



Western Connecticut State University
WestCollections: digitalcommons@wcsu

Education Dissertations

Department of Education & Educational
Psychology

Spring 5-2016

EFFECTS OF THE QUESTION FORMULATION TECHNIQUE ON SECONDARY STUDENTS' ARGUMENT WRITING ACHIEVEMENT SCORES

Mary T. Fernand

Western Connecticut State University, fernandm@bethel.k12.ct.us

Follow this and additional works at: <https://repository.wcsu.edu/educationdis>



Part of the [Secondary Education Commons](#)

Recommended Citation

Fernand, Mary T., "EFFECTS OF THE QUESTION FORMULATION TECHNIQUE ON SECONDARY STUDENTS' ARGUMENT WRITING ACHIEVEMENT SCORES" (2016). *Education Dissertations*. 20.
<https://repository.wcsu.edu/educationdis/20>

This Dissertation is brought to you via free, open access by the Department of Education & Educational Psychology and by WestCollections: digitalcommons@wcsu, the institutional repository of Western Connecticut State University. It has been accepted for inclusion in Education Dissertations by an authorized administrator of WestCollections: digitalcommons@wcsu. For more information, please contact ir@wcsu.edu.

EFFECTS OF THE QUESTION
FORMULATION TECHNIQUE ON SECONDARY STUDENTS'
ARGUMENT WRITING ACHIEVEMENT SCORES

Mary T. Fernand

M.S., Leadership and Strategic Management, Manhattanville College, 2006

B.S., Secondary Education/English, Western Connecticut State University, 1988

B.A., Communication/Media Arts, Western Connecticut State University, 1986

A Dissertation

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Doctor of Education and Education Psychology

at

Western Connecticut State University

2016

EFFECTS OF THE QUESTION
FORMULATION TECHNIQUE ON SECONDARY STUDENTS'
ARGUMENT WRITING ACHIEVEMENT SCORES

Mary T. Fernand, Ed.D.

Western Connecticut State University

Abstract

The purpose of this study was to investigate the effect of the Question Formulation Technique (QFT) and gender on secondary students' argument writing achievement scores. The study was conducted at a secondary school in one suburban Northeastern school district over a 10-week period from March to June 2015. The sample of convenience included male and female students of various abilities ($n = 175$) and English teachers ($n = 4$) from Grades 9 and 10. A quasi-experimental design was used, with a pretest-posttest comparison group structure. Fourteen intact classes were randomly assigned to either a comparison group that used a traditional writing program or a treatment group that used the writing program with the Question Formulation Technique embedded within it. Instruction on the QFT was provided to teachers assigned to the treatment group and offered to other teachers when the study was completed.

The pretest-posttest examination consisted of student written arguments scored via an established writing rubric. Calibration of the instrument was conducted prior to the scoring. Independent scoring of student work was conducted to ensure interrater reliability. Data were disaggregated by gender and treatment level to analyze the effects of the treatment. Consequently, a two-way analysis of covariance (ANCOVA) was conducted to determine if

an interaction effect existed among the variables. The writing achievement pretest scores were used as the covariate and the writing achievement posttest scores were the dependent variable. Teachers maintained program implementation logs. Classes were also videotaped at the start and during the study to monitor the fidelity of the treatment. The results of the ANCOVA analysis indicated a significant main effect for Type of Writing Instruction Program, $F(1, 164) = 23.80, p = .000$, partial $\eta^2 = .127$, small, with the treatment group performing at a higher level than the comparison group. There was no significant effect for Gender, $F(1, 164) = .973, p = .325$, partial $\eta^2 = .006$. There was no significant interaction for Gender and Type of Writing Instruction Program, $F(1, 164) = 2.06, p = .153$, partial $\eta^2 = .012$. The findings indicated that using the Question Formulation Technique in conjunction with the Process Writing Approach Instructional Program did positively affect secondary students' argument writing achievement scores. Students in the treatment group tended to score higher results for argument writing achievement than their counterparts in the comparison group. Implications for educators and researchers are discussed.

Copyright by

Mary T. Fernand, EdD

2016

iii

APPROVAL PAGE



*School of Professional Studies
Department of Education and Educational Psychology
Doctor of Education in Instructional Leadership*

Doctor of Education Dissertation

EFFECTS OF THE QUESTION FORMULATION TECHNIQUE ON SECONDARY
STUDENTS' ARGUMENT WRITING ACHIEVEMENT SCORES

Presented by

Mary T. Fernand, Ed.D.

<u>Karen Burke, CSJ, EdD</u> Primary Advisor	<u><i>Karen Burke</i></u> Signature	<u>5/2/16</u> Date
<u>Jessica Galbraith, EdD</u> Secondary Advisor Committee Member	<u><i>JG</i></u> Signature	<u>4/2/16</u> Date
<u>Janice Jordan, PhD</u> Secondary Advisor Committee Member	<u><i>Janice M. Jordan Ph.D.</i></u> Signature	<u>4/2/16</u> Date

2016

ACKNOWLEDGEMENTS

How lucky am I to be surrounded by people who only want the best for me. Simply saying, “Thank you,” belies the tremendous gratitude I have for the love, support, and mentorship that so many have given me. Their strength has empowered and emboldened me to embark on this 5-year journey.

My committee was my very own *All-Star* team. My primary advisor, Dr. Karen Burke, somehow found a way to not only save me from falling into the *review of literature* abyss, but also gave me the confidence to do a quantitative study. She guided, chided, and provided as needed. Her guidance was instrumental, helping me to see my way through the whole process. *Thank you* seems a paltry return for all that you have done, but truly I am grateful.

My secondary advisors, Dr. Janice Jordan and Dr. Jessica Galbraith, and my reader, Dr. Reine Issa, completed my dream team. MacArthur could have learned a few things from you, Dr. Jordan, about how to mobilize people to action. You gave me the support I needed to get started on this journey and the support was unconditional. You have blazed a trail for so many of us. Dr. Jessica Galbraith knows all too well what it means to take this journey. You were my North Star, guiding me along the way. Your words of support have not gone unappreciated, nor has the loan of your books, the lending of your ear, and the picking of your brain. Dr. Reine Issa has held my hand a time or two, especially when it came to confirming I was reading my findings correctly. Your patience with my questions and shoulder of support meant so much to me. How lucky I am to call you friends. What could two words say that would be enough to let you know how much I appreciate all you have done? Thank you cannot suffice, but it must do.

Dr. Marcia Delcourt, you have built a program of which to be proud. When I first started, I did not know the difference between mean, medium, and mode, yet here I am writing about ANCOVAs and covariates. The passion you have for what you do is inspiring. It is second only to your commitment to the program and the people in it. Dr. Nancy Heilbronner and Dr. Jane Gangi have also contributed to the quality education I have received. It is from Dr. Gangi that I first learned of Rhizomatic Learning and so many other things. I have learned from the very best. Thank you. Thank you. Thank you.

Many thanks also go to the members of Cohort 5. This group of dedicated educators has reminded me why it is I became a teacher. When I struggled, they were there to help me out. They were also there to help celebrate the milestones. Spending Wednesdays together over the past five years have led to so many wonderful memories, including literally and metaphorically making our way out of the cave. It is so good to be in the sun again as this journey nears its end.

Thank you as well to those who enabled me to do this study: the superintendent, principal, teachers, and students who all agreed to support the study's implementation. Your contributions are greatly appreciated.

To my co-workers, especially the members of the English Department: Katie, Lauren, Mattea, Greg, Kyle, Kristen D., Kristen R., Alex, Wendy, and Sue. Here, too, *thank you* cannot convey the depth of my appreciation. I am grateful, humbled, and proud to work with each of you. I am grateful as well to Dr. Patricia Cosentino, mentor extraordinaire.

I have been working on a dream and you have all helped to make it real.

DEDICATION

“I will arise and go now....” So begins W.B. Yeats’ beautiful poem, “The Lake Isle of Innisfree.” Just like the narrator of his poem, I, too, shall arise and go, not to a lake or an isle, but into the arms of my family, for they are my refuge. When I am in chaos, they bring me peace. When I am overwhelmed, they lighten my load. When I am lost, they help me find my way back. It is to them that I dedicate this work.

To my parents, Barry and Mary Cummins, you have given me the very best of yourselves. The sacrifices you have made on my behalf would overwhelm me but they were made with the deepest of love and faith in me. With such love, how can I not but dare to dream.

To my sisters, Patty and Linda, you have given me the gifts of home perms and mixed CDs. You have also given me the gift of seeing you grow into beautifully bold and fabulously fierce females. It is my good fortune to have a sister who is good at math and another who is good at writing. It is even better that when I cry, “Help!” you come running. So, “Stay gold, Ponyboy. Stay gold” (Hinton, 1967, p. 148).

To my children, Ryan and Kelly, you have given me the motivation to do things I never would have attempted otherwise. Your love has made me fearless. Thanks for the cups of cocoa, pats of encouragement, and for doing the laundry. I am so incredibly proud of you both and know your futures are filled with promise. Thank you for always reminding me, “I win!”

To my husband, Greg, from the moment I first said, “Honey, I’ve been thinking...,” you have never had a moment’s hesitation in supporting me through this entire experience. No matter if that tuition check could have taken us on a nice vacation. No matter if that

meant we had to decline a social invitation. No matter if that meant you had to carry a good portion of the household chores. Your response was always, “You *can* do this.”

So as I arise and step away from the keyboard after putting the finishing touches on this dissertation, I feel your loving spirits all around me. Lifting me up. Always.

Table of Contents

	Page
Abstract	i
Table of Contents	Ix
Chapter One: Introduction and Identification of the Topic	1
Rationale for Selecting the Topic	1
Statement of the Problem	4
Potential Benefits of Research	7
Definition of Key Terms	7
Research Questions and Hypothesis	9
Summary	10
Chapter Two: Review of the Literature	11
Rhizomatic Learning	12
Gradual Release of Responsibility	14
Writing Instruction Practices	17
Writing-to-Learn	19
Process Writing Approach	24
Student Generated Questions	25
Dialogic Teaching	36
Gender in Writing	39
Summary	41
Chapter Three: Methodology	43

Research Questions and Hypothesis	43
Research Design	44
Description of the Setting and Participants	45
Setting	45
Participants	46
Teacher Participants	46
Student Participants	49
Description of the Intervention	52
Description of the Modified Writing Curriculum – Treatment	53
Professional Development	54
Question Formulation Technique (QFT)	58
Instructional Time	61
Description of the Traditional Writing Curriculum – Comparison	63
Instructional Time	64
Gradual Release of Responsibility Model	64
Writing Instruction Focus	65
Monitoring of Implementation of the Modified and Traditional Writing Curricula	66
Instrumentation	66
Student and Teacher Demographic Surveys	66
Teacher Writing Curriculum Implementation Logs	67
Writing Rubric	67
Description and Justification of the Analyses	70

Data Collection Procedures and Timeline	71
Ethics Statement	74
Chapter Four: Analysis of Data	75
Research Questions and Hypotheses	75
Description of the Data	76
Data Coding and Entry	77
Data Screening Process	80
Demographic Results	81
Data Analysis	82
Pretest Data Analysis	82
Analysis of Outliers	83
Testing Assumptions	86
Normality	86
Linearity	87
Homoscedasticity	87
Independence of Samples	87
Descriptive Statistics for the Pretest	87
Pretest Data Analysis and Results	88
Posttest Data Analysis	90
Analysis of Outliers	91
Testing Assumptions	91
Normality	92
Linearity	92

Homogeneity of Variance	92
Independence of Samples	92
Homogeneity-of-Slopes	93
Descriptive Statistics for the Posttest	93
Posttest Data Analysis and Results	94
Findings from Teacher Logs	95
Treatment Group	96
Comparison Group	99
Findings from Videos	100
Treatment Group	100
Comparison Group	101
Summary	101
Chapter Five: Summary and Conclusions	103
Overview of the Study	103
Research Questions and Hypothesis	104
Procedures	105
Findings for the Research Question	106
Comparison and Contrast of Findings Related to the Literature Review	107
Implications for Educators	111
Suggestions for Further Research	115
Limitations of the Study	119
Internal Validity	119
Subject Selection	119

History	119
Maturation	120
Testing	120
Instrumentation	120
Compensatory Rivalry by the Comparison Group	121
Resentful Demoralization by the Comparison Group	122
External Validity	122
Population Validity	122
Ecological Validity	122
Experimenter Effect	122
Summary	123
Conclusion	125
References	127

List of Appendices

	Page
Appendix A: Institutional Review Board (IRB) Submission and Permission	143
Appendix B: Letter and Consent Form (Superintendent)	153
Appendix C: Letter and Consent Form (Principal)	156
Appendix D: Letter and Consent Form (Teacher)	159
Appendix E: Demographic Survey (Teacher)	162
Appendix F: Letter and Consent Form (Parent)	165
Appendix G: Letter and Assent Form (Student)	168
Appendix H: Demographic Survey (Student)	171
Appendix I: School-Created Writing Rubric	174
Appendix J: Treatment Teacher Workshop Outline	177
Appendix K: Writing Prompts	180
Appendix L: Implementation Timeline for Intervention Period	182
Appendix M: Sample Teacher Writing Curriculum Implementation Log - Treatment	184
Appendix N: Sample Student Argument Writing Scores Collection <i>Excel</i> Spreadsheet	186
Appendix O: Question Formulation Technique Support Materials (Student)	188
Appendix P: Sample Treatment Student Generated Questions	191
Appendix Q: Sample Teacher Writing Curriculum Implementation Log – Comparison	194
Appendix R: Writing Handouts for Students	196

List of Tables

	Page
Table 1: Description of Quasi-experimental Pretest-Posttest Comparison Group Research Design	45
Table 2: Student Population Ethnicities for District and Participating High School (CSDE, 2013)	46
Table 3: Demographic Characteristics of Participating Teachers	49
Table 4: Treatment and Comparison Student Participation	51
Table 5: Demographic Breakdown of Gender for Student Participants	52
Table 6: SPSS Codebook of Student Demographic Variables	78
Table 7: SPSS Codebook of Pretest and Posttest Computed Variables	80
Table 8: Gender of Student Participants in Treatment and Comparison Groups	82
Table 9: Skewness and Kurtosis Values for Pretest Argument Writing Achievement	85
Table 10: Descriptive statistics for Pretest Argument Writing Achievement	88
Table 11: Two-way ANOVA Results for Mean Pretest Scores for Argument Writing Achievement	90
Table 12: Skewness and Kurtosis Values for Posttest Argument Writing Achievement	91
Table 13: Descriptive Statistics for Posttest Argument Writing Achievement	94
Table 14: ANCOVA Results for Mean Posttest Scores for Argument Writing Achievement	95

Table 15: Comparison and Contrast of Findings	109
Table 16: Suggestions for Future Research	116

List of Figures

	Page
Figure 1: Box and Whiskers Plot for Program Type Pretest Following Removal of Outliers	86

CHAPTER ONE: INTRODUCTION AND IDENTIFICATION OF THE TOPIC

Writing is an essential skill. However, it is a skill that many American students have not yet mastered. Even so, the new demands of the Common Core Standards (CCS) expect students to become proficient at a very challenging type of writing: argumentation. The demands of argument writing cannot be addressed by simply adhering to a model. Instead, it requires a different kind of practice, one that prioritizes social discourse, inquiry, and dialogic collaborative reasoning experiences. This type of practice is promoted by the Question Formulation Technique (QFT), which guides teachers in the instruction of question development for students.

If, indeed, *everything is an argument*, developing the skills to recognize and apply rhetoric is critical. Key to this ability is the art of questioning, whether it is questioning an author's intent or developing one's own judgment on a topic, or even knowing what questions to ask. The Question Formulation Technique provides a process for teaching questioning skills. Traditionally, the art of questioning lay in the hands of teachers, without much explicit instruction on how to develop higher order thinking questions for students. Thus, students quite often work to answer questions designed by another. However, when students explore the answers to the questions they themselves have created, they sharpen their inquiry skills and define rhetorical goals.

Rationale for Selecting the Topic

In their 2007 report, the National Commission on Writing contended, "If students are to make knowledge their own, they must struggle with the details, wrestle with the facts, and rework raw information and dimly understood concepts into language they can communicate to someone else" (Graham & Perin, 2007b, p. 2). In other words, "if students are to learn,

they must write” (Graham & Perin, 2007, p. 2). Such a declaration emphasized a state of urgency upheld in recent curricular reform, particularly embodied by the Common Core Standards.

A key component of the Common Core Standards for English Language Arts for Grades 6-12 is the focus on argumentative writing, in which students “write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence” (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010a). The document itemizes the elements needed to *develop an argument*, including (a) the analysis and evaluation of content knowledge, (b) the writer’s development of a position, and (c) the presentation of that position in a coherent manner (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010a). Yet, despite such clarity in expectations, teachers and students struggle with embracing argumentation (Johnson & Johnson, 2009). This could be for several reasons, including the primary mode of instruction in English Language Arts (ELA).

While discussion may be the dominant mode of teaching literature in American high schools, consistently engaging and challenging discourse is not (Reznitskaya & Gregory, 2013; Tharp & Gallimore, 1988). Too often the pattern consists of teachers doing most of the talking—asking questions; commenting, rephrasing, or elaborating upon student responses; and even answering the question themselves if students do not respond quickly enough (Cazden, 1988). Such a pattern limits the exploration of ideas, which is necessary for the development of deeper understanding. As Gillespie (2010) reminded readers:

Throughout our schooling and life, we will encounter plenty of people who are willing to interpret the world for us and tell us with great certainty what things mean.

If we have exposure to multiple critical viewpoints, we are armed with knowledge against others who might presume to tell us what to think about what we read. If someone in authority tries to impose an interpretation or idea on us in a dogmatic way, we can intelligently challenge and resist that single-mindedness if we understand the many possible ways to read a text or a situation. (p. 13)

Consequently, in their policy brief on adolescent literacy, the National Council of Teachers of English (2007) recommended, “teaching with approaches that foster critical thinking, questioning, student decision-making, and independent learning” (p. 6). To further such efforts, teachers must embrace practices that:

follow a progression in which teachers gradually do less of the work and students gradually assume increased responsibility for their learning. It is through this process of gradually assuming more and more responsibility for their learning that students become competent, independent learners. (Graves & Fitzgerald, 2003, p. 98)

A key phase to this process, as outlined in Fisher and Frey’s (2014) Gradual Release of Responsibility model, is “Students learning through collaboration with their peers—the *you do it together* phase” (p. 3). Since argument implies a social practice (an idea is put forth to which one responds), students may acquire “argumentative literary practices through active participation in dialogic interactions (Newell, Beach, Smith, VanDerHedie, Kuhn, & Andriessen, 2011, p. 292).

One way to achieve this is through questioning. “The use of questioning provides an opportunity for students to engage in a process that will promote thinking, productive learning, and content retention, if done in such a manner as to stir thought processes and

stimulate the imagination” (Smith, Rook, & Smith, 2007, p. 44). Wagner (2008) emphasized the need to develop skills in quality question generation:

The habit of asking good questions was most frequently mentioned as an essential component of critical-thinking and problem-solving skills. It turns out that asking good questions, critical thinking, and problem solving go hand-in-hand in the minds of most employers and business consultants and taken together they represent the *first survival skill* of the new global *knowledge economy*. Equally important, they are the skills that our kids need in order to participate effectively in our democracy. (p. 15)

A partnership between teaching students to craft higher order thinking questions and furthering their critical thinking may lead to deepening of understanding so that they might craft more effective arguments—ones that reflect their voices, and not someone else’s.

The adaptable process of the Question Formulation Technique promotes students’ ability to not only craft their own questions, but to strategize how to use them: “The process manages to develop students’ divergent (brainstorming), convergent (categorizing and prioritizing), and metacognitive (reflective thinking abilities) thinking in a very short time” (Rotherstein & Santana, 2011, p. 1). The process consists of a series of steps: (a) teachers design a question focus, (b) students produce questions, (c) students improve their questions, (d) students prioritize their questions, (e) students and teachers decide on next steps, and (f) students reflect on what they have learned (Rotherstein & Santana, 2011). The process can be used at different points in a unit and with all ages of students.

Statement of the Problem

The National Assessment of Educational Progress (NAEP) Writing Report Card shows a decline in student skillfulness in terms of writing argument essays, with 31% of

twelfth grade students being rated as *skillful* in 2003, as opposed to 27% just four years later (Ferretti & Lewis, 2013, p. 114). Argument writing is challenging. Not only do students evaluate, anticipate, and address opposing perspectives, they also need to link new concepts with familiar ones, synthesize information, and explore relations and implications, all while adhering to the traits of effective writing. They do this to strengthen their conceptual frameworks (Bangert-Drowns, Hurley, & Wilkinson, 2004). However, according to Ferretti, Lewis, and Andrews-Weckerly (2009), students are not “crafting convincing arguments” (p. 577). This is repeatedly seen in the results of assessments conducted at state and national levels.

As recently as 2011, the State of Connecticut used the Connecticut Academic Performance Test (CAPT) to assess Grade 10 students in a variety of areas, including writing. As delineated in the CAPT technical report (Hendrawan & Wibowo, 2011), there are five levels of performance for measuring student achievement on the CAPT Interdisciplinary writing task: (a) below basic, (b) basic, (c) proficient, (d) goal, and (e) advanced.

A review of this previously used State assessment (2006-2011) reveals that approximately 39% of tenth grade students in Connecticut public schools were not performing at the *at or above goal* category for the final year the test occurred (Connecticut State Department of Education [CSDE], 2012). A closer look reveals tenth grade girls consistently outperformed boys at both the *at or above goal* range and *at or above proficient* range for writing. Data from 2006-2012 CAPT testing indicate the ranges of the gaps. While 61.69% - 69.9% of females scored in the *at or above* category, their Grade 10 male counterparts' scores ranged from 44.3% - 52.9%; this gender achievement gap was more

escalated in the *at or above proficiency* category in which girls (87.85% - 92.9%) outscored boys (76.8% - 84.3%); (CSDE, 2012). Similar findings are evident in Vermont's New England Common Assessment Program (NECAP). Results from the 2013 assessment showed 18% more eleventh grade girls achieving writing proficiency or higher as compared to boys (Vermont Agency of Education, 2015). Underscoring what is seen at the state level are the scores on the 2011 NAEP: 29% of the girls earned a *proficient rating* compared to only 19% of the boys. In the *below basic category*, the gender gap is even more pronounced with 28% boys compared to 14% girls earning this level (National Center for Education Statistics [NCES], 2012). Even so, more than 70% of the students, regardless of gender, are not performing at the proficiency rate. Such performances are mirrored in the (pre-2016) Scholastic Aptitude Test (SAT). Overall, writing scores have continued to drop from a high of 497 in 2007 to a low of 484 in 2015, with the average total writing score for males being 478 and females, 490 (College Board, 2015). Meanwhile, the average American College Testing (ACT) Writing scores for graduating class 2012 students in Connecticut and at the national level had the following score breakdown: males averaged 8.0 in the State of Connecticut and 6.8 nationally; correspondingly females earned an 8.3 at the state level and 7.2 at the national level on a 12-point scale (American College Testing, 2012).

While females as a group may be outperforming males on standardized tests, they, too, have room for growth. Less than 30% of all students scored at the proficient level or higher on the NAEP. In fact, many students continue to perform at only the basic levels of writing proficiency (National Center for Education Statistics, 2012). It is not just one-sided. However, it is possible, that due to stronger performances than their male peers, females might show incremental improvements at a lower level since they have less room to grow.

Nevertheless, neither gender is consistently performing at a mastery level. Consequently, research is underway to address this ongoing trend.

Potential Benefits of the Research

Writing remains an essential skill for students to possess, particularly with the increasing demands established by the CCS. Teachers continue to seek resources and strategies to add to their current repertoire of how to prepare students to become more proficient. The Question Formulation Technique may be a purposeful addition to their writing instruction. As such, a district's professional development committee may consider offering all teachers training on the QFT technique. This may also contribute to fostering classroom environments that promote student choice and a sense of self-efficacy, thereby potentially encouraging student engagement, a necessity if student writing is to improve. An element that defines the Question Formulation Technique is its flexibility. Since it is applicable to a variety of genres, disciplines, and situations, teachers may use the QFT to support student writing skill development in multiple formats.

Definition of Key Terms

The following are terms and definitions that are important to the interpretation of this study.

1. *Argumentation* is “a verbal and social activity of reason aimed at increasing (or decreasing) the acceptability of a controversial standpoint for the listener or reader, by putting forward a constellation of propositions intended to justify (or refute) the standpoint before a rational judge” (Ferretti & Lewis, 2013, p. 115).

2. *Argumentative Writing*: “is a genre of writing that requires the student to investigate a topic; collect, generate, and evaluate evidence; and establish a position on the topic in a concise manner” (Baker, Brizee, & Angeli, 2013).
3. *Common Core Standards* are a set of academic standards, adopted by individual states, which define the knowledge and skills students should demonstrate proficiency with throughout their K-12 education careers. They were designed so that students are college and career ready when they graduate from high school (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010b).
4. *Convergent thinking* “is the ability to analyze and synthesize information and ideas while moving toward an answer or conclusion” (Rotherstein & Santana, 2012, p. 16).
5. *Dialogic Teaching* “is a pedagogical approach that involves students in the collaborative construction of meaning and is characterized by shared control over key aspects of classroom discourse” (Reznitskaya & Gregory, 2013, p. 114).
6. *Divergent thinking* is the ability to “generate a wide range of ideas and think broadly and creatively” (Rotherstein & Santana, 2012, p. 16).
7. *Gender Gap* is a “measure of the difference between male and female outcomes...which is calculated by subtracting the mean scale score of boys from the mean scale score of girls on a specific grade-level subject assessment” (Louie & Ehrlick, 2008, p. 2).
8. *Metacognition* is “the ability to think about one’s own thinking and learning” (Rotherstein & Santana, 2012, p. 16).

9. *Question Formulation Technique (QFT)* is a “step-by-step process designed to facilitate the asking of many questions...it takes students through a rigorous process in which they think more deeply about their questions, refine them, and prioritize their use. As the students go through the steps of the QFT, they practice, in addition to question formulation, three fundamentally important thinking abilities: divergent thinking, convergent thinking, and metacognition” (Rotherstein & Santana, 2012, p. 15).

Research Question and Hypothesis

This study will explore the following research question (RQ) and test the non-directional hypothesis:

RQ: Is there a significant difference in Argument Writing Achievement between secondary school (Grades 9 and 10) male and female students who participate in a modified writing curriculum embedded with the Question Formulation Technique (treatment) and those participating in a traditional writing curriculum (comparison)?

- a. Is there a significant difference in Argument Writing Achievement between secondary school students who participate in a modified writing curriculum with the Question Formulation Technique embedded (treatment) and those who participate in a traditional writing program without the embedded Question Formulation Technique (comparison)?
- b. Is there a significant difference in Argument Writing Achievement between secondary school male and female students?

- c. Is there a significant interaction between writing instructional program and gender?

Non-directional hypothesis: There is a significant difference in Argument Writing Achievement between secondary school (Grades 9 and 10) male and female students who participate in a modified writing curriculum embedded with the Question Formulation Technique and those participating in a traditional writing curriculum.

Summary

Several indicators suggest that secondary students in the United States continue to struggle with demonstrating writing proficiency, particularly with argument writing, a situation exacerbated when one looks at the gap in gender achievement in writing at both the state and national levels, in which males consistently lag behind females. One potential opportunity to rectify this situation may lie in shifting the generation of questions primarily from the teacher to the student and in encouraging multiple opportunities for dialogic collaborative reasoning experiences, which is what the Question Formulation Technique provides. The aims of the current research are therefore to determine: (a) whether the Question Formulation Technique may improve secondary students' argumentative writing achievement scores; and (b) what role gender and type of program may play in students' argumentative writing achievement scores.

CHAPTER TWO: REVIEW OF THE LITERATURE

For the purpose of this research, literature was reviewed in the areas of Rhizomatic Learning, the Gradual Release of Responsibility model, writing instruction practice, writing-to-learn, the writing process approach, student-generated questioning, dialogic teaching, and gaps in gender achievement in writing. Academic databases used included EBSCO Host, ERIC, and ProQuest. Searches were made on Google Scholar as well. A variety of terms were used to extend the searches including: (a) Rhizomatic Learning, (b) dialogic collaboration, (c) writing process approach, (d) writing instruction, (e) gender achievement gaps in writing, (f) question formulation technique, (g) student generated questions, (h) inquiry, and (i) gradual release of responsibility.

The progression to student-centered learning environments continues to evolve. Driving this progression are theories about how people learn, and particularly, the role of the learner as an active constructor of knowledge. Rhizomatic learning (Deleuze & Guattari, 1987) and the Gradual Release of Responsibility (Graves & Fitzgerald, 2003; Fisher & Frey, 2014) support this transition. Inherent to both is the need to shift the cognitive load from teacher to student. One area this is applicable to is literacy, specifically to writing. The emphasis the Common Core Standards has placed on writing, and in particular, argumentative writing, calls for a review of current instructional practices and how writing can be used beyond evaluative purposes to deepen comprehension and develop skill proficiency, such as is the case with writing-to-learn and the process writing approach. Correspondingly, dialogic practices in the classroom also contribute to the construction of knowledge. Exploration of such practices is needed given the current gender achievement

gap in writing. This review of the literature investigates possible influences on student writing.

Rhizomatic Learning

As the constructors of knowledge, students are no longer passive recipients in the classroom; instead, they are drivers guiding their own learning. Extending this further requires a reconsideration of the traditional Western metaphor for learning—that of the *tree of knowledge*. Tree-like thought creates boundaries and establishes limits. As explained by Le Grange (2007), tree-like thinking or arborescent-thinking “refers to thinking that branches from a single idea, thought, plan, problem or question” (p. 579). Deleuze and Guattari (1987) created a new critical language for analyzing thinking as flows or movements across space. “Concepts such as *assemblage*, *detrterritorialization*, *lines of light*, *nomadology*, and *rhizomes/rhizomatic* clearly signify spatial relationships and ways of conceiving ourselves and other objects moving in space” (Gough, 2007, p. 282). Le Grange (2007) expounded, “unlike a tree with a single tap-root, rhizomes spread in all directions, creating a network in which every point connects to every other one,” thereby encouraging “thinking that arises from different points and spread in all directions to form networks of thought” (p. 579). Rhizome, as defined by Deleuze and Guattari (1987):

...connects any point to any other point, and its traits are not necessarily linked to traits of the same nature; it brings into play very different regimes of signs and even nonsign states. The rhizome is reducible to neither one or the multiple...it has neither beginning nor end, but always a middle (milieu) from which it grows and overflows...the rhizome pertains to a map that must be produced, constructed, a map

that is always detachable, connectible, reversible, modifiable, and has multiple entranceways and exits, and its own lines of flight. (p. 21)

In other words, there are no set paths to follow, no hierarchical structures that must be adhered to, no organized structure that dictates next steps, or as Edwards (2006) explained:

Deleuze and Guattari displac[ed] roots with routes and introduce[d] unexpected eruptions rather than steady growth into the view of language and meaning, where in desire plays a role in reason...Travel is introduced to the framing of language and meaning; things are metaphorically and literally uprooted. (p. 128)

Hence, the sense that knowledge can grow in a less than linear way and certainly in one that is not orderly, or as Doel (1996) suggested,

A tree or root fixes on a central point, and thus an order, from which emerges a preprogrammed, irreversible, and essentially hierarchical series of bifurcations. By contrast, everything in a rhizome is connectible and disconnectible, everything is reversible and displaceable, and everything can be broken-off or set in play; it is a multiplicity and a becoming with a consistency all of its own. (p. 434)

This is more clearly seen in Deleuze and Guattari's (1987) discernment that "the tree imposes the verb *to be*, but the fabric of the rhizome is the conjunction *and...and...and*. This conjunction carries enough force to shake and uproot the verb *to be*" (p. 25). Apparent in such explication is the accessing of knowledge or learning. Allan (2011) explained how "Deleuze and Guattari offered the rhizome as a model of thought that challenges both conventional knowledge and the means of acquiring this knowledge" (p. 155). Conventional knowledge, as prescribed by Deleuze and Guattari (1987) "is rigid, striated, and hierarchical and has an arborescent or tree-like structure. Learning within such a structure involves

transferring knowledge through a process of representation which articulates and hierarchizes tracings” (Deleuze & Guattari, 1987, p. 12) whereas rhizomatic learning, “encourage ruptures and new sproutings” so that “when a form is broken, one must reconstruct the content that will necessarily be part of a rupture in the order of things” (p. 28); hence, students are required to participate, as opposed to remaining passive, as they map out new routes to address these ruptures and sproutings. In such a manner, learning truly becomes organic.

Gradual Release of Responsibility Model

What is needed to support such a state is a sense of automaticity, which Fisher and Frey (2014) promoted in their Gradual Release of Responsibility (GRR) model (p. 3). As its name implies, the GRR shifts the cognitive load from the teacher to the student. Key to this model, however, is the interaction that occurs amongst students—the collaborative learning component: “Negotiating with peers, discussing ideas and information, and engaging in inquiry with others gives students the opportunity to use what they have learned during focused and guided instruction” (Fisher & Frey, 2014, p. 7). Olson and Land (2007) used the GRR framework both with teachers and students in their over eight-year study (1996-2004) that employed a cognitive strategies approach to reading and writing instruction geared towards English language learners (ELL) beyond the elementary school level. Akin to the experiences of their students, teachers in the study went through professional development that used the GRR model—the cognitive strategies were modeled first, then practiced as teachers learned to internalize the strategies and use them on their own.

Conducted with the consent of a large urban low-SES Californian school district, in which the 13 middle and secondary schools were targeted, the quasi-experimental study

sought to determine “to what extent providing ELLs in secondary school with declarative, procedural, and conditional knowledge of and practice with cognitive strategies would improve their reading and writing ability as based on commonly used measures and sustained over time” (Olson & Land, 2007, p. 285). The scale of the study was reflected in the number of participants: 94 teachers, of which 55 were consistent throughout its entirety, and approximately 2,000 students per year. To assess the intervention, a project-designed pre-/post-timed analytical writing was used along with collected data from a myriad of sources such as standardized measures of students’ reading and total language abilities, scores from high-stakes and on-demand writing assessments, and English placement rates at a local community college. The cognitive strategies intervention applied was developed by the University of California, Irvine School of Education Writing Project (UCIWP) in partnership with the school district in which the study took place and was called the *Pathway Project*. Identified students joined the program in sixth grade and continued with their cohort until they graduated. The *Pathway* teachers, too, worked in something similar to a cohort in that they were paired with a teacher from the same school whose class was of a similar composition in terms of ability level, but not receiving the intervention, for the duration of the study. These non-*Pathway* participants acted as the control group. Data were collected from these individuals as well.

Although all student participants completed the project-designed timed writing assessments, not all of the work was scored by the researchers. Instead, the researchers randomly selected 14 completed assessments from each teacher’s class (this occurred for both the pretest and the posttest testing). All assessments were coded so the scorers would not know from which group the assessment came and to ensure confidentiality. As part of

the scoring protocol, a modified version of the University of California System *Subject A* Placement essay scoring procedures was used. Raters assessed elements such as quality and depth of interpretation, organization of ideas, and other components associated with STAR and CAHSEE rubrics used by California public schools. Additional steps were taken to assure consistency in evaluating student work; two trained veteran UCIWP teachers were primarily responsible for overseeing the scoring and doing the scoring as well. Retraining of individual scorers was provided as needed. Scoring discrepancies (two-points or greater difference on the six-point scale) were addressed by one of the expert scorers. Such practices resulted in a correlation between first and second scores of 0.70, exact agreement approaching 50%, and agreement within one point exceeding 90% (Olson & Land, 2007).

