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Critical Thinking in the Age of Fake News: Developing Fairmindedness and Metacognition among Gifted High School Learners

Tiffany DiMatteo

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CRITICAL THINKING IN THE AGE OF FAKE NEWS: DEVELOPING FAIRMINDEDNESS AND
METACOGNITION AMONG GIFTED HIGH SCHOOL LEARNERS

by

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DEDICATION

This is dedicated to my husband, David, and daughter, Emory. You both provided me with the love, kindness, and support I needed to start and finish this journey. There aren't words to convey my appreciation for both of you.

And to my little baby guinea pigs: for making me a better educator—I am so thankful for each of you in all of your brilliance and weirdness. BABA YAGA!

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section in the ways that I needed the most. Thank you so much. Your love and support mean so much and I hope this makes you proud.

ABSTRACT

Critical thinking has proved essential for college, career, and civic readiness, and K-12 educators have accepted its significance while being unsure of how to implement it in the classroom. The purpose of this mixed methods action research study was to identify effective instructional practices for developing fairmindedness and metacognition, two elements of critical thinking identified by Paul and Elder (2012) and purposefully selected by the participating students and the practitioner-researcher as the focus for this study. A hybrid instructional approach that integrated direct instruction and collaborative learning was developed, enacted and studied using a pre-/post-assessment model with four weeks of intervention. The research questions that guided this study were (1) How does a hybrid model of direct and collaborative instruction in fairmindedness impact gifted high school students' critical thinking skills? and (2) What aspects of performance assessment have a noticeable impact on metacognition? During the intervention, students were engaged in direct instruction on critical thinking, a whole-class discussion of a news media story, worked independently to read a news media article and analyze it with respect to fairmindedness, and then worked collaboratively to develop and deploy a rubric that could assess fairmindedness in news media. Based on the analysis of students' written performance assessments, recorded classroom discussions, and revisions of the student-generated rubric, students demonstrated a marked improvement in both metacognition and fairmindedness. Additionally, students became more engaged in

classroom discourse as the intervention progressed and the need for direct instruction diminished. Implications for teachers and program directors working toward college and career readiness and others working in high school settings are discussed.

TABLE OF CONTENTS

Dedication	iii
Acknowledgements	iv
Abstract	vi
List of Tables	xi
List of Figures	xii
CHAPTER 1: INTRODUCTION	1
Problem of Practice	3
Theoretical Framework	7
Research Questions	11
Researcher Positionality	12
Research Design: Mixed Methods Action Research.....	14
Limitations of the Study	18
Organization of the Dissertation	19
Definition of Terms	19
CHAPTER 2: LITERATURE REVIEW	22
Purpose of Literature Review.....	23
Critical Thinking: An Overview	23

Gifted Learners: An Overview.....	35
Readiness: College, Career, and Civic Life	48
Summary	50
CHAPTER 3: METHODOLOGY	53
Overview of Study	53
Context, Participants, and Researcher Positionality.....	54
Research Design and Intervention.....	59
Data Collection Measures, Instruments, and Tools.....	62
Research Procedure	68
Treatment, Process, and Analysis of Data.....	73
Summary	76
CHAPTER 4: FINDINGS	78
Cycle One.....	79
Cycle Two	96
Cycle Three	111
Discussion of Findings	120
Summary	125
Chapter 5: REFLECTIONS AND IMPLICATIONS FOR FUTURE RESEARCH.....	127
Metacognition and Critical Thinking: The Impact of Curriculum and Instruction.....	130
Action Research: The power of reflective practice	134

Limitations	136
The Action Research Cycle Continues.....	138
Conclusion.....	140
References.....	142
Appendix A: Teacher Created Rubric.....	153
Appendix B: Whole class-generated rubric, version 1	155
Appendix C: Student-created rubric, version 2.....	157
Appendix D: Researcher Journals.....	159
Appendix E: Codebook.....	164
Appendix F: Blog Post Scores	167

LIST OF TABLES

Table 1.1 “The Essential Dimensions of Critical Thinking”	9
Table 3.1 Performance Assessment Guidelines.....	69
Table 3.2 Relationship between Research Questions and Data Collection	75
Table 4.1 Pre-assessment Student Responses.....	82
Table 4.2 Peer Scoring Rationale for Blog Post 1	89
Table 4.3 Adept Student Responses in Category 1 for Blog Post 1	91
Table 4.4 Novice Student Responses in Category 2 for Blog Post 1.....	92
Table 4.5 Novice Student Responses in Category 3 for Blog Post 1.....	93
Table 4.6 Novice Student Responses in Category 4 for Blog Post 1.....	93
Table 4.7 Peer Scoring Rationale for Blog Post 2	104
Table 4.8 Peer Scoring Rationale for Blog Post 3	105
Table 4.9 Novice Student Responses in Category 1 for Blog Post 2.....	108
Table 4.10 Adept Student Responses in Category 3 for Blog Post 3	109
Table 4.11 Peer Scoring Rationale for Blog Post 4	112
Table 4.12 Adept Student Responses on Post-Assessment	118

LIST OF FIGURES

Figure 4.1 Median Student Scores for Pre-assessment.....	81
Figure 4.2 Median Student Scores for Blog Post 1.....	90
Figure 4.3 Median Student Scores for Blog Post 2.....	107
Figure 4.4 Median Student Scores for Blog Post 3.....	108
Figure 4.5 Median Student Scores for Blog Post 4.....	115
Figure 4.6 Median Student Scores for Post-assessment	117

CHAPTER 1

INTRODUCTION

In 2016, my principal came to me with two problems: at our k-12 public charter school, Greater York Academy (GYA, a pseudonym), too many of the brightest eighth grade students were leaving our campus to attend one of the larger local high schools. An additional concern of his was that while our graduation rate was high, less than fifty percent of our graduating seniors opted to attend a traditional four year college or university. He wanted to know what could we offer to attract and retain our gifted and talented middle school students and increase the number of our graduates attending four year universities. He and I brainstormed solutions, and to address the first problem, we created a program within our high school that functions like an honors college at the university level. The students selected for the program are high achieving and intellectually curious, and they are college-bound and eager to be ready for the challenge. Many of our students plan to be the first in their families to attend a four year college. As a first generation college student myself, I am well aware of the difficulties that can derail even the best and brightest from college success.

In my current position, I serve as the director of the new program for gifted students. I also teach a required elective each year for these students. Our seminars are focused on exploring student passions through research with the ultimate goal of graduating students who have written an original thesis and implemented a plan of action in the community based on their research, with the belief that these skills will help

students be more successful in college. When working with the ninth grade group for the first time, I noticed two things: they were capable of deep, analytical thinking, and they were already beholden to some ideologies that seemed intractable and affected their ability to fairly assess an article, speech, or other rhetorical situation. It became clear part of addressing my principal's second concern could be developing their skills to be fairminded critical thinkers. This would offer an appropriate academic enrichment for these gifted learners and prepare them for the challenges of university-level work, which would lead to the kinds of skills that make them attractive to employers.

At the same time that I was teaching this new seminar course, my colleagues and I went through a professional development training series from a professor from a local university on how to develop critical thinking skills in our students and how important it is for them to have these skills for life beyond k-12 school in both college and career. As I was trying to construct an appropriate curriculum of enrichment for these advanced students, I was also learning about the benefits of a strong framework for critical thinking.

At the beginning of the honors seminar course, I asked the students what they wanted to learn. By asking them to contribute to the focus for the course, I was asking them to practice the metacognition that forms the foundation of the course. Many of them said they wanted to understand how to be less judgmental and more fairminded in their personal and political conversations. This requires metacognition as well. The new students and the professional development course prompted me to consider whether I was doing enough to support critical thinking and whether I should be more deliberate and direct with my critical thinking instruction and activities in the classroom.

Problem of Practice

In my recent work with highly gifted students at Greater York Academy (GYA), I have seen a number of students who struggle to demonstrate both the cognitive and metacognitive characteristics associated with college readiness. As discussed in the opening section, I have seen how these students are eager to attend college and be successful, but don't know what that means or what it looks like. Negative patterns associated with these aspects of college readiness have been identified by education researchers who have noted that students graduating from high school, including those identified as gifted and talented, are often college eligible but not always college ready (Ehrmann, 2017). Given my local familiarity with this problem and that it is a more generally known problem in education, developing college readiness among my students is the problem of practice on which this study will focus.

From the variety of descriptions for the characteristics and common indicators of college readiness, I have chosen to use Conley's (2008) definition for this study. Conley defines college readiness as being represented by developed cognitive and metacognitive skills of analysis, interpretation, problem solving, and reasoning among students (2008). A student's inability to use or demonstrate these aspects of college readiness can lead to several negative effects and less desirable outcomes for students who attend college after graduating high school (Selingo, 2015). These negative impacts have also been identified among students who do not choose to go to college, choosing more direct or training-mediated paths into the workforce (Holzer, 1996). Since there is evidence of the negative consequences in both post-high school graduate paths, these skills will benefit all

students and addressing the challenges associated with their development represents a worthy problem of practice for an action research dissertation.

In 2017, a colleague shared an article with me that resonated deeply with a problem I had noticed but been unable to define. "Solving the Mystery of Underachievement" argues that money is not the only barrier to success in college and beyond; a more profound but elusive barrier is preparedness for the quality and quantity of work required to be successful at the college level (Ehrmann, 2017). Given that many of my students are going to be first-generation college applicants and they come from a rural area, this named a very real concern I had for my population of students. I was struck by one sentence in particular from Dr. Joann Cason, the head of Perry Street School in Washington, D.C.: "Schools that simply prepare students to be college-eligible are doing them a disservice" (as cited in Ehrmann, 2017, paragraph 18). Our country has more students graduating from high school and therefore should be ready for college (NCES, 2017), but colleges and employers say the majority of these students are not ready for the challenges of the future (Arum & Roksa, 2011).

