participation (on-task and off-task remarks) also increased their affirming, correcting, and opposing remarks. Interaction, by means of participation content, increases student understanding, which results in an increase in learned experiences (Forbes & McCloughan, 2010).

Based on online and developmental theories, statistical findings, and reports from the focus group members and coders, several concluding remarks can be made by the investigator

concerning participation amount and participation content. Participation amount was increased by the online students, whether as a result of enjoyment, personal routine communication, reflective practices, or collaboration advantages. Although not all participation was positive (i.e. off-task remarks), students demonstrated their productive engagement with greater on-task remarks. It is believed by the investigator that increased participation by students can lead to greater understanding. This was prevalent in the increased affirming, opposing, and correcting remarks. Because students interactively shared their views on the prompts, new information surfaced resulting in new knowledge. The amount of new knowledge could not be statistically measured, yet during focus groups most students stated their opinion of the subject matter was either enhanced or changed as a result of shared viewpoints with their peers. With additional opportunities for collaboration and an enhanced tool to statistically measure student knowledge, future data could be generated to either confirm or deny the current findings for participation amount and participation content.

Male and female participation amount and content. Established findings from theorists and previous studies enabled the investigator to complete the study with a focus on male and female similarities and differences. It has been stated social experiences do not occur in the same sequence in all cultures (Miller, 2002). Students in the focus groups confirmed males and females judged concepts differently from the film and engaged in the discussion sessions in an unparallel manner. As stated by Collis (1999) and Gerbic (2006), diverse culture within a classroom environment brings multiple value and perspectives for students. Focus group participants voiced strongly the differences held by the males and females during discussions, not only in participation amount and content, but in attitude, previous knowledge, and

compassion for the subject matter. Given a choice, the students voiced a group preference for future discussions to be two boys and two girls so as to realize the optimum experience in collaborative discussions.

With a focus on male and female differences, steps were taken, where possible, to ensure accurate findings. It was found a quasi-experimental design needed to be utilized based on the intact groups made available to the investigator. Mirroring the studies of Arnold et al. (2009) and Leh (2002), class groups for this study were chosen for the experiment, thereby providing a naturally-formed convenience sample (Creswell, 2009). Care was taken to ensure a non-gender biased experiment. The film viewed and enjoyed by all students, *Under the Same Moon* (2008), is a drama centering on a young boy's journey across the US/Mexico border to be reunited with his mother (Toby, 2007). The investigator used discussion and interview guides to ensure a more controlled research environment (Scagnoli et al., 2009), and the investigator avoided monitoring the students during discussions, as was a concern by four studies when discussing biased results (Andone et al. 2009; Lin 2008; Pang 2009; Yu 2009).

My hypothesis for the second research question pertaining to male and female participation amount and content was as follows: *There will be no difference found in the amount or content of participation by males and females during face-to-face, small-group, learning-centered discussions as compared to an increase in the amount or content of participation by males and females during online small-group, learning-centered discussions.* Based upon observations in a middle school setting, it was the researcher's belief males and females would increase their participation amount or content when interacting online due to the students' willful

daily interactions using technology. The quantitative and qualitative findings are in keeping with this hypothesis.

Findings previously reported for participation amount by males and females indicate a statistical significance found in male students who participated in the online and face-to-face small-group, learning-centered discussions. In reviewing the transcripts from the online and face-to-face groups, it was found male participants preferred to speak in a reporting style when discussing face to face. In contrast, online males chose to engage in more frequent turns with short, succinct wording; this lead to higher participation count by males in the online environment as compared to the face-to-face environment. Measurement for these quantitative findings was derived through a count of total turns (greater in the online environment) and word count (greater in the face-to-face environment).

Results from the participation content findings indicate a significant statistical difference between male students in the areas of on-task and off-task comments (both greater online). Statistical differences were also found for female students in the areas of off-task, affirming, opposing, and correcting (all greater in the online environment).

Given that the online students contributed more total turns and thus would expect to have contributed more on-task and off-task comments, the investigator reviewed the on-task, off-task, and seven coded comments as a relative percentage for males and females in both the online and face-to-face environment. When comparing comments within each gender, males were prompted to go off task more often online than face-to-face. Males also demonstrated greater discussion online with affirming, opposing, and correcting comments as compared to males face-to-face. In contrast, males demonstrated a greater presence in the face-to-face environment in the areas of

questioning, managing, new information, and answering comments as compared to online males. Females were prompted to go off-task more often online than face-to-face, and stay on-task more often face-to-face than online. Females also demonstrated greater discussion online with affirming, opposing, correcting, and managing comments as compared to females face-to-face. In contrast, females demonstrated a greater presence in the face-to-face environment in the areas of questioning, new information, and answering comments as compared to females online.

Although not statistically significant, when comparing the male and female findings it was determined online females commented off-task more often than online males. In addition, there were more online female affirming, opposing and correcting comments as compared to online male comments. More face-to-face male comments were off-task as compared to face-to-face female comments. In addition, there were more face-to-face male affirming, opposing, and correcting comments as compared to face-to-face female comments.

In order to further clarify the statistical results, four findings from the focus groups demonstrate student preference in the way of participation amount and content:

- Students preferred the discussion groups be two boys and two girls as compared to all boys or all girls. This preference was articulated by the majority of students interviewed. This finding was realized by both online and face-to-face participants.
- Most face-to-face students interviewed said they would prefer online discussions over the face-to-face discussions. In contrast, most online students interviewed said they would prefer having a daily choice of online or face-to-face discussion depending on their assigned group members and if a teacher would be present to minimize off-task comments.

- Male students preferred online discussion. This preference was voiced by the majority of focus group participants (both online and face-to-face). The reasons for this preference include the male's perceived awkwardness in front of a group, his image perception concerns, and his shyness in front of females.
- Student preference for face-to-face discussion was voiced by several females due to the opportunity afforded by the environment to be vocal in discussions in order to share their opinions with others.

In addition, insight by focus group members demonstrated a preference to participate in both an online and face-to-face environments as they realized a need to have a balance among increased use of technology and development of socialization skills:

- Focus group members would like to see future discussion sessions shared between online and face-to-face environments. Although they recognize the need for increased technology skills, they also value the diverse advantages both environments offer.
- The majority of students recognize the need to develop communication and socialization skills. They believe this could not be accomplished with online-only discussions, but with a combination of online and face-to-face dialogue sessions.