The pretest and posttest differences in scores between *Pathway* and control students were statistically significant. As reported by the researchers, “The average standardized mean differences in gain scores between treatment and control groups was 40 standard deviations, favoring *Pathway* students over controls over seven years. The average effect size for these seven years was .34, ranging as high as .64” (Olson & Land, 2007, p. 289). Such gains also were observed in the posttest essay scoring, which was based on a 6-point scale. Since the responses were scored on the 6-point scale by two readers, the two scores were added together, which meant that students could receive a score ranging from 2 to 12. The average posttest score for treatment students was 6.7 and 5.51 for the control students. Results were also reported for the other variables, but were based on 2000-2001 data, due to it being the most recent complete set of data at the time the study was published. Generally “the difference favoring *Pathway* was statistically significant $N = 1,614, p > .001$ ” (Olson & Land, 2007, p. 292) in regards to GPA, SAT-9 Reading and Total Language scores, and

fluency. *Pathway* students (the treatment group) consistently outperformed those in the control group, when using the 40th percentile cut-off rate (considered to be critical cutoff level in some California districts for triggering interventions), with 46% and 62% of the *Pathway* students scoring above this cut-off as compared to 27% and 45% of those in the control group (Olson & Land, 2007). Since the treatment group students continued to outperform their peers in the control group for all quantitative data points collected (GPA, standardized test scores, etc.), it strongly suggests that continued use of modeling and guided practice may lead to internalization of the strategies taught.

Similarly, application of the GRR in another study (Fisher & Frey, 2003) using a variety of writing strategies with struggling adolescent readers indicated potential improvement in writing. The researchers, Fisher and Frey (2003), explained how after a semester, 24 students in a ninth grade class at an urban high school in San Diego, California, were shown to have increased the number of words produced from 4.9 in October to 19.1 in January, a statistically significant difference ($t = 7.40, p < .001$) while also exhibiting a significant difference in sentence length from 4.1 to 6.7 ($t = 5.91, p < .001$; Fisher & Frey, 2003). Such findings may lead to further study of how such a process can be used to promote the transfer of students' learning.

Writing Instruction Practices

Transfer of learning is key, especially when it comes to writing, as academic writing continues to be a core element of the K-12 curricula (Bangert-Drowns, Hurley, & Wilkinson, 2004; Graham & Perin, 2007a, 2007b). Nevertheless, there is limited current research on writing instruction, noticeably so at the secondary level, particularly after reaching its pinnacle in the 1980s (Hillock, Smith, & Cheville, 2006). As Hillock's et al., (2006)

reported, *Research in the Teaching of English* (RTE) published 16 studies, of which 13 studies (81%) dealt with writing. This number diminished dramatically by 1999, with only two (15%) of the 13 articles referencing writing. What research there currently is reveals a need for further study.

Worth noting is the amount of instructional time dedicated to writing instruction. The need for more classroom composition time also has been emphasized consistently (Pressley, Dolezal, Raphael, Mohan, Roehrig, & Bogner, 2003; Pressley, Gaskins, Solic, & Collins, 2006; Pressley, Mohan, Fingeret, Reffitt, & Raphael-Bogart, 2007). Work done by Applebee (1984) acknowledged that American students were spending about 3% of their school time on writing of a paragraph length or longer. A concern arose that for much of that 3% the writing was being done as a way to assess what was taught, or as Applebee (1984) explained, “The task for the student was one of repeated information that had already been organized by the teacher or textbook, rather than extending or integrating new learning for themselves” (p. 3). Fast forward nearly 25 years later, and one finds that less than a half hour of daily instructional time is typically dedicated to writing instruction at the elementary level (Cutler & Graham, 2008). Meanwhile, teachers allotted less than 3 hours per marking period to writing-related instruction at the secondary level—while simultaneously giving assignments that require little analysis, interpretation, or actual composition (Applebee & Langer, 2006, 2011; Kiuahara, Graham, & Hawken, 2009). In fact, almost 80% of high school students reported that their writing assignments averaged a page or less (National Commission on Writing for America’s Families, Schools, and Colleges, 2008). Concurrently, Hillocks (2002) and McCarthy (2008) reported that writing instruction was frequently designed to prepare students for standardized testing requirements—a practice that

may have contributed to 78% of eighth-grade and 66% of tenth-grade students using variations of the five-paragraph essay on Delaware's state writing assessment (Alberston, 2007). Hence, there is a need to find a way to encourage students to move beyond formulaic writing. A potential shift is to focus on writing as a way to deepen understanding.

Writing-to-Learn

In their highly touted report, *Writing Next*, Graham and Perin (2007b) highlighted specific writing instruction techniques. The compilation was derived from a large-scale statistical review of applicable studies, with a focus on adolescent writing. While *Writing Next* did not promote a comprehensive writing curriculum, it did highlight key practices that have shown to improve students' writing. Writing-to-learn was one of those listed.

It surfaced from their literature review that approximately 75% of the writing-to-learn studies had positive effects. Albeit, the average effect was small, $ES = 0.23$, but it was significant, and it was equally effective for all content areas and grades, 4 through 12, studied. Additional main review studies and meta-analyses (Ackerman, 1993; Bangert-Drowns, Hurley, & Wilkinson, 2004; Klein, 1999) supported the usage of writing-to-learn for enhancing the understanding of literature.

Among those studies is one where the researchers performed a random sampling of ninth - twelfth grade teachers in the United States. Over 800 randomly solicited individuals represented an equal distribution of teachers in language arts, mathematics, science, and social studies; 26 % ($N = 211$) responded overall to the survey. A "Chi square analysis revealed no statistically significant differences between responders and nonresponders in terms of content area taught ($p = 0.26$), type of school ($p = 0.35$), or school location ($p = 0.56$)"; (Gillespie, Graham, Kihara, & Hebert, 2014, p. 1049), with most being evenly

distributed across Grades 9-12: “43 ninth-grade teachers, 38 tenth-grade teachers, 32 eleventh-grade teachers, 33 twelfth-grade teachers, and 61 teachers of multiple grades (4 teachers did not provide information about grade level taught)” (p. 1051). One of the key questions asked about the frequency with which they used a variety of writing activities to support student learning. The activities included journal entry, summary, literary analysis, analysis/ interpretation, note-taking, free writing, worksheet, and email. Respondents used an 8-point scale to indicate the degree of frequency, from *never* (0) to *several times a day* (7). Additionally, the teachers prioritized the activities in terms of those most often used to support learning in different scenarios: (a) lecture, (b) reading, (c) video/movies, (d) partner/group work, (e) demonstration/experiments, (f) interactive activities, or (g) other (a space for recording other activities was provided; Gillepsie et al., 2014). Finally, those who responded to the survey were asked to note the approximate average amount of class time spent using writing to support learning, to which the median response was 30% ($M = 35.21$, $SD = 23.67$), and how often on a weekly basis students did homework that involved writing to support learning, which equaled a median of 2 days a week ($M = 2.35$, $SD = 1.71$); (p. 1060). It turned out that subject area was not a factor ($p > .055$; p. 1060). Coinciding with the amount of time dedicated to writing to learn were the types of activities used to support it. In order of frequency listed they were: (a) note-taking, (b) short answer responses, (c) worksheets, (d) analysis/interpretation, and (e) explanation. These revelations indicate a potential discrepancy from what is occurring in classrooms to what is prescribed by the Common Core Standards.

In their year-long study, Boscolo and Carotti (2003) noted how writing and the study of literature are usually perceived as being complementary to one another. This perspective

became the basis for their study in which the teaching of literature to ninth grade students was approached: the treatment group used writing as a tool for analyzing texts, while the comparison group applied a more traditional way. Each group consisted of 25 ninth grade students. Those in the treatment group (14 boys, 11 girls) used writing in various ways (elaborating, clarifying, and commenting on literary experiences) to strengthen literary comprehension. Contrastingly, comparison group members (14 boys, 11 girls) used writing for evaluative purposes—to test their depth of understanding of the literature studied. Each participant in both groups wrote a written commentary on a literary text at the beginning and at the end of the study, which were rated in terms of comprehension, formal correctness, and personal interpretation. This study indicated that using writing as a learning tool in the literature curriculum may help improve students' literary interpretation skills. The results showed an improvement in the writing-oriented students' ability to write a commentary on a literary text, and their perception of the usefulness of academic and personal writing. Thus, helping students to realize the relevance and usefulness of academic writing is not only a way to express and communicate one's ideas, but that writing also is a tool for learning. This is often the case in disciplines such as the social sciences, where inquiry is a foundation for exploration.

Radhakrishnan, Schimmack, and Lam (2011) approached their study with the aim of testing the degree to which inquiry-based writing activities improved writing.

Undergraduate students ($N = 94$) taking third-year psychology courses and two instructors—each teaching two of these courses—participated in the study. One course was randomly designated the control group, leaving the remaining three to comprise the experimental groups: Single Trial Practice with Instructions group, Repeated Practice with Questions

group, and the Hybrid group. The intervention, which consisted of researcher-designed inquiry activities, was implemented over the course of a semester, and required all participants to complete summaries before and after the intervention. It should be noted that these summaries were included as part of the course grade. Two independent raters assessed the quality of the summaries. These two raters were trained by Radhakrishnan, who along with the two individuals, graded 30 randomly selected summaries and discussed inconsistencies, then graded 30 additional summaries, to reach an inter-rater reliability of .70, at which point, the two independent raters scored the remaining student summaries. These summaries were measured for content, grammar, and structure. However, when the three criteria (content, grammar, and structure) were consolidated, the inter-rater reliability of the two independent raters was .77, which the researchers used for their analyses.

During the intervention, participants in the Repeated Practice with Questions treatment group answered questions that helped them in an inquiry-based strategy (i.e., a question used to engage argumentation); those in the Single Trial Practice with Instructions treatment group followed instructions; and those in the Hybrid treatment group adhered to both components. The control group received no writing intervention. When post-intervention summaries for these three experimental groups were combined and compared to post-intervention summary scores of the control group, the results were as follows: “The post-intervention summaries were significantly better for the combined experimental groups ($M_{pre} = 6.86$, $M_{post} = 7.27$; $t(74) = 3.456$, $p < .002$) when compared to the control group ($M_{pre} = 6.46$, $M_{post} = 6.67$), which was not significant” (Radhakrishnan et al., 2011, p. 249). Thus, the control group showed no writing improvement. “Planned contrasts, performed at the pre- and post- intervention, were also conducted with the groups who

received questions as compared to the group that received directions” (Radhakrishnan et al., 2011, p. 249). Here, too, there was a noticeable difference: the post-intervention summaries were statistically significant for “the combined question experimental groups ($M_{pre} = 6.57$, $M_{post} = 7.25$; $t(45) = 4.420$, $p < .001$) as opposed to the instructions experimental group ($M_{pre} = 6.97$, $M_{post} = 7.06$), which was not significant” (Radhakrishnan et al., 2011, p. 249). These findings suggest that those in the question group wrote stronger summaries than those in the instructions experimental group.

Writing also significantly improved when measured for repeated practice. The researchers conducted a 4 x 2 mixed-design Analysis of Variance and found a significant interaction between the type of experimental group and type of measure (pre- vs. post-intervention): $F(3, 90) = 3.03$, $p < .04$, $\eta^2 = .06$ (Radhakrishnan et al., 2011). Post-hoc tests demonstrated that this effect was for the Repeated Practice with Questions Group, $t(22) = 2.62$, $p < .02$ and the Hybrid Group, $t(22) = 3.58$, $p < .003$ (Radhakrishnan et al., 2011). Writing significantly improved in both conditions involving repeated practice with questions (i.e., the Repeated Practice with Questions Group and the Hybrid Group) but not in the condition involving practice with instructions (i.e., Single Trial Practice with Instruction Group). This is primarily because the writing-to-learn approach encourages students to explore their personal line of thinking in relation to the subject matter, as students are encouraged to ask their own questions and reflect upon their thinking. How providing the opportunity to repeatedly do this affects deepening of understanding and sense of epistemic agency still is unclear and continues to be a focus for research.

Process Writing Approach

Inherent to the process approach to writing is repeated practice. Rogers and Graham's (2008) meta-analysis on writing instruction promoted the effectiveness of writing methods such as the process writing approach. Key principles to this cycle included planning, drafting, and revising (Graham & Perin, 2007b; Nagin, 2006). Writing conferences, mini-lessons, and teachable moments with an emphasis on promoting student ownership further supported these steps. Teaching students writing strategies had an effect size of 0.82 as reported in Graham and Perin's (2007b) *Writing Next*, particularly in relation to the different phases of the process writing approach. This was true for both adolescent writers in general and for those who struggle. Included as part of Graham and Perin's (2007b) meta-analysis, were 11 studies with low-achieving writers and 9 studies with students who fell into the acceptable range of writing, for which the average weighted effect size was 1.02 and 0.70, respectively (Graham & Perin, 2007b)), suggesting the process writing approach may be a protocol that serves to meet the needs of students who have a wide-range of writing skills. Additional meta-analyses continue to add to the literature.

Following an extensive selection process, Graham and Sandmel (2011) narrowed the studies reviewed in their process writing approach meta-analysis to 29 studies. The criteria used for selection included: (a) examined the effectiveness of the process writing approach; (b) employed an experimental or quasi-experimental design; (c) measured writing quality, motivation, or both; (d) contained sufficient information to calculate an effect size; (e) conducted with students in the range of grades 1-12; and (f) incorporated students who attended a regular public or private school. A consistent finding across the studies was the

effect of the process approach to writing instruction on the overall quality of student writing produced: 83% of the comparisons resulted in a positive effect for the process writing approach. According to the authors, the mean average weighted effect size (ES) computed with a random-effect model was 0.34.

Interestingly enough, Graham and Sandmel (2011) made among their recommendations, a call for further experimentation with the process writing approach to instruction, which had already evolved since its inception. This urging has been supported by organizations such as the National Writing Project, which recommended including practices such as inquiry learning (Nagin, 2006). Part of this experimentation included addressing the need to engage students with writing, and moving away from a focus on the end product and regurgitation of what they know to what they are interested in exploring, which raises the need for investigating how student generation of questions changes the quality of their writing.

Student Generated Questions

As teacher questioning continues to be a prominent feature of classroom talk (Chin, 2006, 2007) so does the initiation-response-evaluation (IRE; Mehan, 1979) structure in which the teacher initiates a question, the students respond, and then the teacher evaluates the responses. A similar process also exists for writing. In both cases, teachers continue to drive the questions and those questions tend to remain at the cognitive level of Bloom's Taxonomy (1978)—*knowledge, comprehension, and application* (Williamson 1996). With such an onus on teachers, the students' role is reduced. In fact, the number of questions asked by students in classroom settings is low, particularly at the secondary level (Good, Slavings, Hobson-Harel, & Emerson, 1987; Graesser & Person 1994). Even when students ask questions,

numerous studies have found that they fall into the low-level informative range (Brill & Yardley, 2003; Chin 2001; Dillon 1998; Hofstein & Lunetta 2004). Such a situation has created a sense of urgency to change the status quo for despite their limited use, questions, as Aristotle and Socrates themselves argued, are crucial for learning.

No doubt this could be attributed to how the act of composing questions inspires intellectual agency and a sense of exigency. Several studies supported how students, regardless of grade level, like to be involved in asking their own questions and formulating ways to answer them (Crawford, Krajick, & Marx, 1999; Gibson & Chase 2002; Hand, Wallace, & Yang, 2004), an approach that may help to focus students' attention on content and the main ideas being taught (King, 1994; Rosenshine, Meister, & Chapman, 1996). More recent research suggested that student questions might influence whole-class discussions to affect richer and improved conceptual change processes (Eshach, 2010). Nevertheless, such a shift in instructional practices has been challenging.

Keys and Kennedy (1999) discerned these challenges in their study when it came to elementary teachers refraining from answering students' questions and having students respond to them instead. Likewise, Rop (2002) observed that despite an appreciation for intellectual questions as indicators of student understanding and potential engagement, they were perceived as creating an interruption, or, as in the case of the teacher involved in the study, a threat to his control, particularly as it pertained to curriculum coverage. The various challenges that teachers face with fostering and supporting student-generated questions have led to a call for more research.

Addressing the balance between teacher attitudes towards questioning and their actual practices was the focus of a study conducted by Eshach, Dor-Ziderman, and Yefroimsky

(2013). Nine Israeli teachers and their respective science classes participated in the study. The teacher-participants all had seven years of experience and represented three schooling levels: elementary, middle, and high school. Class sizes ranged between 24 and 29 students. The study itself was carried out in three stages. Initially, observation of teacher behavior was completed during 5 consecutive lessons for each participant. These teacher-participants were then interviewed about their attitude towards student question asking. Finally, the data collected from these first two stages were categorized and sub-categorized.

The first finding was in regards to the number of questions asked by teachers versus those asked by students. The disparity is hard to ignore. Unlike teachers, who averaged 22 questions per lesson, students averaged 10, with secondary students asking the most content questions. Even though teachers asked more questions, the questions tended to fall in the low-order question (LOQ) range, regardless of the school level. High school teachers tended to ask more low-order and moderate order questions (MOQ) and fewer higher-order questions (HOQ) than their counterparts in elementary and middle schools. This is a cause for concern as teachers model for their students and the students internalize what they see and hear. It is no surprise, therefore, that the quality of questions that the students themselves ask is low. On average, 5 of the 10 questions generally asked by students per lesson fell into the LOQ range, and, even though secondary students asked more questions than their counterparts in the other grade levels, they also tended to ask more low-order questions. When looked at from an individual perspective, the average shrinks to two questions a month. This is not an aberration. Other studies have reciprocated these findings as well (Borich, 1992; Brill & Yarden 2003; Dillon 1988). Additional studies revealed that

teachers do not encourage student questioning and are not aware of the importance of their responses to questions asked (Chin, 2006; Dillon, 1988; Hoftstein & Lunetta, 2004).

Thus far, research has indicated a need for an explicit system of training for student generation of higher-level questions (King & Rosenshine, 1993; Rosenshine, Meister, & Chapman, 1996). Essential to such a program is teacher modeling, which is also an important part of the Gradual Release of Responsibility model, and think-alouds, from which students develop their own proficiency in asking higher order questions. As their proficiency increases, students look to one another as practitioners of effective questioning behavior. This shift in responsibility encourages student determination of the pace and direction of the questioning process, including the metacognitive element (King, 1994). Furthermore, it appears that critical thinking is supported by combining both approaches—metacognitive and affective (Goh, 2004; Smith, 2003). Consequently, research continues to be conducted in this area, such as that done by Smith, Rook, and Smith (2007).

This trio of researchers conducted their study with a ninth grade world-history class. The intervention examined how using a range of questioning strategies (including cognitive, affective, and metacognitive) interacted with student engagement and academic achievement. Conducted over a 12-week period, the study took place in a freshman-only school and consisted of 86 students from three classes. These three classes were assigned to one of three groups. Since Group 1, the control group, did not participate in the journal writing activity, they received no questions, although they, and the other two groups, all were taught from the same lesson plan. Groups 2 and 3 were the treatment groups. Both treatment groups participated in a journal writing activity, but responded to different types of questions. The questions Group 2 received were cognitive or text-related whereas the questions Group 3

received were cognitive, metacognitive, and affective. The researchers found that a combination of question types, in this case, cognitive, metacognitive, and affective, were more effective than text-related questions alone in fostering student learning, $F(2, 76) = 4.17, p = .019$ (Smith, Rook, & Smith, 2007).

Having an understanding of how students view questioning was a goal of research conducted by Herring, Tarter, and Naylor (2002); Herring (2006); Herring and Hurst (2006); and Herring and Tarter (2007). Results from Herring's (2009) study mirrored those from his other ones: a majority of students saw clear benefits in generating their own questions, particularly when it came to information retrieval, evaluation of information, and structuring and writing their own assignments (Herring, 2009). The teacher in the 2009 study concurred with students' opinion—Question formulation had improved the written work for a majority of students. Herring (2010) continued his research, this time using a constructivist grounded theory approach.

In keeping with such an approach, Herring (2010) collected data using student diaries, student questionnaires, and interviews with participants (students, teachers, teacher-librarians). Student participants wrote out questions prior to conducting their own research. Once completed, they noted their experience with question formulation: (a) how easy or difficult they found it to formulate their assignment questions, (b) how they thought writing questions would be an aid to information retrieval for their assignment, and (c) how well they thought they had used their questions when doing the assignment. What became clear following the researcher's analysis is that while students saw value in question generation, they were not likely to do so without prompting, particularly by the teacher or teacher-librarian, who went on to say that the reasons for which are complex (Herring 2010).

Whereas some students appreciated the craft of question development—engaging critically in the question quality and the reasons why they used such questions, particularly as it related to their own personal learning—others were less reflective, seeing questioning as a way to retrieve information. Participants were selected from a convenience sampling pulled from three rural Australian schools.

Berry and Chew (2008) conducted their study with undergraduate students matriculated at a southern university. Comprised mostly of freshman, the 102 participants (males = 23, females = 79) were enrolled in two sections of general psychology. The researchers evaluated two learning strategies: student generation of concept maps of course topics and weekly student generation of questions of course material. One of their aims was to investigate the effect of voluntary student question generation on student performance. Treatment group participants submitted three questions for the teacher to address through textbook readings or lecture. These submissions were done electronically on a weekly basis throughout the course of the intervention. For this exercise, three multiple-choice examinations and a final exam (optional) were used to assess changes in performance.

The scores of the three exams for the first class (84.1%, 85.8%, and 82.4%) were similarly echoed by the second class (83.4%, 85.1%, and 83.2%; Berry & Chew, 2008). Initially, researchers compared the exam performance of students who generated one or more sets of questions a week with those who composed none and found a statistically significant interaction between groups and exam, $F(1, 100) = 7.82, p < .01 (B = .22)$. Berry and Chew (2008) also used mixed modeling to explore the relationship between the number of questions generated (0-5) and the students' performance on the exams over time for which there was an interaction, $F(1, 100) = 8.82, p < .01 (B = .10)$. Initially, students who did not

generate questions actually performed better than those who did, however, their performance declined over time (Berry & Chew, 2008). Concurrently, students who did ask questions originally performed at a lower success rate than their non-questioning counterparts, but they did close that ground so that by the third exam, they performed at the same level. The gap had been closed, and the degree of improvement, as reported by the researchers, was proportional to the number of questions generated. Such a finding has not been consistently found in other research.

A common classification for student questions is whether the question seeks factual or explanatory knowledge, with explanatory deemed more likely to deepen understanding (Hakkarainen 2003; Lee et al., 2006; Zhang, Scardamalia, Lamon, Messina, & Reeve, 2007). Harper, Etkina, and Lin (2003) found that the depth of questions, not number of questions, had an impact on improvement in learning. Their study of the effects student question generation had on learning in a college introductory physics class lasted for 8 weeks. These questions were coded for level of difficulty and topical content. Here, too, students kept journals in which they generated questions for learning, and then took the tests. Since the relationship between the number of questions asked and students' performance on the assessment did not show any correlation, the researchers extended their focus to ascertain if there were any relationships between the quality of questions and test performance, and, indeed, there were. After independent raters coded each question for degree of difficulty, it was found that approximately half of the questions were categorized as minimal or low in conceptual difficulty (i.e., simple facts, definitions, clarification, low-level comprehension), and the other half consisted of medium to high level conceptual difficulty (i.e., analytical, synthesizing, applying concepts). After looking at the scores for tests given before and after

the question generation phase, Harper et al. (2003) found that students who generated medium or high levels of conceptual difficulty exhibited significantly better learning of concepts, ($r = 0.261, p < .001$).

This coincided with the work previously conducted by Rosenshine, Meister, and Chapman (1996). In their review of question intervention studies aimed at improving comprehension, Rosenshine et al. (1996) concluded that “teaching students the cognitive strategy of generating questions about the material they had read resulted in gains in comprehension” (p. 181), however, this was primarily in relationship with reading comprehension. As they clarify, generating questions did not lead directly, in a step-by-step manner, to comprehension, rather, in the process of generating questions, students needed to search the text and combine information, and these processes helped students comprehend what they read. The primary focus for their review was to isolate a particular cognitive strategy, in this case question generation.

A total of 26 studies were reviewed (Rosenshine et al., 1996), each selected after meeting criteria set by the review authors. The studies selected provided instruction on how to generate questions during or after reading, contained equivalent experimental and control groups, and included a transfer posttest whereby students in both groups were compared on their ability to comprehend new materials. In addition, three types of outcome measures were used: (a) standardized reading achievement tests, (b) experimenter-developed short-answer or multiple-choice tests, and (c) student summaries of a passage. Overall, the findings strongly suggested that providing students with generic questions or stems might improve student comprehension. An overall effect size of 1.12 (87th percentile; Rosenshine et al., 1996) was obtained for the four studies that used experimenter-developed

comprehension tests (King 1989, 1990, 1992; Weiner, 1978). However, in studies where students were taught to develop questions based on the concept of text-explicit, text-implicit, and schema-based questions, results were non-significant in all three cases where standardized tests were used to assess student achievement. For the five studies in which students were instructed to begin the questioning strategy by using a passage's main idea, the effect size was .70 (76th percentile) for the study that used a standardized test and .25 (60th percentile) for the five studies that used experimenter-developed comprehension tests (Rosenshine et al., 1996). When looked at from a larger perspective, teaching students the strategy of generating questions had an overall effect size of .36 (64th percentile), compared to control group students when standardized tests were used to assess student comprehension (Rosenshine et al., 1996). When experimenter-developed comprehension tests were used, the overall effect size, favoring the intervention, was a median of .86 (81st percentile). These results are particularly heightened when looking at the participant population.

The grade levels in these studies ranged from third grade to college, and included a variety of students ranging from average to above average and remedial and learning disabled. In fact, the researchers found no differences among the subgroups when it came to grade level, length of training, instructional group size, and the type of student receiving the intervention instruction. Overall, the three most successful prompts were (a) signal words (who, why, how) for generating questions; (b) generic question stems (e.g., "Another example of...was...") and generic questions (e.g., "What details develop the main idea?") that could be applied to a passage, and (c) story grammar categories, which helped students generate questions focusing on four elements of a story—the setting, the main character, the main character's goal, and the obstacles encountered by the main character (Rosenshine et

al., 1996). Rosenshine et al. (1996) pointedly reminded readers that no studies were found in which students were asked to create their own question prompts, a point for future exploration.

There are, indeed, studies leading to support for students' self-generated questions, particularly as a means to facilitate learning and to deepen conceptual understanding (Chin, Brown, & Bruce, 2002; King, 1990; Palincsar & Brown, 1984). The quality of students' questions can be improved (Cuccio-Schirripa & Steiner, 2000), for as previous research has reported, it is not so much the quantity of questions, but the quality of questions that appear to strengthen learning (Harper, Etkina, & Lin, 2003; Tischer, 1977). Such was the case in a study conducted by Hakkarainen, Lipponen, and Jarvala (2002). Indications from the study purport a positive correlation in that students who had a higher proportion of explanation-seeking questions were proportionally more likely to contribute higher quality knowledge in terms of the levels of explanation among students in three classrooms of fourth and fifth grade students participating in online discussion. As Hakkarainen et al. (2002) explained, a positive relationship existed "between mean level of scientific explanation and proportion of explanation-seeking research questions $r(82) = .34, p < .05$, indicating that a higher proportion of explanation-seeking research questions was associated with a high mean explanatory level of scientific information" (p. 14). Similarly, van Alst (2009) addressed online discourse, but instead used groups for his study. After analyzing the academic discourse for four groups, van Alst reported that the group with the highest proportion of explanation-seeking questions was also the one with the highest proportion of explanation-oriented ideas expressed: "Group A had a higher mean score than the Knowledge Quality (effect sizes ≥ 0.7 , Cohen's d); for most groups" (van Alst, 2009, p. 272).

A larger study conducted by Lai and Law (2012) involved 86 English-speaking sixth grade students and 80 English-speaking tenth grade students in Hong Kong. Questions generated by students were collected, counted, and categorized over a six-week period. A noticeable gap occurred between the two grades, with sixth grade students asking 282 questions as compared to the 477 generated by those in tenth grade (Lai & Law, 2012). However, there was no such distinct gap when it came to the quality of the questions. Both groups tended to ask the same number of explanation-seeking questions, which constituted 40% of the questions (Lai & Law, 2012). More noticeably, 30% of the sixth grade questions were categorized as simple clarification, of which the tenth grade asked less than half that amount (12%; Lai & Law, 2012). Further analysis showed additional differences between the behaviors of the two grade levels. For sixth grade students, the average level of explanation was related to the quality of the question ($r = .54, p < .001$), but not the quantity, unlike their counterparts in tenth grade ($r = .38, p < .001$; Lai & Law, 2012).

When looked collectively at the group level, the degree of explanation was positively correlated to the average level of questions of a group, regardless of grade level, with high correlation coefficients of .70 for sixth graders and .75 for tenth graders (Lai & Law, 2012). The researchers distinguished the discrepancy between the grade levels, suggesting that those in tenth grade who asked the *better* questions were not necessarily the same ones who responded with the high-level explanations, to a need for further research, particularly to examine to what degree, if any, there is a tendency in older students to evolve, as a community, into different roles: (a) those who raise deep inquiry questions, and (b) those who construct good explanations in conducting collaborative inquiry. Unlike the studies reviewed by Rosenshine et al. (1996), this study did not include specific training on

questioning, which might account for high-performing groups who ask *good* questions getting high-level explanations, and low-performing groups asking low-level questions and giving low-level responses. More recent reports surmised that students in inquiry-based and collaborative learning environments are more likely to generate higher quality questions (Hoftstein, Shore, & Kipnis, 2004; Marback-Ad & Sokolov, 2000). However, more research is needed to investigate this relationship.

Dialogic Teaching

Effective teachers tend to use discussion and inquiry to facilitate students' understanding of text (Allington & Johnston, 2002; Malloy & Gambrell, 2010; Taylor, Pearson, Clark, & Walpole, 2000) as there is power in teachers and students learning together (Pressley, 2007), or what Brown and her colleagues call *community of learners*, where teachers facilitate learning through collaborative and student-centered inquiry (Brown, 1992; Brown et al., 1993; Brown & Campione, 1994; Campione, Shapiro, & Brown, 1995). Several benefits arise from working in such communities as they encourage students to share their own interpretations, to learn from the insights and interpretations of others, and to observe how others have worked through a text, including the approaches and strategies taken to build comprehension (Gambrell, 2004; Kucan & Beck, 2003).

In fact, how classroom language provides a gateway to “shaping students’ thinking” (Reznitskaya & Gregory, 2013, p. 114) was affected by the way it was approached. For example, *Dialogic teaching* promotes “involv[ing] students in the collaborative construction of meaning and is characterized by shared control over key aspects of classroom discourse” (Reznitskaya & Gregory, 2013, p. 114). Such practice may, as noted by a growing body of research, foster growth in higher order thinking and subject matter knowledge (Murphy,

Soter, Wilkinson, Hennessey, & Alexander, 2009; Reznitskaya et al., 2009; Schwarz, Neuman, & Biezuner, 2000). As summarized by Reznitskaya and Gregory (2013), “classrooms are transformed into learning communities, where participants meet on terms of equality and take on key roles in navigating class communication” (p. 116), including asking questions. In fact, “dialogic teaching centers around questions that are fundamentally open or divergent...in terms of allowing a broader degree of uncertainty in what would constitute an adequate answer” (Burbules, 1993, p. 97). “These practices include shared control over group communication, focus on collective inquiry into open-ended questions, and the use of metacognitive tools that help to regulate both processes and products of inquiry dialogue” (Reznitskaya & Gregory, 2013, p. 121). Even more so, the epistemic agency of students is further developed as students’ question generation supports knowledge building (Scardamalia, 2002; Zhang et al., 2007). Likewise, students also can practice the development of their *knowledge ideas* (Hakkarainen, 2003) as they respond to questions and develop new ones from that experience (Hakkarainen, 2003; Hakkarainen & Sintonen, 2002).

Chin and Osborne (2010) sought to explore the interrelationship of questioning for learning and argumentation. They hypothesized supporting students in question asking could stimulate their engagement with productive argumentation. Four science classes, consisting of students age 12 to 14 years were used for the study. Two of the classes were from Singapore (co-ed) and two were from London, England (all girls). Following instruction on argumentation and question development, participants were assigned to groups to discuss which of two graphs represented temperature change the best. One group from each class was audiotaped. The number of questions written, the concepts addressed, and the quality of the written arguments were then scored. A positive correlation between these factors was

found. Discourse analysis revealed a focus on questions prompted students to articulate more specifically in regards to claims, key concepts, explanations and even when considering alternatives. Their study suggested that the use of questions and the development of an argument were interrelated.

In their study, Klein and Rose (2010) proposed that if students are taught argumentative writing they will be better able to use it to learn about content area concepts in their quasi-experimental designed research. The 34 participants, consisting of 19 girls and 15 boys in grades 5 and 6, were drawn from two urban schools. Intact classes, one from each school, were randomly assigned to the experimental or comparison group. Two independent raters holistically assessed students' written work, including noting all rhetorical moves. A multivariate analysis of variance (MANOVA) was conducted with the treatment group as the independent variable and the posttest measures as the dependent variables:

Box's test for equality of covariance matrices was marginally significant, $M = 39.93$, $F(21, 327.39) = 1.49$, $p = 0.068$, so the robust Pillai's trace statistic was selected as the multivariate statistic. The test showed a large, statistically significant difference between the experimental and comparison classes on the combination of posttest variables, Pillai's trace = 0.99, $F(6, 26) = 278.46$, $p < 0.001$, $\eta^2 = 0.99$. (Klein & Rose, 2010, p. 451)

The responses between the two groups distinctly varied in that those in the comparison group primarily addressed what occurred, while those in the treatment group extended their observations to include why it occurred, making inferences about causal relationships, thereby extending their thinking (Klein & Rose, 2010). How to extend student thinking

beyond primarily summarizing has been the focus of other researchers as well, especially when it comes to addressing gaps in gender writing effectiveness.

Gender and Writing

The focus on gender gaps in literacy is not new, but it has gained increasing attention, particularly in the area of writing. National attention in the U.S. was heightened in 2005 when the revamped SAT included a writing section that weighted equally with the verbal and math sections, and results indicated a significant gap between males' and females' writing achievement (Klein 2006). This trend continued for the next several years. Results for the first two years of the revised SAT revealed that girls' writing scores were 11 points higher than those of their male counterparts. For the 2009, 2010, and 2011 SAT, the trend continued with girls' writing scores exceeding boys' scores by 12-14 points (College Board, 2014). From 2006 to 2015, female students scored, on average, more than 10 points higher each year than their male counterparts on the SAT writing test, recording an average of 492 versus 481 in 2015. Collectively, neither gender is consistently performing at high levels. The mean score for all college-bound seniors taking the SAT's new writing test in 2006 was 497 on a 200-800 point scale (College Board, 2014). Eight years later, the average writing score for the entire college-bound group was lower by 10 points (College Board, 2104). The 2011 National Assessment of Educational Progress (NAEP) results are in keeping with the gap seen with the SAT Writing section. At the national level, Grade 12 boys had an average scale score of 143 (the NAEP Writing scale ranges from 0 to 300), with a male standard error of 0.6. The Grade 12 female average score was 157, with the female standard error at 0.6 (National Center for Education Statistics 2012). The gap is exacerbated when one looks at both gender and socioeconomic status (SES). In Vermont's 2009 New England Common

Assessment Program (NECAP) writing scores, only 27% of eleventh grade boys eligible for free and reduced lunch (FRL) wrote proficiently—compared to 45% non-FRL boys. A greater disparity existed when compared to girls not in the SES category—40% below (Louie & Ehrlich, 2008).