Critical thinking is not a core academic subject, yet it is a prominent concern in the field of education based on a review of the literature (Abrami, Bernard, Borokhovski, Waddington, Wade, & Persson, 2015; Dwyer, Hogan, & Stewart, 2014). Some worry that students can't think for themselves (Marzano, 1993; Verrell & McCabe, 2015), others argue that critical thinking should be embedded in context of the subject matter in order to be effective (Cargas, Williams, & Rosenberg, 2017), while others claim that it should be taught directly and independently of other subjects to see the most gains (Marin & Halpern, 2010; Ku, 2009). The problem of critical thinking is not just a problem for

education, however. Students who can't think for themselves then become employees who can't think independently, and this creates a problem for a workforce that desires innovation, creativity, and analysis (Hart, 2015). According to research conducted for the Association of American Colleges and Universities (2013), employers repeatedly put critical thinking skills as the top quality they seek when hiring. The direct instruction of critical thinking skills has been a suggested solution since at least 1983 (College Board), but it has never been widely embraced or implemented (Ku, Ho, Hau, & Lai, 2014; Marin & Halpern, 2011).

Research supports the claim that some students are not fully ready for college and career due in part to a lack of critical thinking skills (Arum & Roksa, 2011; Marin & Halpern, 2010). In 2009 with the development of Common Core, specific terminology for the concept of college and career readiness (Common Core, 2017) became pervasive in k-12 public education. Unfortunately, Common Core became associated with standardized testing, which is not an effective mode of demonstrating critical thinking skills, particularly in isolation (Ennis, 2003; Ku, 2009). The pressure on schools, teachers, and students to perform well on standardized tests seems at odds with the desire to help students become aware, articulate, independent adults. How do educators best help to support the development of citizens who are ready for academic and professional life in which they must think critically, analyze and solve problems, and navigate the world around them?

In addition to college and career readiness, critical thinking could be considered a social justice issue. In *The Critical Advantage*, William Gormley (2017) argues that a k-12 emphasis on critical thinking skills will provide not only college and career readiness,

but civic readiness: the ability to fully participate in our democracy as a thoughtful, deliberate citizen. In the current trend of division and acrimony in politics in “the age of fake news” (Eberhart, 2019) the ability to evaluate information, weigh evidence, and consider multiple perspectives are all valuable tools that good citizens should use to encourage respectful discourse. Gormley (2017) argues that schools can help guide our country toward a deliberative democracy, which he defines as one that contains citizens who use critical thinking and communication skills to evaluate arguments and persuade others while also being open-minded and tolerant of other points of view. In other words, a deliberative democracy is comprised of citizens who value fairmindedness.

As a teacher who was trained in secondary English and Language Arts, I have always taught the importance of a well-constructed argument. One aspect of a strong argument is addressing the counterargument, in order to refute it and provide additional support for your own side in the conclusion. This has always been a skill that my students have struggled with and it has taken more instructional time than I thought it should. Nussbaum and Schraw (2007) argue that a strong counterargument requires more elaborate and organized thinking, which are two hallmarks of critical thinking. It also requires an element of fairmindedness.

Paul and Elder (2012) address fairmindedness as one of the essential traits of a critical thinker. Interpretation, inference, assumptions, implications, and point of view are all elements of thought, while relevance and fairmindedness are intellectual standards that can be applied to the elements (Paul and Elder, 1997). Developing fairmindedness means considering one’s privilege in context as it relates to race, power, class, gender and sexual identification. This necessary component of critical thinking can develop

intellectual empathy, a term used by Maureen Linker (2015). Intellectual empathy includes turning the same critical thinking tools that we want students to use in an academic context on themselves in society, outside of school, college, or work. Helping students to identify as fairminded critical thinkers means these tools can be applied to all aspects of their lives as students, employees, and citizens. Using a framework for critical thinking skills has proven to be effective in providing a thought process and language to articulate critical thinking for students (Marin & Halpern, 2010; Ernst & Monroe, 2004).

Metacognition is another important facet of critical thinking. While the easiest way to think about metacognition is simply thinking about one's thinking, a more specific definition is helpful here: "Metacognition refers to higher order thinking that involves active control over the cognitive processes engaged in learning" (Livingston, 2003). Like fairmindedness, metacognition is a more specific element of critical thinking and research supports the argument that students become better thinkers and learners when it is directly taught (Muijs, Kyriakides, Werf, Creemers, Timperley, & Earl, 2014; Perry, Lunder, & Golder, 2019). However, there is no mention of metacognition in the Common Core State Standards (CCSS) even though a specific focus on metacognition would help students develop the more advanced thinking required by the CCSS (Kurzer, 2015). If educators claim that students don't know how to think, then asking students to think about their thinking is an important step forward.

Theoretical Framework

In light of the critical thinking skills associated with college readiness previously discussed, this study attempts to frame these issues as a problem of practice that can be addressed through action research. With both the general and context-dependent factors

that can negatively impact college readiness in mind, I will now provide a brief summary of the theories that offer insight into both the problem and the possible ways to reduce its impact on graduating students. I will provide an overview of Coutinho's framework for understanding metacognition (Coutinho, 2006; Magno, 2010) from the perspective of social constructivism (Mergel, 1998). These theories include Paul and Elder's framework for critical thinking (2007) and more specifically, fairmindedness (2012). The integration of these theories have informed the overall design and development of the intervention as well as the methods of data collection and analysis. As such these theories serve as the foundation of the theoretical framework for this study.

Social constructivism is the theoretical framework that provides the foundation for this action research. In constructivism, learning is an active process and requires personal interpretation (Mergel, 1998) because humans construct our own perspective of the world through experience and reflection (Harasim, 2012). Constructivism requires a high level of independent processing and encourages problem-solving in multiple situations and contexts. Learners must be able to transfer knowledge and skills beyond a classroom or instructional context (Mergel, 1998). Constructivism is a strong foundation for this research because of its focus on critical thinking skills which require that learners be actively engaged, able to interpret based on personal experience, and the importance of reflection (Dwyer, Hogan, & Stewart, 2014). I wanted students to think about their thinking and strengthen their ability to evaluate information and perspectives fairly, without regard for personal interests. The ultimate goal is that students will take these skills with them throughout high school and into college and career.

As is often the case when theorizing about important topics in education, several theories for critical thinking can be found in the literature. This study will use Paul and Elder's approach in which critical thinking is defined as "self-guided, self-disciplined thinking which attempts to reason at the highest level of quality *in a fairminded way*" (2007, emphasis added). This definition establishes a high standard for critical thinking through its metacognitive awareness (Magno, 2010) and through the focus on fairmindedness. Their framework for critical thinking lends itself to educational settings because of its structure; they have identified ten intellectual standards which are applied to eight elements of thought which contribute to developing the eight intellectual traits of a strong critical thinker (Paul & Elder, 1997).

Table 1.1 "The Essential Dimensions of Critical Thinking," Paul & Elder (1997)

Intellectual Standards	Elements of Thought	Intellectual Traits
Clarity Accuracy Relevance Logicalness Breadth Precision Significance Completeness Fairness Depth	Purpose Questions Points of View Information Inferences Concepts Implications Assumptions	Intellectual Humility Intellectual Autonomy Intellectual Integrity Intellectual Courage Intellectual Perseverance Confidence in Reason Intellectual Empathy Fairmindedness

The goal of identifying these structures is to provide a framework with which to analyze our thinking and to develop metacognition about the strengths and weaknesses of our thinking processes. As the eight elements of thought are applied regularly and with fidelity, the intellectual traits that develop are intellectual humility, courage, empathy, autonomy, integrity, perseverance, confidence in reason, and fairmindedness (Paul &

Elder, 2014). These traits represent the characteristics of a “well-cultivated critical thinker” (Paul & Elder, 2010, p.4) who is able to think about difficult issues with an open mind, assess their own biases, arrive at conclusions through solid reasoning, and communicate effectively. These characteristics also represent a student who is capable of both higher order thinking and metacognition.

Metacognition is the process of examining how one processes information, or “thinking about your thinking” (Coutinho, 2006, p. 162). It is rooted in the reflective process that Dewey (1933) encouraged as an essential part of learning, based on the claim that it is more important that students reflect on what they have learned than on the initial experience by itself. It was initially studied in young children for its effect on developing and struggling readers (Baker & Brown, 1984; Palincsar & Brown, 1984), but its applicability to the whole field of education was soon recognized and there is abundant research literature to support the focus on metacognition in the classroom (Halpern, 1998; Tanner, 2012). Metacognition has been shown to be a predictive factor in critical thinking skills (Magno, 2010) and can be taught in order to improve student thinking and academic success (Vrugt & Oort, 2008).

This action research is built on a foundation of social constructivism because I asked students to fully engage with multiple types of higher order thinking. They had to use metacognition to consider whether they had any processes for difficult thinking--none of them had one they could articulate--and then learn about the elements of thought as presented by Paul and Elder (1997). This gave them a framework for the difficult task of evaluating their own fairmindedness and metacognition, applying both concepts to our coursework, and then evaluating each other on their use as a demonstration of critical

thinking. Students were guided through this process using direct and collaborative instruction, and their skill development was measured through performance assessments.

Research Questions

Research shows that exposure to a critical thinking framework can benefit students in their ability to read, write, discuss, and analyze the world around them (Marin & Halpern, 2010; Ernst & Monroe, 2004). Additional studies support the claim that gifted students benefit from the academic stretch offered by a focus on critical thinking and metacognition, particularly when they are measured on growth rather than proficiency (McCoach, Rambo, & Welsh, 2013; Ryser & Rambo-Hernandez, 2014). The development of a new program for gifted and talented high school students has led me to consider the impact of a direct and collaborative instructional approach to fairmindedness and metacognition as elements of critical thinking as an appropriate academic enrichment for this population.