A report provided by the coders demonstrated males more often went off-task as compared to females. This statement substantiates the focus group comments whereby males found it difficult at times to speak to a group of peers which included females. The report also stated females more often steered the discussion group back on task when needed. As revealed from focus group members, females were inclined to use the discussion session to voice their

opinions. When males would begin to stray off topic, females would resurface the discussion prompts, most likely to share their viewpoints with the other members of the discussion group.

Given the statistical significance of the results, and the feedback from the focus group members and the coders, the problem perceived by the educators (middle school students' reluctance to vocally engage in small-group, learning-centered discussions) is again found to be valid. An underlying difference in the way males and females communicate and collaborate resurfaced multiple times during the study. In speaking with students in the focus groups, the majority of online and face-to-face students voiced the opinion that males prefer to discuss online due to their perceived awkwardness in front of a group, image perception concerns, and shyness in front of females. In contrast, females enjoyed the opportunity to be vocal in discussions in order to share their opinions with others.

Based on online and developmental theories, statistical findings, and reports from the focus group members and coders, several concluding remarks can be made by the investigator concerning male and female participation amount and participation content. Participation amount was increased by the male online students, whether as a result of comfort level during online collaborations, ease of disputational conversations, or greater reflective practices. Males also demonstrated greater participation content in both on-task and off-task comments. This is judged by the investigator as a positive effect, as stated previously it is believed increased participation by students can lead to greater understanding.

Females demonstrated more off-task, affirming, opposing, and correcting remarks as compared to females engaged in the face-to-face sessions. This finding demonstrates a greater communication by females online. As reported by focus group members, online females were

not simply voicing their opinions (as demonstrated in the face-to-face sessions) but were eliciting feedback from and providing feedback to their group members by means of short, multiple turns. This method of communication not only results in discussing the prescribed talking points, but also broadens the scope of discussion to touch upon other areas relating to the topic. Contrary to reports from the female face-to-face participants where it was stated students enacted a reporting style of discussion while voicing their opinions, the female online participants presented a genuine interest in listening, questioning, affirming, and contradicting their peers in a non-judgmental arena. Their quest, as a group, to analyze and dissect the topic permitted female students in particular with the opportunity to share personal experiences, bringing new viewpoints to the discussion. Apparent in this finding is that females were exposing their previous knowledge as they discussed personal experiences and opinions relating to the topic, and as a result of group effort, were able to expand the topic and their knowledge base through their questioning, clarifying, and sharing techniques.

The consistency of participation content in an online environment could not be statistically measured with the sample size provided, yet during focus groups most students stated with increased teacher presence during discussions, groups with equal male/female combinations would provide optimum learning. With additional opportunities for collaboration and an enhanced means for teachers to monitor online discussions, future data could be generated to either confirm or deny the current findings for male and female participation amount and participation content.

Variability across individuals by environment and across groups. As previously discussed, Vygotsky believed students benefit from the social interaction of group discussions,

whereby learning is fostered through an active construction of knowledge (Powell & Kalina, 2009). Actively constructing knowledge is the essence of the zone of proximal development, as Tudge (1992) states the zone is the difference between what a child is able to accomplish independently as compared to what the child could accomplish in conjunction with another more competent person. For groups to be successful, students need to be carefully paired during collaboration exercises as this action may be the determining factor as to a student's decision to participate or to not participate (Schmitz & Winskel, 2008). Eastman and Swift (2002) confirm this concept when they remind us unequal contribution by all members of a group is one of the most common problems identified with collaborative group discussions.

A focus was placed on the creation of student groups in this study in order to realize optimum results. Böhlke (2003) reported students in groups of four produced the greatest channel for discussions. He believed students in fours provided the best opportunity to be heard (in a face-to-face environment) as well as the best opportunity to read posted comments. Böhlke also stated groups of four students best support an equalizing effect during discussions.

My hypothesis for the third research question, pertaining to individual and group variability, was as follows: *There will be an equitable distribution in the amount of participation across individuals and within each section group during online small-group, learning-centered discussions as compared to an uneven amount of participation by individual and within each section group during face-to-face small-group, learning-centered discussions.* It was the researcher's belief the online environment would provide students with an equal opportunity to participate whereas the face-to-face environment favors participation by students who prefer to vocalize their opinions. Both the quantitative and qualitative findings support this hypothesis.

Using a Gini coefficient for total turns (Table 29) and word count (Table 30), findings for variability across individuals and within groups confirmed online students demonstrated greater variability (less equitable distribution of discussion contributions) in total turns. This method of unequal participation may be due to the style of discussions by the participants (online demonstrating short, succinct responses and face-to-face students demonstrating lengthier worded statements). In contrast, face-to-face students demonstrated greater variability in word count. This finding may be a result of the inhibitions of shy students to fully engage in face-to-face discussions as compared to their ease in discussion during online collaboration.

According to focus group participants, a deterrent to online discussion for a shy student is the lack of teacher presence in the chat room. As a result of previous studies, it has been confirmed it is the teacher's responsibility to facilitate learning, whether in the classroom or online (Chu Chih & Ju Chen, 2010). It has also been reported without proper online facilitation, students find it difficult to fully participate (Lockyer et al., 2006). A focus group consensus supports this finding when revealing a greater teacher presence in the online environment may have curbed the tendencies of some students to go off-task during the discussions, which in the end resulted in shy students refraining from participation. Students in the online environment reported feeling more relaxed without a teacher in view, and as a result did not take the assignment as seriously as if they had been in a face-to-face discussion with the staff member. Students agreed having a teacher involved in the chat discussion, or at the very least having a picture of the teacher posted in the chat window, would have resulted in a more structured discussion setting.

In reviewing transcripts in regards to variability across individuals and across groups, it was determined by the coders the pacing of comments in the online environment permitted students to read peer comments prior to responding. Although total turns may be higher in online vs. face-to-face environments, turns were taken more evenly across participants of the online treatment as compared to face-to-face. In addition, it was found from both the statistics and the transcripts that one leader emerged from most student groups. This student spoke in excess of the rest of their group members to either keep the group on task or to demonstrate their preferred method in which to answer the prompts. In groups depicting a strong leader, as reported by the coders, there most likely were one or two inactive participants who provided few comments.