Such disparity led the State of Vermont to sponsor a study to ascertain how student performance on the state assessment compared to national performance. The analysis of gender gap in statewide and national assessment, such as the NECAP, the NAEP, and American College Test (ACT) reinforces the gap. The Grade 4 gender gap in writing on the NECAP was more than 21 points in Vermont and almost 18 points nationally. Among eighth grade students, aggregate gender gaps were even larger—girls outperformed boys by more than 24 points in Vermont and almost 21 points nationally, with a .066 standard deviation in Vermont and a .058 standard deviation nationally (Louie & Ehrlich, 2008). A cause for concern continues, particularly when one looks more extensively at the issue.

In her review of research, Peterson (2006) summarized from the findings of numerous studies that “rigid gender expectations constrained both girls’ and boys’ writing choices,” but boys’ writing choices were constrained to a greater degree than those of girls “because it was socially acceptable for girls to take up masculine styles of writing, but socially dangerous for boys to take up feminine themes and topics” (p. 318). However, Peterson (2006) noted that a number of recent studies have found that when students wrote in cooperative groups with, or for, members of the opposite sex, their writing tended to reflect less stereotyped versions of masculinity and femininity. Going beyond the questions of boys’ supposed genre preferences, Jones and Myhill (2007) emphasized that writing is fundamentally a social act rooted in its context, a “socially-situated act of social practice, an act of connection and

communication with others,” and that classrooms are “socially-determined communities of practice that shape both written texts and writing processes...” (p. 4). Because this social element of classroom writing is so central, they argued that the achievement gap in writing is “more likely to be attributable to societal and cultural factors, rather than cognitive or linguistic differences,” and that “the context and the community in which [students’ writing] occurs are powerful influences on writing development [which] shape how boys and girls variously respond to writing tasks” (p. 7). Bozack (2011) and Cavazos-Kottke (2005) emphasized the importance of choice and autonomy in boys’ literacy engagement, echoing the findings of Newkirk (2002), Smith and Wilhelm (2002, 2009), and many other writers on the subject of boys’ literacy. Researchers such as Dredger, Woods, Beach, & Sagstetter (2010) and Zumbrunn and Krause (2012) have suggested that having a sense of autonomy may be essential to students becoming more effective writers. However, more research is needed in this area.

Summary

The 21st century is well-underway, yet much of education continues to adhere to practices rooted in the work of several centuries past. Often epitomized by the tree of learning, Western education, specially that in the United States, is grounded in linear developments, starting at a particular point and following a trajectory progress. This has been cemented by the adoption of the Common Core Standards, which outlines skill expectations for each grade level K-12. Rhizomatic learning is more in keeping with the demands of the current times, where *a one size fits all* philosophy towards education is no longer acceptable. Instead, as required by a more personalized learning environment, rhizomatic learning encourages the more messy *choose your own path* approach, stressing

that thinking can arise from different points and spread in all directions. Something more situated with the move to differentiated learning.

While much has been made of the move towards student-centered learning over the past several years, there is still much work to be done, particularly when it comes to writing instruction. Despite the essential role writing plays in the curriculum, it is only now having a re-emergence in the area of research following its heyday in the 1980s. There is, however, a shift in focus—from an emphasis on grammar and syntactic complexity to fostering a growth in comprehension and development of interpretation-or argument.

Writing an argumentative text about a piece of literature requires a very high level of abstraction (Moffett, 1983), which is why fostering an environment in which student generation of questions is not just promoted but expected is important. For as students develop their questioning skills, they move from a fact-seeking premise to an explanatory one. While learning how to question to extend one's critical thinking makes a case for developing questioning skills, there are also other well-established learning processes such as depth of processing, transfer-appropriate processing, and retrieval practice that are derived from this practice (Karpicke & Roediger, 2007). As such, it is essential for students to develop skills in these areas and to develop a sense of epistemic agency, particularly for male students; their female counterparts have consistently outperformed them on state and national writing assessments. The dearth of study done at the secondary level in regards to student generation of questions and its role in the development of student writing supports the need for more pedagogical research. The current research is meant to address this gap.

CHAPTER THREE: METHODOLOGY

The purpose of this study was to explore the effects of the Question Formulation Technique (QFT) on the argumentative writing achievement scores of secondary students. In particular, the researcher examined whether the use of the QFT process, in combination with the traditional writing program, would impact the scores of ninth and tenth grade male and female students on summative writing assessments. This chapter reviews the process used to address this focus and is outlined as follows: (a) the research question and hypothesis, (b) a description of the research design, (c) a description of the setting and participants, (d) an overview of the intervention for treatment groups and an overview of the comparison groups, (e) a description of the instrumentation, (f) a description of the analysis, (g) a description of the data collection procedures and research timeline, and (h) an ethics statement.

Research Question and Hypothesis

Using a systematic approach, the researcher addressed the following question:

1. Is there a significant difference in Argument Writing Achievement between secondary school (Grades 9 and 10) male and female students who participate in a modified writing curriculum embedded with the Question Formulation Technique (treatment) and those participating in a traditional writing curriculum (comparison)?
 - a. Is there a significant difference in Argument Writing Achievement between secondary school students who participate in a modified writing curriculum with the Question Formulation Technique embedded (treatment) and those who participate in a traditional writing program without the embedded Question Formulation Technique (comparison)?

- b. Is there a significant difference in Argument Writing Achievement between secondary school male and female students?
- c. Is there a significant interaction between writing instructional program and gender?

Non-directional hypothesis: There is a significant difference in Argument Writing Achievement between secondary school (Grades 9 and 10) male and female students who participate in a modified writing curriculum embedded with the Question Formulation Technique and those participating in a traditional writing curriculum.

Research Design

This research followed a quasi-experimental, pretest-posttest treatment and comparison group design (see Table 1; Gall, Gall, & Borg, 2007). As dictated by Gall, et al. (2007), “Quasi-experimental designs are used when random assignment of research participants to experimental and control groups is not possible” (p. 415). A challenge to this experimental design is true random assignment as the setting is restricted by pre-established intact classrooms, a staple of school environments. Hence, the researcher used a quasi-experimental design in which intact classes of students were randomly assigned to either the treatment or comparison condition.

A pretest-posttest treatment and comparison group design enabled the researcher to compare two writing programs: (a) a writing instructional program modified to include the Question Formulation Technique (treatment), and (b) a traditional writing program, when implemented in a high school setting, Grades 9 and 10.

Table 1

Description of Quasi-experimental Pretest-Posttest Comparison Group Research Design

	Pretest	Treatment	Posttest
Treatment	O	X	O
Comparison	O		O

(Quasi-Experimental Design. Adapted from Gall, et al., 2007, p. 417)

The study was quasi-experimental and included a quantitative pre-test-posttest design in order to investigate whether there were statistically significant differences between the treatment and comparison groups. The independent variables included the writing instructional program with two levels (modified writing program embedded with the Question Formulation Technique and traditional writing program) and gender (male and female). The dependent variable was the posttest writing achievement score.

Description of the Setting and Participants

Setting

The research took place at a suburban Western Connecticut high school located in Fairfield County during the 2014 - 2015 school calendar year. During the span of 2007 – 2011, the town had a median income of \$72,235 and home ownership rate of 62.7%, with the median price of \$304,000 (United States Census Bureau, 2013). The population of the town numbered 18,584, of which 959 students attended the local high school, the only one in the district. Despite the decrease in student enrollment, -7.3% over a 5-year period, student ethnicity has changed, as reflected in the 2012 – 2013 Strategic School Profile, from 78.4% White to 75.9%, 11.6% to 12.7 % Hispanic, and 2.1% to 3.0% Black, with the Asian American population remaining the same at 6.5% (CSDE, 2013), resulting in a 24.1% total

minority population. Table 2 illustrates the ethnic breakdown of the student population at both the district and high school levels. Of these students, 175, or 18.2%, qualified for free/reduced-price meals, with 14.9% of the junior/senior population working 16 hours or more per week, which was higher than the District Reference Group (DRG) and the State average, 14.8 and 12.7%, respectively (CSDE, 2013).

Table 2

Student Population Ethnicities for District and Participating High School (CSDE, 2013)

Ethnicity	Percentage	
	District	High School
American Indian	00.00	00.10
Asian American	06.60	06.50
Black	02.40	03.00
Hispanic	12.90	12.70
White	76.10	75.90
Two or More	02.00	01.80
Total	100.000	100.00

Participants

Teacher participants. Following approval from the Institutional Review Board (IRB) at Western Connecticut State University (WCSU; see Appendix A), consent was initially sought from the district’s Superintendent for the study to take place (see Appendix B), and then from the principal of the high school (see Appendix C). Once consent was received, potential teachers were invited to participate. The researcher met with all parties prior to seeking consent to explain the purpose of the study, its methodology, and its

potential benefits. Expectations for the study, including time commitments and responsibilities, were also discussed. Teachers who were interested in participating in the study then gave their written consent (see Appendix D), after which they were asked to complete a researcher-developed demographic survey (see Appendix E). The teacher demographic survey provided background information on elements such as ethnicity, years teaching high school English, and level of education.

The English Department at the participating high school consisted of 12 full time teachers, six of whom taught Grades 9 and 10 English. There are three academic levels: *Advanced Placement/Honors*, *College Preparatory*, and *Academic*. The *College Preparatory* level was used for this study. *College Preparatory* level courses adhere to the following practices:

1. Continual emphasis on the development of abstract concepts, critical analysis, and independent learning;
2. Testing and other forms of formal evaluations are integral parts of each course. Students working on this level are expected to maintain the pace required to cover the course materials as described in the curriculum guide; and
3. Daily homework is required. (*Program of Studies*, 2015, p. 10)

Teacher participants included two ninth and two tenth grade full-time English teachers ($n = 4$) who were responsible for 22 classes; 14 of these classes were at the *College Preparatory* level. The two ninth grade teachers each taught four *College Preparatory English* courses as compared to the tenth grade teachers who each taught three *College Preparatory* classes. The excluded courses included Writing Center support, electives, *Honors* level and *Academic* level courses. The 14 sections were randomly assigned to either a treatment ($n = 7$ classes)

or a comparison condition ($n = 7$ classes), which were distributed between the two grades. The treatment consisted of the traditional writing instructional program embedded with the Question Formulation Technique whereas the comparison group received the traditional writing instructional program without the embedded Question Formulation Technique. To foster confidentiality, each teacher and his or her classes were assigned an identification number.

Demographic information was solicited via a researcher-created survey (see Appendix E). The teacher demographic survey data indicated that there was an equal representation of male ($n = 2$) and female teachers ($n = 2$), all teachers held degrees beyond bachelor level, and participants had been teaching for less than 10 years. Participating teacher demographics are represented in Table 3.

Table 3

Demographic Characteristics of Participating Teachers

Teacher	Gender	Years			Degrees	Certifications
		Teaching	Teaching	Grade		
		Teaching	Grade	Level		
Teacher A	Male	3	3	9	BS MS	Initial Educator
Teacher B	Male	8	3	9	BS MS	Professional Educator
Teacher C	Female	4	4	10	BS MS	Provisional Educator
Teacher D	Female	8	6	10	BS MS	Professional Educator

Student participants. A sample of convenience was taken from the high school population, specifically from Grades 9 and 10. There were 207 students, comprised of 106 male and 101 female, in the ninth grade and 213 students in the tenth grade, of which 108 were male and 105 were female. Students enrolled in *College Preparatory English* were invited to participate in the study. The majority of freshman and sophomores take *College Preparatory English* (English 12 and English 22, respectively). Students are recommended for core courses and parents do have the ability to override teacher recommendations. Since only those enrolled in ninth and tenth grade *College Preparatory English* were invited to participate, it reduced the number of potential participants to 144 Grade 9 students (76 boys,

68 girls) and 146 Grade 10 students (79 boys, 67 girls). In addition, an English Grade 9 and an English Grade 10 teacher did not participate in the study due to logistical reasons: the ninth grade teacher was mentoring a student-teacher during the time the study was scheduled to be conducted while the tenth grade teacher had a course load that was split amongst sophomores and seniors and was a first year teacher. This further reduced the participant pool to 119 ninth grade students and 114 tenth grade students.

The researcher received permission from the participating teachers to speak to their respective classes and invite students to participate in the study. A second and a third round of requests were made since the requisite minimum number of 60 were not received initially. The researcher also posted notices outside participating classrooms during parent conferences to alert parents and guardians to the study and to invite them to encourage their respective student to participate. Information was also shared as to how to contact the researcher for further information or clarification. The teachers in the study followed up with students and collected the consent and assent forms on the researcher's behalf.

A total of 233 consent and assent forms were sent home with students (see Appendices F and G). A total of 76 forms were returned by Grade 9 and 99 by Grade 10, for a response rate of 75.1 %. According to Gall, Gall, and Borg (2007), studies with an experimental design structure should have cells that contain a minimum of 15 participants each. There were four cells for this study (male participants, female participants, treatment condition, and comparison condition), requiring a minimum of 60 participants. Table 4 provides the student participation rate for the treatment and comparison groups and Table 5 gives the gender composition for the treatment and the comparison groups.

Table 4

Treatment and Comparison Student Participation

Group	Accessible (Target)	Participants	Participation Rate (%)
Treatment			
Grade 9	45	33	73.3
Grade 10	64	48	75.0
Total	109	81	74.3
Comparison			
Grade 9	60	43	71.6
Grade 10	64	51	79.6
Total	124	94	76.6
Grand Total	233	175	75.1

Table 5

Demographic Breakdown of Gender for Student Participants

	Total Male Participants <i>n</i>	Percentage of Male Participants	Total Female Participants <i>n</i>	Percentage of Female Participants
Treatment				
Grade 9	22	12.57	21	12.00
Grade 10	23	13.14	28	16.00
Total	45	25.71	49	28.00
Comparison				
Grade 9	17	9.71	16	9.14
Grade 10	22	12.57	26	14.90
Total	39	22.28	42	24.04
Grand Total	84	48.00	91	52.00

Additional demographic information was collected via a researcher-developed student survey (See Appendix H). The survey requested self-reported information in regards to gender, ethnicity, grade level, English course level, name of English teacher, and age. Age and grade level were requested because some students may have been retaking a course in order to earn back a loss of credit.

Description of the Intervention

A random number generator was used to assign participating intact classes (consisting of teacher and students) to either a comparison group that used a traditional writing process

(brainstorm, draft, revise, and publish) or a treatment group that incorporated the traditional process writing approach embedded with the Question Formulation Technique. Students in the comparison group were given direct instruction in the process, and continued instruction in: (a) focus, (b) structure, (c) organization, (d) elaboration, (e) support, and (f) mechanics. The I.C.E. strategy (Introduce, Cite, and Explain), an acronym used to remind students how to integrate support for arguments was also reinforced. This was a continuation of the instruction the students had received throughout the year. Students in the treatment group continued to receive the same instruction as those in the comparison group but they were also trained in the QFT and applied the protocol throughout the writing process.

Description of the Modified Writing Curriculum—Treatment

The protocol outlined by the Question Formulation Technique was incorporated into a traditional writing curriculum. This modified writing curriculum used by the treatment group was based on practices currently used by the English Department at which the study took place: (a) brainstorm, (b) draft, (c) revise, and (d) publish with the addition of the phases advised by the QFT protocol (brainstorm/draft, revise, prioritize, and select). The instruction was guided by the six-traits of writing: (a) ideas, (b) organization, (c) voice, (d) diction, (e) sentence fluency, and (f) conventions. The school-wide writing rubric used for the study assessed writing based on these six-traits and had five stages of mastery (*Advanced*, *Experienced*, *Proficient*, *Developing*, and *Emerging*). The point-value assigned to each stage of the 1-5 scale ranged from 1 point for *Emerging* to 5 points for *Advanced* (see Appendix I).

Students in the treatment group continued to receive the same instruction as those in the comparison group but they also received training in the QFT and applied the protocol throughout the writing process. To initiate the process, teachers explicitly taught how to ask

questions that promote divergent thinking, convergent thinking, and metacognition, after which teachers revealed a question focus for the unit. This cyclical process was used throughout the unit of study: (a) present the question focus; (b) review rules for producing questions; (c) produce questions; (d) categorize questions; (e) prioritize questions; (f) prioritize next steps; and (g) reflect on the process.

Professional Development. Prior to the application of the intervention, the researcher conducted a two-hour workshop (see Appendix J) for the teachers who were randomly assigned to the treatment group.

The primary focus for the workshop included an introduction to the QFT protocol (PowerPoint and instructional guide), samples of its usage in secondary English classrooms (video), and time to consider its implementation during the intervention period. The researcher worked with each treatment teacher individually following the initial orientation section of the training to plan for the implementation.

The professional development conducted by the researcher, included material offered by the Right Question Institute (RQI), the organization established by the authors of the QFT. The session provided an overview of the Question Formulation Technique process, highlighting roles and responsibilities of teachers and students, and the Question Focus (QFocus), the element used to prompt question generation (i.e., it can be visual, topical, situational, or textual). To ensure the integrity of the question generation component, rules, such as *Ask as many questions as you can*, *Change statements into questions*, *Avoid discussing, judging, and answering questions*, were reviewed. This was followed by an opportunity to practice the QFT. The question focus for the practice session was *Students are not asking questions*. Teachers generated questions in response to the QFocus, improved

and then prioritized the questions, and finally, developed a rationale for choosing which questions to use. The session ended with the participating teachers reflecting on their experience with the QFT process.

Pedagogical purposes for using the QFT also were explored (e.g., generate interest, stimulate new thinking, set a learning agenda, deepen comprehension, formative assessment). Another critical component of the professional learning experience addressed the types of thinking the QFT process promoted: divergent thinking, convergent thinking, and metacognition. To support the implementation, teachers had time to work independently and share ideas with one another to design the QFocus for the units that occurred during the intervention time frame.

As part of the orientation section of the workshop, the researcher shared the philosophy behind the QFT protocol: “All students should learn how to formulate their own questions” and “All teachers can easily teach these skills as part of their regular practice” because the goal is to “democratize the teaching of an essential thinking and learning skill that is also an essential democratic skill” (Rotherstein & Santana, 2012, p. 1). According to the Right Question Institute’s literature, “The Question Formulation Technique has been painstakingly developed, tested, simplified, and improved over the past two decades” and offers “a rigorous process that mixes easily with a [teacher’s] explicit and implicit teaching knowledge” (p. 4). Teachers were then introduced to the QFT elements. This introduction was reinforced through a series of video vignettes in which participants were able to see how other teachers used the QFT process in their own classrooms. One of these authentic situations included a Grade 12 Humanities instructor teaching the Pulitzer Prize-winning novel, *The Brief and Wonderful Life of Oscar Wao* by Junot Diaz, thereby providing teachers

with a starting point for how they might introduce the protocol in their classrooms. Following this point, teachers were provided with two short readings regarding the use of the QFT. These readings were taken from Rotherstein and Santana's (2012) *Make Just One Change*, the text that details the Question Formulation Technique's history, components, usage, and case studies. Only treatment teachers were given a copy of this book. Participants were then given materials that they could use with their students to introduce them to the QFT process. Shortly thereafter, the researcher and the teacher-participants reviewed the upcoming unit for their respective curricula to determine at which points to begin the intervention and how to go about presenting it to students. As a final note, questions were encouraged throughout each section of the workshop.

This professional development occurred at the start of a morning in which the participants were working on curriculum revision for their particular grades so the timing of the workshop was supported by the work that the teachers did later in the day. As there was a requirement to implement the QFT a minimum of four times throughout the intervention period, teachers were able to consider at which points they would use the protocol during the established timeframe (over a 10-week period). Participating teachers considered what the question focus would be for each of the four applications. These were selected so they coincided with the focus of the prompts used by the comparison group. For example, if a prompt used by one grade's comparison group dealt with the effects of power on the individual, the treatment group prompt had that same question focus (see Appendix K).

The intervention timeline and treatment teacher curriculum implementation log also were introduced and reviewed (see Appendices L and M). During the period of the intervention, teachers maintained a daily instructional log documenting classroom activities

and time allocated to them. Additional time was spent addressing how to administer and collect the demographic survey; steps taken to ensure privacy and maintain confidentiality for study participants (both students and teachers); and how material, including videotapes, would be collected, securely stored, and eventually destroyed as applicable. An *Excel* spreadsheet was shared with teachers for their collection of data (see Appendix N). The teachers also were directed to submit all completed work to an independent third party to make copies of student work (identified by assigned student identification number) that would then be shared with independent scorers who would use the school-wide rubric to score student work and to validate the reliability of the school-wide rubric. The researcher reminded teachers that they would be videotaped at the start of and during the study for the purpose of observing question generation. Teachers were encouraged to seek out the researcher if they had any questions throughout the process.

Finally, participants were reminded that they had the right to withdraw from the study at any time and were instructed not to discuss the training or the protocol with teachers in the comparison group during the time of the study. They were informed that the researcher would provide training to any teacher interested in the QFT after the intervention was completed. A review of a statement of ethics finished the session. All materials used during the professional development sessions were shared with the participants.

At the request of one of the teachers assigned to the treatment group, the researcher modeled the use of the QFT in a class that the researcher taught. A second training session, one-hour long, was conducted as a follow up to address any additional questions, concerns or need for clarification. This occurred after the initial implementation of the QFT. After the first round of the intervention, teachers noticed that some students chose questions that did

not encourage enough analysis and thereby weakened or limited their arguments. The need to provide additional instruction on the revision and selection of the question to which a student would respond was further addressed. Additional resources, including stem questions and a Bloom's Taxonomy verbs list were shared with the treatment teachers (see Appendix O). Also clarified during the session were the scores to be entered into the *Excel* spreadsheet as one teacher was deducting points for late work and using those scores. Therefore, the researcher directed participating teachers to note the actual quality of work score as determined by the school-wide rubric (not the late work penalty) on the *Excel* spreadsheet.

The researcher continued to meet with participating teachers throughout the intervention, if not on a daily basis, then on a weekly one. At the completion of the study, all participating teachers received a handwritten thank you note and a small gift card as a token of appreciation for their participation.

Question Formulation Technique (QFT). The process of the Question Formulation Technique promotes students' abilities to not only craft their own questions, but to strategize how to use them: "The process manages to develop students' divergent (brainstorming), convergent (categorizing and prioritizing), and metacognitive (reflective thinking abilities) thinking in a very short time" (Rotherstein & Santana, 2011, p. 1). The process consists of six activities: (a) teachers design a question focus, (b) students produce questions, (c) students improve their questions, (d) students prioritize their questions, (e) students and teachers decide on next steps, and (f) students reflect on what they have learned (Rotherstein & Santana, 2011). The process can be used at different points in a unit and with all ages of students. It is applicable to various elements of literacy instruction.

The Question Formulation Technique derived from a need. As Rotherstein and Santana (2011) expounded, “ the skill of being able to generate a wide range of questions and strategize about how to use them effectively is rarely, if ever, deliberately taught” (p. 1). Their goal was to “democratize” this process and to develop a strategy whereby the process would be easily accessible (Rotherstein & Santana, 2011, p. 1), hence the various components to the QFT. The first component, the development of a QFocus, initiates the shift from the traditionally teacher composed questions to those of the students. This is critical to the ideology behind the Question Formulation Technique. Rather than developing the prompt, the teacher provides the focus for which students generate questions. This is why it is important to have a focus that is clear yet stimulates new lines of thinking while at the same time, not revealing teacher bias or preference (Rotherstein & Santana, 2011). Once the QFocus is introduced by the teacher, students primarily drive the process, whether it is making certain all group members adhere to the agreed upon rules and are contributing, which is essential to fostering divergent thinking, or as the authors describe it, “getting to new places and ways of thinking related to the QFocus...as students unpack the meaning of terms and ideas presented to them” (Rotherstein & Santana, 2011, p. 63). As students deconstruct the QFocus, they begin to think about different aspects of it, thereby stimulating their thinking. It is important to acknowledge that some students may struggle with this step and when that occurs, it is important for the teacher to avoid giving examples of questions. Rather, the instructor should allow students time to ruminate or remind them of question starters. By removing him or her self from the process and monitoring the process instead, the teacher then is able to encourage students to refine their questions, which is the next step of the QFT.

These next steps, improving and prioritizing the questions, promote convergent thinking as students “begin to look more closely at their own questions and take apart what information they can get from them” (Rotherstein & Santana, 2011, p. 73) thereby “creating a path that will lead them far more efficiently to those answers” (p. 73) while also “engag[ing] in a powerful metacognitive thinking exercise about the purposes and uses of different kinds of questions and ways to obtain information” (p. 73). This is one of the reasons why students categorize the questions that they have brainstormed as either close-ended or open-ended and revise the closed-ended questions into open-ended ones. After crafting and revising their questions, students need to narrow their lists and prioritize. Prioritization requires students to establish some kind of criterion on which they base their decisions. Teachers can contribute to this stage by directing students to select three questions that most interest them individually, for example, or have them individually select the three most important questions, knowing that also will require some discussion as to what constitutes *most important*. Part of the QFT’s flexibility also allows teachers to implement this step at the individual or group level. Small group discussion is important as group members explain their rationale for their selections. Students will need to compare, contrast, analyze, and assess in order to come to some conclusions about their question selections. These experiences also can be shared with the class as a whole, providing yet another opportunity for students to work and learn from each other, which is why the next step is so valuable.

The partnerships, at the student-to-student level, the teacher-to-student level, and the student-to-teacher level, facilitate a community of learners. The QFT can be used for a range of purposes and at various times, to introduce and start a unit, to close a unit, to generate the

development of an idea or argument one wishes to explore. It is in the final step, the stage of reflection, however, that the QFT emphasizes the onus for learning on the student.

Rotherstein and Santana (2011) explain how:

when students are asked to reflect on the process they just experienced, they are looking back at what has come before and thinking about it from their current perspective. They are naming what has (and has not) been understood. They are identifying what they have learned and how it affects their thinking and feeling now...and they can name what they can do in the future with what they just learned. (p.120)

To facilitate this phase, teachers need to consider how they want to organize the reflection activity and what information they would like to glean from the experience. Here is where the teacher may revert to asking questions until students become proficient at the process themselves. As with other elements of the QFT, the reflection step is flexible and can be done at the individual or group level.

Instructional time. The secondary school in which the study took place used an 8-day rotational cycle. Thus specific classes did not meet every day. During a typical cycle, classes met 3 to 4 times a week, as a class dropped out of the cycle after every third session. In addition, the time period during which the study took place had some disruptions to the typical rotational cycle, with some class sessions missed for assemblies and testing, for example.

There were approximately 24 to 28 class periods during the 10-week intervention period. Teacher logs were reviewed to ascertain how much of this instructional time was reserved for writing instruction. According to these entries, the percentage of available

instructional time dedicated to implementing the modified writing curriculum embedded with the QFT was 51.68% for the treatment groups whereas it was 40.16 % for the comparison groups. It is worth noting that the writing instructional and application time was not evenly distributed across the intervention. Some weeks involved 2-3 hours of writing instructional time and application for some classes, while for others it may have been as low as 45 minutes. This was driven by curriculum needs and changes in school schedules (due to *NWEA MAP Reading* testing and holidays like Memorial Day).

The QFT-embedded writing instruction cycle occurred 4 times during the intervention period. By this time of the year, spring of 2015, students had experienced the traditional writing process a minimum of 10 times with a variety of writing genres and length of assignments, from short responses to essays to research papers. The participating teachers introduced the modified writing instructional curriculum during the first cycle. Direct instruction was provided. The question focus for the initial task related to an essential focus of the respective units being taught (see Appendix K). Teachers placed students into heterogeneous groups to generate, categorize, and refine questions (see Appendix P). Each group prioritized their questions and then shared them with the class after which questions were revised as needed, either as a whole class or in small group settings. Students then individually selected questions to respond to in writing. During the revision process, each student would turn his/her individually selected questions into a new QFocus and would conduct the QFT steps again. The question(s) selected from this generation were then used to guide their revision. These responses were assessed using the school-wide writing rubric.

After the initial round of the QFT-embedded writing curriculum, the teachers in the treatment group observed that some students did not select questions that lent themselves to a

developed response, and, therefore, more time was spent during the second cycle on the question refinement and selection process. The pace was slower in the second cycle as compared to the first one. This change in pacing is in keeping with the flexibility of the QFT. By adjusting the pace from the first interaction with the Question Formulation Technique to the second, teachers were able to work more closely with the groups that needed additional support. By the third round, the teachers grouped students according to their skill needs, thus enabling them to differentiate and focus instruction and adjust the pacing of the QFT accordingly by group. Consequently, by the fourth session, teachers and students had familiarized themselves with the technique. In each stage, the teachers selected a question focus that was relevant to the point of the unit at which they were situated (see Appendix K). Coinciding with instruction on the QFT, students also engaged in writing instruction that addressed grammar and mechanics, fluency and cohesiveness, and developing voice. The instruction corresponded with the stages of the process writing approach used (i.e., brainstorm, draft, revise, and publish). Individual student-teacher writing conferences occurred throughout the intervention period.

During this time period, the teachers participating in the treatment maintained implementation logs. Information recorded included dates and time allotted for writing instruction and the QFT, focus of the writing instruction and QFT, and daily comments. These logs were submitted to the researcher at the end of the study for analysis (see Appendix M).

Description of the Traditional Writing Curriculum—Comparison

Comparison group participants (teachers, students) adopted the traditional writing curriculum used by the school in which the study took place. Whereas much of what was

experienced by those in the treatment group was done collaboratively, students in the comparison group worked primarily in isolation, except when they were editing the writing of other students. During each of the cycles, the teacher generated the prompt to which all students responded to in writing (see Appendix K). Likewise, the pacing of the process primarily remained the same for all students, unless required to do so by a student's Individual Education Plan (IEP), for example. As with their peers in the treatment group, students in the comparison group received instruction in mechanics, grammar, and process of writing. Here, too, teachers conducted individual writing conferences with students. The teacher implementation logs maintained by teachers in the comparison group were collected at the end of the intervention period and analyzed by the researcher (see Appendix Q).

Instructional time. The data gathered included instructional time dedicated to writing, instructional time available for each class, writing instruction focus, and teacher comments. A review of the teacher logs revealed that the comparison groups used 40.16% of the instructional time available for writing instruction and application as compared to the treatment groups, which used 51.68% of the instructional time; a decrease of 11.52%. Further review of the logs showed teachers used their own material as well as professional learning community (PLC)-created materials (see Appendix R). Instruction included strategies such as targeted intervention worksheets, sharing of student exemplars, graphic organizers, and word charts.

Gradual Release of Responsibility Model

In keeping with the expectations for the school in which the study took place, the participating teachers used the Gradual Release of Responsibility (GRR) model for instruction (Pearson & Gallagher, 1983) in both the treatment group and the comparison

group. As its name implies, the GRR shifts the cognitive load from the teacher to the student, or as Fisher and Frey (2014) described: “the cognitive load should shift slowly and purposefully from teacher-as-model, to joint responsibility, to independent practice and application by the learner” (p. 2). Key to this model is the pattern of *I do, we do, you do*, which is outlined in three phases: (a) teachers directly instruct and model the skill or strategy for students (*I do* stage), (b) students and teachers do the work together (*We do*), and (c) students do the work individually (*You do* phase). While the process was in place in the school and teachers were expected to use it, the participating teachers were at varying levels of proficiency with its implementation. Generally, the pattern for lessons followed the GRR format—opening with teacher modeling, followed by an activity in which the class practiced, and if time allowed, the students individually applied the new learning. If there was not enough time during the class period, students either completed the work for homework or during the next class period. What was not consistently implemented was the targeted small group instruction component of the *We do* stage.

Writing Instruction Focus

The writing instructional goals for both groups addressed components such as: (a) writing an engaging introduction, (b) drafting a claim or thesis statement, (c) use of evidence, and (d) creating effective conclusions (see Appendix R). A considerable amount of instructional time was spent on evidence and the use of the ICE strategy, a strategy taught in the school in which the study occurred. The ICE strategy is used as way to incorporate evidence more effectively as it encourages students to a) *Introduce the quotation*, b) *Cite the quotation*, and c) *Explain how it supports or develops the point being made*. However, this component was not addressed until time was spent instructing students on refining thesis

statements or claims. Coinciding with ICE instruction was explicit teaching on paragraph structure and transitioning. Targeted worksheets and activities were used to scaffold the instruction for students accordingly (see Appendix R).

Monitoring of Implementation of the Modified and Traditional Writing Curricula

The researcher took several precautions to monitor implementation of both the modified and traditional writing curricula. In addition to the teacher implementation logs that all teacher participants maintained and the researcher reviewed, the researcher also met regularly with the instructors. As the researcher and participating teachers all worked in close proximity to one another, informal conversations took place several times a week and more formally on a weekly basis throughout the course of the intervention period. Most of these informal daily conversations took place more consistently at the start of the intervention period and resided over time to the more formal weekly debriefing. The close proximity also allowed for the researcher to monitor visually the implementation of both curricula. Additionally, classes were videotaped at the beginning of and during the intervention period to observe question generation practices. Such steps enabled the researcher to monitor fidelity of the treatment.

Instrumentation

The instruments used for the study included: (a) Researcher-developed Teacher and Student Demographic surveys, (b) Teacher Writing Curriculum Implementation Logs, and (c) a Writing Rubric.

Student and Teacher Demographic Surveys

Following submission of assent and consent forms, all participants were asked to complete either a student or a teacher demographic survey as applicable to their role in the

study. The student demographic survey provided the researcher with information relevant to the student's grade, the English class attending, the teacher's name, gender, and ethnicity (see Appendix H). The teacher demographic survey sought similar information, such as gender and ethnicity, but it also requested details regarding the total number of years as a teacher and the number of years teaching English specifically, level of education completed or degrees earned, and types of teaching certification (see Appendix E). The researcher used this information to better describe the characteristics of the student and teacher participants in the treatment and comparison groups.

Teacher Writing Curriculum Implementation Logs

The teachers in both the treatment and comparison groups were given teacher logs to maintain for data collection and to ensure fidelity of the implementation of the two writing programs over the course of the intervention period. The researcher reviewed these logs both during and after the intervention. These writing curriculum implementation logs captured information such as time allotted to writing instruction, types of instruction provided and activities conducted (see Appendices M and Q). They differed in one respect: treatment teachers also were asked to note how the QFT was used during the lesson.

Writing Rubric

A writing rubric, developed and calibrated by the district and aligned with the Common Core Standards (CCS) was used to assess the students' pre-and post-essays (see Appendix I). The school's writing rubric had gone through three revisions since its first implementation in the fall of 2007. The most recent revision was driven by the school's Learning Initiatives Teacher (LIT) during the 2013-2014 school year. The CCS was the impetus for the revision. Partial implementation of the revised rubric occurred to test for the

effectiveness of the tool. Based upon teacher and student feedback, further revision was required. Two follow up sessions to seek input from stakeholders, one held in September 2014 with the Social Studies Department, and one held with the English Department in October 2014, led to the most recent version used for this study. Grounded in the foundations set by the CCS, the rubric reflected various stages of mastery: *Advanced*, *Experienced*, *Proficient*, *Developing*, and *Emerging*.