The purpose of the study is to identify effective instructional practices for developing critical thinking (Paul & Elder, 2012) among high school gifted students through an instructional focus on fairmindedness and metacognition. The students themselves asked to focus on topics related to evaluating evidence, arguing fairly, and giving equal weight to different points of view. In order to develop their skills in fairmindedness and metacognition as elements of critical thinking, I designed a pre-/post-assessment intervention that took place over six weeks. I created a rubric for measuring student growth in fairmindedness and metacognition, and then I used a hybrid model of

direct and collaborative instruction to guide the students through this unit. This research was based on answering the following research questions:

1. How does a hybrid model of direct and collaborative instruction in fairmindedness impact gifted high school students' critical thinking skills?
2. In what ways does performance assessment contribute to the development of metacognition in gifted high school students? (What aspects of performance assessment have a noticeable impact on student metacognition?)

These questions serve as the basis for this research proposal because they directly address the specific constructs which both my students and I find valuable: critical thinking, fairmindedness, and metacognition. While not addressing the entirety of the problems associated with college readiness, these aspects of critical thinking represent the discrete leverage points on which this study will focus and thus contribute to a more robust plan for developing college ready graduates. I believe that creating students who are confident critical thinkers and who are thoughtful and aware of their reasoning will contribute to them being college ready, not just college prepared. The messaging from universities, employers, and American society as a whole seems to focus on the deficits in critical thinking in k-12 education, so I wanted to create an opportunity for my students to demonstrate their capabilities and growth, particularly as a mode of academic enrichment.

Researcher Positionality

Who I am has a significant effect on my research and approach, from the topic I choose to study to how I relate to the participants (Bourke, 2014). While factors like my race and gender might not have a direct impact on my problem of practice, they have

shaped who I am and contribute to my position as a researcher. I am a White cisgender female, and I grew up in a working class family with no expectation of attending college because no one in my immediate or extended family had attempted higher education. Receiving a high school diploma was a recent generational measure of success. Books were considered non-essential luxury items in my house. To the puzzlement of my family, I spent the first allowance I ever received on buying a book at the local grocery store.

School became the place where I felt most comfortable. I was identified as gifted in elementary school and participated in programs that valued creative and critical thinking. My high school adopted the International Baccalaureate program, which has been identified as an appropriate curriculum for gifted secondary students (Poelzer & Feldhusen, 1997). The most significant part of the program was a metacognitive philosophy course called Theory of Knowledge, which challenges students to consider personal values, philosophical theories, and interdisciplinary connections.

I have been teaching since 2003 and in that time, my time has been split between courses at all levels: IB and AP, honors, and standard. I have consistently embedded critical thinking tasks into all of my classes. I use group work and discussion on a daily basis, and students know there are rarely easy answers in my classroom. Early in my career I became certified in differentiation for Gifted and Talented (G/T) students. Even though many teachers treat their lower-achieving students as incapable of learning how to think (Zohar & Dori, 2003), I realized that many of the strategies designed for those identified as G/T would work just as well with my lower-level students as long as they were properly scaffolded to encourage access.

Greater York Academy is a k-12 charter school in upstate South Carolina, where I have taught since 2014. Our mission statement is “for the faculty, staff, students, parents, and community to provide an engaged learning environment that leads to the success of each individual student, while also challenging these students to become lifelong learners, independent thinkers, respectful individuals, and responsible citizens thus preparing them for a 21st century global economy” (School Charter, 2016). Our mission is directly connected to my own philosophy--that it should not matter whether students are taking AP or standard level classes; all students should be encouraged to develop critical thinking skills that they can apply in order to be ready for college and/or career, and directly teaching them the language of critical thinking will provide a framework for success in their lives beyond high school.

Research Design: Mixed Methods Action Research

Action research is a practical and applicable methodological approach for educators to use in their classrooms as they attempt to address meaningful problems of practice (Efron & Ravid, 2013). Like the problem of practice described in this study, classroom-based problems of practice develop organically from the setting of the researcher (Efron & Ravid, 2013). The action research approach can be used to investigate a specific problem of practice, uncover a deeper understanding of the problem and its causes, and to develop informed strategies for resolving or reducing the problem and its impact on teaching and learning (Merriam & Tisdell, 2016). Action research is different from other types of research because of its practitioner-based and cyclical nature, making it a good fit for educational research (Efron & Ravid, 2013) and a good fit

for my inquiry into the development of critical thinking skills among my gifted and talented high school students.

While action research provides a systematic and accessible framework for practitioner researcher, it is strengthened by the selection of a more specific methodological framework to guide the collection and analysis of data generated during the study (Efron & Ravid, 2013). For this study, I chose to use a mixed methods approach in which both qualitative and quantitative data are blended into a single analytical framework in order to reap the greatest benefits from interpretation (Creswell, 2014). Both numerical and narrative data are valued and significant to the findings of the research (Ivankova, 2015; Efron & Ravid, 2013). Through the development of a scoring rubric that reflects my review of the literature (Paul & Elder, 2012), I was able to generate numerical data that I used to identify patterns in student thinking and skill development that resulted from my efforts over time (see Appendix E). These patterns were then further explored and explained using qualitative data generated through the documentation of student utterances, student artifacts, and my own thoughts captured in a researcher journal (see Appendix D).

Both sets of data were collected throughout the study, thus a concurrent mixed methods action research study design (Ivankova, 2015) was selected as the specific methodological approach for this study. In this design, quantitative and qualitative data are collected simultaneously, analyzed separately and then interpreted together in order to generate a synthesis of key findings (Ivankova, 2015). Action research provided a broad framework that involved iterative cycles of planning, action, observation, and reflection

(Efron & Ravid, 2013) which allowed this study to generate rich data from a variety of sources (Merriam & Tisdell, 2016).

In order to justify the need for action research, a review of the pertinent literature is conducted in order to contextualize and validate the current research within the field of existing research (Merriam & Tisdell, 2016). This is the primary activity in the planning stage (Herr & Anderson, 2015). For the action stage, the researcher applies what was learned from the literature review and then implements an intervention that will yield useful data for analysis (Machi & McEvoy, 2016; Ivankova, 2015). This action is observed by the researcher for the third stage, who can see and record what impact the intervention has had in context (Herr & Anderson, 2015). The fourth stage is reflection, in which the researcher considers the effect the intervention has had and plans for the next steps. This type of action research is dynamic and cyclical, occurring in a spiral as a way for the researcher to continually improve her practice (Efron & Ravid, 2013).

My own research adhered to the four steps of action research using a mixed methods design (Herr & Anderson, 2015). In the planning stage, I immersed myself in the previous research to understand what others had contributed to the field and I used that to form the basis of my intervention (Machi & McEvoy, 2016). In addition, the literature provided the rationale for the rubric that I created and used for the duration of the research. In the action stage, I began by implementing a pre- and post-test research design (Creswell, 2012). I then took those results to construct a unit that involved the direct instruction of a framework for critical thinking, focusing on fairmindedness and metacognition, as well as student-led discussions through Socratic Seminar. Students were assigned an online media source to follow, and they wrote blog posts each week

about a current news story. They also created a class rubric and scored each other, writing rationales to justify their scoring. In the observation stage, I scored the blogs using my rubric and reviewed the class discussions for insights and problematic areas that needed further clarification. That led to the reflection stage, in which I planned what our next steps would be, leading to another cycle of research. The strength of this design is in its structure (Merriam & Tisdell, 2016); it is appropriate for this type of research because I was able to gather broad information to develop categories and then highlight specific elements through qualitative and quantitative analysis (Ivankova, 2015). I incorporated classroom observation, audio/video recordings, student artifacts, and pre- and post-instruction assessment in order to triangulate my data (Efron & Ravid, 2013).

To increase the authenticity and trustworthiness of the findings, the research was triangulated through multiple data sources (Merriam & Tisdell, 2016). In order to adequately measure for the construct of critical thinking skills, the terms were clearly defined and attached to an instrument that can measure these skills. One of the reasons education has shifted towards a standardized implementation and measurement model is because it is easier to measure growth and success of these measures through rote retention of facts and subsequent multiple choice assessment (Haynes et al., 2016). The use of context-based rubrics that defines levels of critical thinking were an essential tool to employ in this research (Rhodes, 2010). The rubrics for student work have the goal of measuring fairmindedness and metacognition as critical thinking skills and consider whether students are developing the skill, at benchmark, or exceeding expectations.

Potential issues with data collection included technological problems, student and teacher attendance, misunderstanding or misinterpretation of critical thinking skills,

observer error, and poor questioning. Several of these were under my control as the researcher. Other issues, like malfunctioning technology and attendance, could not be directly controlled by me as the researcher and are subject to narrative description in the analysis of the data.

Limitations of the Study

This research may be of value to other high school-level educators who would like to see how much of the university-level research can be implemented at the secondary level in order to imbed more direct critical thinking into the curriculum. While I have a background in English Language Arts, this research has interdisciplinary applicability. Additionally, there was a time limitation of six weeks for implementing the lesson plans and gathering data. Uncontrollable extraneous factors, like student and teacher attendance, may affect how much data is collected for analysis.

Limitations to this research were carefully considered and explicated in the final chapter. Due to the qualitative nature of this action research, the majority of my findings will come from these sources and they can be affected by researcher/design error as well as by poor question development or obtrusive observation. I will be conducting all research at the public charter high school where I work and hold a position of authority. I must be aware of confirmation bias from students who may seek to tell me what I want to hear. In terms of future research, I hope that this study encourages more research on how high school students perceive the value and application of critical thinking skills and how more teachers can be convinced of the importance of teaching critical thinking skills as an enrichment for gifted and talented students in the future.