When reviewing the problem (middle school students' reluctance to vocally engage in small-group, learning-centered discussions) the concepts of group design and student confidence tend to play a role in individual and group variability making this statement valid. Pairing students to increase success is critical (Schmitz & Wiskel, 2008). Hagerty et al., (2010) confirms this stance by suggesting a low level student be paired with a higher level student in order to achieve greater success in collaborative environments. Student confidence is also a concern during discussions as it has been reported to be a direct reflection on student learning (Woodworth & Applin, 2007). This was found to be true for the shy students who hesitated to offer an opinion during discussions. In focus group dialogue, students agreed the online conversation tends to be the method of choice by shy students who find speaking in public difficult or uncomfortable. This finding is shared by Stewart (2009) who states students less comfortable speaking have an opportunity to share their thoughts using online tools.

Based on online and developmental theories, statistical findings, and reports from the focus group members and coders, several concluding remarks can be made by the investigator concerning individual and group variability within online and face-to-face environments. Variability across individuals and within groups was greater in an online environment, as compared to a face-to-face environment, when measured by total turns. Variability across individuals and within groups was greater in a face-to-face environment when measured by word count. These findings compare to the equitable distribution of participants' discussion contributions during online and face-to-face discussion. As a result, these students deprived themselves (active student) or were deprived (inactive student) of receiving assistance from other group members utilizing the zone of proximal development. Their inability to either listen to others or share previous knowledge resulted in a possible lower level of student learning. With additional opportunities for collaboration and an enhanced means to appropriately appoint students to discussion groups, future data could be generated to either confirm or deny the current findings for individual and group variability.

Increased student learning. The fourth research question seeks to find a difference in student learning as an outcome of small-group, learning-centered discussions in online and face-to-face environments. A teacher-prepared rubric served as a measurement tool by evaluating student answers to the writing prompt.

As previously stated, Vygotsky believed learning occurs through students' social interactions (Bliss & Lawrence, 2009). A student's misconceptions or lack of knowledge is identified through participation and collaboration (Mayes, 2006). This was confirmed when the focus group members commented on the assistance received by their peers in clarifying

information. Tudge (1992) reminds us that during the zone of proximal development, a student may move beyond their existing ability as a result of assistance from others. Focus group members reported they learned the opinions of others, which ultimately assisted them in their open-response writing. Schmitz and Winskel (2008) confirm this concept as they believe students modify their thinking to incorporate the ideas of others. Students were able to take their previous knowledge and as a result of group collaboration, create a new meaning for the discussion topic (Kumar, 2009; Lim, 2004; Miller & Benz, 2008).

My hypothesis for the fourth research question, pertaining to increased student learning, was as follows: *There will be a greater demonstration of student learning from students participating in the online small-group, learning-centered discussions as compared to students participating in the face-to-face small-group, learning-centered discussions.* It was the researcher's belief that the online environment would promote greater participation (active learning) by students, as compared to the face-to-face environment, resulting in an increase in student learning. The qualitative findings support this hypothesis.

Findings for increased student learning were not found to be apparent in the quantifiable data. In contrast, through qualitative data (discussions with focus group members), student learning was perceived to increase as a result of the small-group, learning-centered discussions. Having the opportunity to listen to others' point of view (whether in a face-to-face or online environment) provided several advantages to the students. Validation of one's opinion was cited as students found comfort in knowing others had the same point of view. New knowledge was also stated as ideas discussed included concepts missed or misunderstood as a result of viewing the film. New perspectives was a third advantage brought to the focus group table; as a result of

a question and answer process during the small-group, learning-centered discussions, the topic was defined and clarified, which allowed students to more fluently express their thoughts during the writing activity.

As the student typed responses were blindly coded, the coders could not state an opinion on increased student learning as a result of online or face-to-face discussions.

When reviewing the problem (middle school students' reluctance to vocally engage in small-group, learning-centered discussions) the concept of increased participation leading to an increase in student learning tends to make this statement valid. We found the online environment fostered more affirming, opposing, and correcting comments, demonstrating student involvement in the discussion as well as student comprehension of the subject matter. The focus group members reported that although statistically student learning did not increase as a result of the group discussions, it was perceived those who actively participated gained a better understanding of the topic, and as a result, learned of their peers' point of view. This gained information was construed to create their writing prompt which in this study was ultimately used to measure student learning.

Based on online and developmental theories, statistical findings, and report from the focus group members, several concluding remarks can be made by the investigator concerning student learning as a result of online and face-to-face environments. Although no statistical evidence could be derived from the coded student typed responses, results in the form of qualitative feedback from focus group members confirm student learning was evident by those members who had taken part in active focus group sessions. Focus group members stated, as a result of student discussions (debating the pros and cons of the subject matter) their viewpoint of

the topic of immigration was changed, directly demonstrating a step toward student learning. With additional opportunities for collaboration and an enhanced means to appropriately assess student learning (improved rubric), future data could be generated to either confirm or deny the current findings for student learning as a result of online and face-to-face small-group, learning-centered discussions.

Connecting Theory to Key Findings

Two theoretical strands served as a framework for this research. Online Educational Theory, with particular focus on social constructivism, was the foundation for discussion-based collaboration within both online and face-to-face environments. It assisted to define student participation tendencies and the differences between the discussion-based collaborative environments. Cognitive theory, as part of developmental theory, assisted in the research of student learning, and the online tools that foster learning. Given the purpose of this study to determine whether today's students might benefit from use of an online collaboration environment, the investigator found a direct connection between the above theories and the study's key findings.

Peer instructional scaffolding, as previously discussed by Peterson and Caverly (2005), proved to be a significant component of the online student discussions and a key finding. Peer questioning allows students to attain greater understanding resulting in achieved learning (Gnadinger, 2008). Supported by students' comments in the focus groups, this study's online discussions provided a forum to reflect, ask questions, and formulate concepts, resulting in additional information to the student's knowledge base. Peer instructional scaffolding in the online environment was clearly evident by the significant results found in greater affirming,

opposing, and correcting comments by online participants, as well as greater female participation in the online environment. Mayes (2006) confirms that the opportunity to share ideas, knowledge, and opinions online is enhanced by technology as it assists to identify missing or misunderstood concepts.