Calibration was part of the process used by both the English and Social Studies departments to ensure consistency of measuring students' writing achievement. A school-established protocol was used for calibration. Initially time was spent reviewing the components of the rubric to determine if the terms were clear. Then, all participants used the school-wide rubric to assess the same essay individually. Once completed, the English and social studies teachers then shared the scores and discussed how the score was achieved based upon the criteria established in the rubric. Disparities were discussed until the team agreed upon a final score. This was done a minimum of 8 to 10 times depending on the session. Teachers then scored student samples independently. After approximately 45 minutes passed, another round of calibration was conducted to see if scores were still consistent. Two more separate sessions of calibration occurred prior to the implementation of this study. The same format was followed for each calibration session.

Additionally, two independent raters, trained in scoring and calibrating the rubric, scored 100% of the pre- and post- essay samples to establish interrater reliability. If the two independent raters had a gap of more than 3 points on the 6-30 point scale, a third independent rater who also was trained on using the school rubric, intervened and scored the

essay. The teachers involved in this study participated in calibration during a separate session.

The rubric listed six traits (*Ideas, Organization, Voice, Diction, Sentence Fluency, and Conventions*) that were assessed as *Advanced, Experienced, Proficient, Developing, or Emerging*. Each trait was worth up to five points (1 = *Emergent* and 5 = *Advanced*), which placed the rubric on a 30-point scale. All students were assigned a score for each writing component (1-5 scale). All six scores were then totaled to determine the final score. For the purposes of this study, this total score was used as the argument writing achievement for the pretest and posttest measure.

The English teachers participating in this study were trained by the researcher in how to administer the assessments and maintain student privacy. Students noted their respective identification number on their essays prior to scoring by the teachers and the independent raters. Scores were not shared between the participating teachers and independent raters. Each party submitted scores to separate *Excel* spreadsheets that were then consolidated by the researcher into one that consisted of all scores submitted for each participating student's writing. If a set of scores (teacher and independent rater) for a particular student on a particular assignment deviated by more than three points from each other, the essay was re-read and scored by a third party, also trained in using the rubric. This process was conducted for both the pretest and posttest. The texts students were studying during the intervention were William Shakespeare's *Romeo and Juliet* (Grade 9 pretest and posttest), Shakespeare's *Macbeth* (Grade 10 pretest) and Lawrence and Lee's *Inherit the Wind* (Grade 10 posttest). The ninth grade pretest and posttest each had a Lexile level of 1260. The tenth grade pretest had a Lexile level of 1080 and the posttest had a Lexile level of 1010.

Description and Justification of the Analysis

To organize and maintain data, the researcher initially set up a Microsoft *Excel* spreadsheet (see Appendix N). The data from the demographic surveys and the writing scores (teachers and independent raters) were entered. When the intervention period concluded, this file was then uploaded to the Statistical Package for the Social Sciences (SPSS; SPSS, Inc., 2009), which the researcher used for the statistical data analysis of the research question.

A two-way analysis of variance (ANOVA) was used to determine if there was an interaction effect between two independent variables on a continuous dependent variable (Gall et al., 2007). The analysis reviewed if a two-way interaction effect existed between type of instruction and gender in explaining writing achievement scores. The independent variables were: (a) the type of writing instructional program with two levels (modified writing program embedded with the Question Formulation Technique and traditional writing program), and (b) gender with two levels (male and female). The dependent variable was the writing achievement score, determined by students' mean posttest scores on the Writing Rubric. ANOVA was used to analyze the pretest writing scores for the purpose of determining if significant differences existed between the two groups. A two-way analysis of covariance (ANCOVA) was used to analyze the posttest Argument Writing scores in order to “control for initial differences between groups before a comparison of the within-groups variance and between-groups variance is made” (Gall et al., 2007, p. 320).

Data Collection Procedures and Timeline

The following account delineates the timeline and procedures for data collection. The researcher tracked the timeline of key events in a log that was maintained for this purpose (see Appendix L).

1. The researcher submitted a proposal for IRB approval. In February 2015, the approval was granted by the Western Connecticut State University (WCSU) Institutional Review Board (IRB) to conduct the study.
2. The researcher requested and received permission from the district superintendent and building principal to conduct the study after which consent from teachers to participate was achieved. The participating teachers also completed their demographic surveys in February 2015.
3. The researcher randomly assigned teachers and their intact classes to either the treatment group or the comparison group and assigned identification numbers for the participating teachers and classes to ensure confidentiality (February – March 2015).
4. The researcher created a Microsoft *Excel* file to organize and secure the demographic data collected. Additional quantitative data were added throughout the intervention period (March – June 2015).
5. The researcher finalized preparations for professional development. She conducted the first workshop for treatment teachers on March 6, 2015. During the initial workshop, specific steps for the modified writing curriculum were explicitly taught; expectations were communicated regarding administration of

materials, surveys, and intervention as well as collection of data; and teacher handbooks were distributed. The *Excel* spreadsheet was reviewed.

6. The researcher also conducted separate professional development for teachers in the comparison group. This one-hour workshop addressed specific steps and expectations for the study, such as completion of the teacher curriculum implementation log; a review of how to administer and collect student work, including the student demographic surveys; and confirmation that they would have an opportunity to receive the same training that participants in the treatment group experienced once the study was completed on March 6, 2015.
7. The participating teachers agreed upon a date on which to start the research (March 6, 2015).
8. Two calibration sessions (March 10, 2015 and March 19, 2015) were conducted with the participating teachers and the independent raters to continue work with the writing rubric and the scoring of student work.
9. Following the initial professional development, teachers in both groups met to discuss the curriculum and revise plans for the upcoming units. It was at this point in time that the treatment teachers began to modify their plans to accommodate the intervention (March 6, 2015).
10. After the teacher professional development, parent consent and student assent forms were distributed and collected, the initial request was made via researcher presentations in the classrooms. The participating teachers in both groups conducted two follow-up waves of invitation for their students to participate. The

researcher also posted notices about the study and the need for student participants during parent conferences (March 2015).

11. The researcher modeled the Question Formulation Technique with one of her own classes upon the request of a teacher participating in the treatment group (March 9, 2015).
12. The participating teachers distributed student identification codes to individual student participants to be used on all written work submitted for the study, and administered and collected student demographic surveys which they then submitted to the researcher (March – April 2015).
13. The research study began at the start of the third quarter of the 2014-2015 school year with the administration and scoring of the pretests, at which point the teachers also began to maintain their teacher writing curriculum implementation logs (March 2015).
14. An additional teacher training session was held for those in the treatment group to refine some of the instructional QFT practices (March 27, 2015).
15. The researcher met regularly (initially daily and then weekly) with the teacher participants to assess fidelity of the program implementation (March – June 2015).
16. Videotaping of classes in the treatment and comparison groups took place at the start and during the intervention period for the purpose of observing student question generation (March – June 2015).
17. Collection of student work to share with independent raters for scoring occurred on June 2, June 9, and June 19, 2015.

18. Administration and scoring of posttests for the comparison and treatment groups occurred (June 19, 2015).
19. Thank you cards and small gift of appreciation were distributed to the teacher participants (June 21, 2015).
20. Data input continued throughout the intervention period (April – June 2015).
21. Analysis of data occurred (October – December 2015).

Ethics Statement

The permission to conduct the research was applied for through the IRB at Western Connecticut State University. Once approval was received, permission was sought from the participating district's superintendent, the high school principal, and the English teachers. After this consent was granted, parental consent and student assent were sought. Participation was completely voluntary and the participants were able to withdraw at any time. Full disclosure of the study's purpose, procedure and methodology were made. The participants' names, the school district, and other identifying details were kept confidential. All data, therefore, were coded and compiled without reference to specific individuals.

CHAPTER FOUR: ANALYSIS OF THE DATA

This study investigated the impact of the Question Formulation Technique (QFT) and gender on the argumentative writing achievement scores of secondary school students, specifically those in Grades 9 and 10. This chapter delineates the statistical procedures and findings of the research questions that guided the study. These results are presented in the following sections: (a) research questions and hypothesis, (b) description of the data, (c) data coding and entry, (d) screening of the data, and (e) quantitative data analysis and results for the research question.

Research Question and Hypothesis

By using a systematic approach, this study addressed the following questions:

1. Is there a significant difference in Argument Writing Achievement between secondary school (Grades 9 and 10) male and female students who participate in a modified writing curriculum embedded with the Question Formulation Technique (treatment) and those participating in a traditional writing curriculum (comparison)
 - a. Is there a significant difference in Argument Writing Achievement between secondary school students who participate in a modified writing curriculum with the Question Formulation Technique embedded (treatment) and those who participate in a traditional writing program without the embedded Question Formulation Technique (comparison)?
 - b. Is there a significant difference in Argument Writing Achievement between secondary school male and female students?
 - c. Is there a significant interaction between writing instructional program and gender?

Non-directional hypothesis: There is a significant difference in Argument Writing Achievement between secondary school (Grades 9 and 10) male and female students who participate in a modified writing curriculum embedded with the Question Formulation Technique and those participating in a traditional writing curriculum.

Description of the Data

The data analysis conducted for this study used quantitative data from the writing rubric used by teacher participants and independent raters to score student participant argumentative writing samples. The rubric outlined criteria that reflected the six traits of writing: ideas, organization, voice, diction, sentence fluency, and conventions and had 5 stages of mastery (*Advanced, Experienced, Proficient, Developing, and Emerging*). A point-value, on a 1-5 scale, was assigned to each stage, from 1 point for *Emerging* to 5 points for *Advanced*. Quantitative data (pretest and posttest) from the writing rubric were collected for the research question. In addition, all participants (teachers and students) completed demographic surveys. Lastly, the teachers maintained program implementation logs and their classes were videotaped at the start and during the intervention.

The independent variables included the writing instructional program with two levels (modified writing curriculum embedded with the Question Formulation Technique, traditional writing instruction) and gender (male, female). The dependent variable was the single writing achievement score. The writing achievement score was the total points allotted on the writing rubric with all six sections combined (scale of 6-30).

Data Coding and Entry

As a first step in the data coding process, the researcher created a codebook registering the researcher-assigned codes to all quantitative data. Labeled by names and coded by values, the researcher noted the demographic data for the participants (teachers and students), the pretest and posttest data, and the teachers and independent raters scoring of student work. To ensure confidentiality, student names were not used. All student participants were assigned student identification numbers. The participating teachers and their corresponding classes were coded with identification numbers. The codebook was used to ensure consistency, reasonableness and legitimacy of coding application (Meyers, Gamst, & Guarino, 2006).

A Microsoft *Excel* spreadsheet was created as a repository for all the quantitative data derived from the scored writing assignments (teachers, independent rater 1, independent rater 2, and, as applicable, independent rater 3) and key demographic data, such as gender. This information was then transferred to the Statistical Package for the Social Sciences v. 18 (SPSS, Inc., 2009). Tables 6 and 7 outline the codes for these data.

Table 6

SPSS Codebook of Student Demographic Variables

Code Name	Type of SPSS Field	Assigned Values
Student ID	Numeric	10022-1020111
Teacher	Numeric	1 = Teacher 9A 2 = Teacher 9B 3 = Teacher 10A 4 = Teacher 10B
Class	Numeric	1 = Teacher 9A, Period 2 2 = Teacher 9A, Period 4 3 = Teacher 9A, Period 5 4 = Teacher 9A, Period 8 5 = Teacher 9B, Period 2 6 = Teacher 9B, Period 3 7 = Teacher 9B, Period 5 8 = Teacher 9B, Period 6 9 = Teacher 10A, Period 1 10 = Teacher 10A, Period 5 11 = Teacher 10A, Period 8 12 = Teacher 10B, Period 1 13 = Teacher 10B, Period 3 14 = Teacher 10B, Period 4

(continued)

Table 6

SPSS Codebook of Student Demographic Variables

Code Name	Type of SPSS Field	Assigned Values
Group	Numeric	1 = Comparison, Traditional 2 = Treatment, Modified
Grade	Numeric	9 = Ninth Grade 10 = Tenth Grade 11 = Eleventh Grade 12 = Twelfth Grade
Gender	Numeric	1 = Male 2 = Female
Ethnicity	Numeric	1 = African American 2 = Asian/Pacific Islander 3 = Hispanic 4 = Native American 5 = White 6 = Multi-racial

Table 7

SPSS Codebook of Pretest and Posttest Computed Variables

Label	Code Name	Type of SPSS Field	Possible Values
Pretest Argument Writing Rubric Total Score	Pretest	Numeric	6-30
Posttest Argument Writing Rubric Total Score	Posttest	Numeric	6-30

Data Screening Process

As noted by Meyers et al. (2006), it is important to “ensure that once a given data set is in hand, a verification procedure is followed that checks for appropriate numerical codes for the values of each variable under study” (p. 44), which is why the researcher visually verified and cleaned the data as needed. Step one was a visual inspection of the SPSS dataset: (a) data missing, (b) data entered incorrectly, such as beyond the assigned ranges or in non-numeric form, and (c) code violation (Meyers et al., 2006). Frequency tables were used for pretest and posttest data.

All data for the pretest and posttest Writing Rubric scores were accounted for, but the researcher did note that three data points had been entered incorrectly on the Microsoft *Excel* spreadsheet. These data did not fall within the expected ranges, denoting an extreme value violation (Meyers et al., 2006). The data had been inputted incorrectly as values of 221, 200, and 207; all beyond the range of 6-30. The researcher reviewed the original scores (22, 20, and 27 respectively), and then entered these into the dataset. Such steps were necessary for

as Meyers et al. (2006) explained, “The challenge in code cleaning is to determine, for every case, whether each variable contains only legitimate numerical codes or values, and secondarily, whether these legitimate codes seem reasonable” (p. 44).

The researcher also conducted a visual inspection of the demographic data using a similar process. No code violations or duplicate entries were found. However, six students did not indicate or did not clearly indicate their ethnicity. Meyers et al. (2006) acknowledged, “Respondents may refuse to answer personal questions...some respondents may not be competent to respond because of a lack of knowledge regarding a particular topic” (p. 56). Since this information (ethnicity) was not necessary to the statistical analysis, the researcher chose to include the work of these participants in the data analysis.

Demographic Results

Participants were asked to complete researcher-created demographic surveys, one for teachers and one for students (Appendices E and H). The results were used to help characterize the participants. The total number of student participants was 175 from ninth and tenth grades. More girls than boys participated in the study, 94 as compared to 81, respectively. Table 8 presents the composition for student participants’ gender for the treatment and comparison groups.

Table 8

Gender of Student Participants in Treatment and Comparison Groups

	Percentage of Treatment Group (<i>n</i> = 94)	Percentage of Comparison Group (<i>n</i> = 81)	Percentage of Total (<i>n</i> = 175)
Female	52.10	48.10	52.00
Male	47.90	51.90	48.00
Total	100.00	100.00	100.00

Data Analysis

The research question that guided this study investigated whether a significant difference in Argument Writing Achievement existed between male and female secondary students who participated in a traditional writing program embedded with the Question Formulation Technique (treatment) and those who participated in a traditional writing curriculum without the embedded Question Formulation Technique (comparison). There were two independent variables with two levels each: (a) type of writing instruction (traditional writing curriculum embedded with the Question Formulation Technique and traditional writing curriculum), and (b) gender (male = 1, and female = 2). The dependent variable was secondary students' argumentative writing achievement scores.

Pretest Data Analysis

To account for potential critical discrepancies in group composition, the researcher analyzed the pretest data. This step was taken because assigning intact classes to a treatment group or a comparison group does not guarantee equalization at the starting point. Meyers et

al. (2006) explained that initially “the relationship observed between two dependent variables or between a dependent variable and an independent variable may lead [the researcher] to an incorrect answer” (p. 26). Gall et al. (2003) recommended that an “analysis of covariance should be used” to “adjust for initial differences in pretest means” (p. 429). This is because “[analysis of covariance] permits you to attribute observed gains to the effect of the experimental treatment rather than to the differences in initial scores” (Gall et al., 2007, p. 440). Therefore, the researcher used the covariant to examine whether there were any statistical differences between student participants (treatment and comparison) on their argumentative writing achievement scores prior to the intervention. Accounting for key differences between the two groups prior to implementation of the intervention and analysis of posttest data was critical to the integrity of the study.

Analysis of outliers. Also critical to the integrity of a study’s outcomes was an analysis of outliers, which Meyers et al. (2006) defined as “cases with an extreme or unusual value on a single variable (univariate) or on a combination of variables (multivariate)” (p. 65). While outliers may be included if justified by the researcher because “their existence may signal a serendipitous presence of new and exciting patterns within a data set” (Meyers et al., 2006, p. 65), one must be careful about their inclusion because outliers have the potential to distort data, thereby potentially leading to a misinterpretation of a study’s results (Meyers et al., 2006).

The researcher began the analysis by first examining Writing Achievement pretest scores and then the posttest scores to see if there were any outliers in the data. This was done for both gender and type of writing program. While no outliers were found for the treatment group, two were discovered in the comparison group. An examination of box-and-whiskers

plots revealed that these two outliers were present for both program type and gender comparison groups, which could affect normality as the distribution may be altered in a way that resists a bell-shaped curve (Meyers et al., 2006). These outliers scored a 5 and a 4 on the pretest. The standard deviation for the pretest comparison group was 4.58 while it was 4.00 for the treatment group. The skewness (1.186) and kurtosis (1.186) for the comparison group were noticeably different from that of the treatment group for which skewness was -.207 and kurtosis was -.356. The researcher made the decision not to include these two outliers in the data analysis. Removal of the outliers altered the skewness for pretest program type comparison group to .054 and kurtosis to -.396 and the pretest gender comparison group to .405 for skewness and .160 for kurtosis. These values for the Argument Writing Achievement pretest means were within acceptable values of absolute 2, an indication of normal distribution (D'Agostino, Belanger, & D'Agostino, 1990). D'Agostino, Belanger, and D'Agostino (1990) deem skewness and kurtosis which are less than + or -2 as appropriate for determining normality. Their removal also reduced the number of data points to 173. Table 9 presents Pretest Argument Writing Achievement values for skewness, kurtosis, mean, and standard deviation.

Table 9

Skewness and Kurtosis Values for Pretest Argument Writing Achievement

	Skewness	Kurtosis	Mean	Standard Deviation
Program Type				
Comparison ($n = 81$)	.054	-0.396	19.36	4.00
Treatment ($n = 94$)	-.207	-0.356	20.30	4.00
Gender				
Male ($n = 84$)	-.405	0.160	19.29	3.79
Female ($n = 91$)	.060	-1.041	20.39	3.79

Note. Students could earn between 1-5 points in each of the six categories of the rubric, resulting in a total rubric score between 6-30 points.

Figure 1 reflects the box-and-whiskers plots following the removal of the two outliers, resulting in the cleaning of data.

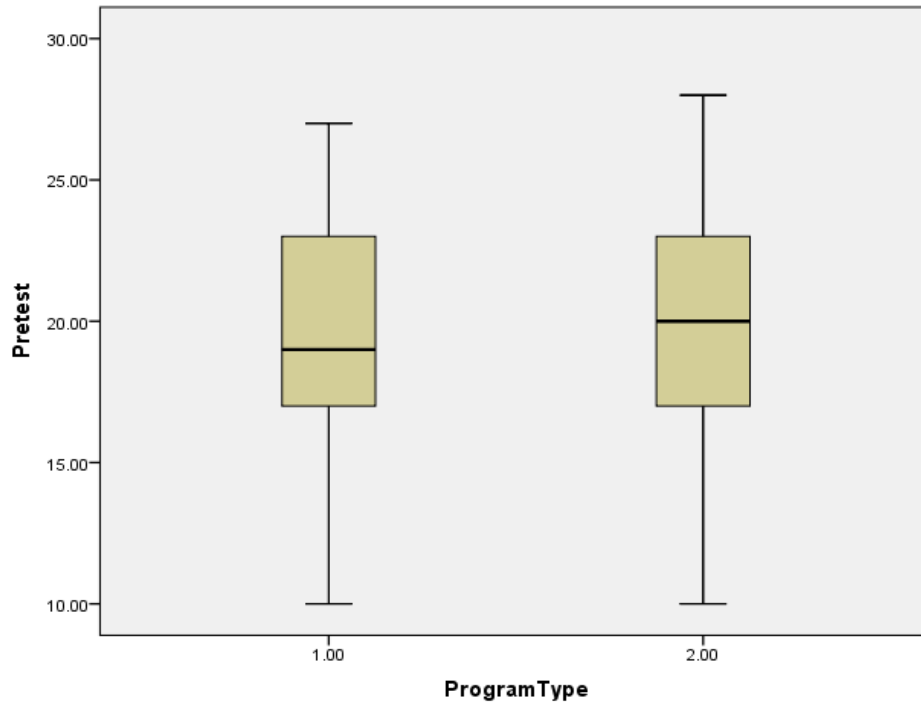


Figure 1. Box and whiskers plot for Program Type pretest following removal of outliers.

Testing assumptions. Following the analysis of outliers, the researcher tested for the assumptions required to conduct a two-way ANOVA: (a) normality, (b) linearity, (c) homoscedasticity, and (d) independence of samples, which are considered to be “of special significance to multivariate analyses” (Meyers et al., 2006, p. 67). These assumptions must be met if the distribution of the variable is to resemble a normal bell curve; otherwise, it may indicate that the statistical results may have “become biased or distorted” (Meyers et al., 2006, p. 67).

Normality. One method for “gaug[ing] the very general shape of the distribution of data” is frequency tables (Meyers et al., 2006, p. 48). Histograms and stem-and-leaf diagrams are recommended tools for such an investigation (Meyers et al., 2006). Skewness

and kurtosis values were confirmed to be in the range of absolute value of 2, or between -2.0 and +2.0, an indicator that the data were approaching normal distribution (D'Agostino et al., 1990). The researcher also conducted a visual inspection of the histogram for the pretest dependent variable, which also indicated that the data were normally distributed.

Linearity. A visual inspection of the scatter plot graphs by the researcher indicated that no curvilinear relationships were observed among the variables (Meyers et al., 2006).

Homoscedasticity. This assumption maintains that the dependent variable has equal variance across the independent variables (Meyers et al., 2006). It is also referred to as homogeneity of variance when used in “the context of an ANOVA” (Meyers et al., 2006, p. 70). Prior to conducting a two-way ANOVA, the researcher tested for homogeneity of variance by running a Levene’s Test of Equality of Error Variance as this test “assesses the statistical hypothesis of equal variance across the levels of the independent variable” (Meyers et al., 2006, p. 70). Equal variances were assumed as the Levene’s Test for Equity of Variances was not significant for either independent variable, program type ($p = .960$) or gender ($p = .135$).

Independence of Samples. Confirmation of having met this assumption was achieved as intact classrooms were randomly assigned to either a treatment or a comparison group. No participants were assigned to both groups and none switched groups during the duration of the study.

Since the four assumptions were met, the data were considered fit for further analysis, including conducting a two-way ANOVA.

Descriptive Statistics for the Pretest. Green and Salkind (2011) explained that not only do “descriptive statistics involve summarizing distributions of scores...” (p. 148), they

can be summarized with the use of statistical indices. “Measures of central tendency, include the mean..., median..., and mode...” (p. 148), while indices of variability, such as standard deviation, “can also be computed” (p. 148). Table 10 presents the descriptive statistics for the pretest argument writing rubric scores for writing instructional program (comparison and treatment) and gender (male and female).

Table 10

Descriptive Statistics for Pretest Argument Writing Achievement

	Mean	Standard Deviation	Minimum	Maximum
Program Type				
Comparison (<i>n</i> = 81)	19.36	4.00	10.00	27.00
Treatment (<i>n</i> = 94)	20.29	4.00	10.00	28.00
Gender				
Male (<i>n</i> = 84)	19.29	3.79	10.00	27.00
Female (<i>n</i> = 91)	20.39	4.16	13.00	28.00

Note. Students could earn between 1-5 points in each of the six categories of the rubric, resulting in a total rubric score between 6-30 points.

Pretest Data Analysis and Results. With the assumptions being met, the researcher then conducted a 2 x 2 ANOVA using pretest scores. The independent variables were the type of writing instruction program (traditional writing curriculum embedded with the Question Formulation Technique and traditional writing curriculum) and gender (male, female). The dependent variable was the secondary students’ pretest total score on the Writing Rubric. The alpha level was set at .05 for it is the “default indicator of statistical

significance” for the social sciences (Meyers et al, 2006, p. 34). Since “the traditional alpha level of .05 specifies that only statistics occurring less than 5% of the time are considered sufficiently unlikely to occur by chance alone,...something else” must be attributed (Meyers et al., 2006, p. 35).

The results of the two-way ANOVA for pretest scores indicated that there was no significant main effect for gender, $F(1, 169) = 3.07, p = .081$, partial $\eta^2 = .018$, small. They also indicated that there was no significant effect for type of writing instructional program, $F(1, 169) = 2.25, p = .135$, partial $\eta^2 = .013$, small. Nor was there a significant interaction between gender and program type, $F(1, 169) = .754, p = .386$, partial $\eta^2 = .004$. These results indicated that there was equalization between the two groups prior to the intervention. See Table 11 for the pretest two-way ANOVA results.

Table 11

Two-way ANOVA Results for Mean Pretest Scores for Argument Writing Achievement

Source	Type III Sum of Squares	<i>df</i>	Mean Squares	<i>F</i>	Sig.	Partial Eta Squared
Gender	48.65	1	48.65	3.070	.081	.018
Program	35.74	1	35.74	2.250	.135	.013
Gender*Program	11.94	1	11.94	.755	.386	.004

Note. $p = .05$

Posttest Data Analysis

Although the pretest analysis indicated equalization between the two groups prior to intervention, the researcher made the decision to use the students' pretest Argument Writing Achievement scores as a covariate for the posttest analysis. The importance of recognizing the "possible influence of a covariate" may prevent "an incorrect conclusion" (Meyers et al., 2006, p. 26). The "effects of a covariate can also be assessed in the context of ANOVA when the analysis becomes known as an analysis of covariance (ANCOVA)" (Meyers et al., p. 26). Using the pretest scores as a covariate also decreases the chances of making a Type I error. Initially, the researcher conducted a test of the homogeneity-of-slopes assumption, since "it should be tested before conducting an ANCOVA" (Green & Salkind, 2011, p. 214). The relationship between the covariate (pretest Writing Achievement scores) and the dependent variable (posttest Writing Achievement scores) for all combinations of the factors (gender and type of writing instruction) was not significant, $F(1, 164) = 2.06$, $p = .153$, partial $\eta^2 = .012$, indicating the population slopes did not differ.

Analysis of outliers. A procedure similar to that conducted for the pretest data was done for the posttest data analysis. It began with searching for outliers. The posttest total scores contained three outliers from the program type and two from gender. The researcher adhered to the recommendation of Meyers et al. (2006) when determining outlier removal. This resulted in changes to the skewness and kurtosis values for the Argument Writing Achievement posttest means falling within acceptable values of absolute 2 (D’Agostino et al., 1990). Table 12 presents these values.

Table 12

Skewness and Kurtosis Values for Posttest Argument Writing Achievement

	Skewness	Kurtosis	Mean	Standard Deviation
Program Type				
Comparison ($n = 77$)	-.128	-.574	20.57	3.80
Treatment ($n = 91$)	-.394	-.623	23.47	3.71
Gender				
Male ($n = 77$)	-.320	-.510	21.80	4.01
Female ($n = 91$)	-.387	-.654	22.42	4.01

Note. Students could earn between 1-5 points in each of the six categories of the rubric, resulting in a total rubric score between 6-30 points.

Testing assumptions. After completing the examination of outliers, the researcher tested the assumptions for a two-way ANCOVA as identified by Meyers et al. (2006): (a) normality, (b) linearity, (c) homogeneity of variance, (d) independence of samples, and (e) homogeneity of slopes. It is important that these assumptions are met if one is to interpret

the data accurately. As Meyers et al. (2006) reasoned, testing such assumptions allows the researcher to confirm that the dependent variable resembles a normal bell curve and that the data are not misrepresented.

Normality. Table 11 depicts all skewness and kurtosis values falling within the range of absolute value of 2, or between -2.0 and +2.0 (D'Agostino et al., 1990). As addressed by Meyers et al. (2006), "the variable's frequency distribution of values should roughly approximate a bell-shaped curve" (p. 67). They also contended that "when the frequency count is based on a continuous variable, we should request a histogram...because it will provide a visual approximation of the distribution's shape" (p. 48). Approaching normal distribution was observed; an indication that the data were deemed fit for analysis.

Linearity. The researcher did not observe any curvilinear relationships after a visual review of scatter plots (Meyers et al., 2006).

Homogeneity of variance. An analysis of Levene's Test of Equality of Error Variances, which was not significant program type ($p = .819$) or gender ($p = .881$), confirmed for the researcher that there was an even distribution across independent variable levels of error values.

Independence of samples. The research methodology followed a quasi-experimental, pretest-posttest treatment and comparison group design using random assignment of intact classrooms (Gall et al., 2007). Intact classes were assigned to one of two groups, either the treatment or the comparison group, and remained in that particular group throughout the study. Students remained in their assigned classrooms for the entire study. Such a random assignment meant that the study met this assumption (Green & Salkind, 2011).

Homogeneity-of-slopes. The researcher also conducted a test of the homogeneity-of-slopes assumption, since “it should be tested” “before conducting an ANCOVA” (Green & Salkind, 2011, p. 214). The homogeneity-of-slopes, or “the slopes relating the covariate to the dependent variable” should be “the same for all” (Green & Salkind, 2011, p. 209). The relationship between the covariate (pretest Writing Achievement scores) and the dependent variable (posttest Writing Achievement scores) for all combinations of the factors (gender and type of writing instruction) was not significant $F(1, 164) = 2.06$, $p = .153$, partial $\eta^2 = .012$, indicating that the population slopes did not differ. Following the testing of all assumptions, it was found that the posttest data were fit for analysis.

Descriptive statistics for the posttest. The researcher conducted descriptive statistics with students’ posttest argument writing achievement scores in conjunction with the independent variable levels: (a) type of writing instruction program (traditional writing curriculum and traditional writing curriculum embedded with the Question Formulation Technique), and (b) gender (male and female). The rubric used to measure the dependent variable had six categories, each rated on a scale of 1-5, resulting in a range of total score between 6-30. The descriptive statistics for these posttests ($n = 168$) and for gender may be found in Table 13.

Table 13

Descriptive Statistics for Posttest Argument Writing Achievement

	Standard			
	Mean	Deviation	Minimum	Maximum
Program Type				
Comparison ($n = 77$)	20.57	3.80	13.00	28.00
Treatment ($n = 91$)	23.47	3.71	15.00	29.00
Gender				
Male ($n = 77$)	21.80	4.01	13.00	28.00
Female ($n = 91$)	22.42	4.01	13.00	29.00

Note. Students could earn between 1-5 points in each of the six categories of the rubric, resulting in a total rubric score between 6-30 points.

Posttest data analysis and results. The ANCOVA evaluated the posttest scores of those participants in the treatment and comparison groups. Students' pretest Argument Writing Achievement scores were used as a covariate for the posttest analysis. The independent variables were writing instructional program, with two levels (modified writing program embedded with the Question Formulation Technique and traditional writing program without the embedded Question Formulation Technique) and gender, with two levels (male and female). The dependent variable was secondary students' posttest Argument Writing Achievement scores, measured by the students' mean posttest scores on the writing rubric.

The results of the ANCOVA analysis indicated a significant main effect for Type of Writing Instruction Program, $F(1, 164) = 23.80$, $p = 0.000$, partial $\eta^2 = 0.127$, small. There

was no significant effect for gender, $F(1, 164) = .973, p = .325$, partial $\eta^2 = .006$. There was no significant interaction effect for gender and type of writing instruction program, $F(1, 164) = 2.06, p = 0.153$, partial $\eta^2 = 0.012$. The program main effect indicated that the treatment group ($M = 23.47, SD = 3.71$), regardless of gender, scored significantly higher than the comparison group ($M = 20.57, SD = 3.80$) on Argument Writing Achievement. Table 14 shows the results of the analysis.

Table 14

ANCOVA Results for Mean Posttest Scores for Argument Writing Achievement

Source	Type III			F	Sig.	Partial Eta Squared
	Sum of Squares	df	Mean Squares			
Gender	13.602	1	13.602	.973	.325	.006
Program	332.810	1	332.817	23.800	.000	.127
Gender*Program	28.870	1	28.870	2.060	.153	.012

Note: p = .05

These results suggest that the modified writing curriculum embedded with the Question Formulation Technique did have a statistically significant effect on both male and female secondary students' argumentative writing achievement scores.

Findings from Teacher Logs

Instruments for this research included not only a writing rubric and researcher-created demographic surveys, but also curriculum implementation logs. Participating teachers in both the treatment and comparison groups maintained the logs. Data captured by the logs included instructional time devoted to writing instruction (noted in minutes), implemented

learning activities and/or strategies, learning outcomes and objectives, and assessments given. While this was not part of the research question, this information provided additional context for the study's findings as well as a means to ensure fidelity of curricula implementation.

Treatment Group

A review of the treatment teachers' implementation logs provided data on how instructional time was used. According to these logs, the treatment groups dedicated 51.68% of the available instructional time to the traditional writing curriculum embedded with the Question Formulation Technique. Further review of the treatment teacher logs revealed that class content balanced an emphasis on the skills, strategies, and components associated with the traditional writing process (brainstorm, draft, revise, and publish) with the addition of the steps advised by the QFT protocol (brainstorm/draft, revise, prioritize, and select). The instruction was guided further by the 6-traits of writing: ideas, organization, voice, diction, sentence fluency, and conventions.

Among the instructional focus provided by teachers was an emphasis on thesis development; selection, integration, and use of evidence to develop one's stance, and use of transitional elements. Teachers explicitly provided and modeled strategies. As noted in one entry, a teacher conducted a *Think-aloud* during which she verbalized her thinking as she selected evidence to support the development of her interpretation. As she modeled the process, she explicitly explained why she chose one piece of evidence over another. This scenario was repeated as the teacher and the students did the exercise together with a new selection of evidence for the same thesis. The next part of the lesson involved students either working independently or in small groups that were organized based on instructional need.

The teacher met with the various groups and provided targeted small group instruction on evidence selection. Those students who worked independently met one-on-one with the teacher to review the rationale for their choices. There were several entries that noted students were provided with one-on-one support and participated in reciprocal teaching moments with their peers, as was the case with integration of evidence. Some students were grouped according to need. Those who struggled with basic evidence incorporation continued to refine their skills by using stem phrases that introduced quotations while those who were ready for more sophisticated techniques worked on integration and parsing the quotation so key elements were used as opposed to the entire quotation. Effective use of evidence, including its incorporation into the written work was a primary focus for peer editing. In addition to peer editing, students also worked with each other to refine questions, generate ideas, evaluate each other's work and self-assess (using the same writing rubric used by the teachers and the researcher for the study). Activities involving dialogic collaboration were regularly noted in the treatment logs.

Prior to introducing the Question Formulation Technique process, teachers spent time explicitly teaching how to develop one's question-generation capability, particularly when it came to higher order thinking. Teachers modeled the generation and evaluation of questions. Treatment teacher logs show that students continued practicing with question generation and evaluation of question effectiveness throughout the intervention.