Organization of the Dissertation

In chapter two, I will provide a deeper evaluation of the significant literature in the field of critical thinking, specifically regarding the direct instruction of critical thinking skills at the high school level, metacognition, and gifted learners. In chapter three, I provide a more detailed description of steps taken for the enactment of this concurrent mixed methods action research study design (Ivankova, 2015). Chapter four presents the specific data generated during the study, the analysis and resulting interpretation of the data, as well my interpretations and the key findings that are potentially evocative for various audiences in education including teachers, professional development providers, and k-12 school level administrators. In keeping with the spirit and purpose of action research, chapter five is a reflection on the process and the learning that resulted from the study as well as a plan for future implementation of the key findings of the study.

Definition of Terms

Career Readiness: the possession of a variety of skills that make one attractive to a wide array of employers, including the ability to think critically, communicate clearly, collaborate well, use technology effectively, and demonstrate respect and inclusivity for others (NACE, 2017).

Civic Readiness: the ability to participate knowledgeably in the political process; a good citizen is informed, thoughtful, possesses moral virtue, and can participate in a dialogue respectfully (Gormley, 2017).

College Readiness: the ability to successfully complete credit-bearing work without remediation (Conley, 2007); the college ready student is intellectually and

socially ready to take on the increased freedom and responsibility associated with college and to engage in the coursework, advocate for him/herself, and reason through difficult situations.

Collaborative Instruction: A class-centered method that involves the students working on a problem or task together (Dillenbourg, 1999).

Critical Thinking: a collection of intellectual skills that are employed in situations for more than a superficial understanding; “critical thinking is the art of analyzing and evaluating thinking with a view to improving it” (Elder, 2007).

Direct Instruction: A teacher-centered method demonstrated by the explicit teaching of a skill or concept.

Fairmindedness: A conscious and purposeful effort to eliminate personal or associated bias from thinking and action; an ability to consider the validity of all points of view equally (Paul, Binker, Martin & Adamson, 2008).

Metacognition: An awareness and understanding of one’s own thought process (Coutinho, 2006).

Performance Assessment: A form of assessment or testing that requires the student to complete an authentic task rather than answer preconceived questions.

Rubric: A scoring guide with specific indicators that describe the level of skill demonstrated in student work.

Skill: the expertise or ability to do something well; learning a framework for critical thinking and being able to apply it in multiple situations is a skill.

Socratic Seminar: a formal discussion based on one or more texts in which students lead a dialogue with each other. Personal experience and opinion are included, but the conversation must be guided by text support and evidence.

Task: a particular item to be done or completed; many students are able to complete critical thinking tasks in context, but are less adept with the skills required to transfer the critical thinking ability in a variety of settings.

CHAPTER 2

LITERATURE REVIEW

The purpose of the study is to identify effective instructional practices for developing critical thinking (Paul & Elder, 2012) among high school gifted students through an instructional focus on fairmindedness and metacognition. Ensuring that gifted students who regularly perform above grade level are receiving an appropriate challenge is the central problem of practice under consideration in this action research, and one potential method to achieve that goal is the implementation of a critical thinking framework in order to develop fairmindedness and metacognition as foundational elements of critical thinking. The research questions under evaluation are:

1. How does a hybrid model of direct and collaborative instruction in fairmindedness impact gifted high school students' critical thinking skills?
2. What aspects of performance assessment have a noticeable impact on metacognition?

The literature review is a reflective chapter that brings together the most pertinent research that inform how a framework of critical thinking skills that focuses on fairmindedness can lead gifted learners to be appropriately challenged (Machi & McEvoy, 2016). The review includes an overview of critical thinking; historical perspectives and definitions; a constructivist framework for critical thinking; need for cognition, metacognition, and critical thinking; direct instruction of critical thinking; and assessing critical thinking through higher order questioning and standardized

tests. Regarding gifted learners, the review covers the history of gifted and talented identifications; the underrepresentation of students of color; cohort ability grouping; empathy, self-concept and perception of the gifted; measuring growth; the potential of gifted students; the achievement and excellence gaps, and previous studies about critical thinking for the population of gifted learners that informs this practitioner-researcher.

Purpose of Literature Review

According to Machi and McEvoy (2016), a literature review must be rooted in a logical argument that establishes the need for further research on a given question or topic. As part of a dissertation, a literature review demonstrates the researcher's ability to delve into the relevant field of study, critically evaluate a wide range of journal articles, research studies, and other texts in order to carefully select the pieces that will help form a reasonable path forward into the uncharted territory of new action research. In order to conduct a thorough review of the literature, I used a variety of scholarly texts, including peer-reviewed journal articles, research studies, and educational and government reports as well as newspaper articles and books to gather information on gifted students and critical thinking skills. Search engines and databases utilized include ERIC, EBSCO, JSTOR, and Google Scholar, and sources were gathered via bibliographic reference review from various articles and publications.

Critical Thinking: An Overview

The term 'critical thinking' is used frequently, but research shows that there are few consistent definitions and that educators do not always have a strong grasp of what the term should cover (Atabaki, Keshtiaray, & Yarmohammadian, 2015; Mulnix, 2012; Pithers and Soden, 2000). Pithers and Soden (2000) addressed this disconnect in their

research that shows the term means different things in various contexts of life, education, and career. They specifically mention government papers from the UK, Australia, New Zealand, and North America that highlight the desire for critical thinking abilities, which are defined as “identifying a problem and its associated assumptions; clarifying and focusing the problem; and analyzing, understanding, and making use of inferences, inductive, and deductive logic, as well as judging the validity and reliability of the assumptions” (p. 239). The authors present evidence that critical thinking is not a likely outcome in all degree-seeking college courses and that there are courses that claim critical thinking as part of their course descriptions, but that there were frequent instances of assertion without justification throughout the coursework. This research demonstrates the problematic nature of defining, examining, and assessing critical thinking.

Historical perspective and definitions. John Dewey wrote one of the earliest descriptions of what critical thinking should look like in education, though he called it ‘reflective thinking’ (1910). In *How We Think*, he described thinking as an activity with a consequence and through which human beings can create patterns of thought based on examining beliefs carefully and considering the basis of the belief. He argued,

The function by which one thing signifies or indicates another, and thereby leads us to consider how far one may be regarded as warrant for belief in the other, is then the central factor in all reflective or distinctively intellectual thinking. (p. 8)

This concept of thinking is distinguished by the focus on a critical examination of the root and subsequent factors that result from thought. Perhaps most importantly, he argued that this type of thinking can be cultivated through education and that schools have a responsibility to teach it. In a twenty-first century review of Dewey’s concept of

reflective thinking, Rodgers (2002) examines the idea of reflection and argues that the increased visibility of the term has erased or confused its meaning, making it difficult to measure or study as it relates to “teachers’ practice and students’ learning” (p. 843). However, returning to Dewey’s original intent reveals the specific language and ideas he used to describe reflective thinking, which means that it can be practiced, assessed, and measured.

The problem extends beyond how to educate students and into the philosophical nature of defining the idea itself. The question, ‘What is critical thinking?’ has a multitude of answers (Moore, 2013; Mulnix, 2012). In a 2012 article, Mulnix evaluates different definitions while also incorporating effective strategies for instruction for critical thinking. Mulnix compared definitions of critical thinking from a variety of acknowledged scholars, including Richard Paul and Michael Scriven, Harold Brown, Lewis Vaughn, Ken Petress, Barbara Thayer-Bacon, and Daniel T. Willingham. Mulnix concludes that critical thinking is a process covering a specific set of skills that demonstrate “a commitment to using reason in the formulation of our beliefs” (Mulnix, 2012, p. 471). The identified skills in order to develop critical thinking include understanding inferences, giving justifiable reasons, and the ability to understand the evidence that would undermine a set of beliefs.

A related study by Moore (2013) investigates how different disciplines define the idea of critical thinking and how it affects university-level classrooms. In interviews with seventeen faculty members in the fields of History, Philosophy, and Cultural Studies, Moore asked questions about the relevance of critical thinking to their teaching practice, how they defined the term, how it was represented in their coursework, and what it

looked like in students. In the interview findings, the author revealed that all three discipline areas see “critical thinking fundamentally as the making of judgments” (Moore, 2013, p. 7). Additionally, they agree that critical thinking is skeptical and evaluative in nature. The researcher concluded that the term ‘critical thinking’ might not have a single, simple definition, but that it is valuable in multiple disciplines and that the concept is important to the field of education.

The definition of critical thinking that will guide this action research is attributed to Paul and Elder (1997):

Critical thinking is a mode of thinking about any subject, content, or problem in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them. (p. 3)

This definition is useful because of its focus on not only the nature of thought, but on the inclusion of a framework that can guide the thinker.

Constructivist framework and critical thinking. The constructivist framework is so named because of the learner’s responsibility to participate and construct a perspective through experience and reflection (Harasim, 2012). Through constructivism, student learning is a dynamic process that requires personal interpretation (Mergel, 1998). It requires the learner’s active involvement in an experiential relationship with the instructor and with the world with the goal of problem-solving. Constructivism is a practical framework for any curriculum that seeks to augment critical thinking skills because of its focus on the learner’s active engagement, personal interpretation, and reflection, which are all hallmarks of critical thinking (Dwyer, Hogan, & Stewart, 2014).

Researchers Kwan and Wong (2015) operationalize constructivism from the position that students are most effectively learning when actively engaged and constructing knowledge for themselves and when they connect to prior knowledge. They argue that this instructional approach would seem to provide a natural relationship to critical thinking and that student motivational beliefs and cognitive and metacognitive strategies play a role in this relationship. The study evaluated the direct relationship between a constructivist classroom environment and critical thinking ability with cognitive strategies and motivational beliefs as mediating variables. They used a cross-sectional survey design of participants, all high school freshmen, who self-reported on a questionnaire that included items about the constructivist learning environment, learning motivation, and critical thinking. The researchers concluded that a constructivist learning environment had a positive effect on critical thinking ability. As the perception of a constructivist learning environment increases, goal orientations and cognitive strategies increase; as goal orientation increases, critical thinking ability increases. This study clearly demonstrates the positive relationship between a constructivist approach and critical thinking ability.