A second key finding in the online environment was the use of reflection during student discussions. Piaget believed students should actively construct knowledge through a process of applying previous knowledge to new experiences. As confirmed by Dede (2007), it is found that this process is enhanced through internal dialog and reflective practices with online activities. This study's results demonstrated that a significantly greater amount of time was spent in student discussions online, as was more turn-taking. Focus group results support this finding as students confirmed having the ability to reflect on peer comments prior to discussing enabled them to comprehend information, recall past experiences, and form new opinions. As a result, this study confirms online participation promotes reflective practices resulting in greater active listening by students. In contrast, students in the face-to-face environment demonstrated less active listening as evidenced in more disjointed conversations.

The third key finding to the online environment was students' preference for mixed-gender discussion groups to support greater participation in discussions by all members, which was supported by the analysis of participation in both the online and face-to-face environments. Male participation amount, male participation content (on-task and off-task comments), and female participation content (off-task comments) was greater in the online environment when students were in mixed gender groups of two males and two females. Resonant with this finding was focus group participants' stated preference to be in 2x2 mixed gender groups, allowing for

greater reflection and information during discussions. Collis (1999) and Gerbic (2006) both believe diverse culture in the classroom lends itself to differences in attitude, previous knowledge, and compassion amongst students. Student knowledge can be enhanced or changed as a result of sharing alternative viewpoints with peers. Forming discussion groups of two boys and two girls might then allow for a greater diversity of viewpoints in the discussion groups leading to greater learning.

The final key finding in the study is the potential advantage of the online environment to support greater participation in discussions by males and shy students. In contrast to face-to-face discussions whereby student interaction necessitates ongoing interaction and turn-taking to advance a topic, online discussions provide students with the benefit of wait time as well as the opportunity to contribute to the discussion at any time (Barker, 2003). Online students, and in particular males and shy students (those who do not readily participate), were afforded the opportunity online to formulate their thoughts prior to adding to the conversation. Focus group participants commented that males and shy students can be timid when discussing face to face in contrast to the opportunity to contribute online. Students also shared a belief that males feel awkward during face-to-face discussions. As a result of the transcript analysis of participation in both the online and face-to-face environments and focus group discussions, the investigator believes having the ability to discuss in short, succinct phrases, as found in the online environment, enables both males and shy students to more readily participate in student discussions, resulting in active learning practices.

Online educational theory and developmental theory provided a foundation for this study. As a result of the key findings, the investigator confirms that the use of technology in the form of

an online tool for student discussions can enhance peer instructional scaffolding and reflective dialogue, particularly in mixed gender groups and in support of male and shy student participation. Student participation is the first step towards students actively constructing knowledge. As a result of this study, it has been found that technology can foster greater student participation, resulting in possible greater student learning.

Conclusion

As a result of conducting this quasi-experimental study to determine whether technology provides a means to increase participation amount and participation content in the classroom, which in turn may increase student learning, several key findings have been realized:

- Participation amount (total turns, word count, and discussion time) is significantly different in online and face-to-face environments. Significant findings indicate total turns and discussion time were greater in the online environment, where total word count was greater in the face-to-face environment.
- Participation content is significantly different (on-task, off-task, and affirming, opposing, and correcting comments) in online and face-to-face environments. Significant findings indicate all five of the areas of participation content were greater in the online environment.
- Male participant amount (total turns and word count) is significantly different in online and face-to-face environments. Males produced greater total turns in the online environment while increasing their word count in the face-to-face environment.

- Male participation content (on-task and off-task comments) is significantly different in online and face-to-face environments. Males made more on-task and off-task comments online as compared to face-to-face.
- Female participation content (off-task, affirming, opposing, and correcting comments) is significantly different in online and face to face environments. Females made more off-task, affirming, opposing, and correcting comments online as compared to face-to-face.
- Variability of discussion contributions within each group is higher in the online environment as measured by total turns.
- Variability of discussion contributions with each group is higher in the face-to-face environment as measured by word count.
- There is no significant difference in student learning between online or face-to-face discussion environments.

This study, grounded in online (social constructivism) and cognitive (developmental) theories, reveals possible benefits to the use of discussion-based online environments to support student dialogue about a topic of instruction. First, findings in this study indicate participation amount and content differences between an online and face-to-face environment for many students, especially for those as determined by focus group members who do not readily participate in traditional classroom discussions. Second, students participating in this study recognized the advantages of increasing their technological skills as well as partaking in both online and face-to-face discussion environments. Third, the importance of group selection, when considering gender as a pivotal means to greater student interactions, was determined as focus group members shared their group preference of two boys and two girls. And finally, this study

contributes to the further understanding of online theory as it lends insight into the successful use of online tools in a middle school setting.

Moylan (2008) reported a significant gap in current skills among middle school students. Communication and collaboration skills, utilizing today's high-tech offerings, is currently lacking in school systems, and as a result students are denied a quality education. As technology increases in nearly every facet of our lives, students struggle with the opportunity to learn the needed 21st century skill sets. Society places responsibility in the school systems to prepare students for further education and employment, yet many school systems have not accepted the responsibility that comes with curriculum enhancements. Mellow and Katopes (2009) propose that without this knowledge, students will fail to become productive members of society.

Today's technology has the ability to empower educational systems in order to prepare students to communicate and collaborate in today's high-tech environment. Accessing Web 2.0 tools in the classroom is a good first step as students can integrate their current out-of-school high tech lifestyle and place it into the hands of educators to support quality 21st century skills in students. As a result of this study, we found many middle school students prefer to interact with others using online technology. It is the investigator's belief that if we are to prepare our students to take the needed steps to prepare for lifelong learning and interaction in the population, technology is the key to increasing student participation resulting in prepared 21st century students.