Teachers then applied the Question Formulation Technique to the text being studied. Throughout the intervention students in Grade 9 Treatment and Comparison Groups studied Shakespeare's *The Tragedy of Romeo and Juliet*, while Grade 10 Treatment and Comparison Groups studied Shakespeare's *The Tragedy of Macbeth* and then Lawrence and Lee's *Inherit*

the Wind. Students initially used the QFT process while working in small groups. To initiate the process, teachers disclosed the question focus (QFocus) for the unit. Students brainstormed questions in reaction to the QFocus. Working in groups, they reviewed their list, revised questions as needed (e.g., making closed questions open, clarifying language, adding levels of complexity to their questions), and narrowed down their choices. Prioritization of questions led to the final step—an individual’s selection of a question to respond to in written form. As students worked with the QFT, they also applied it not only at the group level, but also at the individual level: brainstorming, revising, and prioritizing additional questions, which then enabled them to develop their arguments further. Coinciding with instruction on the QFT, the logs showed that students engaged in writing instruction that addressed grammar and mechanics, fluency and cohesiveness, and developing voice.

The QFT-embedded writing instruction cycle occurred four times during the intervention period. After the initial round of the QFT-embedded writing curriculum, the teachers in the treatment group noted that some students did not select questions that lent themselves to a developed response so more time was spent during the second cycle on the question refinement and selection process. By the third round, the teachers grouped students according to skill needs, thus enabling them to differentiate and focus instruction and adjust the pacing of the QFT accordingly by group. By the fourth session, the teachers and students had familiarized themselves with the technique.

Treatment teachers also logged how they were able to differentiate instruction according to student needs. On several occasions, they worked with students who struggled with developing higher order thinking questions that required more sophisticated analysis

and thoughtful argument. As a result, instructional pacing varied and was dependent upon student needs. In addition, student-teacher writing conferences occurred throughout the intervention period.

Comparison Group

Comparison Group Teachers also maintained program implementation logs. A review of the teacher logs revealed that the comparison groups used 40.16% of the instructional time available for writing instruction and application; a decrease of 11.52% when compared to the treatment groups. The comparison group teachers and students used the traditional writing curriculum used by the school in which the study took place. Whereas much of what was experienced by those in the treatment group was done collaboratively, the students in the comparison group worked primarily in isolation when it came to their writing. The exception occurred when the teachers had students do peer editing. During each of the cycles, the teacher generated the prompt to which all students responded in writing (see Appendix K). Likewise, the pacing of the process primarily remained the same for all students, unless required otherwise by a student's Individual Education Plan (IEP), for example. As with their peers in the treatment group, students in the comparison category received instruction in mechanics, grammar, and process of writing. Here, too, teachers conducted individual writing conferences with students.

The comparison group logs indicated that writing instruction occurred more often in shorter segments of time as compared to the treatment counterparts in which writing instruction had a longer duration, particularly at the smaller group level. One comparison group entry noted that 10 minutes was dedicated to evidence integration and was not taught again until three weeks later. Another entry logged showed that students practiced revising

sentences to promote sentence complexity and variety, but here, too, spent 10 minutes doing it, which also included instructional time. Whereas the writing instruction for the treatment group could be categorized as differentiated for student-need and sustained over longer durations of time, the comparison group writing instruction appeared more teacher-directed and conducted in shorter spans of time with a larger group of students.

It is worth noting that for both groups, treatment and comparison, writing instructional time was not evenly distributed across the intervention. Some weeks involved 2-3 hours of writing instructional time, while for others it may have been as low as 45 minutes. This was driven by curriculum needs and shifts in school schedules (such as *NWEA MAP Reading* testing and holidays like Memorial Day).

Findings from Videos

Treatment and comparison classes were videotaped prior to and during the intervention to ascertain fidelity to the intervention's implementation. The school's media specialist set up the videotaping system so that the classes could be videotaped without anyone manning the camera. These recordings were then viewed solely by the researcher. The researcher erased the recordings after the study was completed.

Treatment Group

The recording of treatment classes prior to the implementation of the intervention indicated that teachers generated questions more than students did. This was noticeably different when the recordings taken during the intervention's implementation were reviewed. These tapes showed students asking a majority of the questions. Students worked in small groups as they generated questions in response to the QFocus. Students also asked questions of one another when they revised and prioritized the questions they generated. It was also

noticed that teachers had posted charts in the classroom that outlined the steps of the Question Formulation Technique.

Comparison Group

The researcher also reviewed the recordings taken of the comparison groups prior to and during the intervention. Similar to the treatment group pre-intervention videos, the comparison group teacher participants generated most of the questions, with few of the questions being raised by students. This pattern was also observed in the recordings that took place during the intervention. In both situations it was the teacher who generally generated the questions. In these videos, comparison group teachers and student participants were observed participating in various stages of the process approach to writing.

Summary

Chapter Four presented an account of the statistical procedures used by the researcher to examine the data garnered. The researcher sought to investigate the effects of type of writing instruction curriculum and gender on secondary students' argument writing achievement. A two-way ANOVA was used to analyze the pretest data. Results indicated secondary students' writing achievement scores did not vary by type of writing instructional program or gender. The researcher then conducted an ANCOVA with the posttest data. The covariate was the students' Pretest Writing Achievement Scores and the dependent variable was the students' Posttest Writing Achievement Scores. The independent variables were the type of writing instructional curriculum with two levels: treatment and comparison and gender with two levels: male and female. A significant main effect was indicated for the type of writing instructional curriculum, $F(1,164) = 23.80, p = 0.000, \text{partial } \eta^2 = 0.127,$

small. No main effects were found for gender. No significant interaction between program type and gender existed.

The researcher also examined the curriculum implementation logs maintained by the participating teachers in both the treatment and comparison groups. Entries recounted the amount of time dedicated to writing instruction (modified with the Question Formulation Technique and the traditional writing curriculum), types of strategies, activities, and assessments given during the course of the study, and lesson objectives/outcomes. This analysis provided context for other findings from the study, which will be addressed further in Chapter Five.

CHAPTER FIVE: SUMMARY AND CONCLUSIONS

Chapter Five offers a summary of the research as well as a confirmation of how the findings of the study related to the literature reviewed, implications for educators, opportunities for future research, and limitations of the study. This chapter extends and concludes the previous chapters.

Overview of the Study

A renewed emphasis on writing, particularly argumentation, has revealed a discrepancy in student performance, with females traditionally outperforming males. Yet, while females tend to outperform males on state and national assessments, they, too, would benefit from further development of their writing skills. One opportunity arises from reimagining the role of the student in the classroom. Traditionally, the teacher has been the generator of questions. In fact, researchers have ranked questioning as second only to lecturing as the most common instructional practice (Black, 2001). Yet it is through asking questions that one begins to construct knowledge, for asking a good question is a creative act. Even so, this is an area that remains untapped. If the change is made to foster the development of student question generation, students then begin to develop autonomy and are no longer passive recipients in the classroom, for “people who wonder set a purpose for themselves” (Tovani, 2015, p. 32). Deleuze and Guattari’s (1987) concept of Rhizomatic Learning aligned with this sentiment. Rhizomatic Learning negates the traditional linear approach to learning and encourages the promotion of accessing and developing knowledge through different points of entry on a topic which then spread in various directions, thereby forming a network of learning as opposed to a hierarchical delineation of thought.

Limited research has been conducted on the role of student question generation on student writing achievement. The purpose of this study was to investigate the impact of two different writing curricula (traditional writing curriculum embedded with the Question Formulation Technique and traditional curriculum writing program) and gender (male and female) on secondary students' argument writing achievement. A sample of convenience was used and intact participating classrooms were randomly assigned to either a treatment group (traditional writing curriculum embedded with the Question Formulation Technique) or comparison group (traditional writing curriculum). The study took place in a secondary school located in a suburban northeastern town. The participants included four English teachers and 175 secondary students (ninth and tenth grades), who comprised the 14 intact classes used in the study. Their participation occurred after receiving consent and assent (as applicable). The data collected included pretest and posttest student argument writing total rubric scores and demographics.

Research Question and Hypothesis

By using a systematic approach, this study addressed the following questions:

1. Is there a significant difference in Argument Writing Achievement between secondary school (Grades 9 and 10) male and female students who participate in a modified writing curriculum embedded with the Question Formulation Technique (treatment) and those participating in a traditional writing curriculum (comparison)?
 - a. Is there a significant difference in Argument Writing Achievement between secondary school students who participate in a modified writing curriculum with the Question Formulation Technique embedded (treatment) and those

who participate in a traditional writing program without the embedded Question Formulation Technique (comparison)?

- b. Is there a significant difference in Argument Writing Achievement between secondary school male and female students?
- c. Is there a significant interaction between writing instructional program and gender?

Non-directional hypothesis: There is a significant difference in Argument Writing Achievement between secondary school (Grades 9 and 10) male and female students who participate in a modified writing curriculum embedded with the Question Formulation Technique and those participating in a traditional writing curriculum.

Procedures

The research question was used to explore the effects of the two-level independent variables, writing instruction curricula and gender on the dependent variable, Argument Writing Achievement. Consisting of a quasi-experimental research design, the study included a pretest-posttest design. Using an alpha level of .05, the pretest scores indicated that there were no significant differences between males and females. A two-way ANCOVA was conducted for the posttest data with the pretest data as the covariate. The writing rubric scores constituted the quantitative data. The descriptive data came from the researcher-created teacher and student demographic surveys, whereas the curriculum implementation data came from the teacher curriculum implementation logs and videos.

The participants were invited to participate in the study. A sample of convenience, specifically Grades 9 and 10, was taken from the high school in which the study took place. A total of 233 student assent and consent forms were distributed, to which 175 responses

were received, for an 75.1% response rate. The teacher participants ($n = 4$) and their corresponding intact classes ($n = 14$) were randomly assigned to either a treatment group ($n = 7$) or a comparison group ($n = 7$). All classes were from the *College Preparatory* level English classes at the participating high school.

Findings for the Research Question

The researcher began by testing the pretest data for assumptions and cleaning the data after which an ANOVA was conducted. A two-way ANOVA was used to determine if significant differences existed among students' pretest scores. The results indicated that the pretest writing achievement scores did not have a significant main effect for gender, $F(1, 169) = 3.07, p = .081$, partial $\eta^2 = .018$, small. They also indicated that there was no significant effect for type of writing instructional program, $F(1, 169) = 2.25, p = .135$, partial $\eta^2 = .013$, small. Nor was there a significant interaction between gender and program type, $F(1, 169) = .754, p = .386$, partial $\eta^2 = .004$, small. Consequently, there were no significant differences between treatment and comparison students' writing achievement scores which meant that there was equalization amongst the two groups.

Steps also were taken to clean the posttest data before additional analyses was conducted. Assumptions were then tested for the posttest data. The results of the ANCOVA analysis indicated a significant main effect for the type of writing instruction program, $F(1, 164) = 23.80, p = 0.000$, partial $\eta^2 = 0.127$, small. There was no significant effect for gender, $F(1, 164) = .973, p = .325$, partial $\eta^2 = .006$. There was no significant interaction for gender and type of writing instruction program, $F(1, 164) = 2.06, p = 0.153$, partial $\eta^2 = 0.012$. The program main effect indicated that the treatment group ($M = 23.47, SD = 3.71$), regardless of gender, scored significantly higher than the comparison group ($M = 20.57, SD = 3.80$) on

Argumentative Writing Achievement. The covariate was students' pretest writing achievement scores. The independent variables included the type of writing instruction curricula (traditional writing program embedded with the Question Formulation Technique, traditional writing program) and gender (male, female). The dependent variable was students' posttest argument writing achievement scores.

Comparison and Contrast of Findings Related to the Literature Review

Deleuze and Guattari (1987) challenged the traditional tree metaphor for learning, in which the tree or the root "plots a point, fixes an order" (p. 7). Instead they ventured into a different landscape, one riddled with rhizomes. It is the interconnectedness of rhizomes and their relationship to their environment that suggest more clearly the chaoticness of learning. As the rhizomes shift and change their dimensions, they also change their nature, which alters their environment (Deleuze & Guattari, 1987, p. 21). Such is the case with creating knowledge.

Allowing for such an approach to learning requires changes in the classroom terrain. Students need to be supported in their excursions into the foray. The Gradual Release of Responsibility (GRR) provides such a scaffold for student independence. As its name implies, the Gradual Release of Responsibility shifts the cognitive load from the teacher to the student (Fisher & Frey, 2014; Graves & Fitzgerald, 2003). The model also emphasizes the ever-shifting role of the learner from student to teacher and back again. It echoes the transitory nature of the rhizome and the progressive nature of learning. This transfer of learning is critical to developing automaticity. A variety of methods, including Writing-to-learn, have shown to contribute to strengthening an individual's understanding and skill development (Graham & Perin, 2007). Repeated practice cultivates this growth, as is the

case with the process of writing approach and development of writing skills (Graham & Perin, 2007; Graham & Sandmel, 2011; Rogers & Graham, 2008). Yet what must not get lost is the need to prioritize the journey and not just the end point.

Students also must play a role in the generation of questions. Composing questions inspires intellectual agency, a sense of exigency and a claim to purpose (Hand, Wallace, & Yang, 2004; Rosenshine, Meister, & Chapman, 1996). Yet a disparity remains: teachers hold a monopoly on question generation (Chin, 2006, 2007). Transitioning from such a state can be facilitated by dialogic teaching, in which teachers use discussion and inquiry to facilitate students' understanding of text (Allington & Johnston, 2002; Malloy & Gambrell, 2011; Reznitskaya & Gregory, 2013). Creating such communities of learners develops students' sense of epistemic agency, which is critical given the gender achievement gaps that exist, particularly in the area of writing achievement. The concern has been ongoing for sometime, but has gained even more attention with a renewed focus on writing proficiency.

This research study was used to investigate how writing instructional curriculum (traditional writing program embedded with the Question Formulation technique, traditional writing program) and gender (male, female) affect secondary students' argument writing achievement. The study was meant to address a void in the current body of literature, particularly as it applied to the secondary level. Table 15 provides a summary of the comparison and contrast of this study to the current body of research.

Table 15

Comparison and Contrast of Findings

Research	Description of Previous Findings	Findings from Current Research
College Board, 2014; Louie & Ehrlich, 2009; NAEP, 2011; NCES, 2014	Females seem to be more adept at writing than males.	The current research was not in keeping with previous findings. There was no significant difference in writing achievement scores between the genders for the pretest or for the posttest.
Berry & Chew, 2008; Harper, Etkina, & Lin, 2003; Herring, 2009; Rosenshine, Meister, & Chapman, 1996; Smith, Rook, & Smith, 2007	Student generation of a combination of question types (cognitive, metacognitive, and affective) and degree of conceptual difficulty appear to be more effective than just using text-related questions to foster student learning.	The research supported these findings as the argument writing achievement scores for students in the treatment group, regardless of gender, were significantly higher than those in the comparison group.

Previous research has indicated that there is a significant gap between girls and boys' writing achievement (Klein, 2006). This trend was observed in national standardized testing such as the SAT (NCES, 2014; College Board, 2014) and at the state level, such as in

Connecticut (CSDE, 2012) and Vermont (Louie & Ehrlich, 2009). However, no significant difference was found in this study when it came to gender and pretest, $F(1, 169) = 3.07, p = .081$, partial $\eta^2 = .018$ and gender or posttest, $F(1, 164) = .973, p = .325$, partial $\eta^2 = .006$, writing achievement scores. The participants from the study were invited from a sample of convenience that included ninth and tenth grade students enrolled in *College Preparatory English*.

In keeping with previous research, however, this study did find a significant difference when it came to program type. The program main effect indicated that the treatment group ($M = 23.47, SD = 3.71$), regardless of gender, scored significantly higher than the comparison group ($M = 20.57, SD = 3.80$) on Argument Writing Achievement. The key element for the treatment group was the use of the Question Formulation Technique, which promotes the use of student-generated questions in a variety of categories: cognitive, metacognitive, and affective. Previous research has shown that teachers tend to ask most of the questions (Good, Slavings, Hobson, Harel, & Emerson, 1987; Graesser & Person, 1994), and that when students do ask the questions, they tend to fall into the low-level informative range (Borich, 1992; Brill & Yardley, 2003; Chin, 2001; Dillon, 1998; Hofstein & Lunetta, 2004). This is a missed opportunity for as research like that conducted by Eschach (2010) and Harper, Etkina, and Lin (2003) suggested, student questions might positively influence class discussions creating richer and improved conceptual change processes. Other studies indicated that combining approaches, such as using both metacognitive and affective questions, may be beneficial to student learning (Chin, Brown, & Bruce, 2002; Goh, 2004; Palinscar & Brown, 1984; King, 1990; Smith, 2003; Smith, Rook, & Smith, 2007). What is not as clear is the degree to which the number of questions generated is proportional to

student improvement (Berry & Chew, 2008; Lai & Law, 2012). Even so, the need for an explicit system that provides training for student generation of higher-level questions has been suggested by other research (King & Rosenshine, 1993; Rosenshine, Meister, & Chapman, 1996), which the present research also supports.

Indications from various research suggested that the quality of student-generated questions can be improved (Cuccio-Schirripa & Steiner, 2000; Hakkarainen, Lipponen, & Jarvala, 2002). While this study did not evaluate the quality or quantity of student-generated questions, student participants did have multiple opportunities to generate and revise their questions, in accordance with the Question Formulation Technique protocols, which also emphasized dialogic teaching. Students engaged in collaborative discourse with their peers as part of this process, which researchers Reznitskaya and Gregory (2013) contended contribute “to shaping students thinking” (p. 114) and may foster growth in higher order thinking and subject matter knowledge (Murphy, Soter, Wilkinson, Hennesey, & Alexander, 2009; Reznitskaya, Kuo, Clark, Miller, Jadallah, Anderson, & Nguyen-Jahiel, 2008; Schwarz, Neuman, & Biezuner, 2000).

Implications for Educators

Implications for practice must be considered after reviewing the current research. This study investigated the impact of type of writing curriculum on argument writing achievement scores. It also examined gender and its affect on these same scores. While no significant difference was found for gender, this was not the result for program type. Participants were assigned to either a treatment group that used a traditional writing approach program embedded with the Question Formulation Technique or a comparison group, which solely used the traditional writing program. Participants who received instruction in the

process writing approach embedded with the Question Formulation Technique scored significantly higher on the argument writing posttests than their peers in the comparison group.

This key finding has implications for educators. School personnel should consider the role of student-question generation as a practice in the classroom. Attention should be given to implementing a curriculum that explicitly teaches students how to ask a variety of questions (cognitive, affective, metacognitive), teaches students how to engage in dialogical collaboration, and how to use questions to guide and deepen their own learning. Professional development for teachers that supports the transition from teacher generated to student generated questions as well as a shift to dialogic teaching in which a community of learning is encouraged should be implemented. School personnel should consider the role of student-question generation as a practice in the classroom. Critical to these changes is the use of the Gradual Release of Responsibility model that should also be used to support student independence. Likewise, the Question Formulation Technique should be considered when revising curricula.

The Gradual Release of Responsibility (GRR) model facilitates the transition of the cognitive load from the teacher to the student as an apprenticeship is formed between the two parties: The teacher models, then guides students as they do the work with the teacher and collaboratively with one another, until they are ready to do the work independently (Fischer & Frey, 2014). Once this degree of proficiency or automaticity is achieved, students begin to take on more of the role traditionally assigned to the teacher, as was the case in this study. The teachers used the GRR model to introduce students to the Question Formulation Technique. Olson and Land (2007) found that continued use of modeling and guided

practice may lead to internalization of strategies as students in the study's treatment group continued to outperform their peers on the various quantitative data points used, including standardized test scores.

While there was a significant difference for writing program type, there was no significant difference for gender on the pretest or the posttest when it came to argument writing achievement. Jones and Myhill (2007) argued that the achievement gap in writing is “more likely to be attributable to societal and cultural factors, rather than cognitive or linguistic differences” (p.7) and that “the context and the community” (p.7) in which the students' writing “occurs are powerful influences on writing development [which] shape how boys and girls respond to writing tasks” (p. 7). Many changes have occurred in the expectations of student writing, much of it generated by the demands of the Common Core Standards and now changes to the SAT. These changes include an emphasis on the use of evidence in writing, taking a clear stance, and developing a point of view—all elements associated with writing an argument. For reasons such as these, educators need to be wary of preconceived notions regarding student performance, particularly when it comes to gender. Rather, educators should focus attention on what these writing demands mean for instruction and, in particular, for developing student independence as learners in the classroom. To this end, educators should continue to identify and model strategies and skills that benefit both genders when it comes to writing an argument.

Consideration also should be made for the role of writing in the classroom, including how much instructional time is dedicated on a regular basis to the purpose for which writing is assigned. Research findings encouraged dedicating more time to writing instruction compared to what is traditionally provided (Pressely, et al., 2003; Pressley, et al., 2006;

Pressley, et al., 2007). This is even after research dated from the 1980s revealed how little time was spent on writing instruction (Applebee, 1984; Cutler & Graham, 2008) and how writing was primarily being used as a way to assess what was taught (Applebee, 1984) or as a means to prepare students for standardized testing (Hillocks, 2002; McCarthey, 2008). The current study's use of the Question Formulation Technique (QFT) embedded with the traditional process approach to writing provided flexibility in how writing was used in the classroom. It also provided various ways for teachers to provide writing instruction to students: (a) one-on-one, (b) small group, and (c) whole class. Providing opportunities to differentiate instruction in accordance with student needs is also supported by the GRR model, which was used by both the treatment group teachers and comparison group teachers (Fisher & Frey, 2014). However, the reflection component of the QFT encouraged students to use writing as a means to learn, a writing instruction technique highlighted by Graham and Perin (2007b) in their report, *Writing Next*, as a practice shown to improve students' writing. Other studies also supported this observation (Radhakrishnan, Schimmack, & Lam, 2011). Likewise, Roger's and Graham's meta-analysis on writing instruction (2008) commended the process writing approach, which includes practices of planning, drafting, and revising. Graham and Sandmel (2011) selected the process writing approach as the focus for their meta-analysis and found that 83% of the comparisons resulted in a positive effect for the process writing approach. Both the treatment and comparison groups used the traditional process writing approach to support writing instruction.

However, Graham and Sandmel (2011) did make among their suggestions a call for further experimentation with the process writing approach to instruction, which this study did by using the Question Formulation Technique in conjunction with the process writing

approach. By aligning these two practices, students were able to use strategies and practices, such as student-generated questions, dialogic collaboration, and reflection, which may further student comprehension and foster transfer of learning (Rosenshine, Meister, & Chapman, 1996; Smith, Rook, & Smith, 2007). Districts should consider offering professional development that supports teachers in developing the practices that promote these skills. Similarly, districts should encourage teachers to look for opportunities to practice and embed these strategies when revising curricula. Purposefully planning for such experiences make them more likely to occur.

Suggestions for Future Research

This study adds to the need for future research, particularly in the area of writing instruction. Suggestions for future research are presented in Table 16.

Table 16

Suggestions for Future Research

Finding	Suggestions for Future Research
<p>Treatment participants scored higher in argument writing achievement than comparison participants, regardless of gender.</p>	<ul style="list-style-type: none"> • Would the application of the Question Formulation Technique lead to changes in student argument writing achievement across multiple grades and/or subject areas? • Would ongoing professional development for teachers change the quality of writing instruction, the adherence to the Gradual Release of Responsibility Model, and the use of the Question Formulation Technique?
<p>There was no significant difference in argument writing achievement between boys and girls.</p>	<ul style="list-style-type: none"> • Would similar results occur if the research study occurred with middle school male and female students? • Do changes to demands on writing, such as an emphasis on argument writing contribute to changes in the gap in gender writing achievement?

There was a significant difference in the posttest performance of participants in the treatment group as compared to their counterparts in the comparison group. This finding leads to opportunities for future research, particularly as it pertains to the use of the modified

writing instruction program. Researchers may want to investigate whether or not expanding the process writing approach with the Question Formulation Technique (QFT) embedded changes students' argument writing achievement scores in disciplines other than English/Language Arts, particularly since argumentation has traditionally been emphasized in the discipline of social studies, or across different grade levels, such as middle school, as grade level may change degree of question difficulty (Lai & Law, 2012). Also open for consideration is to what degree ongoing professional development in writing instruction, particularly with components that include the use of the Gradual Release of Responsibility and the Question Formulation Technique, affect students' argument writing achievement. This also raises the need for a qualitative study in regards to teachers' attitudes towards writing instruction, teachers attitudes' towards student-generated questions, and teachers' attitudes towards changes in expectations regarding student writing. Qualitative research could also be done with students and their attitudes towards the aforementioned categories, such as attitudes towards writing instruction. Overall, however, it is evident that future research is needed to more clearly ascertain the state of writing instruction, particularly in light of changes wrought by the Common Core Standards and a shift towards more student-centered learning, especially because research on writing has diminished since its proliferation in the 1980s.

While limited research has been conducted on the impact of the Question Formulation Technique on reading comprehension, virtually no research has been done on the impact of the Question Formulation Technique on students' writing. One area in which the research could be refined is in regards to professional development. Teachers continue to dominate when it comes to question generation in the classroom, yet several studies have supported

how students like to ask their own questions and formulate ways of answering them (Crawford et al., 1999; Gibson & Chase, 2002; Hand, Wallace, & Yang, 2004). Future researchers may want to investigate how providing consistent professional development in areas such as writing instruction, the Gradual Release of Responsibility, and the Question Formulation Technique may affect teacher practices in the classroom, individually or together. Such information may lead to making better decisions about writing instruction.

Further research is also warranted for gender gaps in argument writing achievement. While girls did score slightly higher than boys on the pretest and posttest, their scores were not significantly different. This was atypical in relationship to previous research. Yet this may lead future researchers to see if shifts in demands on writing are also contributing to shifts in the gender gap in writing achievement or to discover what other variables may be affecting the argument writing achievement of males and females. As Peterson (2006) observed in her review of research, “rigid gender expectations constrained both girls’ and boys’ writing choices” (p. 318). Grade level and its affect on gender performance on argument writing achievement may also be an option for further exploration. The Common Core Standards have specified learning expectations at each grade level for a variety of domains, including writing. Future researchers may want to investigate how these standards affect the development of boys and girls’ writing proficiency. The current research may have benefitted from addressing these areas.

Reflection has lead to several recommendations for replication of the study. A school-developed writing rubric was used as an instrument for the study. It may behoove future researchers to use one that has been established on a much broader scale. Additionally, student participants came from one level and discipline, *College Preparatory English*. A

consideration for future researchers involves including participants from a variety of levels and disciplines. Teacher participants offer another opportunity for researchers as they may consider examining teachers' experience, attitudes, and practices in regards to writing instruction, particularly argument writing. Timing might also be an element to account for as the intervention for this study took place in the last quarter of the academic year.

Limitations of the Study

This section addresses the threats or limitations that may have affected the interpretation of the study, specifically in the areas of internal validity and external validity. It also acknowledges the steps taken by the researcher to offset these threats to minimize their effect on the research study.

Internal Validity

As defined by Gall et al. (2007), internal validity is, “the extent to which extraneous variables have been controlled by the researcher so that any observed effect can be attributed solely to the treatment of the study” (p. 383). The researcher took steps to control for such variables as much as possible, particularly as applicable to a quasi-experimental design.

Subject selection. It is important to discern if participants differ prior to implementation of the intervention. To account for this possibility, intact classrooms were randomly assigned to either a treatment group or a comparison group. The use of the pretest also determined if differences existed prior to the study.

History. Disruptions to the schedule did occur during the course of the study, however, it occurred equally for both treatment and comparison groups. Consistent ongoing communication existed between the researcher and teacher participants thereby allowing the researcher to assess the degree to which such disruptions might impact students and the

study. To offset such disruptions, teacher participants maintained implementation logs to monitor how they implemented their respective curriculum and both groups were videotaped prior to and during the intervention. It was determined such disruptions were deemed a moderate threat.

Maturation. To address maturation, intact classrooms were randomly assigned to either a treatment or a comparison group. Hence, these two groups were composed of individuals who were similar in age and in other demographics. Both groups received instruction primarily on the same curriculum, *College Preparatory English*. The pretest was also used to determine if differences existed. Such steps were necessary as the potential “physical or psychological changes in the research participants” (Gall et al., 2003, p. 370) meant that the study might be affected.

Testing. In this study, pretest sensitization was deemed a small threat. Firstly, 10 weeks separated the administration of the pretest from the posttest. Secondly, while the tasks were similar, the prompts for the tests varied, but were equivalent. Such steps should minimize the tendency for the researcher to make false conclusions regarding the data between pretests and posttests (Gall et al., 2007).

Instrumentation. Since the writing rubric used to assess students’ pretest and posttest argument writing achievement was developed by the school in which the study took place, several steps were taken to offset this threat. Founded in the standards outlined by the Common Core, the rubric is also based on the six-traits of writing. Revisions to the rubric were made on three different occasions prior to the study being conducted. These revisions were made based upon feedback from users and reflected changes driven by the Common Core Standards. Calibration occurred several times as well with both the English and Social

Studies Departments. The same calibration protocol (described in Chapter Three) was used by the teachers and the independent raters as part of their training for the research study.

Instrumentation was deemed to be a moderate threat.

Compensatory rivalry by the comparison group. Since the treatment and comparison groups were all in the same building, the researcher had to consider this as a moderate threat, as comparison group participants may perceive they are in competition with their counterparts in the treatment group and thusly overcompensate in their performance (Gall et al., 2007). Steps taken to address this possibility included providing training in the Question Formulation Technique to teacher participants: prior to the intervention for those teachers in the treatment group and following the conclusion of the intervention for those teachers in the comparison group. Teachers were then able to provide instruction on the intervention to all student participants accordingly.

Resentful demoralization by the comparison group. Resentful demoralization may occur due to the nature of the participants and to their proximity to one another during the time of the study, particularly if they perceive that the treatment group is benefitting from the intervention while they are not. Such perceptions may contribute to feelings of demoralization, which may affect data outcomes, such as lower scores for the comparison group. To account for the potential of such a threat the researcher informed all participants that professional development for comparison group teachers on the Question Formulation Technique would be provided once the study was completed so that they could then provide instruction to their students. A larger sample size ($n = 175$) than was required for the study was also used as a safeguard against this threat. Nevertheless, this threat was deemed to be moderate.

External Validity

As noted by Gall et al. (2007), external validity concerns itself with the degree to which a researcher may apply the results of a study to areas beyond the scope of the initial study. The researcher took a variety of precautions to minimize external threats that may affect the repeating of this study with different participants and settings.

Population validity. Described by Gall et al. (2007) as the “extent to which the results of an experiment can be generalized from the sample that was studied to a specified, larger group” (p. 389), population validity was deemed a moderate threat by the researcher since participants came from just one school. The intact classes used during the study consisted of heterogeneously grouped students of wide ranging abilities, thereby mimicking a larger sample population with similar demographics to the school in which the study occurred, such as school size and socio-economic status, but they may not be representative of a nationally larger scale.

Ecological validity. Since ecological validity is “the extent to which the results of an experiment can be generalized from the set of environmental conditions created by the researcher to different environmental conditions” (Gall et al., 2007, p. 390), the researcher must clearly and accurately depict the details of the study, including descriptive characteristics of the participants as was the case with this study. The researcher described in detail the study participants, methodology, instrumentation, data collection process, and analysis protocols so that other researchers could replicate the study in a different setting.

Experimenter effect. The experimenter effect occurs when the individual who administers the treatment unknowingly affects the treatment’s outcome (Gall et al., 2007). To curtail such an effect, the researcher provided professional development for teacher

participants on two occasions, including one prior to the start of the study. All materials were shared with teacher participants, including student materials. The researcher also modeled the implementation of the treatment. Classes were videotaped at the start and during the intervention to observe fidelity to implementation of the intervention to ensure fidelity to the intervention. The participating teachers maintained implementation logs, which were reviewed by the researcher. Their log data indicated that they adhered to the curriculum.

Summary

Chapter Five summarized the current study. It presented an overview of the research, including: the research question and hypothesis that guided the study, the procedures used, key findings, and the study as it related to the literature reviewed. It also considered implications for educators, suggested opportunities and considerations for future research, and acknowledged limitations of the study. The study was used to investigate the impact of two different writing curricula and gender on secondary students' argument writing achievement scores.

The study was grounded in Deleuze and Guattari's (1987) Rhizomatic Learning. The design included a treatment group and a comparison group determined by program type. The curriculum used by the treatment group included a traditional process writing approach applied in conjunction with the Question Formulation Technique while the comparison group used the same traditional writing program as used by the treatment group, but without the embedded QFT. Both groups used the Gradual Release of Responsibility as part of their instructional practices.

The Question Formulation Technique provided a protocol for student-question generation, question refinement, and question selection as well as for student reflection. The treatment teachers provided the question focus from which students generated their own questions. These questions addressed a variety of facets associated with the question focus. The treatment students then wrote written responses to the questions they individually selected. Students in the comparison group all had to give a written response to the same prompt, which was generated by the teacher. The teachers in both groups used the school-created writing rubric to score these responses.

The participating students in both groups used the process approach to writing when they wrote their responses: (a) brainstorm, (b) draft, (c) revise, and (d) publish. The intervention occurred over a 10-week period and took place in ninth and tenth grade *English College Preparatory* classes in one suburban northeast secondary high school. The aim of the study was to examine whether or not the Question Formulation Technique would improve students' argument writing achievement scores.

While research in writing reached its peak in the 1980s, there is a growing movement towards more work in this area in light of a renewed focus on writing. This renewal resulted from changes brought about by the Common Core Standards, and concerns about performance in national and state standardized testing scores. However, there are some differences in the focus: a shift from an emphasis on grammar and learning how to write to writing to learn and fostering development of interpretation—or argument. While this is true for both genders, boys have been targeted as a point for concern more so than girls as they tend to score lower on writing assessments, resulting in a gender achievement gap in writing. The process writing approach has consistently been identified as having a positive effect on

writing, but recommendations have been made to consider further experimentation with the process, which is what the current study does. By incorporating the Question Formulation Technique with the writing process approach students are given more opportunity to become active participants in their own learning. Prior to this study, research on the Question Formulation Technique was very limited and primarily related to reading comprehension. This study addressed this gap.

Results from the study indicated that there was no significant difference for gender on pretest and posttest argument writing achievement. This opens the way for future research as to how the gender achievement gap may be affected by changes to writing instruction. The study's results did indicate significant findings for program type as the posttest scores revealed a significant difference between the treatment and comparison groups. Students who used the Question Formulation Technique in conjunction with the process writing approach showed significant differences in argument writing achievement than their peers in the comparison group, regardless of gender, and after accounting for any differences in pretest scores. Further research that addresses how changes to question generation and the use of dialogic collaboration may affect argumentative writing achievement is needed.

Conclusion

Changes to writing instruction are already underway due to societal demands such as those brought on by the Common Core Standards. One such change has been an emphasis on writing arguments, which brings with it a focus on the use of evidence. A focus on argumentation requires students to have an understanding of their own stance on a situation and how that position fits into a larger framework. Students need to consider various interpretations of the evidence, acknowledge a variety of viewpoints, and then examine how

they will use this knowledge to present their own positions. This cannot be done in isolation. Providing a learning environment that supports student question generation contributes to the development of their critical thinking, while also developing a sense of epistemic agency.