Need for cognition, metacognition, and critical thinking. Two concepts closely tied to critical thinking are need for cognition (NFC) and metacognition, and research has considered their role, connection, and significance to critical thinking (Luong, Strobel, Wollschlager, Greiff, Vainkainen, & Preckel, 2017; Magno, 2010; Vrugt & Oort, 2008). Both are predictors of academic success, but they are different, though related, terms. Need for cognition originated from research by Cohen, Stotland, and Wolfe (1955) and was refined by Cacioppo and Petty (1982) to mean “the tendency to

engage in and enjoy effortful cognitive activity” (p. 117), and describes people who enjoy expending energy to think. Metacognition is a more familiar term to educators that describes one’s ability to monitor thought processes, or “thinking about your thinking” (Coutinho, 2006, p. 162). Both strategies describe important elements of critical thinking.

In an earlier piece on the concept of metacognition, Halpern (1998) argued that metacognition is purposely improving thinking skills by using knowledge and critical thinking skills like process-monitoring, checking progress, and making decisions about time management. This framework was not tested empirically, which was the purpose for Magno’s study (2010). This research questioned whether metacognition is an important factor or predictor that provides a pathway to better critical thinking. In an explanatory longitudinal design study, the researcher tested for two models of metacognition and their effect on the critical thinking of college freshmen. Magno (2010) concluded that metacognition is a significant factor in predicting critical thinking skills, providing evidence for Halpern’s conjectural framework. This supports the claim that metacognition is a skill that can be developed and the students should be trained to use metacognitive strategies, improving the student’s ability to “make inferences, deduce conclusions, interpret accurately, evaluate arguments, and recognize assumptions” (p. 151).

Research has been done to test the effectiveness of metacognition on student self-regulation and academic success. A study by Vrugt and Oort (2008) examined whether metacognitive or surface cognitive strategies had an effect on the exam scores of effective self-regulators and less effective self-regulators. The study results showed that

effective self-regulators used metacognitive strategies to achieve a positive effect on exam scores and demonstrating mastery, while less effective self-regulators tended to use surface cognitive strategies, leading to a negative effect on exam scores and less demonstration of mastery. Metacognition is recognized as an important factor in academic success and as a tool for critical thinking.

Need for cognition (NFC), or the enjoyment and engagement of cognitive endeavors, is related to a deeper understanding of information and more effective, complex problem-solving (Cacioppo & Petty, 1982). A comprehensive, collaborative study by Luong et al. (2017) investigated NFC in multi-level school contexts and its relationship to academic performance. The purpose of the study was to examine NFC in children as distinct from intelligence and as it related to academic potential, achievement, and motivation. Participants included third, sixth, and ninth grade students who self-reported NFC on a survey and completed cognitive ability tasks. Student data was also collected for academic achievement as measured by math, language, and foreign language grades. Research findings demonstrated significant, positive correlations between NFC and motivation, moderate correlations between NFC and ability self-concept, and strong correlations between NFC and potential and NFC and achievement for grades 6 and 9. The researchers argue that these results support an argument that NFC should be supported in academic contexts from elementary school on. This study supports a positive relationship between cognition and academic achievement.

Research by Coutinho (2006) evaluated the significance of need for cognition (NFC) and metacognition as they relate to intellectual task performance. In a study of undergraduate college students, researchers used two self-reporting inventories to

measure NFC and metacognition and then they had the participants complete analytical items from the GRE. The findings demonstrated that NFC was a significant predictor of performance, while strong metacognition showed only a slight relationship to higher scores on the GRE items than poor metacognition. The researcher concluded that schools might include training students to adopt a more positive attitude toward learning in order to enhance academic performance.

Critical thinking instruction. An essential facet of the research being examined is whether critical thinking skills can be strengthened through exposure or direct instruction. Given the immense scope of content students are expected to learn in any given academic environment, should critical thinking skills even be addressed? Educators may wonder if it is necessary to teach critical thinking skills explicitly within a framework or if the skills will simply transfer through higher order questioning. Research within the last ten years (Ku, Ho, Hau, & Lai, 2014; Marin & Halpern, 2011) suggests that some improvement occurs with implicit support of critical thinking but even greater academic success comes with the instruction of critical thinking skills within a framework that can be applied to multiple disciplines.

Ku et al. (2014) sought to determine whether one of three types of instruction in critical thinking delivered through modules was effective in improving high school students' critical thinking performance. The study evaluated direct instruction, inquiry-based learning, and a combination of both as delivered to participants through eighteen total hours of module instruction. Direct instruction is described as teacher to student guided learning, while the inquiry-based approach is a "bottom-up process that aims to have students construct their own understanding of a piece of knowledge" (p.

253). Assessed through pre- and post-assessments of both critical thinking performance and disposition, all students who received a critical thinking skills intervention improved. The researchers argue that “the direct and the inquiry-based instructional approaches should not be seen from an either-or perspective; they should be discussed with the aim of maximizing student learning” (Ku et al., 2014, p. 256). Ultimately, the presence of instruction of critical thinking is more important than the method itself. This study supports the presence of critical thinking training in the classroom and demonstrates the effectiveness of direct instruction.

Research findings from Marin and Halpern (2011) challenge those of Ku et al. regarding the effectiveness of direct versus inquiry-based or indirect instruction of critical thinking skills. While the findings from Ku et al. showed little difference between the academic performances of groups that received direct instruction, inquiry-based instruction, or a combination of both, the results from Marin and Halpern are far less equivocal. The results of two studies were published in the same journal article and compared student performance after explicit or direct instruction of critical thinking with an embedded or implicit model of critical thinking. In the first study, student participants were assigned to one of three groups: explicit instruction in a critical thinking workshop, imbedded instruction through an introduction to psychology course, and a control group given no instruction. Students were given pre- and post-assessments to judge their gains in critical thinking skills. While both of the instructed groups made gains, the improvements were much larger and demonstrably transferable to other academic disciplines in the group receiving explicit instruction. A second study the following year had a similar structure with two intervention groups and a control group and also

demonstrated significant improvements on the critical thinking test after direct instruction and some minor gains for the group with imbedded instruction. Marin and Halpern (2011) make a similar conclusion to Ku et al., that critical thinking instruction should be included in secondary education, but they go one step further and argue that the explicit instruction of critical thinking skills will offer the most gains to make students college ready. They also contend that critical thinking instruction should be covered in pre- and in-service teaching instruction in order to help educators gain comfort with the material.

Assessment of critical thinking. One of the myriad difficulties with implementing a program for the instruction of critical thinking skills is assessment. How do educators measure something as intangible as critical thinking? In an increasingly data-driven culture of education (Bambrick-Santoyo, 2010), it seems nearly impossible to spend time teaching something that cannot be directly assessed and measured. However, a meta-analysis by Abrami et al. (2015) that analyzed 341 effects sizes determined that there are effective strategies for assessing critical thinking skills. It is important to note that there are those who follow a model of education not directed strictly by data and who recognize the value of critical thinking skills beyond test scores (Smith & Szymanski, 2013). For most in public education, though, achievement must be measured, and multiple assessments of critical thinking have been created and tested for accuracy and validity (Cargas, Williams, & Rosenberg, 2017; Shim & Walczak, 2012; Stupple, Maratos, Flander, Hunt, Cheung, & Aubeeluck, 2016). This demonstrates that critical thinking can be measured and that the results can help educators predict and assess not only academic performance, but college readiness.

The ability to think critically is a clearly identified desired outcome in education. Employers, colleges, and all levels of schooling have recognized that critical thinking should be an essential facet of a quality education that prepares all types of students for college, career, and civic life beyond school (AACU, 2013; Arum & Roksa, 2011; Gormley, 2017; Marin & Halpern, 2010; Marzano, 1993; Paul, 1992). There is, however, concern that holding students and teachers accountable through state-mandated standardized tests does not promote higher order or critical thinking skills (Ennis, 2003; Ku, 2009). In an article written for school administrators, Smith & Szymanski (2013) recognize the dissociation between the field of education's lip service to critical thinking skills and state and federal requirements for standardized testing. They argue that "[w]hen educators and students spend an inordinate amount of time preparing for high stakes testing it leaves little time for focusing on the research-based methods of teaching" (p. 17), including critical thinking skills. Smith and Szymanski propose that principals offer professional development to faculty on the use of higher order questioning in order to improve critical thinking. They argue that the employment of this classroom strategy will improve educational and personal outcomes for students.

Further research supports the implementation of higher order questioning as a way to foster and assess critical thinking. A classroom study by Barnett and Francis (2012) explored whether critical thinking via higher order questioning could be embedded in different modes of assessment and if that would affect student academic achievement in a college course. In a quasi-experimental design, the study measured student critical thinking ability via a pre- and post-test assessment using the Watson-Glaser Critical Thinking Appraisal. Students enrolled in three different sections of the

same course were then given different interventions: 1) multiple choice quizzes of factual textbook knowledge; 2) essay-based quizzes requiring critical thinking of the material; and 3) essay-based quizzes based on factual textbook knowledge. The findings support the research hypothesis that students whose quiz items focused on higher order thinking skills of analysis and synthesis performed better academically than the other two groups. These results support the idea that students benefit from a targeted approach that uses higher order questioning in their subject matter knowledge, academic performance, and critical thinking ability.