Today's middle school students are much different than in years past as technology provides them with new and exciting ways to communicate, collaborate, learn, and entertain. Students and technology have become inseparable, which can clearly be seen when the closing

school bell rings and devices immediately come out of students' lockers and pockets. Students are comfortable with changing technologies, even more so than many adults. Therefore, this investigator recommends the following:

- Whereby it was found that student participation in learning-centered discussions is greater with the use of an online chat tool, as measured by total turns and discussion time but not word count, online discussion and collaboration sessions should be encouraged particularly as the environment was found to promote greater instructional scaffolding among students.
- Feedback to students is an important part of the learning process; as online tools allow for the readily accessible synchronous and asynchronous documentation of student discussions (including ideas, opinions, and questions), educators should look to their use for fostering ongoing feedback amongst students and between students and teachers.
- Students learn best when engaged in enjoyable activities; whereby students embrace technology outside of the classroom, educators should seek ways to bring this powerful catalyst for learning into the classroom.
- Shy students prefer discussions online as compared to face-to-face; with an increasing number of online tools available, students once too timid to speak out during classroom sessions may now find a voice in these discussions.
- Student reflection increases learning; online discussions promote student reflection through written transcripts of the collaboration sessions.

- Females gravitate to online practices as it provides a forum for increased instructional scaffolding; through short-phrased interactions, females tend to increase their knowledge base with the assistance of peers during online discussions.
- Teacher presence fosters on-task practices by students; educators need to adapt their teaching style in order to better guide online practices.
- Males prefer online interactions as compared to face-to-face classroom discussions; awkwardness, negative image perception, and shyness by males may be lessened through online practices.
- Both online and face-to-face practices in the classroom are necessary to promote communication and socialization by middle school students.

It is the recommendation of this investigator that the potential use of online environments be investigated in a middle school setting. If replicating this study, the following guidelines should be considered:

- Increase the sample sizes of each gender group (two boys and two girls, three boys and one girl, three girls and one boy, all boys, and all girls) to gain insight on whether it is the online tool or gender make-up of the groups that differentiates online and face-to-face learning by gender.
- Conduct all activities during a single day to avoid outside influence and to sustain participation by all members of the study.
- Create a writing prompt that will facilitate a means for students to report what they had learned from the small-group, learning-centered discussions.

- Several days after the small-group, learning-centered discussions, direct students to prepare a written response to the two discussion prompts in order to determine individual student learning.
- Devise and test a more comprehensive rubric to better evaluate student learning.
- Conduct both discussion environments (online and face-to-face) with the same amount of teacher presence so as to increase study validity.
- Conduct a discourse analysis of student discussions to identify with greater specificity what had been learned by students as a result of small-group, learning-centered discussions.

In this study it was found that middle school students enjoy using technology to communicate and collaborate with others. It was also found that an online environment (chat) can effectively support student-centered learning discussions. In some ways, (for example, the potential for greater instructional scaffolding amongst student participants and with teachers), the use of an online environment for learning-centered discussions can be beneficial for students, allowing for greater and more equitable participation by all group members independent of gender. Given these findings, along with the increasing use of online environments, including distance learning opportunities at the high school level, further investigation should be given to the potential of these environments to enhance student learning.

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Appendix A

Parental Permission Request.

January, 2011

Dear Parent/Guardian:

Dedham Public Schools' technology integrator, Cathy Oravetz, has asked permission to conduct a study in Ms. Lothrop's and Mr. Nadeau's grade 8 Spanish classes as part of her Northeastern University's Doctor of Education Program. Students in selected sections of Ms. Lothrop's and Mr. Nadeau's grade 8 Spanish classes will participate in a short unit involving the viewing of a movie, participation in a small-group discussion based on the movie, and a follow-up writing task. Some students will engage in the small-group discussions on the Dedham Public Schools' online Blackboard site and some students will engage in their small group discussions face-to-face. A sub-sample of all students will also be asked to participate in a focus group with Ms. Oravetz after viewing the movie and their participation in either the face-to-face or online discussion.

For the purpose of documenting the outcomes of these small group discussions, face-to-face discussions will be audio taped for later analysis and online discussions electronically recorded will also be reviewed. Students' responses to an open-ended writing prompt after viewing the movie and participating in the discussions will also be reviewed as part of the study.

Potential benefits to the participants, as a result of the study, include insight on the potential value of using online collaboration tools in respect to student participation and learning. This information could prove beneficial to Dedham Middle School students in future years.

There will be no penalty to your student if you or he/she declines the invitation to participate in the research portion of the study. All information acquired from the discussions will be kept confidential. Activities will take place at Dedham Middle School in February or early March, and the results of the study will be shared with the students by the end of April.

Please complete the attached form indicating your permission for your son/daughter to take part in this timely study. We ask that all completed forms be returned to the Ms. Lothrop or Mr. Nadeau by the end of this week.

If you have any questions regarding the study or your child's participation, you may contact me or Ms. Oravetz at 781-326-6900.

Sincerely,

Northeastern University, College of Professional Studies**Investigator Name:** Cathleen L. Oravetz**Title of Project:** Assessing Middle School Student Participation and Learning in Online vs. Face-to-Face Environments

We are inviting your child to take part in a research study. This form will tell you about the study, but the researcher, Mrs. Oravetz, has explained it to your child during a portion of his/her Spanish class. Both you and your child may ask the researcher any questions that you have. When you are ready to make a decision, you may tell the researcher if you want to participate or not. Your child does not have to participate if he/she does not want to. If he/she decides to participate, the researcher will ask you to sign this statement and will give you a copy to keep.

Why is my child being asked to take part in this research study?

We are asking your child to be in this study because he/she is a Dedham Middle School student who is enrolled in one of Mr. Nadeau's or Ms. Lothrop's 8th grade Spanish class.

Why is this research study being done?

The purpose of this research is to determine whether student participation in small group discussions increases in an online environment, whether the discussion content is different, (for example, more focused on the topic of learning), and if student learning may have benefited from student engagement in online or face-to-face collaboration.

What will my child be asked to do?

If your child decides to take part in this study, he/she will be asked to participate in the following activities:

- Activity #1 (**routine procedure**): As part of your child's regular Spanish curriculum in Mr. Nadeau's or Ms. Lothrop's classes, your child will view the Spanish film "*Under the Same Moon*." This film will be presented in its entirety at Dedham Middle School during one day, and will be accompanied by English subtitles.
- Activity #2 (**research procedure**): Your child will be randomly assigned to a discussion group of four students and engage in a small-group, learning-centered discussion. Two guiding questions, pertaining to the film, will be provided. Each group will be given no more than twenty minutes in either an online (chat) environment or a face-to-face environment to discuss the film. In order to accurately capture student participation and conversations, the online discussion groups will be recorded using Blackboard's archive option, and students participating in the face-to-face discussion groups will have their discussions audio taped.
- Activity #3 (**routine procedure**): Your child will be asked to compose an answer to an open-response prompt demonstrating student learning as a result of the film and/or group

discussion session. Your child will have twenty minutes to compose a response using Microsoft Word.