References

- Ackerman, J. (1993). The promise of writing to learn. *Written Communication, 10*(3), 334-370.
- Albertson, B. (2007). Organization and development features of grade 8 and grade 10 writers: A descriptive study of Delaware student testing program (DSTP) essays. *Research in the Teaching of English, 41*(4), 435-465.
- Allan, J. (2011). Complicating, not explicating: Taking up philosophy in learning disability research. *Learning Disability Quarterly, 34*(2), 153-161. Retrieved from o-eds.a.ebscohost.com/www.consuls.org
- Allington, R., & Johnston, P. (2002). *Reading to learn: Lessons from exemplary fourth-grade classrooms*. New York, NY: Guildford Press.
- American College Testing (2012). ACT profile report: Connecticut. Graduating class 2012. ERIC number: ED535092. Retrieved from <http://eric.ed.gov/?id=ED535092>
- Applebee, A. (1984). Writing and reasoning. *Review of Educational Research, 54*(4), 577-586.
- Applebee, A., & Langer, J. (2006). *The state of writing instruction in America's schools: What existing data tell us*. Albany, NY: Center on English Learning and Achievement.
- Baker, J., Brizee, A. & Angeli, E. (2013, March 10). "What is an argumentative essay?" Retrieved from <https://owl.english.purdue.edu/owl/resource/685/05/>
- Bangert-Drowns, R., Hurley, M. , & Wilkinson, B. (2004). The effects of school-based writing-to-learn interventions on academic achievement: A meta-analysis. *Review of Educational Research, 74*, 29-58.
- Berry, J., & Chew, S. (2008). Improving learning through interventions of student-generated questions and concept maps. *Teaching of Psychology, 35*, 305-312. DOI 10.1080/00986280802373841

- Black, S. (2001). Ask me a question: How teachers use inquiry in the classroom. *American School Board Journal*, 188(5), 43-45.
- Bloom, B. (1978). *Human characteristics and school learning*. New York, NY: McGraw-Hill.
- Borich, G. (1992). *Effective teaching methods*. (2nd edition). Upper Saddle River, NJ: Merrill Prentice Hall.
- Boscolo, P., & Carotti, L. (2003). Does writing contribute to high school students' approach to literature? *LI-Educational Studies in Language and Literature*, 3(3), 197-224.
- Bozack, A. (2011). Reading between the lines: Motives, beliefs, and achievement in adolescent boys. *The High School Journal*, 94(2), 58-76.
- Brill, G., & Yardley, A. (2003). Learning biology through research paper: A stimulus for question-asking by high-school students. *Cell Biology Education*, 2(4), 274-276.
- Brown, A. (1992). Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. *Journal of the Learning Sciences*, 2, 141-178.
- Brown, A. , Ash, D., Rutherford, M., Nakagawa, K., Gordon, A., & Campion, J. (1993). Distributed expertise in the classroom. In G. Salomon (Ed.), *Distributed cognitions: Psychological and educational considerations* (pp. 188-228). New York, NY: Cambridge University Press.
- Brown, A., & Campion, J. (1994). Guided discovery in a community of learners. In K. McGilly (Ed.), *Classroom lessons: Integrating cognitive theory and classroom practice* (pp. 229-270). Cambridge, MA: MIT Press/Bradford Books.
- Burbules, N. (1993). *Dialogue in teaching: Theory and practice*. New York, NY: Teachers College Press.
- Campion, J., Shapiro, A., & Brown, A. (1995). Forms of transfer in a community of learners: Flexible learning and understanding. In A. McKeough, J. Lupart, & A. Marini (Eds.)

Teaching for transfer: Fostering generalization in learning (pp. 35-68). Hillsdale, NJ: Erlbaum.

Cavazos-Kottke, S. (2005). Tuned out but turned on: Boys' (dis)engaged reading in and out of school. *Journal of Adolescent & Adult Literacy*, 49(3), 180-184.

Cazden, C. (1988). *Classroom discourse: The language of teaching and learning*. Portsmouth, NH: Heinemann.

Chin, C. (2001). Learning in science: What do students' questions tell us about their thinking? *Education Journal*, 29(2), 85-103.

Chin, C. (2006). Classroom interaction in science: teacher questioning and feedback to students' responses. *International Journal of Science Education*, 28(11), 1315-1346.

Chin, C. (2007). Teacher questioning in science classrooms: Approaches that stimulate productive thinking. *Journal of Research of Science Teachers*, 44(6), 815-843.

Chin, C., Brown, D., & Bruce, B. (2002). Student-generated questions: A meaningful aspect of learning in science. *Journal of Research in Science Teaching*, 24(5), 521-549.

Chin, C., & Osborne, J. (2008). Students' questions: A potential resource for teaching and learning science. *Studies in Science Education*, 44(1), 1-39.

Chin, C., & Osborne, J. (2010). Students' questions and discursive interaction: Their impact on argumentation during collaborative group discussions in science. *Journal of Research in Science Teaching*, 47(7), 883-908.

College Board. (2014). 2014 College-bound seniors total group profile report. New York: The College Board. Retrieved from <https://secure-media.collegeboard.org/digitalServices/pdf/sat/TotalGroup-2014.pdf>

- College Board. (2015). 2015 College-bound seniors: Total group profile report. Total group. Retrieved from <https://secure-media.collegeboard.org/digitalServices/pdf/sat/total-group-2015.pdf>
- Connecticut State Department of Education. (2012). *Connecticut Education Data and Research*. Retrieved from http://sdeportal.ct.gov/Cedar/WEB/ct_report/CedarHome.aspx
- Connecticut State Department of Education. (2013). Strategic school profiles. Retrieved from
- Crawford, B., Krajcik, J., & Marx, R. (1999). Elements of community of learners in a middle school science classroom. *Science Education*, 83, 701-723.
- Cuccio-Schirripa, S., & Steiner, H. (2000). Enhancement and analysis of science question level for middle school students. *Journal of Research in Science Teaching*, 37(210) 224.
- Cutler, L., & Graham, S. (2008). Primary grade writing instruction: A national survey. *Journal of Educational Psychology*, 100(4), 907-919.
- D'Agostino, R., Belanger, A., & D'Agostino, R., Jr. (1990). A suggestion for using powerful and informative tests of normality. *The American Statistician*, 44(4), 316-321.
- Deleuze, G. & Guattari, F. (1987). *A thousand plateaus: Capitalism and schizophrenia*. Minneapolis, MN: University of Minnesota Press.
- Dillon, J. (1988). The remedial status of student questioning. *Journal of Curriculum Studies*, 20, 197-210.
- Doel, M. (1996). A hundred thousand lines of flight. A machinic introduction to the nomad thought and scrumpled geography of Gilles Deleuze and Felix Guattari. *Environment and Planning D: Space and Society*, 14, 421-429.

- Dredger, K., Woods, D., Beach, C., & Sagstetter, V. (2010). Engage me: Using new literacies to create third space classrooms that engage student writers. *Journal of Media Literacy*, 2(2), 85-101.
- Edwards, R. (2006). A sticky business? Exploring the *and* in teaching and learning. *Discourse: Studies in the Cultural Politics of Education*, 27(1), 121-133.
- Eshach, H. (2010). An analysis of conceptual flow patterns and structures in the physics classroom. *International Journal of Science Education*, 32(4), 451-477.
- Eschach, H., Dor-Ziderman, Y., & Yefroimsky, Y. (2014). Question asking in the science classroom: Teacher attitudes and practices. *Journal of Science Education Technology*, 23, 67-81. DOI 10.1007/s10956-013-9451-y.
- Ferreti, R., Lewis, W., & Andrews-Weckerly, S. (2009). Do goals affect the structure of students' argumentative writing strategies? *Journal of Educational Psychology*, 101(3), 577-589. Doi: 10.1037/a0014702.
- Ferretti, R. & Lewis, W. (2013). "Best practices in teaching argumentative writing." (113- 135). *Best practices in writing instruction* (2nd edition). Graham, S., MacArthur, C. A., & Fitzgerald, J., Eds. (2013). Guilford Press. Retrieved from http://books.google.com/books?id=2C_y5Wx7x-8C&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
- Fisher, D., & Frey, N. (2003) Writing instruction for struggling adolescent readers: A gradual release model. *Journal of Adolescent and Adult Literacy*, 46, 397-407.
- Fisher, D., & Frey, N. (2014). *Better learning through structured teaching: A framework for the gradual release of responsibility*. Alexandria, VA: ASCD.

- Gall, M., Gall, J., & Borg, W. (2007). *Educational research: An introduction (8th edition)*. New York, NY: Allyn & Bacon.
- Gambrel, L. (2004). Exploring the connection between oral language and early reading. *The Reading Teacher*, 57(5), 490-492.
- Gibson, H., & Chase, C. (2002). Longitudinal impact of an inquiry-based science program on middle school students' attitudes towards science. *Science Education*, 86, 693-705.
- Gillespie, A., Graham, S. , Kiuahara, S., & Hebert, M. (2014). High school teachers use of writing to support students' learning; A national survey. *Read Write*, 27, 1043-1072. DOI 10.1007/s11145-013-9494-8.
- Gillespie, T. (2010). *Doing literary criticism: Helping students engage with challenging texts*. Portland, ME: Stenhouse Publishers.
- Goh, K. (2004). "What do you think?" The art and science of questioning in the PBL classroom. Retrieved August 15, 2005, from <http://discovery.rp.edu.sg/home/CED/research/papers/questioning.pdf>
- Good, T., Slavings, R., Hobson Harel, K., & Emerson, H. (1987). Student passivity: A study of question asking in K-12 classrooms. *Sociology of Education*, 60, 181-199.
- Gough, N. (2007). Changing planes: Rhizosemiotic play in transnational curriculum inquiry. *Studies in Philosophy and Education*, 26, 279-294.
- Graesser, A., & Person, N. (1994). Question asking during tutoring. *American Educational Research Journal*, 31, 104-137.
- Graham, S., Harris, K., Fink, B., & MacArthur, C. (2001). Teaching efficacy in writing: A construct validation with primary grade teachers. *Scientific Studies of Reading*, 56, 17-202.

- Graham, S., & Perin, D. (2007). A meta-analysis of writing instruction for adolescent students. *Journal of Educational Psychology, 99*, 445-476.
- Graham, S., & Perin, D. (2007). *Writing next: Effective strategies to improve writing of adolescents in middle and high schools: A report to Carnegie Corporation of New York*. Washington, DC: Alliance for Excellent Education.
- Graham, S., & Sandmel, K. (2011). The process writing approach: A meta-analysis. *The Journal of Educational Research, 10*(4), 396-407. Doi: 10.1080/00220671.2010.488703.
- Graves, M., & Fitzgerald, B. (2003). *Scaffolding reading experiences for English Language Learners*. Norwood, MA: Christopher-Gordon.
- Green, S., & Salkind, N. (2008). *Using SPSS for Windows and Macintosh: Analyzing and understanding data*. Upper Saddle River, NJ: Pearson.
- Hakkarainen, K. (2003). Progressive inquiry in a computer-supported biology class. *Journal of Research in Science Teaching, 40*(10). 1072-1088.
- Hakkarainen, K., Lipponen, L., & Jarvala, S. (2002). Epistemology of inquiry and computer-supported collaborative learning. In T.Koschmann, N. Miyake, & R. Hall (Eds.), *CSCL2: Carrying forward the conversation* (pp. 129-156). Mahway, NJ: Erlbaum.
- Hakkarainen, K., & Sintonen, M. (2002). Interrogative model of inquiry and computer-supported collaborative learning, *Science and Education, 11*, 25-43.
- Hand, B., Wallace, C., & Yang, E-M. (2004). Using a science writing heuristic to enhance learning outcomes from laboratory activities in seventh-grade science: Quantitative and qualitative aspects. *International Journal of Science Education, 26*(2), 131-149.

- Harper, K., Etkina, E., & Lin, Y. (2003). Encouraging and analyzing student questions in a large physics course: Meaningful patterns for instructors. *Journal of Research in Science Teaching*, 40(8), 776-791.
- Hendrawan, I., & Wibowo, A. (2011). *The Connecticut academic performance test: Technical report*. Durham, NC: Measurement Incorporated.
- Herring, J. (2006). A critical investigation of students' and teachers' views of the use of information literacy skills in school assignments. *School Library Media Research*, 9, 1-37.
- Herring, J. (2009). A grounded analysis of year 8 students' reflections on information literacy skills and techniques and identification of students' information literacy attributes. *School Libraries Worldwide*, 15(1), 1-13.
- Herring, J. (2010). School students, question formulation and issues of transfer: A constructivist grounded analysis. *Libri*, 60, 218-229.
- Herring, J., & Hurst, J. (2006). An investigation into the extent to which Year 6 students transfer information literacy across subjects. In J. McGregor & L. Hay, (Eds.), *Research in teacher librarianship: Proceedings of the Centre for Studies in Teacher Librarianship Research Conference*, Australian National University. Canberra, Australia. Retrieved from <http://www.csu.edu.au/faculty/educat/sis/CIS/epubs/CSTLpapers.htm>
- Herring, J., & Tarter, A. (2007). Progress in developing information literacy in a secondary school using the PLUS model. *School Libraries in View*, 23, 23-27.
- Herring, J., Tarter, A., & Naylor, S. (2002). An evaluation of the PLUS model to develop pupils' information skills in a secondary school. *School Libraries Worldwide*, 8(1), 1-124.
- Hillocks, G. (2002). *The testing trap: How state writing assessments control learning*. New York, NY: Teachers College Press.

- Hillocks, G. Smith, M., & Cheville, J. (2006). "I guess I'd better watch my English": Grammar and the teaching of language arts. In S. Graham, C.A. MacArthur, & J. Fitzgerald (Eds.) *Handbook of Writing Research* (pp. 263-274). New York: Guildford Press.
- Hinton, S. E. (1995). *The outsiders*. New York, NY: Puffin Book.
- Hofstein, A., & Lunetta, V.N. (2004). The laboratory in science education: Foundation for the 21st century. *Science Education*, 88, 28-54.
- Hofstein, A., Shore, R., & Kipnis, N. (2004). Providing high school students with opportunities to develop learning skills in an inquiry-type laboratory. *International Journal of Science Education*, 26(1), 47-62.
- Johnson, D., & Johnson, R. (2009). Energizing learning: The instructional power of conflict. *Educational Researcher*, 38(1), 37-51. doi:10.3102/0013189X08330
- Jones, S., & Myhill, D. (2007). Discourse of differences? Examining gender differences in linguistic characteristics of writing. *Canadian Journal of Education/Revue canadienne de l' education*, 30(2), 456-482.
- Karpicke, J., & Roediger, H. III. (2007). Expanding retrieval practice promotes short-term retention, but equally spaced retrieval enhances long-term retention. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 33, 704-719.
- Keys, C., & Kennedy, V. (1999). Understanding inquiry science teaching in context: A case study of an elementary teacher. *Journal of Science Teacher Education*, 10, 315-333.
- Kiahara, S., Graham, S., & Hawken, L. (2009). Teaching writing to high school students: A national survey. *Journal of Educational Psychology*, 101, 136-160.
- King, A. (1989). Effects of self-questioning training on all college students' comprehension of lectures. *Contemporary Educational Psychology*, 14, 366-381.

- King, A. (1990). Enhancing peer interaction and learning in the classroom through reciprocal peer questioning. *American Educational Research Journal*, 27(4), 664-687.
- King, A. (1992). Comparison of self-questioning, summarizing, and notetaking-review as strategies for learning from lectures. *American Educational Research Journal*, 29, 303-325.
- King, A. (1994). Guiding knowledge construction in the classroom: Effects of teaching children how to question and how to explain. *American Educational Research Journal*, 31(2), 338-368.
- King, A., & Rosenshine, B. (1994). Effects of guided cooperative questioning on children's knowledge construction. *Journal of Experimental Education*, 61, 127-148.
- Klein, A. (2006). Score drop prompts debate over effects of revised SAT: Girls outdo boys in writing. *Education Week*, 26(2), 18. Retrieved from <http://www.wedweek.org/ew/articles//2006/09/06/02sat.html>
- Klein, P., & Rose, M. (2010). Teaching argument and explanation to prepare junior students for writing to learn. *Reading Research Quarterly*, 45, 433-461.
- Kucan, L., & Beck, I. (2003). Inviting students to talk about expository texts: A comparison of two discourse environments and their effects on comprehension. *Reading Research and Instruction*, 42, 1-29.
- Lai, M., & Law, N. (2012). Questioning and the quality of knowledge constructed in a CSCL context: A study on two grade-levels of students. *Instructional Science*, 41(3), 597-620.
- Lee, E., C., Chan, C., & van Alst, J. (2006). Student assessment of collaborative learning in a CSCL environment. *International Journal of Computer-Supported Collaborative Learning*, 1(1), 57-87.

- Le Grange, L. (2007). Integrating western and indigenous knowledge systems: The basis for effective science education in Sough Africa? *International Review of Education*, 53, 577-591. doi: 10.1007/s/1159-007-90564
- Louie, J., & Ehrlich, S. (2008). Gender gaps in assessment outcomes in Vermont and the United States. Institute of Education Services. U.S. Department of Education. *Issues & Answers* REL 2008-No.062. Retrieved from <http://files.eric.ed.gov/fulltext/ED502616.pdf>
- Malloy, J., & Gambrell, L. (2010). The contributions of discussion to reading comprehension and critical thinking. In A. McGill-Franzen & R. Allington (Eds.), *Handbook of reading disabilities research* (pp. 253-262). Mahwah, NJ: Erlbaum.
- Marbach-Ad, G., & Sokolove, P. (2000). Can undergraduate biology students learn to ask higher level questions? *Journal of Research in Science Teaching*, 37(8), 854-870.
- McCarthy, S. (2008). The impact of No Child Left Behind on teachers' writing instruction. *Written Communication*, 25(4), 462-505. Doi: 10.1177/0741088308322554.
- Mehan, H. (1979). *Learning lessons*. Cambridge, MA: Harvard University Press.
- Meyers, L., Gamst, G., & Guarino, A. (2006). *Applied multivariate research: Design and interpretation*. Thousand Oaks, CA: Sage Publications.
- Mo, Y., Kopke, R. A., Hawkins, L. K., Troia, G., Olinghouse, N. (2014). The neglected 'R' in a time of Common Core. *Reading Teacher*, 67(6), 445-453.
- Moffett, J. (1983). *Teaching the universe of discourse*. Portsmouth, NH: Heinemann.
- Murphy, P., Soter, A., Wilkinson, I., Hennessey, M., & Alexander, J. (2009). Examining the effects of classroom discussion on students' comprehension of text: A meta-analysis. *Journal of Educational Psychology*, 101, 740-764. Doi: 10.1037/a0015576.

Nagin, C. (2006). *Because writing matters: Improving student writing in our schools*. San Francisco, CA: Jossey-Bass.

National Center for Education Statistics (2012). *The nation's report card: Writing 2011 (NCES 2012-470)*. Washington, DC: Institute of Education Sciences. U. S. Department of Education.

National Commission on Writing for America's Families, Schools, and Colleges. (2008). *Writing technology and teens. Pew Internet and American Life Project*. New York, NY: College Entrance Examination Board. Retrieved from www.pewinternet.org/~media/Files/Reports/2008/PIP%5FWriting%5FReport%FFinal3.pdf
[.pdf](http://www.pewinternet.org/~media/Files/Reports/2008/PIP%5FWriting%5FReport%FFinal3.pdf)

National Council of Teachers of English. (2007). *Adolescent literacy: A policy research brief produced by The National Council of Teachers of English (Policy brief)*. Retrieved from <http://www.ncte.org/library/NCTEfiles/Resources/Magazine/Chron0907AdLitBrief.pdf>

National Governors Association Center for Best Practices, Council of Chief State School Officers. (2010a). *Common core state standards for English language arts and literacy in history/social studies, science, and technical subjects*. Council of Chief State School Officers: Washington, DC. Retrieved from www.corestandards.org/the-standards

National Governors Association Center for Best Practices, Council of Chief State School Officers. (2010b). *Common core state standards initiatives: About the standards*. Council of Chief State School Officers: Washington, D.C. Retrieved from <http://www.corestandards.org/about-the-standards>

Newell, G., Beach, R., Smith, J., VanDerHeide, J., Kuhn, D. & Andriessen, J. (2011). Teaching and learning argumentative reading and writing. *Reading Research Quarterly*, 46(3), 273-304. Retrieved from: <http://www.jstor.org/stable/41228654>.

- Newkirk, T. (2003). *Misreading masculinity: Boys, literacy, and popular culture*. Portsmouth, NH: Heinemann.
- Olson, C., & Land, R. (2007). A cognitive strategies approach to reading and writing instruction for English language learners in secondary school. *Research in the Teaching of English, 41*(3), 269-303.
- Palincsar, A., & Brown, A. (1984). Reciprocal teaching of comprehension-fostering and monitoring activities. *Cognition and Instruction, 1*(2), 117-175.
- Pearson, P., & Gallagher, M. (1983). The instruction of reading comprehension. *Contemporary Educational Psychology, 8*, 317-344.
- Peterson, S. (2006). Influence of gender on writing development. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (pp. 311-323). New York, NY: Guilford Press.
- Pressley, M., Dolezal, S., Raphael, L., Mohan, L., Roehrig, A., & Bogner, K. (2003). Increasing academic motivation in primary grades. *Catholic Education: A Journal of Inquiry & Practice, 6*(3), 372-392.
- Pressley, M., Gaskins, I., Solic, K., & Collins, S. (2006). A portrait of benchmark school: How a school produces high achievement in students who previously failed. *Journal of Educational Psychology, 98*(2), 282-306. Doi:10.1037/0022-0663.98.2.282
- Pressley, M., Mohan, L., Fingeret, L., Reffitt, K., & Raphael-Bogart, L. (2007). Writing instruction in engaging and effective elementary settings. In S. Graham, C. A. MacArthur, & J. Fitzgerald (Eds.) *Best practices in writing instruction* (pp. 13-27). New York, NY: Guilford.
- Program of Studies. (2015). *2015-2016 program of studies*. Retrieved from <http://www.bethel.k12.ct.us/subsite/bhs>

- Radhakrishnan, P., Schimmack, U., & Lam, D. (2011). Repeatedly answering questions that elicit inquiry-based thinking improves writing. *Journal of Instructional Psychology*, 38(4), 247-252.
- Reznitskaya, A., & Gregory, M. (2013). Student thought and classroom language: Examining the mechanisms of change in dialogic teaching. *Educational Psychologist*, 48(2), 114-133. Doi: 10.1080/00461520.2013.
- Reznitskaya, A., Kuo, L., Clark, A., Miller, B., Jadallah, M., & Anderson, R. (2009). Collaborative Reasoning: A dialogic approach to group discussions. *Cambridge Journal of Education*, 3(1), 29-48.
- Rogers, L., & Graham, S. (2008). A meta-analysis of single subject design writing intervention research. *Journal of Educational Psychology*, 100, 879-906.
- Rop, C. (2002). The meaning of student inquiry questions: A teacher's beliefs and responses. *International Journal of Science Education*, 24(7), 717-736.
- Rosenshine, B., Meister, C., & Chapman, S. (1996). Teaching students to generate questions: A review of the intervention studies. *Review of Educational Research*, 66, 181-221.
- Rotherstein, D., & Santana, L. (2011). Teaching students to ask their own questions. *Harvard Education Letter*, 27(5). Retrieved from hepg.org/helhome/issues/27_5/helarticle/teaching-students-to-ask-their-own-questions_507#home
- Rotherstein, D., & Santana, L. (2012). *Make just one change: Teach students to ask their own questions*. Cambridge, MA: Harvard Education Press.
- Scardamalia, M. (2002). Collective cognitive responsibility for the advancement of knowledge. In B. Smith (Ed.), *Liberal education in a knowledge society* (pp. 67-98). Chicago, IL: Open Court.

- Schwarz, B., Neuman, Y., & Biezuner, S. (2000). Two wrongs may make a right...If they argue together! *Cognition and Instruction*, 18(4), 461-494.
- Smith, K. (2003). Increasing motivation, clarity, and depth in writing assignments for at-risk students. *The E-Journal of Teaching and Learning in Diverse Settings*, 1(1), 94-104.
- Smith, K., Rook, J., & Smith, T. (2007). Increasing student engagement using effective and metacognitive writing strategies in content areas. *Preventing School Failure*, 51(3), 43-48.
- Smith, M., & Wilhelm, J. (2002). *Reading don't fix no Chevys: Literacy in the lives of young men*. Portsmouth, NH: Heinemann.
- SPSS Inc. (2009) [Computer software]. PASW Statistics for Windows: Version 18.0. Chicago, IL: SPSS Inc.
- Taylor, B., Pearson, P., Clark, K., & Walpole, S. (2000). Effective schools and accomplished teachers: Lessons about primary-grade reading instruction in low-income schools. *Elementary School Journal*, 101, 121-166.
- Tharp, R., & Gallimore, R. (1988). *Rousing minds to life: Teaching, learning, and schooling in context*. New York, NY: Cambridge University Press.
- Tisher, R. (1977). Practical insights gained from Australian research on teaching. *Australian Science Teachers Journal*, 23, 99-104.
- Tovani, C. (2015). Let's switch questioning around. *ASCD Educational Leadership*, 73(1), 31-35.
- U.S. Census Bureau. (2013). *2007-2011 American Community Survey*. Retrieved from http://factfinder2.census.gov/faces/nav/jsf/pages/community_facts.xhtml.
- van Alst, J. (2009). Distinguishing knowledge-sharing, knowledge-construction, and knowledge-creation discourses. *International Journal of Computer-Supported Collaborative Learning*, 4, 259-287.

- Vermont Agency of Education. (2015). 2013 fall NECAP results. *State, National, and International Assessments*. Retrieved from http://education.vermont.gov/documents/EDU-NECAP_State_Level_Results_from_2005.pdf.
- Wagner, T. (2008). *The global achievement gap: Why even our best schools don't teach the new survival skills our children need—and what we can do about it*. New York, NY: Basic Books.
- Weiner, C. (1978, March). *The effect of training in questioning and student question-generation on reading achievement*. Paper presented at the Annual Meeting of the American Educational Research Association, Toronto, Ontario, Canada. (ERIC Document Reproduction Service No. ED158 223).
- Williamson, R. A. (1996). Self-questioning—An aid to metacognition. *Reading Horizons*, 37, 30-47.
- Yeats, W. (1890). *The Lake Isle of Innisfree*. Retrieved from <http://www.poetryfoundation.org/poem/172053>
- Yu, F. (2009). Scaffolding student-generated questions: Design and development of a customizable online learning system. *Computers in Human Behavior*, 25(5), 1129-1138.
- Zhang, J., Scardamalia, M., Lamon, M., Messina, R., & Reeve, R. (2007). Socio-cognitive dynamics of knowledge building in the work of 9-and 10-year-olds. *Educational Technology Research and Development*, 55, 117-145.
- Zumbrunn, S., & Krause, K. (2012). Conversations with leaders: Principles of effective writing instruction. *The Reading Teacher*, 65, 346-353.

Appendix A: Institutional Review Board (IRB) Submission and Permission

Proposal # _____

**Human Subjects Research Application Coversheet
Western Connecticut State University Institutional Review Board**

PRINCIPAL INVESTIGATOR: Mary Fernand

If the PI is a student, FACULTY SUPERVISOR: Karen Burke, CSJ, EdD

DEPARTMENT: Education and Education and Educational Psychology
EMAIL/S: fernandm@bethel.k12.ct.us

PROJECT TITLE: Effects of the Question Formulation Technique on Secondary Students' Argument Writing Achievement Scores

Check any of the following that apply to this proposal:

_____ A. Proposal is an undergraduate student research project.
funded/developed

X B. Proposal is a graduate student research project.

NO

_____ C. Proposal is WCSU faculty-developed research.

_____ D. Proposal is externally-developed research. **indicate WCSU "sponsor"*



Is the research
with an external grant?

If yes, indicate Funding Agency:

I. Purpose of IRB Review

The role of the WCSU Institutional Review Board (IRB) is to review all proposed research at WCSU or by WCSU faculty, staff or students to ensure that the research meets Federal standards for the safety and protection of any human subjects involved in the research. The WCSU

IRB operates in compliance with the U.S. Code of Federal Regulations, Department of Health and Human Services (DHHS) Title 45 Part 46. WCSU's IRB has registered approval (Federalwide Assurance/FWA) from the Office of Human Research Protections (OHRP). To help the IRB fulfill its role, WCSU requires all researchers to submit their protocol for review and approval. Please refer to the **Research Application Guide available at www.wcsu.edu/irb** for complete instructions. The WCSU IRB is unlikely to reject an application without first discussing its concerns about the research with the investigator. However, applications may be deferred for review at another meeting if substantial issues are present. **Researchers are encouraged to attend the IRB meeting of their review - in order to address any concerns directly.** Failure to submit complete materials by the published deadlines will delay review processes.

II. Application for IRB Review Checklist

Before submitting your research application for review by the IRB, you must ensure: **Everyone involved has completed the Human Subjects Collaborative Institutional Training Initiative (CITI) program, accessible on our website <http://www.wcsu.edu/irb/> or its equivalent.**

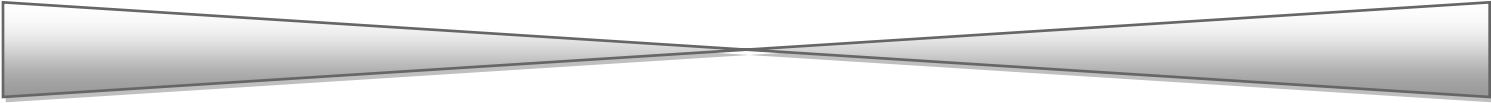
IS THIS A NEW RESEARCH PROJECT?	
YES	NO
If yes, are you applying for? application _____	Protocol # of previously approved _____
_____ Exempt Review approved research?	Are there any modifications to the previously approved research?

Expedited Review

Full Review

YES

NO



COMMITTEE ACTION

Approved through _____ review
clarification/modification required

Not approved;

IRB Chair's Approval:

Date:



Western Connecticut State University

Institutional Review Board

Office of Sponsored Research & Admin Services
320 White Hall, 181 White St.
Danbury, CT 06810
Secretarial contact: 203-837-8740
irb@wcsu.edu Web: www.wcsu.edu/irb

IRB Application for EXPEDITED or FULL Review

Application for Review of Research Involving Human Subjects

All forms must be typed & completed, signed by all investigators & sponsors, and submitted via Email attachment along with the HUM-1 form.

1. PRIMARY INVESTIGATOR The proposal must involve a nonvisiting member of WCSU faculty or staff who will serve as “project supervisor” at WCSU. Include all persons who will be 1) directly responsible for the project’s design or implementation, 2) recruitment, 3) obtain informed consent, 4) involved in data collection, data analysis, or follow-up. Make sure you have indicated this person on the cover page above.

2. PROJECT TITLE:

Effects of the Question Formulation Technique on Secondary Students’ Argument Writing Achievement Scores

3. FUNDING: Indicate whether/what this research is funded by, or application has been made for, a grant/contract/gift.

No funding has been provided.

4. RESEARCH SUMMARY: Please summarize, in lay language, the objectives and significance of the research.

The objective for the research is to explore the effects of the Question Formulation Technique (QFT), gender, and grade on secondary students’ argumentative writing achievement scores. The research’s significance lies in its potential to offer an intervention for teachers to use to support their students critical thinking, to improve the quality of students’ argumentative writing, and to foster student collaboration and independence.

The Common Core State Standards (CCSS) expect students to become proficient at a very challenging type of writing: argumentative. Hence, developing the skills to recognize and apply rhetoric is critical. Key to this ability is the art of questioning, whether it is questioning an author’s intent or developing one’s own judgment on a topic, or even knowing what questions to ask. The Question Formulation Technique provides a process for teaching questioning skills. Traditionally, the art of questioning has lain in the hands of teachers, without much explicit instruction as to how to develop higher order thinking questions for students. Thus, students quite often work to answer questions designed by another. However, when students explore the answers to the questions they themselves have created, they sharpen their inquiry skills and define rhetorical goals. A partnership between teaching students to craft higher order thinking questions and furthering their critical thinking may lead to deepening of understanding so that they might craft more effective arguments—ones that reflect their voices, and not someone else’s.

5. PERFORMANCE SITES: Including WCSU sites, describe ALL the research sites for this protocol. For each non-WCSU site, describe: Whether the site has an IRB & your stage in the process of seeking that approval; Whether the site has granted permission for this research to be conducted; Contact info for the site; and attach any relevant supporting materials.

The research site is Bethel High School, 300 Whittlesey Drive, Bethel, CT, 06801. Initial permission has been granted to conduct the research and will be given upon obtaining IRB by the Bethel Public School District Superintendent, Dr. Christine Carver (See Appendix A) and Bethel High School Principal, Christopher Troetti (See Appendix B). The research will be conducted in the English Department of which I, the primary researcher, am the chairperson.

Contact information:

Address:

Email:

Address:

Email:

Phone:

6. PARTICIPANTS & RECRUITMENT: Describe who will participate in the research, how many people, and how they will be recruited. Indicate any special or vulnerable classes/populations included in the design. Describe solicitation via advertising (e.g., posters, flyers, internet), face-to-face interactions, phone, classrooms, registries, referrals, etc. Attach any recruitment/solicitation materials to be used. Address if: any of the researchers are associated with the subjects (e.g., students, employees, patients); any specific agencies providing access to subjects or their data; who will contact subjects.

There are two categories for participants: Ninth and tenth grade English teachers (two from each grade) and ninth and tenth grade students (from a target sample of 291 students, both male and female). Teacher participants will be recruited via face-to-face interactions, which will be followed up by a letter that addresses the purpose of the study and its intended objectives and asks for their voluntary participation (See Appendix C). Student participants will be recruited via classroom presentation and letter notification to both parents and student (See Appendix D and Appendix E). Letters will be sent seeking permission and consent to participate in the research from appropriate individuals: Superintendent, principal, participating teachers, participating students and parents (See Appendices A-F). The researcher is an employee of the district and in the school in which the research will take place. Although the chairperson of the English Department, I do not evaluate the teachers' performances, nor am I responsible for the terms of their employment. Teachers work in Professional Learning Communities in which they plan lessons, develop curricula, coach each other, and review student data to help drive their instruction. The administrative team completes evaluations. There is no threat to teachers to participate in the study. I do not teach these grade levels so I do not have these students in my classes. Participants may choose to leave the research at any time.

Individuals who choose to participate in the study will also receive a demographic study, one that depends on their role in the research: teacher (See Appendix F) or student (See Appendix G). The teacher demographic survey asks information in the following categories: gender, ethnicity, teaching experience, current grade level assignment, years teaching at the current grade level assignment, level of own education, and certification of endorsement. The student demographic survey solicits the following categorical information: name of current English teacher, class level, grade level, gender, ethnicity, and primary language. Voluntary teacher participants and their intact classrooms (voluntary student participants) will be randomly assigned to either a treatment group or a condition group. Teacher participants who are not assigned to the treatment group will have the opportunity to receive training in the Question Formulation Technique, if they so desire, after the research has been completed.

6A. PROTECTED HEALTH INFORMATION (PHI): The IRB must address the privacy and use of health information that is created, received, or housed by health care providers, health plans, or health care clearinghouses and that identifies or could be used to identify an individual. During *either recruiting or data collection*, will you use or have access to such information that is related to the past, present or future health or conditions of a *living or deceased* individual, provision of health care to the individual, or the payment for the provision of health care to the individual? Yes No

7. RESEARCH PROCEDURES: Using LAYMAN’S LANGUAGE, specifically describe what the participants (treatment groups and controls) will do and where the research activities will take place. Give approximate dates and durations for specific activities, including the total number of treatments, visits, or meetings required and the total time commitment. Address if: any of the researchers are associated with the subjects (e.g., students, employees, patients); **Include a copy of each of your measures as attachments.**

For schools-based research where class time is used, describe in detail the activities planned for nonparticipants and explain where (e.g., in a classroom, in a private area) both participants and nonparticipants will be located during the research activities, and a rationale/method for assuring students who choose to not participate will not be affected in their course standing. Include a concise description of procedures, locations, time commitments, and alternate activities on the relevant consent and assent (for minors) forms.