Two university-level studies measured the impact of critical thinking ability on student outcomes. The first study claimed a goal of measuring college student attitudes towards and beliefs about critical thinking as they relate to a declared major through a valid and reliable tool that measures type 2 thinking, identified as “conscious, purposeful, and analytic” (p. 93). The researchers developed an assessment they named the Critical Thinking Toolkit (CriTT) to measure three factors: confidence in critical thinking, valuing critical thinking, and misconceptions. Participants self-reported their GPAs and completed three measurements on argument evaluation, cognitive reflection, and a critical thinking questionnaire. The results showed a significant correlation between the three factors and argument evaluation which distinguished between type 1, or surface level, thinking and type 2 thinking.

The second study (Cargas et al., 2017) took a different approach; the researchers created a common rubric and asked college faculty from three different departments to design performance tasks that would align with critical thinking and then assess the work based on the common rubric to determine if student and instructor awareness of critical

thinking skills could be raised. The exploratory study used convenience sampling in which participants completed a pre- and post-assessment of critical thinking skills, an intervention of a performance task based on a common rubric, student and instructor reflections, and a post-assessment of student confidence regarding critical thinking skills. The qualitative data showed positive gains in critical thinking attitudes from both students and instructors and that a common rubric for multiple disciplines can be effectively used to demonstrate critical thinking. These studies support the argument that not only is critical thinking an important element of education, but it can be measured and taught.

Gifted Learners: An Overview

How gifted learners are identified and what it means to a child's education to be identified as gifted are questions that the field of education have been wrestling with for decades. As with everything challenging, there are no easy answers, but there is significant research to support an amended curriculum for gifted learners that will both support and challenge them, pushing them to achieve their full potential as human beings (Callahan, Moon, Oh, Azano & Hailey, 2015; Colangelo, Assouline, & Gross, 2004; Irrizary, 2015; Marland, 1972; Vogl & Preckel, 2014).

Gifted identification and potential. The necessary first step to appropriately educating gifted and talented students is knowing how to look for them. There have been many different approaches to identifying the gifted that extends far beyond the history of American public schools. Stoeger (2009) researched the history of giftedness and argued there were three phases throughout history. The first era was a theological phase, in which giftedness was thought to be "a bestowal from a higher power" (p. 18), and there is

evidence from Plato in ancient Greece to support this interpretation. Next, a metaphysical phase is defined as being connected to individuality beginning in the Renaissance. This definition persisted for centuries until near the beginning of the twentieth century, which saw the empirical approach and the beginning of scientists learning how to measure for exceptionality, initially just associated with a high level of intelligence.

The beginning of purposeful gifted education in the United States is usually tied to the Marland Report (1972), marking the first time that the federal government researched giftedness, offered a working definition of the term, and outlined the needs and challenges of gifted learners. Prior to this time, there was no federal money given to schools for the education of gifted learners (Jolly & Robins, 2016). The definition of giftedness provided in the report states that “gifted and talented children are those identified by professionally qualified persons who by virtue of outstanding abilities, are capable of high performance. These are children who require differentiated educational programs and/or services beyond those provided by the regular school program to *realize their contribution to self and society* [emphasis added]” (Marland, 1972, p. 10). While the definition was historically interpreted as relying heavily on intelligence testing (Jolly & Robins, 2016), it also highlights the importance of appropriately challenging gifted students so that they can achieve their full potential.

Educational researcher Joseph Renzulli (1978) operationalized the definition of giftedness as a three ring cluster of traits. Believing that the single criterion of intelligence was too restrictive, he argued that above-average ability, task commitment, and creativity are proven to be equally important necessary components of identifying

giftedness. Based on his research and presentation of the three main elements, Renzulli argued that “gifted and talented children are those possessing or capable of developing this composite set of traits and applying them to any potentially valuable area of human performance” (p. 87). In later research, Renzulli (2012) reexamined the three ring conception of giftedness along with three other research-based models as a way of rethinking the foundational principles of programs and services for the gifted and talented with the explicit goal of “maximiz[ing] young people’s opportunities for self-fulfillment and increas[ing] society’s reservoir of creative problem solvers and producers of knowledge” by enhancing student “capacity for creative productivity, not just content acquisition” (p. 150). Renzulli’s focus on self-fulfillment, problem-solving, and creative productivity are essential elements to recognizing a student’s true potential, far beyond a score on an intelligence test or in an academic subject.

There is some research that argues that gifted students are being held back from reaching their potential due to an institutional focus on the achievement gap, defined as “the discrepancy in educational outcomes and access between various student groups in the United States” (Howard, 2010, p. 1). In other words, so much time, attention, money, and resources have been spent on helping students perceived as below grade level proficiency that there has been almost no attention paid to those students who are above grade level proficiency. Educational researchers and gifted education advocates Colangelo, Assouline, and Gross wrote *A Nation Deceived* (2004) as a counternarrative to the well-known government paper on public education, *A Nation at Risk* (US, 1983). In *A Nation Deceived*, the authors argue that “America’s school system keeps bright students in line by forcing them to learn in a lock-step manner with their classmates,”

which has potentially large range consequences resulting in the “slow but steady erosion of American excellence” (p. 1). They present acceleration as way to challenge gifted students and to help them fulfill their potential. There are multiple methods of acceleration, including early entrance to school, grade skipping, and college-level courses like Advanced Placement, all of which “match the level and complexity of the curriculum with the readiness and motivation of the student” (p. 53). This research presents the potential of gifted students as a moral and cultural imperative in addition to being educationally sound.

Underrepresentation of students of color. A recent article in *The New York Times* (Goldstein, 2018) highlighted the current ‘excellence gap,’ which is the term given for different subgroups of students achieving academic success at the highest levels. In a paper for the Center for Evaluation and Education Policy, the authors decried the “comparatively small percentage of students scoring at the highest level on achievement tests,” suggesting “that children with advanced academic potential are being under-served, with potentially serious consequences for the long-term economic competitiveness of the U.S.” (Plucker, Burroughs, & Song, 2010, p. 1).

Standardized intelligence tests have a long history in identifying giftedness (Jolly & Robins, 2016). Even if they are not preferred as the sole measure used to identify giftedness today, they are still used to recommend and support students with programs and services (Renzulli, 2012). As early as 1963, however, researchers MacArthur & Elley argued that some intelligence tests demonstrated bias that would negatively affect a student’s identification. Their research concluded that “it is possible to measure a broad

component of intellectual ability with significantly less cultural bias than is found in the conventional intelligence test” (p. 107).

The Marland report (1972) first asserted that at least 3% to 5% of a school’s population would be identified as gifted based on the given definition of the term. While that number is both ubiquitous and challenged (Borland, 2009), there is no question as to the disparity between gifted and talented identification between different races and ethnicities. In a data analysis study, Grissom and Redding (2016) present information that puts this reality, called the ‘excellence gap,’ into stark relief. While they found that 5% of *all* students received gifted services, this changed dramatically when examined by race/ethnicity grouping: White students were represented at 5.3%, Black students at 2.2%, Hispanic at 3.5%, and Asian at 6.2%. The researchers also found that at the elementary school level, where almost all gifted identification takes place, that a Black student is 66% less likely and a Hispanic student is 47% less likely to be assigned to a gifted program than a White student, while an Asian student is 44% more likely to be assigned gifted services than a White student. This research also evaluated the impact of the teacher’s race on student identification, and determined that Black students with a Black teacher are three times more likely to be assigned to gifted services than Black students with a non-Black teacher. These findings demonstrate the significant anti-bias work that still needs to occur in education so that all students are fairly assessed and appropriately challenged.

Gifted students are typically considered ‘exceptional,’ as are students with disabilities. Both categories of students should receive appropriate support in an educational setting. Fish (2016) argues that students of color are overrepresented in

categories with disabilities and underrepresented in gifted and talented programs, and the research supports that claim. In an experimental design with a vignette survey component, teachers identified whether fictional students described in a narrative should be referred for testing, either for a disability or for giftedness. The findings showed that profiles of White males with academic challenges were more likely to be referred for testing than Black or Latino males, supporting the hypothesis that teachers have lower expectations for students of color than for White students. Student profiles describing academic giftedness were more likely to be referred for services when the student was identified as White, suggesting that high academic abilities are more likely to be missed in students of color. This research supports the claim that teachers have lower expectations for students of color than they do for White students, and that White students are treated as the control for behavior and academic success in educational settings (Yosso, 2002).

A potential solution to the problem of over- and under-identification is offered by Joseph and Ford (2006), who propose that nondiscriminatory assessment practices, currently used for students with disabilities, be applied to students of diverse cultures who may be gifted as a way to minimize bias. If a student who is referred for gifted services may be required to take a test that is culturally loaded or linguistically biased, then that student may not be able to demonstrate the full breadth of ability. Educators must be aware of potential personal bias and should test a given student under the “presumption of normality” (p. 44), and that a poor performance may be the result of extrinsic factors such as language or lack of educational access. The authors describe twelve steps that comprise a framework for non-biased assessment by considering

external factors and continually assessing for bias. They argue that this practice of non-discriminatory assessment may help to open the gates of gifted education and provide access to underrepresented groups of minorities and English language learners.

Cohort ability grouping. Once gifted students are correctly identified, the question then becomes how best to support and challenge them. A typical method is ability grouping, defined as an instructional practice in which students are placed in different group settings “based on their initial achievement skill levels, readiness, or abilities...to create a more homogenous learning environment so teachers can provide instruction better matched to students’ needs and so students can benefit from interactions with comparable academic peers” (Steenbergen-Hu, Makel, Olszewski-Kubilius, 2016). This is typically instituted at the elementary level, flattens out in middle school, and transitions into college-level courses like Advanced Placement, International Baccalaureate, or dual enrollment in high school. The population at the center of this action research is a cohort ability group, meaning that they are identified as a single cohort, attend two academic classes together and two classes with the rest of the school population. Their identification as gifted and their function as an ability-grouped cohort are significant to this action research.