- **Activity #4 (research procedure):** After student discussions have been transcribed and analyzed, and the open-response prompt answers evaluated, a sample of students will be asked to participate in a focus group. This small group of students (approximately six-members) will discuss their experiences in either the online or face-to-face discussion groups as well as their evaluated writing prompt. The focus group sessions will be audio taped to accurately capture student participation and conversations. Each focus group will represent students from each section of Mr. Nadeau's or Ms. Lothrop's classes.

Where will this take place and how much of my child's time will it take?

All activities associated with this research study will take place at Dedham Middle School. Viewing the film, (scheduled for the middle school auditorium), will take approximately two hours on the first day of the study. On the second day of the study, the small-group, learning centered discussions will take place during one regularly-scheduled Spanish class block. On the third day of the study, the open-response prompt activity will take place during one regularly-scheduled Spanish class block. Approximately 2-3 weeks later, the focus group activity, for those who are chosen to participate, will be conducted. The researcher will seek to conduct this activity, with minimal disruption as possible, at the start of a school day. It is estimated the focus group activity will take approximate 30 minutes to complete.

Will there be any risk or discomfort to my child?

The Dedham Middle School students participating in this study should incur minimal risks (if any) as a result of the study. All information acquired from the discussion sessions and open-response prompt answers will be kept confidential.

Will my child benefit by being in this research?

Potential change in the middle school curricula for all subject areas, integrating Web 2.0 tools for enhanced participation and student learning, could prove to benefit Dedham Middle School students in future years.

Who will see the information about my child?

Those having access to the data during the collection process are the two Spanish teachers (Mr. Nadeau and Ms. Lothrop), staff members assisting during the small-group learning-centered discussions, and the researcher (Mrs. Oravetz). The need for confidentiality throughout the research process has been discussed, understood, and followed by all parties.

To increase student confidentiality, the following measures will be taken:

- Data collected through the online portion of the collaboration sessions will be student identified with a computerized username. These name identifiers will be deleted and a student code (numbers and letters) will be applied.
- Data collected through the face-to-face portion of the collaboration sessions will be student identified by a student code (numbers and letters).

- Data collected through the writing prompt will be identified by a student code (numbers and letters).
- All identifiable documentation will be destroyed after the information is coded.
- Transcription of the audio segments will begin immediately after acquired. Transcripts will be coded without student names (student code of numbers and letters utilized).
- Audio segments will be destroyed after information has been transcribed.

In rare instances, authorized people may request to see research information about your child and other people in this study. This is done only to be sure that the research is done properly. We would only permit people who are authorized by organizations such as Northeastern University to see this information.

If my child does not want to take part in the study, what choices does he/she have?

Students wishing not to participate in the research portion of the study that is conducted during their regular Spanish class block (the small-group, learning-centered discussions) will be asked to complete silent reading during this time period.

Can my child stop his/her participation in this study?

Your child's participation in this research is completely voluntary. He/she does not have to participate if he/she does not want to. Even if he/she begins the study, he/she may quit at any time. This study poses no reflection to your child's Spanish grade. Therefore, there will be no penalty to the Spanish class grade if he/she does not participate or if he/she decides to quit.

Who can I contact if I have questions or problems?

Questions of the research study, building activities, or classroom activities may be directed to any of the following Dedham Public School staff members:

- Mrs. Cathleen Oravetz, 781-326-4773 x1150, email: coravetz@dedham.k12.ma.us
- Ms. Debra Gately, DMS Principal, 781-326-6900, email: dgately@dedham.k12.ma.us
- Mr. Christopher Nadeau, 781-326-6900, email: cnadeau@dedham.k12.ma.us
- Ms. Maureen Lothrop, 781-326-6900, email: mlothrop@dedham.k12.ma.us

Who can I contact about my child's rights as a participant?

If you have any questions about your rights as a participant, you may contact Nan C. Regina, Director, Human Subject Research Protection, 960 Renaissance Park, Northeastern University Boston, MA 02115 tel. 617-373-7570, email: irb@neu.edu. You may call anonymously if you wish.

Is there anything else I need to know?

The data, gathered by the researcher to complete her dissertation will be used to determine whether online student participation by Dedham Middle School students enhances student learning. The data will be formalized into a report and used to:

- Guide others on future middle school student studies.

- Determine the effectiveness of Web 2.0 tools (chats) in collaboration activities in a middle school environment.
- Determine if enhancements could be suggested in curriculum (advancement toward online activities) at Dedham Middle School.

I agree to take part in this research.

Signature of student agreeing to take part

Date

Printed name of person above

I agree to have my child take part in this research.

Signature of parent/guardian

Date

Printed name of person above

Signature of person who explained the study to the student above and obtained consent

Date

Printed name of person above

Appendix B

Document Guide for Film

This morning you have been gathered together to view the film “Under the Same Moon.”

This film will be presented to you in Spanish. English subtitles have been added for ease in understanding. You should remain seated during the entire film, and pay close attention to the characters, language, Spanish concepts, activities, along with the story outcome. We ask that all questions on the film are held until tomorrow’s group discussions. If you need to leave the film viewing for any reason, please raise your hand.

Now sit back, relax, and enjoy the film “Under the Same Moon.”

At the conclusion of the film:

During tomorrow’s regular class block, each of you will participate in a small-group, learning-centered discussion session in order to share your insight on the film. Prior to tomorrow’s class, take time to reflect on the two guiding questions: 1) Putting yourself in Carlitos’ shoes, would you have made an attempt to cross the U.S. border illegally, and in describing that decision do you believe it would have been a courageous or foolish undertaking? and 2) In weighing alternatives, what do you believe Carlitos would have gained by crossing the border and what would he have lost if he had stayed in Mexico with his extended family? You will be notified of your group assignment at the start of tomorrow’s class. Thank you.