The research will take place in ninth and tenth grade English classrooms at [REDACTED], over a course of ten weeks during the time frame of February-May 2015. Random assignment of intact groups will result in two teachers (one from grade 9 and one from grade 10) and their classes being designated as the control groups while the other two teachers (one from grade 9 and one from grade 10) and their classes will be identified as the treatment groups. Teachers in the control group will use the school’s traditional writing curriculum (brainstorm, draft, revise, and publish) to instruct their students while teachers in the treatment group will embed the Question Formulation Technique within the traditional writing program when they instruct their students. The QFT entails several components including a question focus; rules for producing questions; brainstorming, categorizing, and prioritizing questions; and reflection. These elements promote divergent, convergent, and metacognitive thinking. Teachers in both groups will have their students complete two argumentative writing responses, one of which will be done prior to the intervention to be potentially used as a covariate to ensure the groups begin the study equally, while the second response will be used to explore the effects of the Question Formulation Technique on secondary students’ argumentative writing achievement scores. Researcher-developed surveys, one for student demographic data and one for teacher demographic data, will be used. The writing rubric employed for the research was developed and calibrated by the high school in which the study will occur. To ensure interrater reliability, two independent raters, trained in scoring and calibrating the rubric will score 100% of the pre-and post- essay samples.

Teacher training will include two calibration sessions to ensure consistency in application of the writing rubric that will be used. The protocol will consist of: review of the rubric, participants individually scoring each of the same 10 essays, sharing scores with the group. Essays that score outside the 3-point range will be discussed to reach consensus. Two rounds of this process will be conducted. Teachers in the treatment group will also receive training on the Question Formulation Technique. This two-hour session which will be conducted during the school day, will use materials provided by the Right Question Institute (promoter of the Question Formulation Technique), and will provide an overview of the QFT process, strategies and tips for its implementation, application of the QFT so that teachers can experience it themselves prior to introducing it in their classrooms, and planning for its use in the classroom. If needed, a 1-hour follow up session will be conducted after school.

To assist with ensuring treatment fidelity, teachers will be asked to maintain implementation logs. Classes in both groups will be videotaped prior to and during the intervention period.

Pending IRB Approval, the anticipated timeline is as follows:

- February 2015—Seek consent and assent from participants and key parties; Teacher training—Calibration of writing rubric; Videotaping of both groups
- March-April 2015—Pretest administration and scoring by teachers and independent raters; teacher

training—Question Formulation Technique; implementation of QFT embedded in traditional writing curriculum with treatment group while control group uses traditional writing program; teachers maintain implementation logs; videotaping of both groups

- May 2015—Administration and collection of posttests; scoring by teachers and independent raters; QFT Training provided to teachers not participating in the treatment group, if desired

The data collected will be analyzed during the summer of 2015.

8. DATA COLLECTION: Explain who will be collecting the data and how it will be handled in terms of the following:

Please explain how confidentiality will be maintained during and after data collection. If applicable, address confidentiality of data collected via e-mail, web interfaces, computer servers and other networked information. If anonymous data collection is proposed, provide details of how investigators *will not have the ability to trace responses to subject identities*. For multiphase data collection or if multiple contacts will be made with subjects, specifically explain the subject tracking and coding systems. Identify if (what) any inducements or rewards will be offered.

The researcher will collect all data. The data will come from the demographic surveys and scored written responses. Privacy will be protected and confidentiality maintained by numerically coding student and teacher names. Participant names will not be included in the findings section of the study or be shared at any time within the dissertation process.

The videotapes will be used to confirm validity of curriculum program implementation (traditional writing program, traditional writing program with the Question Formulation Technique embedded). Video recordings will not be shared with any individuals and will be viewed solely by the researcher. At the end of the process, the video recordings will be destroyed by the researcher.

All subjects' identities and data collected will be maintained in a secure location in the researcher's home in order to maintain confidentiality. Any material related to this dissertation will not be shredded at any time in the future.

9. CONSENT PROCESS: University policy requires the execution of a comprehensive, written document that is signed by the subject (or the subject's authorized representative) as the principal method for obtaining consent from subjects. The language in the document must be understandable to the subject or the subject's legally authorized representative. Children must *assent* (or, voluntarily agree) to participation and a parent must separately consent on behalf of their child (*i.e.*, two different forms are generally required). Children under age 8 may assent either orally or passively, depending on their level of maturity. Children 8–17 years old should sign a written form unless the WCSU IRB approves a different process. Describe steps taken to minimize the possibility of coercion or undue influence. Indicate the language used by those obtaining consent. Indicate the language understood by the prospective subject or the legally authorized representative. Describe when/where consent will be obtained, how often, and by/from whom. Attach all consent/assent forms.

Initially, written approval to conduct the research will be sought from the superintendent (January 2015), and pending her approval, from the high school principal (January 2015) as well. Participating teachers are from a sample of convenience and their written consent will be required (February 2015). Parents and students will be asked to give their consent and assent, respectively (February 2015). Independent raters will be used to score student writing to foster interrater reliability. All participants will have the right to terminate their study involvement at any time.

10. RISKS: Specifically describe all known risks to the subjects for the activities proposed and describe the steps that will be taken to minimize the risks. Include any risks to the subject’s physical well-being, privacy, dignity, self-respect, psyche, emotions, reputation, employability, and criminal and legal status. Risks must be described on consent forms.

There are no potential risks to the human subjects involved in my study.

11. BENEFITS: Describe the expected benefits of the research to the subjects and/or to society.

Potential benefits of the study may include providing teachers with another resource to support student learning; increased student engagement; development of student voice in writing; improved development of a written argument; increased support for more student-centered instruction; and noticeable change in quality of questions generated.

12. RISK/BENEFIT ASSESSMENT: Weigh the risks with regard to the benefits. Provide evidence that benefits outweigh risks.

Not applicable as there are no risks. Benefits outweigh the risks.

13. RESULTS DISSEMINATION: Detail proposed form(s) of dissemination (e.g., journal, thesis, academic papers/presentations, industry/professions, etc).

The results of this study will be included in a doctoral dissertation to be completed at Western Connecticut State University.

14. INDIVIDUAL INFO: Will *any* individually identifiable information, including images, be published/shared/otherwise disseminated?

No
 Yes

If yes, participants must provide explicit consent or assent for such dissemination. Provide appropriate options on the relevant consent/assent documents.

15. INVESTIGATOR ASSURANCES: The signature of the Responsible Project Investigator is required (scanned or signatures are acceptable). Other investigators are also responsible for these assurances and are encouraged to sign.

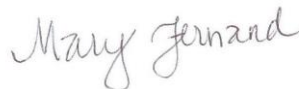
- I certify that the information provided in this application, and in all attachments, is complete and correct.
- I understand that I have ultimate responsibility for the protection of the rights and welfare of human subjects, the conduct of this study, and the ethical performance of this project.
- I agree to comply with all WCSU policies and procedures, the terms of its Federal Wide Assurance, and all applicable federal, state, and local laws regarding the protection of human subjects in research.
- I agree that any changes to the project will be submitted to the Institutional Review Board for review prior to implementation.

I certify that

- the project will be performed by qualified personnel according to the WCSU IRB-approved protocol.
- the equipment, facilities, and procedures to be used in this research meet recognized standards for safety.
- no change will be made to the human subjects protocol or consent form(s) until approved by the WCSU IRB.
- legally effective informed consent or assent will be obtained from human subjects as required.
- unanticipated problems, adverse events, and new information that may affect the risk–benefit assessment for this research will be reported to the WCSU IRB Office (203-837-8470; irb@wcsu.edu).
- student and guest investigators on this project are knowledgeable about the regulations and policies governing this research.
- I agree to meet with the investigator(s), if different from myself, on a regular basis to monitor study progress.
- if I will be unavailable, as when on sabbatical or other leave, including vacation, I will arrange for an alternate faculty sponsor to assume responsibility during my absence. I will advise the WCSU IRB by email of such arrangements.

I further certify that the proposed research has not yet been done, is not currently underway, and will not begin until IRB approval has been obtained. I realize that some changes may alter the exempt status of this project. *[Current IRB policies mandate that handwritten signatures for each person involved in the research accompany this form. If you do not have an image file of your own signature to copy/paste below, consider taking a picture of the page (or your signature) and pasting it in the appropriate location below].*

Primary Investigator (or Faculty Sponsor, if student project)
February 1, 2015



Date:

Investigator:



Date: February 1, 2015

Mail Message From: Mary Fernand

Reply Reply All Forward Move Mark Unread Delete Resend Print View

Mail Properties

From: **Mary Fernand** Thursday - February 19, 2015 1:37 PM
To: **Carol O'Connor**
Subject: **Re: I.R.B. approval**

Hello Mary Fernand,

I am pleased to inform you that your I.R.B. protocol number 1415-103 has been approved by full review. This email is documentation of your official approval to start your research. If you need a copy of this official approval for funding purposes, please let me know occonnorc@wcsu.edu. The WCSU I.R.B. wishes you the best with your research.

You have 1 year from the date of this email to complete your research; if you are still conducting that date, you will need to fill out a renewal application. When are you finished with your study please fill out and return via email a Termination/Completion Report (available here: <http://wcsu.edu/irb/forms.asp>) so we know your study is complete.

Finally – and most importantly! – we have recently learned that current BOR technology policies do not guarantee privacy of any info stored on work computers physically, remotely, or otherwise (i.e., laptop, dropbox, etc.). As such, to maintain the truth of any anonymity or confidentiality promises you make to participants (consent form, for example), you will need to store all electronic data obtained from those human subjects on a system/computer/file not connected to any CSU system. It is your responsibility as the primary researcher to make sure personal data of participants remains securely private – something not guaranteed in the currently existing CSU system. Rest assured, (because it's ridiculous to expect faculty to store work-related research on non-work-related systems and/or to conduct research where participants are not guaranteed anonymity/confidentiality), we are working to gain an exception for research purposes to this policy. But until then, it's technically and legally possible for anyone in the system office to access your participants' data at any time – without your consent or knowledge before doing so... which makes any guarantees made on research documents (e.g., consent forms) deceptive unless info is stored elsewhere.

Thanks,
Jessica Eckstein, Ph.D.
Chair, Institutional Review Board
Western Connecticut State University
www.wcsu.edu/irb

Carol O'Connor
Psychology/Philosophy Department Secretary
C.E.L.T
I.A.C.U.C.
I.R.B.
Warner Hall 304
Phone: 203-837-8470
Fax: 203-837-8905

Appendix B: Letter and Consent Form (Superintendent)



Dear Dr. [REDACTED]:

As a candidate in the doctoral program for Instructional Leadership at Western Connecticut State University, I am required to design and implement a dissertation research study. My study, *The Effect of the Question Formulation Technique on Secondary Students' Argumentative Writing Achievement Scores*, looks to explore the effect of student question generation and gender on students' argumentative writing achievement scores. I am seeking district permission to carry out my dissertation study at [REDACTED] High School during the spring semester of 2015.

The process for the study will require teachers to be randomly assigned to either a treatment or a comparison condition. Teachers assigned to the comparison condition will implement traditional classroom curriculum while those assigned to the treatment condition will implement the traditional classroom curriculum in conjunction with the Question Formulation Technique. Prior to the start of the study, I will train participating ninth and tenth grade English teachers who have been randomly assigned to the treatment group on the techniques and strategies of the modified writing curriculum. The same training will be offered to teachers who have been randomly assigned to a comparison group at the end of the study.

Before the respective writing curricula are implemented, teacher and student demographic information will be collected via a brief survey (approx. 5 minutes). Other information collected will include a review of students' argumentative writing at the start and at the end of the research study. Likewise, classes will be videotaped at the start of and during the study for the purpose of validating treatment fidelity. During the 10-week period of the intervention, teachers in both conditions will maintain a daily instructional log documenting classroom activities. Coding of names for all involved will be used to maintain confidentiality and all steps will be taken to ensure privacy for study participants (both students and teachers).

All participation in this study will be voluntary and will not have any effect on students' grades. Teachers and students have the right to withdraw from the study, and parents may remove their students from the study at any time. Data may be provided to you on request, in aggregate form only. This research project has been reviewed and approved by Western Connecticut State University's Institutional Review Board. **If you have questions concerning the rights of the subjects involved in research studies please contact the WCSU Assurances Administrator at irb@wcsu.edu and mention Protocol Number 1415-103. This study is valid until February 19, 2016.**

If you agree to allow [REDACTED] High School to participate in this study, please sign a copy of this form and return it to me. If you have any questions, please feel free to contact me at fernandm@bethel.k12.ct.us. I thank you for your consideration.

Sincerely,

Mary Fernand
EdD Candidate

Consent to Participate in Doctoral Dissertation Research Study

I agree that the study described above can be conducted in the [REDACTED] Public Schools District.

Superintendent Signature _____ Date: _____

Superintendent Name _____
(Please print name)

Appendix C: Letter and Consent Form (Principal)



Dear [REDACTED]:

As a candidate in the doctoral program for Instructional Leadership at Western Connecticut State University, I am required to design and implement a dissertation research study. My study, *The Effect of the Question Formulation Technique on Secondary Students' Argumentative Writing Achievement Scores*, to explore the effect of student question generation and gender on students' argumentative writing achievement scores. I am seeking district permission to carry out my dissertation study at [REDACTED] High School during the spring semester of 2015.

The process for the study will require teachers to be randomly assigned to either a treatment or a comparison condition. Teachers assigned to the comparison condition will implement traditional classroom curriculum while those assigned to the treatment condition will implement the traditional classroom curriculum in conjunction with the Question Formulation Technique. Prior to the start of the study, I will train participating ninth and tenth grade English teachers who have been randomly assigned to the treatment group on the techniques and strategies of the modified writing curriculum. The same training will be offered to teachers who have been randomly assigned to a comparison group at the end of the study.

Before the respective writing curricula are implemented, teacher and student demographic information will be collected via a brief survey (approx. 5 minutes). Other information collected will include a review of students' argumentative writing at the start and at the end of the research study. Likewise, classes will be videotaped at the start of and during the study for the purpose of validating treatment validity. During the period of the intervention, teachers in both conditions will maintain a daily instructional log documenting classroom activities. Coding of names for all involved will be used to maintain confidentiality and all steps will be taken to ensure privacy for study participants (both students and teachers).

All participation in this study will be voluntary and will not have any effect on students' grades. Teachers and students have the right to withdraw from the study, and parents may remove their students from the study at any time. Data may be provided to you on request, in aggregate form only. This research project has been reviewed and approved by Western Connecticut State University's Institutional Review Board. **If you have questions concerning the rights of the subjects involved in research studies please contact the WCSU Assurances Administrator at irb@wcsu.edu and mention Protocol Number 1415-103. This study is valid until February 19, 2016.**

If you agree to allow [REDACTED] High School to participate in this study, please sign a copy of this form and return it to me. If you have any questions, please feel free to contact me at fernandm@bethel.k12.ct.us. Thank you for your consideration.

Sincerely,

Mary Fernand
EdD Candidate

Consent to Participate in Doctoral Dissertation Research Study

I agree that the study described above can be conducted in [REDACTED] High School.

Principal Signature: _____ **Date:** _____

Principal Name: _____
(Please print name)

Appendix D: Letter and Consent Form (Teacher)



Dear Teacher,

As a candidate in the doctoral program for Instructional Leadership at Western Connecticut State University, I am required to design and implement a dissertation research study. My study, *The Effect of the Question Formulation Technique on Secondary Students' Argumentative Writing Achievement Scores*, may provide further insight into the effect of student question generation and gender on students' argumentative writing achievement scores. I am seeking your permission to carry out my dissertation study in your classroom during the spring semester of 2015.

If you decide to participate in the study, your classroom will be randomly assigned to either a treatment or a comparison condition. If assigned to the treatment condition, you will be asked to implement the Question Formulation Technique along with the traditional writing curriculum whereas if assigned to the comparison condition, you will adhere solely to the traditional writing curriculum.

You will be notified as to which group you have been assigned prior to the study's start. Teachers in the treatment condition will be given training on the Question Formulation Technique at the start of the study while those in the comparison group will be offered the training when the study is completed.

Before the respective writing curricula are implemented, teacher and student demographic information will be collected via a brief survey (approx. 5 minutes). Other information collected will include a review of students' argumentative writing at the start and at the end of the research study. Likewise, your classes will be videotaped at the start of and during the study for the purpose of validating treatment fidelity. During the period of the intervention, you will maintain a daily instructional log documenting classroom activities. Coding of names for all involved will be used to maintain confidentiality and all steps will be taken to ensure privacy for study participants (both students and teachers).

Participation in this study will be voluntary and should not have any effect on students' grades. You or your students have the right to withdraw from the study, and parents or guardians may also remove their students from the study at any time. This research project has been reviewed and approved by Western Connecticut State University's Institutional Review Board. **If you have questions concerning the rights of the subjects involved in research studies please contact the WCSU Assurances Administrator at irb@wcsu.edu and mention Protocol Number 1415-103. This study is valid until February 19, 2016.**

If you agree to participate in this study, please sign a copy of this form and return it to me. Please contact me at fernandm@bethel.k12.ct.us if you have any questions.

Sincerely,

Mary Fernand
EdD Candidate

Consent to Participate in Doctoral Dissertation Research Study

I agree to participate in the study described above at [REDACTED] High School.

Teacher Signature: _____ **Date:** _____

Teacher Name: _____
(Please print name)

Appendix E: Demographic Survey (Teacher)

Teacher Demographic Survey

ID: _____

Directions: Please answer the questions as they best apply to you.

1. Gender:

- Male
- Female

2. Ethnicity:

- Hispanic-American
- African-American
- Native-American
- Caucasian American
- Asian-American/Pacific Islander
- Other: Please specify _____

3. Teaching Experience (years): _____

4. Current Grade Level:

- 9th
- 10th

5. Years teaching at the grade level identified in question 4: _____

6. Level of Education (Please circle the highest degree completed):

- Bachelor's (BA/BS), Major:
- Master's (MA/MS), Major:
- Sixth-year/Ed. Spec.
- Doctorate (Ph.D/Ed.D)

7. Certification of Endorsement—Check all that apply:

Educator Certification (Please select your current certification)

- Initial Educator Certificate
- Provisional Educator Certificate
- Professional Educator Certificate

6th year certificate

- Please indicate area of 6th year certificate: _____

Administrative certificate (092)

Appendix F: Letter and Consent Form (Parent)



Dear Parent or Guardian,

As a candidate in the doctoral program for Instructional Leadership at Western Connecticut State University, I am required to design and implement a dissertation research study. My study, *The Effect of the Question Formulation Technique on Secondary Students' Argumentative Writing Achievement Scores*, may provide further insight into the effect of student question generation and gender on students' argumentative writing achievement scores.

Ninth and tenth grade students will receive classroom instruction in either the traditional writing curriculum (brainstorm, draft, revise, and publish) or the traditional writing curriculum embedded with the Question Formulation Technique in which students develop questions that guide their research and the content and structure of their writing. All students will be videotaped at the start of and during the study. The purpose of the videotaping is to ensure validity of the curriculum implementation.

If you permit your student to participate in the study, he or she will be asked to provide demographic information such as gender, ethnicity, and grade level. Samples of his/her argumentative writing prior to and at the end of the study will also be reviewed and scored using the high school's writing rubric. This scoring will have no bearing on your student's grade in his/her English class.

Participation in this study is completely voluntary. You have the right to withdraw your child from the study at any time. If you decide to allow your child to participate, results will not impact your child's grades. Student names will be coded and remain confidential. All efforts will be made to ensure your student's privacy.

This research project has been reviewed and approved by Western Connecticut State University's Institutional Review Board. **If you have questions concerning the rights of the subjects involved in research studies please contact the WCSU Assurances Administrator at irb@wcsu.edu and mention Protocol Number 1415-103. This study is valid until February 19, 2016.**

Please contact me at fernandm@bethel.k12.ct.us if you have any questions.

If you agree to have your child participate in this study, please sign the attached statement and return it to your child's English teacher.

Sincerely,

Mary Fernand
EdD Candidate

Consent to Participate in Doctoral Dissertation Research Study

I, _____, the parent/legal guardian (18 years of age or older) of the student minor below, acknowledge that the researcher has explained to me the purpose this research study, identified any risks involved, and offered to answer any questions I may have about the nature of my child’s participation. I voluntarily consent to my child’s participation. I understand all information gathered during this project will be confidential.

Student/Minor’s Name:
(Please print clearly)

Student’s English Teacher: _____
(_____, _____, _____, or _____)

Signature of Parent/Guardian: _____ **Date:** _____

Name of Parent or Guardian: _____
(Please print clearly)

Appendix G: Letter and Assent Form (Student)



Dear Student,

I am a student at Western Connecticut State University who will be doing a research study in the spring semester of 2015 and I would like you to be a participant.

The study is on the Question Formulation Technique and argumentative writing achievement. All ninth and tenth grade students will receive classroom instruction in either the school's traditional writing curriculum (brainstorm, draft, revise, and publish) or the traditional writing curriculum embedded with the Question Formulation Technique in which students develop questions that guide their research and the content and structure of their writing. All students will be videotaped at the start of and during the study. The purpose of the videotaping is to ensure consistency of the curriculum implementation.

If you agree to participate in my study, you will complete a demographic survey telling me some background information about yourself, such as the grade and English class you are in, your ethnicity, and gender. Your teacher will also provide me with data, such as your argument writing achievement scores, and will provide samples of your argumentative writing before and at the end of the study. In order to ensure your privacy, I will not use your name. Instead, I will use identification numbers. All efforts will be made to keep your information private. Participation in this study does not affect your grade for English class.

Participation in the study is completely voluntary and participation will not affect your classroom grades. You may withdraw from the study at any time. Participation is contingent upon your parent or guardian signing off on the permission slip attached to the parent/guardian letter.

Please contact me if you have any questions. I can be reached at fernandm@bethel.k12.ct.us.

Thank you,

Mrs. Fernand
EdD Candidate

Student Assent Form to Participate in a Research Study

If you would like to be in my study, please print and sign your name below.

Student Signature: _____ **Date:** _____

Student Name: _____

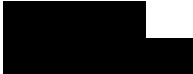
(Please print clearly)

English Teacher (Please check one):

Grade 9



Grade 10



Appendix H: Demographic Survey (Student)

Student Demographic Survey

Student ID Number: _____

Directions: Please respond to each question as it best applies to you.

1. Name of English Teacher:

██████████

██████████

██████████

██████████

2. Class:

English 11

English 12

English 21

English 22

English 23

3. Grade:

9

10

11

4. Gender:

Male

Female

5. Ethnicity:

- African American
- Asian/Pacific Islander
- Hispanic
- Native American
- White
- Multi-Racial (Please list all)

6A. Is English your primary language?

- Yes
- No

6B. If no, please identify primary language:

Appendix I: School-Created Writing Rubric

TRAIT	CT Core Standards	5	4	3	2	1
		<i>Advanced</i>	<i>Experienced</i>	<i>Proficient</i>	<i>Developing</i>	<i>Emerging</i>
		<i>Above grade level</i>		<i>Grade level</i>		<i>Below grade level</i>
Ideas	1. 1.a. 1.b. 1.e. 2. 2.a. 2.b. 2.f. 3. 3.a. 3.b. 3.c. 3.e. 4. 5. 6.	Statement of Purpose/Focus <ul style="list-style-type: none"> Thesis/claim is clearly stated, focused, and strongly maintained Engaging context provided for thesis/ claim *For arguments, alternate or opposing claims are refuted 	Statement of Purpose/Focus <ul style="list-style-type: none"> Thesis/claim is clear and for the most part maintained, though some loosely related material may be present Adequate context provided for thesis/ claim *For arguments, alternate or opposing claims are accommodated or conceded 	Statement of Purpose/Focus <ul style="list-style-type: none"> Thesis/claim is present with basic or general development Some context provided for thesis/claim *For arguments, alternate or opposing claims are stated or acknowledged 	Statement of Purpose/Focus <ul style="list-style-type: none"> Thesis/claim is stated but may be confusing or unclear Little context provided for thesis/ claim 	Statement of Purpose/Focus <ul style="list-style-type: none"> Main idea/topic must be inferred by reader Possible topic/theme emerging
	7. 8. 9.	Elaboration of Evidence <ul style="list-style-type: none"> Information is completely accurate Comprehensive, relevant, and precise details contribute to substantial depth Use of evidence from sources is smoothly integrated Effective use of a variety of elaboration techniques Effective elaboration, considering various aspects of evidence 	Elaboration of Evidence <ul style="list-style-type: none"> Information is mostly accurate, although inaccuracies do not detract from meaning Relevant, and precise details contribute to some depth Evidence from sources is integrated correctly Consistent, effective elaboration of evidence 	Elaboration of Evidence <ul style="list-style-type: none"> Information is mostly accurate, with few inaccuracies detracting from meaning Minimally sufficient support/ evidence for claim, although details may be limited in number or clarity Some evidence from sources is integrated, though citations may be general or imprecise Adequate elaboration of evidence throughout most of the piece 	Elaboration of Evidence <ul style="list-style-type: none"> May be incidental or confusing; most details lack specificity Evidence from sources is weakly integrated, and citations, if present, are uneven Weak or uneven elaboration of evidence 	Elaboration of Evidence <ul style="list-style-type: none"> Limited, unclear, irrelevant, or erroneous support
Organization	1.a. 1.c. 1.e. 2. 2.a. 2.c. 2.f. 3. 3.a. 3.c. 3.e. 4. 5. 6.	Order <ul style="list-style-type: none"> Inviting introduction Effective, well-placed details contribute to coherence Conclusion supports and extends ideas presented Structure <ul style="list-style-type: none"> Effective, consistent use of a variety of transitional strategies Consistently logical progression of ideas 	Order <ul style="list-style-type: none"> Effective introduction Well-placed details Conclusion supports the ideas presented Structure <ul style="list-style-type: none"> Smooth use of transitional words, phrases, sentences, or paragraphs Evident progression of ideas 	Order <ul style="list-style-type: none"> Adequate introduction Mostly well-placed details Conclusion is related to the topic, but needs more development Structure <ul style="list-style-type: none"> Adequate use of transitional strategies with some variety, although some may be formulaic Adequate, if slightly inconsistent, progression of ideas 	Order <ul style="list-style-type: none"> Underdeveloped introduction Some effectively placed details Conclusion is not related to the ideas presented Structure <ul style="list-style-type: none"> Inconsistent use of basic transitional strategies with little variety Uneven progression of ideas from beginning to end 	Order <ul style="list-style-type: none"> No introduction Extraneous or randomly-placed details intrude No conclusion Structure <ul style="list-style-type: none"> Missing or confusing transitional strategies are evident Ideas exist separate from, as opposed to in conjunction with, each other

Voice	1.b. 1.d. 2.b. 2.e. 3.a. 4. 5. 6.	Purpose <ul style="list-style-type: none"> Clearly conveyed through structure, content, and diction Sense of audience <ul style="list-style-type: none"> Considerate, thoughtful awareness & understanding Tone <ul style="list-style-type: none"> Adds interest and energy to message throughout the piece Appropriate for purpose and audience 	Purpose <ul style="list-style-type: none"> Conveyed through structure, content, and/or diction Sense of audience <ul style="list-style-type: none"> Clear awareness & understanding Tone <ul style="list-style-type: none"> Adds some interest or energy to message Appropriate for purpose and audience 	Purpose <ul style="list-style-type: none"> Inconsistently conveyed through structure, content, and/or diction Sense of audience <ul style="list-style-type: none"> Discernable, although maybe inconsistent, awareness & understanding Tone <ul style="list-style-type: none"> Attempts to bring topic to life Appropriate for purpose and audience with some inconsistencies 	Purpose <ul style="list-style-type: none"> Difficult to discern through structure, content or diction Sense of audience <ul style="list-style-type: none"> Emerging awareness & consideration Tone <ul style="list-style-type: none"> Uneven 	Purpose <ul style="list-style-type: none"> Not discernable through structure, content, or diction Sense of audience <ul style="list-style-type: none"> Little or no awareness, interaction or consideration Tone <ul style="list-style-type: none"> Flat or disinterested
Diction	1.d. 2.c. 2.d. 3.d. 4. 5. 6.	Vocabulary <ul style="list-style-type: none"> Consistently precise verbs, nouns and modifiers Engaging, wide-ranging, & enhances meaning Academic and/or domain-specific vocabulary is used consistently and is clearly appropriate for audience and purpose 	Vocabulary <ul style="list-style-type: none"> Accurate verbs, nouns and modifiers Varied and clarifies meaning Academic or domain-specific vocabulary is correct and used through majority of piece 	Vocabulary <ul style="list-style-type: none"> Some specific verbs, nouns and modifiers Mostly varied, with some repetition that detracts from interest Some academic and/or domain-specific vocabulary used, although may be uneven 	Vocabulary <ul style="list-style-type: none"> Common, predictable verbs, nouns and mundane modifiers Little variation Attempts to use academic and/or domain-specific vocabulary in a few places 	Vocabulary <ul style="list-style-type: none"> Vague, general Limited range Little or no academic and/or domain-specific vocabulary used
Sentence Fluency	1.c. 2.c. 3.d. 4. 5. 6.	Sentence length and structure <ul style="list-style-type: none"> Extensive variation, strongly controlled to enhance meaning Sentence beginnings <ul style="list-style-type: none"> Purposful and varied Transitions <ul style="list-style-type: none"> Creative and appropriate 	Sentence length and structure <ul style="list-style-type: none"> Good variation Sentence beginnings <ul style="list-style-type: none"> Varied Transitions <ul style="list-style-type: none"> Appropriate 	Sentence length and structure <ul style="list-style-type: none"> Some variation, maybe inconsistent Sentence beginnings <ul style="list-style-type: none"> Somewhat varied although may be uneven Transitions <ul style="list-style-type: none"> Appropriate with some repetition 	Sentence length and structure <ul style="list-style-type: none"> Some awkwardness Sentence beginnings <ul style="list-style-type: none"> Few attempts to vary Transitions <ul style="list-style-type: none"> Repetitive or formulaic 	Sentence length and structure <ul style="list-style-type: none"> Choppy, incomplete, rambling Sentence beginnings <ul style="list-style-type: none"> Similar or repetitive Transitions <ul style="list-style-type: none"> Lacking
Conventions	1.d. 2.e. 4. 5. 6. 8.	Editing <ul style="list-style-type: none"> Ready to publish Spelling <ul style="list-style-type: none"> Correct Punctuation <ul style="list-style-type: none"> Accurate, effective, at times creative Capitalization <ul style="list-style-type: none"> Consistent and correct Grammar and usage <ul style="list-style-type: none"> Consistently correct Manipulation of conventions <ul style="list-style-type: none"> Works as a stylistic effect 	Editing <ul style="list-style-type: none"> Minor editing needed Spelling <ul style="list-style-type: none"> Mostly correct Punctuation <ul style="list-style-type: none"> Accurate and effective Capitalization <ul style="list-style-type: none"> Mostly correct Grammar and usage <ul style="list-style-type: none"> Mostly correct Manipulation of conventions <ul style="list-style-type: none"> Works as a stylistic effect 	Editing <ul style="list-style-type: none"> Some editing needed Spelling <ul style="list-style-type: none"> Correct for most common words Punctuation <ul style="list-style-type: none"> Correct end-of-sentence punctuation; internal sometimes incorrect Capitalization <ul style="list-style-type: none"> Some capitalization errors Grammar and usage <ul style="list-style-type: none"> Some inaccuracies Manipulation of conventions <ul style="list-style-type: none"> Emerging awareness 	Editing <ul style="list-style-type: none"> Moderate editing needed Spelling <ul style="list-style-type: none"> Some spelling errors of common words Punctuation <ul style="list-style-type: none"> Many errors Capitalization <ul style="list-style-type: none"> Inconsistent Grammar and usage <ul style="list-style-type: none"> Noticeable, frequent errors 	Editing <ul style="list-style-type: none"> Extensive editing needed Spelling <ul style="list-style-type: none"> Frequent spelling errors Punctuation <ul style="list-style-type: none"> Basic punctuation omitted or incorrect Capitalization <ul style="list-style-type: none"> Random Grammar and usage <ul style="list-style-type: none"> Interferes with meaning and readability

Appendix J: Treatment Teacher Workshop Outline

Professional Learning: Introduction to the Question Formulation Technique (QFT)

- I. Welcome participants
- II. Review agenda for session
 - a. Overview of the QFT
 - b. QFT video: Grade 12 Humanities class using the QFT process
 - c. Readings on the QFT
 - d. Practice application of the QFT
 - e. Time to plan for QFT application in own classrooms
- III. Overview of the QFT (PowerPoint presentation)
 - a. The philosophy behind the QFT
 - b. QFT key components
 - c. Rules for question generation
 - d. Closed/Open-ended questions
- IV. Provide opportunity to see the QFT in action via video link:
- V. Readings on the QFT
 - a. Focus: Different types of thinking generated by questions
 - i. Divergent
 - ii. Convergent
 - iii. Metacognitive
 - b. Debrief of readings
- VI. Guided practice QFT application
 - a. Qfocus: “Many students are not asking questions.”
 - b. Debrief application

- VII. Independent application of the QFT
 - a. Participants have time to plan for an upcoming lesson in which to apply the QFT.
 - b. Participants will also plan for how and when to introduce the QFT to students.
 - i. Distribution and review of materials to potentially use with students
 - ii. Process for collection of student work
 - 1. Administration of student demographic surveys
 - 2. Assignment of student identification codes to use on QFT written responses
 - 3. Collection of QFT written responses
 - 4. Teacher scoring and data collection
 - 5. Submission to independent party for independent scoring
 - c. Debrief activity
- VIII. Closure
 - a. Introduce and review teacher implementation logs
 - b. Discuss communication process
 - c. Participants complete researcher-created teacher demographic survey

Appendix K: Writing Prompts

Comparison Group

Grade	Assignment #1	Assignment # 2	Assignment # 3	Assignment #4
9	Is it better to have pride or humility? Text: Shakespeare's <i>Romeo and Juliet</i>	Based on Act I, what makes for effective and ineffective parenting on the part of the Montagues and Capulets? Text: Shakespeare's <i>Romeo and Juliet</i>	Is Romeo a sympathetic character? Text: Shakespeare's <i>Romeo and Juliet</i>	Who is to blame for the deaths of Romeo and Juliet? Text: Shakespeare's <i>Romeo and Juliet</i>
10	To what degree does having power (versus something else) affect Macbeth's character? Text: Shakespeare's <i>Macbeth</i>	To what extent is Macbeth responsible for what happens in the play? Text: Shakespeare's <i>Macbeth</i>	Should conformity be considered detrimental or not? Text: Lawrence and Lee's <i>Inherit the Wind</i>	Does an individual have a responsibility to stand up to his/her beliefs? Text: Lawrence and Lee's <i>Inherit the Wind</i>