Vogl and Preckel (2014) conducted research that analyzed whether there is any benefit to a gifted student’s socioemotional development or self-concept when grouped with other gifted peers full-time as opposed to being in a mixed-ability regular class. This study collected data, including cognitive ability, socioeconomic status, and sex, from students at multiple schools, and then students were paired based on this data to create “statistical twins.” Further data was collected via self-report questionnaires and

cognitive ability tests administered by psychologists. The findings showed that gifted students in a full-time ability group improved their self-concept of acceptance and had a stable interest in both school and student-teacher relations, while gifted students in regular classes demonstrated a declining interest in the school and student-teacher relations. This research supports the claim that ability grouping is beneficial to students on multiple levels, academically, socially, and personally.

Teacher beliefs and attitudes play a significant role in how acceleration and ability grouping are implemented at the school building and classroom levels. These interventions have significant research to support their effectiveness and are considered best practices (Colangelo et al., 2004; Steenbergen-Hu et al., 2016; Vogl & Preckel, 2014), but they are not always implemented in the classroom. Research by Missett, Brunner, Callahan, Moon, and Azano (2014) investigated how teacher expectations and beliefs influenced their use of ability grouping, acceleration, and formative assessment. Through intensive interviews and observations of teachers in both control and experimental groups, researchers gathered data about how teachers implemented a program that used one or more of the interventions: ability grouping, acceleration, or formative assessment. The results showed that teachers who believed their students were less capable of advanced work were less likely to use the interventions because they saw their classes as a single unit rather than individual students. Teachers who “believed their students to be capable of advanced work were generally oriented toward individual student needs and readiness levels...[and] seem more likely to use personalized pacing, ability grouping, and formative assessment” (p. 256). This research supports the need for continuing teacher education on how to best support accelerated or gifted learners and to

encourage teachers to see their students as individuals and to engage in best practices like acceleration and ability grouping.

The practices of ability grouping and acceleration throughout a century of educational research were examined and analyzed through two second-order meta-analyses by researchers Steenbergen-Hu et al. (2016). The authors situate the argument by operationalizing the terms and including historical and contemporary criticisms of these two methods. Opponents argue that these strategies divide students unnecessarily, increase achievement gaps, and have negative social-emotional outcomes. The meta-analyses allowed the researchers to comprehensively examine the data from existing published research. The findings showed that students benefited from multiple types of grouping, but particularly from gifted and talented programs and from acceleration. In all of the existing research, accelerated students outperformed their same-age peers. Ultimately, the research proves that acceleration and ability grouping are cost-effective and successful at supported gifted learners.

Empathy, self-concept and perception. There is a cultural stereotype that frames highly intelligent people as ‘absent-minded professors’ who are so fixated on their work that they neglect their personal lives or fail to connect to the people around them (Freeman, 1999). There are also broad social concerns about poor self-concept that may stem from bullying or a lack of self-esteem due to being seen as different. However, research simply does not support these notions (Bain & Bell, 2004; Kosir, Horvat, Aram, & Jurinec, 2016; Litster & Roberts, 2012; Lopez & Sotillo, 2009; Shechtman & Silektor, 2012). Gifted students, for the most part, have similar or better self-concept and empathy than their non-gifted peers.

Shechtman and Silektor (2012) claim that “loneliness is one of the most common characteristics associated with gifted children” (p. 63). In their research, they investigate whether gifted students experience lower academic self-concept, social competence, and more loneliness and anxiety than non-gifted students, and whether these factors are mitigated by placement in pullout or segregated gifted classrooms. The researchers used a total of 974 students in grades 5-12 with 330 in segregated gifted classrooms, 178 in pull-out programs, and 466 identified as non-gifted. Participants self-reported on four questionnaires. Findings showed no differences between gifted and non-gifted students on loneliness or social competence, while gifted students showed higher scores on empathy than non-gifted students, as expected based on previous research. Gifted students also showed a lack of emotional anxiety, which the researchers note does not fit with previous research, and they argue more research should be done to better understand the relationship between gifted children and anxiety.

Kosir et al. (2016) conducted research to measure social acceptance and self-concept between gifted and non-gifted adolescents and whether it is moderated by gender. Participants were based on a convenience sample, with a total of 404 students from 25 classrooms among five different schools. The Self-description Questionnaire II was used to measure student social, academic, and general self-concept; participants nominated their peers to measure sociometric criteria; and teachers assessed participant social acceptance on a Likert scale for students. The results “found no significant differences between gifted students and students not identified as gifted in most of the social acceptance measures” (p. 142). However, there was an interesting finding in that gifted students were less likely to receive a negative nomination from their peers and

more likely to receive a positive nomination from a teacher, which is supported by previous research. In addition, the group with the lowest peer relation self-concept was gifted girls. The researchers argue that this “could indicate high standards or expectations for their own performance in the field of peer relations and higher level of perfectionism” (p. 143).

Measuring growth of the gifted. The debate in education regarding growth versus proficiency measures has a long history, but every educator knows it is more difficult to show evidence of growth with students who are on- or above-grade level than with students who are below-grade level because the former groups have less room to grow. There can also be an unfortunate attitude toward the gifted that their growth matters less than the growth of average or low-ability learners because the gifted will be fine on their own (VanTassel-Baska & Stambaugh, 2005). However, as mentioned in the previous section, the potential of gifted students should be as important as the potential of every other learner in the classroom, and assessment should be based on a growth model rather than proficiency in order to measure learning.

In a methodological brief, McCoach, Rambo, and Welsh (2013) overview the debate in measuring the growth of gifted students and the different statistical methods to measure academic growth. They first provide background for the topic by outlining the difference between status, or proficiency, and growth. They provide examples of holistic status measures from the past, like passing requirements for end of course tests, which hold entire schools responsible. Growth models show student achievement over time, providing more accountability for individual students and the school. Growth is arguably more equitable because it distinguishes between initially low-achieving and high-

achieving schools. They argue that growth modeling criteria must include the following: “(a) there must be at least three observations or test scores, (b) the test scores should be comparable across time, and (c) a measure of time must be collected for every testing occasion” (p. 57). The researchers provide two statistical growth models that can provide flexible approaches: HLM, or multilevel modeling, and SEM latent growth modeling. However, there are problems that exist in measuring gifted student growth, including small sample sizes due to the limited population and the fact that giftedness can’t be manipulated so it is difficult to find comparison groups.

Ryser and Rambo-Hernandez (2014) contextualize McCoach et al.’s (2013) work and situate it within the historical and legislative context of the time. Assessing the growth of gifted students is a concern because there are many variables at work beyond proficiency, which they often achieve very early in the school year. However, the federal legislation known as the No Child Left Behind Act (NCLB) focused on proficiency, potentially to the detriment to gifted learners. In this article, the researchers define and evaluate several growth models, what research has been conducted using the models, and how their use might affect gifted learners. This article describes the three-prong, McCoach et al. (2013) growth criteria which might be difficult to meet, but these criteria contribute to a statistical growth model for individual students. However, Ryser and Rambo-Hernandez (2014) identify some problems that may occur when trying to measure gifted learners even with a growth model. For example, the majority of test items are written for the average, not gifted, student, so it can be hard to tell whether the gifted students guessed correctly or missed a challenging item, raising more error in the accuracy of their scoring. Similarly, if a student achieves a 100 on a test the first time,

there is no room for growth. Ryser and Rambo-Hernandez argue that educators must be familiar with the reliability and validity of assessments and be able to compare standardized tests with classroom assessments. These two research studies show how difficult it can be to demonstrate growth for gifted students and how important a growth model is for this action research.

Gifted students and critical thinking. Kettler (2014) states that “the field of gifted education has considered critical thinking a desirable goal for gifted programs...and critical thinking instruction has been included as an evidence-based practice in the National Gifted Programming Standards” (p. 128). This lays the groundwork for his research questions: is there a measurable difference between the critical thinking skills of students identified as gifted and the general populations, and does gender cause measurable differences when testing critical thinking skills in gifted and general education students? In this study, Kettler randomly selected elementary student volunteers from three different schools within one school district. Of the volunteers, 163 were general education and 45 identified as gifted/talented. Data were taken from student scores on two assessments: the Cornell Critical Thinking Test (CCTT) and the Test of Critical Thinking (TCT). Of the total population, 203 students took both tests. There was a significant difference between the two populations of students, with the gifted students scoring higher on both tests and demonstrating more sophisticated critical thinking. No impact on scoring was noted when gender was factored in as a variable. Kettler concluded that the gifted students were naturally better at critical thinking than the general education students because their participation in a gifted program demonstrated no significant impact. While the results of this study may prove

that gifted students need no interventions for critical thinking, it also does not take into account the concerns regarding proficiency versus growth as raised by McCoach et al. (2013) and Ryser and Rambo-Hernandez (2014).

In another research study, this one aimed at gifted secondary students, Dilekli (2017) examined the relationships between gifted students and their critical thinking skills and learning styles. The four learning styles are described as diverging, assimilating, converging, and accommodating. Divergers are excellent at observation and are imaginative problem-solvers. Assimilators are logical and prefer abstract concepts. Convergers are technically minded, and accommodators are intuitive, hands-on experimenters. The researcher used two measurements: the Critical Thinking Skills Scale (CTSS) and the Kolb Learning Style Inventory. The results showed that the participants, who were all identified as gifted, scored high on the overall critical thinking scale and its subdimensions. The most dominant learning style was assimilating, followed by converging, diverging, and accommodating.

These research studies demonstrate that gifted students are more likely to have high critical thinking abilities, but that is also true of their general academic abilities. Just as it is important to develop and grow their academic abilities, so is it also true for their critical thinking skills.