Appendix C

Review of Student Consent (Small-Group, Learning-Centered Discussions)

Prior to the start of today's activities, I would like to review your option for participating in the study:

- Today you will be randomly assigned to discussion groups of four students and engage in a small-group, learning-centered discussion.
- You will be provided with two guiding questions pertaining to the film.
- Each group will be given no more than twenty minutes in either an online (chat) environment or a face-to-face environment to discuss the film.
- Your discussion will be either audio taped (face-to-face discussion) or archived (online).
- If you do not want to participate in today's activity you may choose to complete the alternative activity and participate in a silent reading activity.
- Is there anyone who does not want to take part in today's research study activity?

Appendix D

Document Guide for Online Small-Group, Learning-Centered Discussions

Today you will participate in a small-group, learning-centered discussion. Guided by two prompts, you are being asked to discuss the film “Under the Same Moon” using Blackboard’s chat feature. This session will be recorded, and the written transcript of this discussion will be used as part of the research process. Your group will have twenty minutes to discuss the prompts. If you believe you have finished the discussion prior to this time limit, type and submit “I am done discussing.” This session will be completed either once all members have finished discussing the prompts or twenty minutes have elapsed. The two discussion prompts, and the “I am done discussing” phrase have been printed on a card which you will find at your computer station. Discussions may begin as soon as I complete the reading of the prompts: 1) Putting yourself in Carlitos’ shoes, would you have made an attempt to cross the U.S. border illegally, and in describing that decision do you believe it would have been a courageous or foolish undertaking? and 2) In weighing alternatives, what do you believe Carlitos would have gained by crossing the border and what would he have loss if he had stayed in Mexico with his extended family? Time will now begin for your discussion group.

At the conclusion of the session:

We have reached the conclusion of the discussion period. Tomorrow you will be using the computer lab to type an answer to a writing prompt pertaining to the film and discussion session. Thank you for participating in this session.

Appendix E

Printed Card for Online Small-Group, Learning-Centered Discussions

Online Discussion Groups – Discussion Prompts:

- 1) *Putting yourself in Carlitos' shoes, would you have made an attempt to cross the U.S. border illegally, and in describing that decision do you believe it would have been a courageous or foolish undertaking?*
- 2) *In weighing alternatives, what do you believe Carlitos would have gained by crossing the border and what would he have lost if he had stayed in Mexico with his extended family?*

When you have finished discussing, type and submit the following: "I am done discussing."

Appendix F

Small-Group, Learning-Centered Discussion Prompts

Prompt #1	<i>Putting yourself in Carlitos' shoes, would you have made an attempt to cross the U.S. border illegally, and in describing that decision do you believe it would have been a courageous or foolish undertaking?</i>
Prompt #2	<i>In weighing alternatives, what do you believe Carlitos would have gained by crossing the border and what would he have lost if he had stayed in Mexico with his extended family?</i>
Finished Remark	"I am done discussing."

Appendix G

Document Guide for Face-to-Face Small-Group, Learning-Centered Discussions

Today you will take part in a small-group, learning-centered discussion. Guided by two prompts, you are being asked to discuss the film “Under the Same Moon.” This discussion will be audio taped as part of the research process. To best facilitate the discussions, you are asked to follow a few guidelines: 1) Speak clearly so that the audio taping will be completed appropriately, and 2) Only one student should speak at a time. To begin this process, please take a moment now to individually recite the follow message: “Hello. My name is _____. I am a member of the 8th grade Spanish class.” Your group will have twenty minutes to discuss two prompts. If you believe you have finished the discussion prior to this time limit, say “I am done discussing.” This session will be completed either once all members have finished discussing or twenty minutes have elapsed. The two discussion prompts, and the “I am done discussing” phrase have been printed on a card, which you will find on the table in front of you. Discussion may begin as soon as I read the following prompts: 1) Putting yourself in Carlitos’ shoes, would you have made an attempt to cross the U.S. border illegally, and in describing that decision do you believe it would have been a courageous or foolish undertaking? and 2) In weighing alternatives, what do you believe Carlitos would have gained by crossing the border and what would he have loss if he had stayed in Mexico with his extended family? Time will now begin for your discussion group.

At the end of the session, the facilitator will read the following:

We have reached the conclusion of the discussion period. Tomorrow you will be using the computer lab to type an answer to a writing prompt pertaining to the film and discussion session. Thank you for participating in this session.

Appendix H

Printed Card for Face-to-Face Small-Group, Learning-Centered Discussions

Face-to-Face Discussion Groups – Discussion Prompts:

- 1) *Putting yourself in Carlitos' shoes, would you have made an attempt to cross the U.S. border illegally, and in describing that decision do you believe it would have been a courageous or foolish undertaking?*
- 2) *In weighing alternatives, what do you believe Carlitos would have gained by crossing the border and what would he have lost if he had stayed in Mexico with his extended family?*

When you have finished discussing, say: "I am done discussing."

Appendix I

Open-Response Prompt Document Guide

Today you will have an opportunity to share your viewpoints of the film “Under the Same Moon” and the group discussions that occurred yesterday in class. Step 1: Please log in to the network. Step 2: Enter Blackboard and access the Spanish course. Step 3: Access the last navigation button which reflects the words “Prompt.” Step 4: Open the file entitled “Open Response Writing Prompt.” This document contains your prompt. You will have twenty minutes in which to provide a response. Begin your typing under the prompt so that you may refer to the prompt during the process. When you have completed your answer, please print one copy and hand it to one of the facilitators who will add a student identifier code to your hard copy. Do not type your name on the document. Do not save the document. Time begins when I have finished reading the prompt: “Using supporting details from the film and group discussion make a case to either support immigration into the United States or to deny entrance by undocumented immigrants into our country.”

At the conclusion of the twenty-minute period, the following will be read by a facilitator:

This concludes the open-response writing prompt portion of the study. If you have not printed your answer, please do so now. Be sure to remove it from the printer and hand it to one of the facilitators so that your student identifier code may be placed on the document. Thank you for participating in this segment of the study. In the next few days several of you will be asked to participate in a focus group pertaining to your thoughts on participation and student learning. You will be contacted if you will be partaking in the focus group activity.