Treatment Groups' Qfocus

Grade	Assignment #1	Assignment # 2	Assignment # 3	Assignment #4
9	Pride and Humility Text: Shakespeare's <i>Romeo and Juliet</i>	Parent/teen relationships Text: Shakespeare's <i>Romeo and Juliet</i>	"Away from lights steals home my heavy son, and private in his chamber pens himself, Shuts up his windows, locks fair daylight out, and makes himself an artificial night." Text: Shakespeare's <i>Romeo and Juliet</i>	Shakespeare makes a statement when he presents Romeo and Juliet's love for each other alongside the hatred that swirls between the families. Text: Shakespeare's <i>Romeo and Juliet</i>
10	"Power's affect on an individual" Text: Shakespeare's <i>Macbeth</i>	Personal responsibility Or "Let not light see my black and deep desires"-Macbeth Text: Shakespeare's <i>Macbeth</i>	"One of the peculiar imbecilities of our time is the grid of morality we have placed on human behavior: so that every act of man must be measured against an arbitrary latitude of right and longitude of wrong- in exact minutes, seconds, and degrees!" Drummond in <i>Inherit the Wind</i> Text: Lawrence and Lee's <i>Inherit the Wind</i>	"Disillusionment is what little heroes are made of"- E.K. Hornbeck in <i>Inherit the Wind</i> Or <i>Standing up for one's beliefs</i> Text: Lawrence and Lee's <i>Inherit the Wind</i>

Appendix L: Implementation Timeline for Intervention Period

Time Frame	Action
February 2015	Applied for and received IRB approval
February 2015	Sought and received consent from district superintendent and high school principal
February-March 2015	Invited potential teacher participants, met with teachers as applicable, distributed and received consent forms. Two teachers from grade 9 and two teachers from grade 10 participated consented to participate in the study
March 2015	Met with participating teachers to review process for getting student participation
March 2015	Conducted two more rounds of consent/assent collections, including posting notices during parent conferences; Received enough consent and assent forms to move forward with the study
March 2015	Randomly assigned teachers and their classes to treatment and comparison groups; Assigned codes to participating teachers and students to use on all work submitted to ensure anonymity and confidentiality
March 2015	Videotaping of participating classes to confirm current practices in regards to student question generation
March 2015	Scheduled, arranged, and conducted workshop on the QFT process for teachers in the treatment group
March 2015	Met with teachers in the comparison group to discuss their role in the study, including data collection process and teacher logs
April-June 2015	Conducted ongoing informal meetings with teacher participants to address questions and to confirm study's progress and implementation of the intervention
April 2015	Pretest assessment completed and scored
April 2015	Implementation of the intervention-Cycle #1
May 2015	Implementation of the intervention-Cycle #2
May 2015	Videotaped treatment and comparison groups
May 2015	Implementation of the intervention-Cycle #3
May-June 2015	Scoring conducted by independent raters
June 2015	Implementation of the intervention-Cycle #4 /Administration and scoring of the posttest
June 2015	Scoring conducted by independent raters
June 2015	Final collection of all materials associated with the study, including teacher logs
June 2015	Thank you and small gift of appreciation given to each participating teacher
November-December 2015	Data analysis conducted

Appendix M: Sample Teacher Writing Curriculum Implementation Log - Treatment

Teacher Writing Curriculum Implementation Log:

**Treatment Group
Sample Entry**

Writing Curriculum embedded with Question Formulation Technique

Teacher ID: 10012015

Class ID: 10A - 10B - 10C

Date	Class Code (if multiple classes apply)	Description of Class	Type of Writing Instruction (QFT & Traditional Writing Process)	Length of Class in minutes (note if different from 57 min.)	Approximate time spent on writing instruction (in minutes)
Ex: 4/22/15	10A	<ul style="list-style-type: none"> - Vocabulary quiz and Independent reading time - Introduced and conducted the questioning session for <i>Macbeth</i> –prompt was assigned by ability - Addressed different types of questions (closed vs. open-ended) -Reviewed crafting effective thesis statements 	<ul style="list-style-type: none"> - Introduced the Question Focus for the assignment: “Personal Responsibility” or “Let not my light see my black and deep desires” - Students were put in purposely assigned groups of 4 and given chart paper and markers. They were given five minutes to write as many questions about the focus as possible - As a class, we reviewed open-ended vs. closed questions. -The students labeled their questions - The students turned their closed questions to open questions - As a group, they selected their top 3 questions 	57	35
4/23/15	10A	<ul style="list-style-type: none"> -Reviewed sample thesis statements from previous class -Draft a thesis and outline for selected questions 	<ul style="list-style-type: none"> -Students selected one of the questions highlighted during yesterday’s class to write a response to -Drafted thesis and outline (with textual evidence) -Students worked collaboratively and gave feedback to each other; students revised accordingly 	57	45
4/13/15	10A	<ul style="list-style-type: none"> - Reviewed common writing errors from previous writing assignment -writing conferences -drafting of responses 	<ul style="list-style-type: none"> -Reviewed common errors (formal writing, integrating quotations, choosing substantial pieces of evidence) -conducted individual writing conferences as students drafted responses to selected question 	57	47

Appendix N: Sample Student Argument Writing Scores Collection *Excel* Spreadsheet

Excel Spreadsheet of Argument Writing Achievement Pretest and Posttest Scores

ID	Grade	ProgType	Gender	Pretest	Posttest
104761	9	1	1	18	21
101770	9	1	1	10	12
101092	9	1	1	21	22
101723	9	1	1	23	25
101775	9	1	1	24	20
104363	9	1	1	21	22
101736	9	1	1	24	26
101778	9	1	1	24	25
1020111	9	1	1	24	25
102688	9	1	1	20	21
101712	9	1	1	20	24
101762	9	1	1	24	24
101843	9	1	1	22	20
101743	9	1	1	17	16
105440	9	1	1	19	20
101651	9	1	1	25	26
10033	9	1	1	21	22
104361	9	1	2	17	21
102254	9	1	2	24	26
101739	9	1	2	25	24
101857	9	1	2	23	25
101683	9	1	2	27	25
101694	9	1	2	25	26
101671	9	1	2	27	28
101686	9	1	2	21	22
101878	9	1	2	25	28
101731	9	1	2	25	23
104112	9	1	2	27	25
10041	9	1	2	25	21
101759	9	1	2	17	20
101052	9	1	2	17	18
103269	9	1	2	25	23
102813	9	1	2	27	27
101056	9	2	1	21	23

Sample O: Question Formulation Technique Support Materials (Students)

Bloom's Taxonomy Action Verbs

Level	Definition	Sample verbs					Sample behaviors
KNOWLEDGE	Student recalls or recognizes information, ideas, and principles in the approximate form in which they were learned.	arrange define describe duplicate	identify label list match	memorize name order outline	recognize relate recall repeat	reproduce select state	The student will define the 6 levels of Bloom's taxonomy of the cognitive domain.
COMPREHENSION	Student translates, comprehends, or interprets information based on prior learning.	explain summarize paraphrase describe illustrate classify	convert defend describe discuss distinguish estimate explain	express extend generalized give example(s) identify indicate	infer locate paraphrase predict Recognize	rewrite review select summarize translate	The student will explain the purpose of Bloom's taxonomy of the cognitive domain.
APPLICATION	Student selects, transfers, and uses data and principles to complete a problem or task with a minimum of direction.	use compute solve demonstrate apply construct	apply change choose compute demonstrate discover dramatize	employ illustrate Interpret manipulate modify operate	practice predict prepare produce relate schedule	show sketch solve use write	The student will write an instructional objective for each level of Bloom's taxonomy.
ANALYSIS	Student distinguishes, classifies, and relates the assumptions, hypotheses, evidence, or structure of a statement or question	analyze categorize compare contrast separate apply	change discover choose compute demonstrate dramatize	employ illustrate interpret manipulate modify operate	practice predict prepare produce relate schedule	show sketch solve use write	The student will compare and contrast the cognitive and affective domains.
SYNTHESIS	Student originates, integrates, and combines ideas into a product, plan or proposal that is new to him or her.	create design hypothesize invent develop arrange assemble	categorize collect combine comply compose construct create	design develop devise explain formulate generate plan	prepare rearrange reconstruct relate reorganize revise	rewrite set up summarize synthesize tell write	The student will design a classification scheme for writing educational objectives that combines the cognitive, affective, and psychomotor domains.
EVALUATION	Student appraises, assesses, or critiques on a basis of specific standards and criteria.	Judge Recommend Critique Justify Appraise Argue	Assess Attach Choose Compare Conclude Contrast	Defend Describe Discriminate Estimate Evaluate Explain	Judge Justify Interpret Relate Predict	Rate Select Summarize Support Value	The student will judge the effectiveness of writing objectives using Bloom's taxonomy.

Reference: <http://chiron.valdosta.edu/whuitt/col/cogsys/bloom.html>

Question Stems

NOTE: These are potential structures to consider for use when developing your own questions. While the question stems are meant to be used to help generate your own thinking, know that some of these stems may need to be adjusted in order to fit the assignment. For example, you may want or need to change the verb in the question. This list is not definitive.

- How does _____ affect _____?
- How is _____ related to _____?
- What would happen if _____?
- If _____ happened, how might this have affected _____?
- Why did _____ changes occur?
- How would you judge the value of _____?
- How could you change _____ to _____?
- How would you adapt _____ to create _____?
- Using what you have learned, how would _____?
- How can _____ make use of _____?
- How does _____ justify _____?
- To what extent does _____ contribute to _____?
- How would you determine that _____ caused _____?
- How do _____ use _____ to _____?
- Why has _____ allowed _____ to _____?
- How does _____ help _____?
- How does _____ shape _____?
- What is the relationship between _____ and _____?
- How effective was _____ with _____?
- Which _____ was _____ and why

Appendix P: Sample Treatment Student Generated Questions

Grade 9 Text: Shakespeare's *The Tragedy of Romeo and Juliet*

QFocus: Romeo and Juliet's love for each other is developed along with the hatred that swirls between the two families.

Sample Student Generated Questions From One Group:

- Why would Shakespeare do that? What claim is he making?
- How might this be related to theme?
- Why are love and hatred so often paired together in stories and movies?
- What difference does it make that Romeo and Juliet are teenagers in love and their parents are older and feuding?
- What can be made of the love being so at first sight and the feud going on for a while?
- How does love conquer hate?
- How can love be as destructive as hate?
- How can hatred turn into love?
- To what degree are we responsible for those we love? Do we have any responsibility to those we hate?
- Where might this be applicable today? Where else do we see this happening and what does it mean for society?
- How can love develop when there is hatred?
- How does Romeo and Juliet's love affect their families and their relationships with their families?
- What needs to happen for love to develop when there is hatred?
- Why is it that both love and hatred seem to share some common things?
- Why does their love and the families' feud seem to escalate at the same pace?

Grade 9 Sample Student Question Generation Selection

Question Selected for Individual Student Prompt (from list generated above)

How can love be as destructive as hate?

QFocus: Love can be as destructive as hate.

Individual Student Generated Questions (which the student used to guide her written response):

- In what ways is love destructive?
- Why does love cause destruction?
- How can love destroy?
- Does the destruction love creates have a greater impact than that caused by hate?
- How is Romeo and Juliet's love destructive?
- How are the parents' love destructive?
- In what ways is the Nurse's love destructive? The Friar's?
- How is Mercutio and Tybalt's love for their families destructive?
- How is love for their families' honor destructive?
- How can destruction be good and bad?

Grade 10 Text: Shakespeare's *Macbeth*

QFocus: Standing up for one's beliefs

- What causes people to be unwilling to compromise their beliefs? Especially for progress?
- How does knowledge impact understanding of beliefs?
- How are beliefs restricted by law?
- How are beliefs influenced?
- What motivates people to stand up for their beliefs?
- Why are beliefs rejected?
- How do beliefs impact change in a society?
- How can you tell when someone is standing up for their beliefs versus someone else's?
- How do you know Rachel's beliefs are her own and not someone else's?
- How does Drummond demonstrate his faith in his beliefs?
- How is Rachel prevented from standing up for her beliefs?
- How are people affected by those who stand up for their beliefs?
- How does age affect someone's decision to stand up for his/her beliefs?
- How can people stand up for their beliefs without putting other people down?
- How does environment affect one's beliefs?
- How are beliefs generated?
- How is it different if one believes he should stand up for his beliefs versus if he feels he has a responsibility to stand up for his beliefs?
- What is at risk when you stand up for your beliefs?
- How does Cates standing up for his beliefs affect others?
- Who more effectively models standing up for you beliefs: Brady, Drummond, Cates, Reverend Brown, or Rachel Brown?

Grade 10 Sample Student Question Generation Selection

Question Selected for Individual Student Prompt:

QFocus: Environment affects the individual.

Individual Student Generated Questions (which the student used to guide her written response):

- Why does a person's environment affect how they decide to stand up for their beliefs or not?
- How does a person's environment affect how they decide to stand up for their beliefs or not?
- Who has more of an impact on how a person decides to stand up for their beliefs: family? Friends? Others?
- What things in an environment affect a person's choice to stand up for what they believe in?
- To what degree does changing a person's environment affect how they choose to act to stand up for their beliefs?

Appendix Q: Sample Teacher Writing Curriculum Implementation Log - Comparison

Teacher Writing Curriculum Implementation Log:

Comparison Group Traditional Writing Curriculum

Teacher ID: 201510102

Class Codes: listed below

Date	Class Code(s)	Description of Class (include elements of the traditional writing curriculum implemented)	Type of Writing Instruction (Traditional writing process)	Length of Class in minutes (note if only different from 57 min.)	Approximate time spent on writing instruction (in minutes)
4/22/15	10Z	Modeled "significance" sentences where students explain the relevance of evidence	Drafting and analyzing	57	5 min
4/23/15	10Z	Choosing appropriate evidence to support a claim/evaluating strengths of particular evidence	Planning/drafting	57	10 min
4/24/15	10Z	Drafting an ICE response	planning and drafting	57	35 (5 for planning, 30 for writing)
4/28/15	10Z	Editing and revising for sophisticated language/avoiding common errors	Editing/Revising	57	40 min.
4/29/15	10Z	Revising ICE responses	Revising	57	38 min.
4/30/15	10Z	Revising ICE responses	Revising	57	35 min.
5/4/15	10Z	Evaluating rhetorical arguments in writing	Analyzing and Revising	57	20 min.
5/5/16	10Z	Evaluating strengths and weaknesses: goal-setting	Analyzing and Planning	57	3-5 min. per student/ the whole class period was used for conferencing 1 on 1 with students; students watched a video when they were not conferencing
5/6/16	10Z	Assembly	N/A	57	0

Appendix R: Writing Handouts for Students

Effectively Using the ICE Method in Writing

- **Introduce** the main idea and quotation.
- **Cite** the quote.
- **Explain** how it supports your main idea and thesis.

This method should be employed in the writing of body paragraphs.

How do I use this?

1. Determine the topic of your paragraph
2. Find three pieces of evidence that support your topic
3. Incorporate them smoothly into the paragraph
4. Clearly show how the chosen quote relates to the topic

Example: Is the Cyclops a villain?

1. **Introduce your idea:** “Although Polyphemos is aggressive and hungry, he is not the villain that Odysseus deems him to be. In fact, Polyphemos is a victim of a conceited intruder.”
2. Give a bit of background to introduce your quotation: “When Odysseus lands on Cyclops’s island and barges into his home, he demands places certain demands on Polyphemos to be welcoming.”
3. Cite your quotation: “Odysseus states, ‘It is custom to be a gracious host or to fear Zeus’” (42).
4. Explain by paraphrasing the quotation and connecting it to your main idea: “Odysseus breaks into Polyphemos’s home and then threatens to call the wrath of Zeus if he does not welcome him. Polyphemos’s violent behavior is simply a reaction to Odysseus’s hubristic behavior. Therefore, Polyphemos is the innocent party and Odysseus resembles the monster.”

This seems time-consuming.

At first, but you will become pros at this!

But is it worth it?

This skill will support you throughout high school, into college, and beyond. Persuasive writing is a necessary skill and ICE is key to successful persuasion.

Handy Tips for using the ICE Method

*For **Introducing** a quote:*

When using the author's name to introduce a quote, use a variety of phrases.

- In *The Alphabet*, John Smith writes, “---“
- In *The Alphabet*, John Smith observes, “---“
- In *The Alphabet*, John Smith remarks, “---“

The verb you choose (i.e. ‘writes’ or ‘observes’) can help the reader understand your position. For example, the verb “informs” is positive while the verb “alleges” is negative. Verbs like “observes” and “writes” are neutral; neither good nor bad.

Other verbs you may consider using are:

Continues	Explains	Remarks	Charges	Criticizes
Expresses	Reports	Claims	Declares	Illustrates
Determines	Implies	Shows	Describes	Points Out
Concurs	Confirms	Argues	Proposes	Suggests
Maintains	Asserts	Mentions	Examines	Believes

Sometimes you might want to use a colon introduction, like this:

In *The Alphabet*, John Smith offered this explanation: “A comes before B because it is better.”

You may also choose to begin your quotation in the middle of the writer's sentence. You can do so, like this:

In *The Alphabet*, John Smith proved that “S is the most entertaining letter to write.”

*For **Citing** a quotation:*

Use the least amount of a quoted passage you can to support your point. Don't quote the less relevant parts; use only what supports your point directly.

Choose carefully. Your quotation should clearly relate to your position.

*For **Explaining** a quote:*

Don't assume the reason you are using a piece of textual evidence is obvious to your reader. For every quotation you use, expect to write two or three lines of your own analysis and explanation after it.

So, what? This is the part where you tell the reader why the quotation is important. Explain how the quotation supports your thesis.

ICE Practice

“Children must practice what they learned at school. It helps write important information and skills into long-term memory. Additionally, many skills require a great deal of practice for mastery. In addition, homework helps develop independence in children, the children work independently when completing their homework. It also gives a sense of responsibility and self-discipline. As homework assignments have a deadline on them, children learn to complete tasks on time. Homework also helps bridge the gap between teachers and parents. As parents monitor their children’s homework, they stay connected to their child’s progress and classwork. “

-*homework-help.net*

Skill: Choosing Appropriate Quotations

Read the above quote about homework and complete the following skill-building tasks.

1. The topic of your body paragraph is homework as a memory aid. Find a quote that supports this topic.
2. The topic of your body paragraph is homework as a skill-builder. Find a quote that supports this topic.
3. The topic of your body paragraph is homework and its importance to studentship, the practice of and skills related to being a student. Find a quote that supports this topic.

Skill: Introducing and Citing the Quotation

Using the provided ‘tips’, introduce and cite the quotation you used in Number 1.

Skill: Explaining the Quotation

For each quotation you use, you must consider how it supports your thesis.

Imagine that your thesis is as follows:

Homework is a necessary element of school because it builds students' knowledge, encourages skills practice, and helps children become better students.

Take your response to the previous task and rewrite it below, adding your explanation that links it back to your support topic of 'building students' knowledge' and your thesis.

All done? Check it with your teacher for final sign-off.

The writing exercise was successfully completed.

Student Signature: _____

Teacher Signature: _____

Proving your Thesis

- What type of information should you put in a paragraph to help prove your thesis statement? Think about literary analysis, persuasive speech, and research essays.
- What information should you put at the end of every body paragraph?
- How important is proving your thesis in the essay process? Explain.

Look at the following paragraphs and determine what students need to add to better prove their thesis:

Thesis: *Humans don't evolve together when it comes to racism.*

To Kill a Mockingbird is a classic American novel. In this novel they are charging Tom Robinson for rape. Even though he couldn't have beat her and raped her with one hand they are still trying to charge him and put him in jail because of the fact he is black. The people who were charging Tom had no good evidence they were a racist family who were trying to blame a black person because Bob Ewell beat his daughter and didn't want to say he did so he picked Tom to blame it on. At the end Tom was charged for rape and was sent to jail shortly after he was killed for trying to escape the jail. This can relate to social injustice because when people are looking for someone to blame they go straight to black people because they think they cause all the problems. So when they go to court they are mainly looked at for their skin color.

How does the writer introduce their topic? Is it an effective topic sentence?

What type of evidence did they use?

What type of evidence do they need to add?

Did they connect back to their main idea?

Did they prove their thesis? Explain. If not, write a better closing statement.

Thesis: *Racism affects blacks and whites both physically and mentally, which can lead to extreme violence and possibly death.*

Norman Rockwell, a famous painter, tried to show how racism affects people. In 1964 he drew a painting called, *The Problem We All Live With*, which became an important symbol of civil rights. It represented, “Ruby Bridges, a young black girl, on her historic walk in 1960 to a white school six years after the Supreme Court declared that segregation of schools was unconstitutional”(Villarreal). The picture is focused on a young black girl who is on her way to school, a white school. One can see how officers are trying to protect her from being physically tormented while they are escorting her to school. People may think that mentally this girl may not be strong, but in the picture, she seems proud and confident about going to school. Racism tears people apart mentally. Rockwell wanted everyone to see what was going on. He was trying to point out the social injustices in society. He wanted things to change. When Ruby Bridges got older she talked about Rockwell. She said that he knew, “The treatment of blacks was wrong and he was going to say it was wrong. He had enough courage to step up to the plate and say I’m going to make a statement, and he did it in a very powerful way”(Villarreal). During that time everyone was not a racist. There were others who knew that the treatment of black people was wrong, but they were afraid if they said something they might get hurt. More people like Norman Rockwell needed to step forward and fight racism. Norman Rockwell was not the only one who tried to make a statement about racism.

How does the writer introduce their topic? Is it an effective topic sentence?

What type of evidence did they use?

What type of evidence do they need to add?

Did they connect back to their main idea?

Did they prove their thesis? Explain. If not, write a better closing statement.

From Simple Sentences to Compound and Complex Sentences

Combining simple sentences to make complex sentences is an important exercise to help you advance in your writing abilities.

What does this mean?

A simple sentence is an independent clause, meaning it has both a subject and a verb and it represents a complete thought. It can stand alone – but that doesn't mean it should!

Ex. "I learned to paint. I painted a sparrow." These are both simple sentences.

A compound sentence is one that combines two independent clauses.

Ex. "I learned to paint, then I painted a sparrow." This is a compound sentence.

A complex sentence includes both an independent clause AND a dependent clause. A dependent clause is something that cannot stand alone as a sentence, like, "Even though I just learned." That can't stand alone! It needs to be paired with an independent clause.

Ex. "Even though I just learned, my painting came out pretty well."

Exercise 1: Write ten simple sentences about the weekend. Follow the example given.

1. I see my friends on the weekend.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Exercise 2: Turn those ten simple sentences into five compound sentences.

Tips: Use a semicolon between two independent clauses.

Use a comma or a conjunction between two independent clauses, like for, and, nor, or, yet, so, but...

- 1.
- 2.
- 3.
- 4.
- 5.

Exercise 3: Choose two of your simple sentences and combine them into a complex sentence, using words to introduce them.

Fun fact: Those words that introduce them are called subordinating conjunctions.

Subordinating conjunctions to help...

After	Although	As	As if	As long as
As much as	As soon as	As though	Because	Before
Even if	Even though	If	If only	Inasmuch
In order that	Lest	Now that	Once	Provided that
Rather than	Since	So that	Than	That
Though	Till	Unless	Until	When
Whenever	Where	Whereas	Wherever	While

Your sentence:

Just remember! Avoid run-on sentences (which are improperly joined independent clauses) and fragments (which are dependent clauses standing alone).

Exercise 4: Improving Sentence Structure

Improve the sentence structure by combining simple sentences into compound and/or complex sentences.

1. “Adolf Hitler killed many people. He never asked for forgiveness.”
2. “After the Depression, people could have more children. They weren’t moving from place to place.”
3. “Having a larger amount of food helped with supporting larger societies. Having more food also lead to being able to trade.”
4. “After the Dust Bowl in Oklahoma, farmers searched for work. They were called migrant workers. Work was usually unavailable. This led to migrant workers living in poor conditions”

Challenge Sentence

Turn this bundle of simple sentences into ONE sentence without losing meaning!

“With the invention of television, companies were able to advertise to many people at once. They would use commercials to get people to buy their product. Also, later on while they were still figuring everything out, advertisers found out that not only could they advertise their products but they could target ideal costumers during specific programs.”

All done? Check it with your teacher for final sign-off.

The writing exercise was successfully completed.

Student Signature: _____

Teacher Signature: _____

Strong vs. Weak Verbs

To help you move away from summary and toward **ANALYSIS**, you need to begin to incorporate strong verbs into your writing when discussing the writer’s rhetorical choices.

Below is a list of verbs that are considered weak because they imply summary and a list of verbs that are considered strong because they imply analysis.

Strive to use the stronger verbs in your essays to help push yourself away from summary and toward analysis: “The writer flatters...” NOT “The writer says...”

WEAK VERBS (Summary)

Says/relates/goes/on/to/say/tells/this/quote/shows/explains/states/shows

STRONG VERBS (Analysis)

Implies/trivializes/flatters/qualifies/processes/describes/suggests/denigrates/lionizes/dismisses/analyzes/questions/compares/vilifies/praises/supports/enumerates/contrasts/emphasizes/demonizes/establishes/admonishes/expounds/argues/defines/ridicules/minimizes/narrates/lists/warns

Powerful and meaningful verbs to use in your analyses as Alternatives to “show”

Acknowledge	Engage	Justify	Reference
Address	Enhance	Locate	Refine
Analyze	Establish	Loosen	Reflect
Apply	Evaluate	Maintain	Refute
Argue	Exacerbate	Manifest	Regard
Assert	Examine	Manipulate	Reject
Augment	Exclude	Measure	Relate
Broaden	Exhibit	Merge	Rely
Calculate	Expand	Minimize	Remove
Capitalize	Explain	Modify	Repair
Characterize	Exploit	Monitor	Report
Claim	Express	Necessitate	Represent
Clarify	Extend	Negate	Resolve
Compare	Facilitate	Nullify	Retrieve
Complicate	Feature	Obscure	Reveal
Confine	Forecast	Observe	Revise
Connect	Formulate	Obtain	Separate
Consider	Fracture	Offer	Shape
Construct	Generalize	Omit	Signify
Contradict	Group	Optimize	Simulate
Correct	Guide	Organize	Solve
Create	Hamper	Outline	Specify

Convince	Hypothesize	Overstate	Structure
Critique	Identify	Persist	Suggest
Declare	Illuminate	Point out	Summarize
Deduce	Illustrate	Possess	Support
Defend	Impair	Predict	Suspend
Demonstrate	Implement	Present	Sustain
Deny	Implicate	Probe	Tailor
Describe	Imply	Produce	Terminate
Determine	Improve	Promote	Testify
Differentiate	Include	Propose	Theorize
Disagree	Incorporate	Prove	Translate
Discard	Indicate	Provide	Undermine
Discover	Induce	Qualify	Understand
Discuss	Initiate	Quantify	Unify
Dismiss	Inquire	Question	Utilize
Distinguish	Instigate	Realize	Validate
Duplicate	Integrate	Recommend	Vary
Elaborate	Interpret	Reconstruct	View
Emphasize	Intervene	Redefine	Vindicate
Employ	Invert	Reduce	Yield
Enable	Isolate	Refer	

The Use of Transitions in Persuasive Writing

A good essay must use transitions within paragraphs and especially between paragraphs to preserve the logical flow of the essay. An essay without good transitions is like a series of isolated islands; the reader will struggle to get from one point to the next. Use transitions as bridges between your ideas. A good transition statement between paragraphs will straddle the line between the two paragraphs.

Transitions Within Paragraphs:

- One type of transition connects ideas within one paragraph. This type connects two pieces of support, or possibly a piece of evidence to an explanation.
- Ex. Lennie was a character that was threatening in size but truly a mouse at heart. **Similarly**, Boo Radley was deemed a monster when he truly was a good man.
- Ex. Technology led to greater efficiency and productivity in agriculture. **For example**, the plow allowed farmers to seed and harvest their fields more quickly **thus** allowing them to produce more crops.

Transitions Between Paragraphs:

- Another type of transition creates a connection between two paragraphs. This type of paragraph is used to link to major support topics (your body paragraphs) and to help your essay ‘flow’.
- Ex. To link a paragraph about Boo Radley as a Christ figure to Lennie as a martyr, I might use a topic sentence like this . . .
 - **Accordingly**, just as Boo was a Christ figure, Lennie represents a martyr.

Ex. To link a paragraph about Odysseus choices to a paragraph about the death of his crew, I might use a topic sentence that looks like this...

- **As a result** of Odysseus’s failure to notify his crew of the danger ahead, the crew died a horrible death without any opportunity to save themselves.

The chart on the reverse provides a number of different transitional phrases.
You are not limited to these phrases, however they can be very helpful.

SOME TRANSITION WORDS AND PHRASES ACCORDING TO MEANING

ADDING	CONTRASTING	CONCLUDING
additionally also besides further furthermore in addition in the same way likewise moreover similarly	at any rate even so however in contrast in spite of that instead nevertheless on the contrary on the other hand otherwise still	accordingly as a result as a/in consequence consequently in conclusion for this reason hence therefore thus to conclude
COMPARING	ADDING ADDITIONAL DETAIL	SUMMARIZING
by comparison equally in the same way likewise similarly	as an illustration for example for instance indeed in fact in other words in particular specifically that is	briefly in a word in brief in short in summary to summarize

INDICATING SEQUENCE (LOGICAL)	EXPRESSING OPINION
first(ly), second(ly), third(ly)... next finally last(ly) then above all in conclusion to illustrate that is	actually apparently certainly (un)fortunately of course undoubtedly

INDICATING SEQUENCE IN TIME

SAME TIME	EARLIER TIME	NOW	LATER TIME
at the same time concurrently simultaneously	before that earlier first formerly previously	at this time at present now nowadays these days	after that afterwards in the future later next soon subsequently

Practicing Transitions Within Paragraphs

Read the following paragraph. Note that the sentences seem disconnected and choppy.

Odysseus landed on Cyclops island. He goes to Cyclops's cave. He threatens the Cyclops saying Zeus will punish him if he is not a good host. Cyclops gets mad and eats the crew.

He only does this because of Odysseus's threats. Odysseus comes up with a plan to attack the Cyclops. Cyclops is a victim in this situation. Odysseus is the intruder. Cyclops is the one who is ultimately punished.

Rewrite the paragraph using transitional phrases to direct your readers' understanding.

Go back and underline all of the transitional phrases that you used.

What difference do you see between the first paragraph and the one that you wrote?

Practicing Transitions Between Paragraphs

For each essay scenario, you must create a topic sentence for the second paragraph.

- a. The essay topic is Odysseus causes the downfall of the crew. Create a transition between Paragraph One on Odysseus's hubris and Paragraph Two on the death of his crew members.

What topic sentence would you use to introduce Paragraph Two?

- b. The essay topic is George must kill Lennie for his own good. Create a transition between Paragraph One on Lennie's dangerous behavior and Paragraph Two on George's decision to kill him.

What topic sentence would you use to introduce Paragraph Two?

- c. The essay topic is the Mother Theresa as the greatest hero of the century. Create a transition between Paragraph One on Mother Theresa as helper of the poor and Paragraph Two as Mother Theresa as an inspiration to children.

What topic sentence would you use to introduce Paragraph Two?

Challenge

One of the difficulties in using transitions is making connections between topics. Challenge yourself to make connections between seemingly unrelated topics.

- a. Bull Dogs and Freight Trains
- b. Fairy Tales and Dinosaurs

All done? Check it with your teacher for final sign-off.

HOW TO WRITE AN ICE PARAGRAPH:

Based on the message of the poem, would the speaker have helped the lady in the subway if he were in Colon's place? Why/why not? Be sure you include evidence from both texts to support ideas.

Steps:	Example
Answer the question in a statement. (don't forget to add "as shown by...")	The speaker of Donne's poem "No Man Is an Island" would help the lady in the subway as shown by the speaker's opinion of mankind and the lady's need for assistance.
Introduce the first piece of evidence	Donne writes that
Cite evidence "..." (Author pg #).	"Any man is a piece of the continent, a part of the main" (Donne).
Explain how the evidence proves the point (do NOT just summarize the quotation)	The speaker believes that all men are important and the good of mankind is reliant on people helping each other.
Introduce the second piece of evidence	Colon didn't help the lady in the subway even though she was trying to manage
Cite evidence #2	"two small children, a baby in her arm and a suitcase in her hand" (Colon).
Explain evidence #2	Colon always regretted that he did not help the woman get off the subway, but Donne would have because he sees all mankind as equal, unlike Colon who was concerned about race keeping him separate from her.
Conclude your argument (refer to your original statement)	The white woman badly needed the help of Colon but he did not help her out of fear of prejudice; Donne

	would have assisted her because he recognizes all humans as important regardless of their race.
--	---

Definition of Summary:

A short snapshot of the important parts of a text

1. Decide which parts/events are most important

A. Moishe the Beadle (new character)

1. really poor/needy
2. lives in Sighet
3. “stays out of people’s way” (3)
4. “mastered the art of remaining insignificant, invisible” (3)
5. looks awkward
6. doesn’t talk a lot, but he likes to sing
7. Knows a lot about Jewish religion, very religious
8. foreign, not from the same place as Wiesel
9. got expelled, but returned
10. got injured while a Nazi prisoner at a war camp (escaped)
11. trying to warn the Jews, but they ignore him

2. Use your own words to give a 1-2 sentence explanation of the events/character

Example: Moishe the Beadle is a strongly religious Jew who experiences the Nazi war camp. When he returns to his town to warn his neighbors about the dangers, they ignore him, possibly because he is poor, or because they are in denial.

TEACHER COPY

The following paragraphs have 20 total errors based on what we have reviewed this year in regards to formal writing expectations. Underline and correct each error you can find, labelling it with the corresponding number for the error in the list below. THEN, on the back, choose one of the paragraphs to rewrite so that it is formal, sophisticated, and contains no errors. You may change the wording and add/delete as necessary.

Mankind has always been greedy. This is truly the cause of many problems in society. If you act greedy, you will get what is coming to you. This is the reason why *Macbeth* ends in tragedy. At first glance, Macbeth's greed gets him what he wants-power and kingship; but this is a short-lived satisfaction. Shakespeare's *Macbeth* can be defined by the word "greed" as demonstrated by Lady Macbeth's manipulations and Macbeth's murdering actions.

Lady Macbeth is able to convince her husband to kill Duncan by manipulating him. Here are 2 examples of her manipulating Macbeth out of greed. She asked him "art thou a man," deliberately challenging him to prove his manliness. She does this because she herself desires to be queen. "Glamis thou art and Cawdor thou shalt be" (1.5.24). Her speech shows that she is very eager to convince Macbeth to kill Duncan so she can have more power. It is obvious that she wants Macbeth to take action, even though Macbeth seems hesitant. Another prime example of Lady Macbeth's greed is when she is talking to Macbeth about killing Banquo. She tells him Banquo is "dangerous" and Macbeth's fear of him is "necessary" (3.4.38). Macbeth isn't happy about murdering his friend, but he too is greedy for power.

1. Integrating quotations (not plopped in as their own sentences)
2. Use of unsophisticated language, like the word "very"
3. Active voice (not passive)
4. Present tense (not past OR progressive)
5. Citation
6. Using 3rd person (not 1st or 2nd)
7. Unprovable statements like "it is _____ that..."
8. Unprovable statements that use "if"
9. Be definite (not using "seems" or "may")
10. Formal language (no contractions!)
11. Generalizing with words like "always" and "truly"
12. Numbers written out in word form
13. Always pair the word "reason" with the word "that" and NOT the word "why"
14. Avoiding cliches like "On the other hand," "a prime example is" and "as a whole..."
15. Explaining the significance of the paragraph itself to the thesis statement