Appendix J

Review of Student Consent (Focus Groups)

Prior to the start of today's activities, I would like to review your option for participating in the study:

- Today you are being asked to participate in a focus group.
- This small group of students (approximately six-members) will discuss their experiences in either the online or face-to-face discussion groups as well as their evaluated writing prompt.
- The focus groups include students from each section of Mr. Nadeau's or Ms. Lothrop's classes.
- If you do not want to participate in today's activity you may choose be removed from the group and return to class.
- Is there anyone who does not want to take part in today's research study activity?

Appendix K

Focus Group Interview Guide for Students

1. Do you feel you worked well together as a group to discuss the prompts?
2. During the discussions, did you actively participate (ask questions or provide comments to others)? If not, why?
3. Do you believe you learned anything about immigration as a result of your group's discussions? If yes, can you provide an example?
4. Did having the discussions help you to write the open response answer?
5. If you had a choice, would you rather be in a discussion group of all girls, all boys, or two boys and two girls? Why? Do you think the groups would provide a different amount or type of discussion? Why?

Appendix L

Focus Group Interview Guide for the Investigator

1. Do you feel you worked well together as a group to discuss the prompts?
2. During the discussions, did you actively participate (ask questions or provide comments to others)? If not, why?
3. Do you believe you learned anything about immigration as a result of your group's discussions? If yes, can you provide an example?
4. Did having the discussions help you to write the open response answer?
5. If you had a choice, would you rather be in a discussion group of all girls, all boys, or two boys and two girls? Why? Do you think the groups would provide a different amount or type of discussion? Why?
6. Why do you think some group members talked a lot while other group members spoke only once or twice?
7. *Online group:* Did you find it difficult to stay on task while online? If so, why?
8. *Online group:* In what ways did you find it easier or more difficult to participate in the online environment? Please explain.
9. *Face-to-face group:* would you have rather discussed the prompts online? If so, why?
10. *Online group:* would you have rather discussed the prompts face to face? If so, why?
11. Data taken from the study shows those participating in the online chat discussed more. Why do you think this is the case?
12. *Online group:* Did you typing skills hamper your ability to participate during your discussions?

13. Data taken from the study shows males participated more when online than in a face-to-face setting? Why do you think this may be true?
14. Students discussing online seemed to go off task more often than those discussing face-to-face. Why do you think this may be true?
15. Would you like it if all discussions in 8th grade classes were conducted online? Why or why not?

Appendix M

Disallowed Remarks

Remark	Examples
Typed emoticons	:) and :D
Typed symbols holding no meaning	=== and ...
Typed abbreviations relating to verbal emoticons	ha ha and lol
Typed redundant words during the online discussions	The word “and” typed repeatedly on separate turn lines

Appendix N

Chat Abbreviations Used During Discussions

Abbreviation	Meaning
bc	Because
btw	By the way
cabeza	Spanish for “head”
cux	Because
dwai	Don’t worry about it
IDK	I don’t know
IDKK	I don’t know
ik	I know
IKR	I know right
kay	Okay
lol	Laugh out loud
mah b	Maybe
nvm	Don’t worry about it; forget it
OMG	Oh my God
PPL	People
w/e	Whatever

Appendix O

Rubric for Open-Response Prompt

Points Assigned:	4	3	2	1
Effort to make a case to support immigration or to deny access by undocumented immigrants to the United States	Student states a case with three or more supporting details to support or denying immigration	Student states a case with two supporting details to support or denying immigration	Student states a case with one supporting detail to support or denying immigration	Student does not make a case to support or deny immigration.
Direct reference to the film impacting student's case (argument to support or deny access to the United States by undocumented immigrants)	Student made three or more direct references to the film to support the case.	Student made two direct references to the film to support the case.	Student made one direct reference to the film to support the case.	No direct reference to the film was made by the student to support the case.
Direct reference to the small-group, learning-centered discussions impacting student's case (argument to support or deny access to the United States by undocumented immigrants)	Student made three or more direct references to the small-group, learning-centered discussions to support the case.	Student made two direct references to the small-group, learning-centered discussions to support the case.	Student made one direct reference to the small-group, learning-centered discussions to support the case.	No direct reference to the small-group, learning-centered discussion was made by the student to support the case.
Indirect reference to the film or small-group, learning-centered discussions impacting student's case (argument to support or deny access to the United States by undocumented immigrants)	Student made three or more indirect references to the film or small-group, learning-centered discussions to support the case.	Student made two indirect references to the film or small-group, learning-centered discussions to support the case.	Student made one indirect reference to the film or small-group, learning-centered discussions to support the case.	No indirect reference to the film or small-group, learning-centered discussion was made by the student in their argument.

Quality and coherence of the argument as relating to the prompt	Student demonstrated a excellent level of understanding of the issue of immigration (provide evidence of both sides of the issue).	Student demonstrated a good level of understanding of the issue of immigration (provide evidence for one side of the issue).	Student demonstrated a poor level of understanding of the issue of immigration (unclear evidence of the issue).	Student demonstrated no understanding of the issue of immigration (provided no evidence of the issue).
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Appendix P

On-Task Comments

Code	Definition
Affirming	To agree, confirm, or ratify a comment previously stated by a peer. If both affirming and opposing viewpoints have been stated prior, the coders should seek to follow the natural discussion of the participants and not specifically the threaded order of the discourse typed appearance. The initial statement made by the online participants should be treated as an opening argument; therefore, affirming should not apply unless specifically supporting a previously-typed comment.
Opposing	To disagree, speak against, or take a stand contrary to a direct comment previously made by a peer. If both affirming and opposing viewpoints have been stated prior, the coders should seek to follow the natural discussion of the participants and not specifically the threaded order of the discourse typed appearance. The initial statement made by the online participants should be treated as an opening argument; therefore, opposing should not apply unless specifically rebutting a previously-typed comment.
Correcting	To set or make true, accurate, or right; to point out or mark the errors in a factual remark; to denote the attempted correction of an incorrectly-spelled typed response. Note: correcting does not apply to a difference of one's opinion or further explanation of a peer's statement; it also does not apply to a spelling correction of a word/phrase that is not related to the discussion.
Questioning	To discuss with others, in more detail, a statement of inquiry about the discussion prompt.
Management	To organize the participants in order to assist the flow of discussion.
New Information	An opinion or factual remark made to advance or support the discussion.
Answering	The Answering definition is as follows: a direct response to a participant who has made an inquiry to the group during discussions.

Note: an Off Task Comment is defined as having no connection to the discussion prompts.