Readiness: College, Career, and Civic Life

Ensuring that students are ready for life beyond graduation is one of the essential purposes of education. Unfortunately, many students graduate high school and enter college or the workforce ill-equipped for the challenges that they will face because they do not have a process for analyzing data or reasoning through steps to find a rational

solution (AACU, 2013; Arum & Roksa, 2011). Teaching a framework for critical thinking is one way to ensure students are more prepared for the challenges of college, career, and civic life (Butler, Pentoney, & Bong, 2017; Conley & French, 2013; Fong, Kim, Davis, Hoang, & Kim, 2017; Gormley, 2017; Loes, Salisbury, & Pascarella, 2015).

In a research article, Conley and French (2013) present two conceptual models: one for college readiness and one for ownership of learning. The authors argue that ownership of learning is a key part of college readiness and that all students should be taught these skills, particularly those who may be part of an achievement gap. The college readiness model is composed of four ‘keys:’ key cognitive strategies/thinking skills; key content knowledge or attitudes toward content and understanding; key learning skills and techniques, also known as ownership of learning via self-regulatory behaviors; and key transition knowledge and skills, or contextual knowledge of the college process. The authors identify five keys for student ownership of learning: motivation and engagement, both of which are necessary for college success; goal orientation and self-direction which support a growth mindset; self-efficacy and self-confidence encourage students to attribute success to ability and effort; metacognition and self-monitoring demonstrate active participation and reflection in the learning process; and persistence shows the value of sustained hard work toward a goal, which can be developed and mastered by all students. These nine elements, when taken together, provide students with necessary skills for success that they may not have acquired. Additionally, students in the achievement gap are less likely to “buy into the belief that they should learn what teachers tell them to learn” (p. 1030), so providing them with the metacognitive skills to take ownership of learning is a key step in increasing high school success and college

readiness. This type of information is similar to the critical thinking framework and allows the claim that direct instruction of metacognitive strategies supports students beyond the classroom.

Butler, Pentoney, and Bong (2017) conducted research to determine whether critical thinking ability or intelligence was better for determining success in handling real world events. The researchers discussed the controversial nature of intelligence and make clear that “intelligence does not appear to predict whether a person will use good reasoning or exercise good judgment” (p. 39). For this study, critical thinking is operationalized as rational problem-solving. In the study, 244 young adults from ages 19-28 years old participated in three assessments: a critical thinking assessment, an IQ assessment, and a life events assessment. The participants were divided into college students and community adults, and all participants took all three assessments on the same day. The researchers’ prediction that there would be a stronger correlation between critical thinking and accurately assessing the negative real world outcomes was correct. There was a smaller correlation between intelligence and experiencing real world negative outcomes. The researchers made a direct plea for increasing the direct instruction of critical thinking skills in order to have an effect not only on individual decision making, but also to improve communities and civic responsibility. Their research validates the need for this type of action research.

Summary

This chapter reviewed relevant literature on critical thinking, gifted learners, and college, career, and civic readiness. In the review of the literature, research on critical thinking indicates that even though the term itself has a multitude of definitions and it can

be difficult to assess (Atabaki et al, 2015; Dewey, 1910, Mulnix, 2012; Pithers & Soden, 2000), when students are directly taught a framework of skills for critical thinking, it can have a demonstrable impact on their ability to analyze, interpret, and problem-solve (Ku et al, 2014; Marin & Halpern, 2011). A constructivist framework is particularly helpful when using a framework for critical thinking because it provides a natural relationship between the instructional approach and the students' ability to construct knowledge for themselves (Kwan & Wong, 2015). Metacognition and Need for Cognition are particularly important for critical thinking because they deal with thought processes related to monitoring and enjoyment of thinking and they are both effective tools for critical thinking (Coutinho, 2006; Luong et al., 2017; Magno, 2010; Vrugt & Oort, 2008). Assessing critical thinking skills can be difficult, but is both highly desirable and achievable (Abrami et al., 2015; Cargas et al., 2017; Stupple et al., 2016).

For the purposes of this action research, the issues of identification, potential, and underrepresentation of gifted learners were all addressed because they have an immediate impact on the population of participants in the study (Callahan et al., 2015; Colangelo et al., 2004; Grissom & Redding, 2016; Renzulli, 2012). The benefits of ability grouping and acceleration for gifted learners were highlighted through the research (Steenbergen-Hu et al., 2016; Vogl & Preckel, 2014), and the elements of empathy, self-concept, and perception of gifted students were given special attention as they are sometimes thought to be lacking, but the research finds that to be untrue (Kosir et al., 2016; Shechtman & Silektor, 2012). Just as with critical thinking, assessing the gifted can be difficult, but can be done, particularly through growth modeling (McCoach et al., 2013; Ryser & Rambo-Hernandez, 2014).

Making certain that all students are ready to meet the challenges of life beyond the expectations of a k-12 classroom is one purpose of education, and teaching a framework of critical thinking skills to gifted learners is a way to challenged gifted learners to reach their full potential in college and career (Fong et al., 2017; Gormley, 2017; Loes et al., 2015). Providing students with the keys to analytical thinking can provide them with a path to college readiness and ownership of learning (Conley & French, 2013). Research indicates that students with strong critical thinking abilities are more successful at handling real world life events than those with just high intelligence (Butler et al., 2017).

Chapter three will provide an overview of the methodology of this action research.

CHAPTER 3

METHODOLOGY

Overview of Study

The purpose of this study is to identify effective instructional practices for developing critical thinking (Paul & Elder, 2012) among high school gifted students through an instructional focus on fairmindedness and metacognition. Employers, professors, teachers, and parents all point fingers at the group down the line for not pushing students to perform tasks that demonstrate and reinforce critical thinking: to think analytically, read thoroughly, reason dialogically, and discuss respectfully (AACU, 2013; Gormley, 2017; Haynes, Lisic, Goltz, Stein & Harris, 2016). One area of critical thinking in particular that needs attention is fairmindedness, or the ability to give multiple perspectives equal consideration without concern for personal interests. While gifted students are shown to be more proficient critical thinkers than their same-age peers (Kettler, 2014; Dilekli, 2017), they do not always receive the academic enrichment that pushes them to their full potential. This action research addresses the following questions:

1. How does a hybrid model of direct and collaborative instruction in fairmindedness impact gifted high school students' critical thinking skills?
2. What aspects of performance assessment have a noticeable impact on metacognition?

In this chapter, I describe the research design and proposed intervention plan and explain why it is an appropriate fit for this study. I provide an overview of the setting for

this research at the classroom and school level, and I give details about the participants and my relationship with them. I describe the data collection instruments, including their creation, purpose, and connection to the research proposal. I explain why qualitative action research is a fitting approach to this problem of practice, as well as the data collection and review process. Finally, I review the quality criteria for qualitative action research and explain why my data analysis methods are effective for my context and population.

Context, Participants, and Researcher Positionality

I am in the setting of our single building high school, working as an insider in collaboration with other insiders, the students. GYA (pseudonym) is a k-12 public charter school in suburban South Carolina. Our school charter was written in 2008, with classes beginning in 2010 and our campus was built in 2013. As a public, non-profit charter school, we work with about 25% less per-pupil money than a traditional public school in order to receive some flexibility in how we deliver instruction to our students. According to a Revenue Per Pupil Report created by the state, traditional public school students receive \$13,656 in federal, state, and local spending per student, while public charter schools in South Carolina receive \$10,047 in funding for each student (SC Revenue and District Affairs Office, 2018). Decision-making for our charter school is made by our school board, which is comprised of parents and local community members, and decisions are specific to our campus and its students.

As a k-12 school, we are in the unique position of having our own feeder population on the same campus, which has four buildings: an elementary school, middle school, high school, and administration building that also houses the gym. We are

surrounded by farmland and residential neighborhoods, though our students can come from anywhere in the state. There are families that drive an hour for the opportunity to attend GYA.

Our school opened as a k-8 institution and grew one grade each year until our first graduating class in 2015. We have a grade level cap of 130 students and we are currently at a total enrollment of 1645, with 485 students at the high school in grades 9 through 12. Our total population ethnic breakdown is 73% White, 17% African American, 3.5% Hispanic, 3.5% mixed race, 1.5% Asian; the remaining students are Native American or Pacific Islander.

As the director of the in-house program for our gifted and talented students, I am responsible for selecting the group of eighth grade students who will enter the program as ninth graders based on established criteria of PSAT scores of 980 or better, 85% or better on state math and reading exams, and honor roll grades. The students are also identified as gifted and talented by the state. It is a cohort program modeled on an honors college at a university, and the students are intended to move together through high school. Each year the students take an honors seminar, which I teach. It is the only class that the cohort takes together exclusively and it is an honors elective designed to create authentic learning experiences that engage their personal interests and develop them as critical thinkers.

The participants in this study are tenth grade students in the cohort program at GYA. The program was designed with the explicit goal of keeping more of our gifted students on campus to graduate from our high school. As a small public charter school, we are able to offer some competitive experiences, but we cannot compete with a high

school that exceeds our total k-12 enrollment in some areas. We wanted a program that would allow us to attract some of our most successful middle school students to our high school, rather than those students choosing to attend a much larger local high school that can offer more honors and AP electives, sports, and clubs.

The program is unique to our school and the area. Students are invited from GYA's eighth grade and must have PSAT scores of 980 or better, state test scores in reading and math of 85% or better, and honor roll grades. These criteria were selected based on a recommendation from a similar program and as a way to allow students multiple opportunities to demonstrate their academic success.

The group of students who serve as the population for this action research are the ones I taught in the spring of 2019, the sophomores. There are fifteen total, comprised of eight females and seven males. Thirteen are White, one is African American, and one is a Pacific Islander. Three of the group qualify for free/reduced lunch. These students make up the first cohort that was invited to this program and they are creative, divergent thinkers who embrace their role as pioneers in this program. There were originally nineteen students in this cohort, but two students chose not to continue the program but stayed at GYA and two students had families who moved out of the area. The remaining fifteen are tight-knit and seem to enjoy the intellectual challenge of the Seminar, which is the course I teach.

The participants are comprised of a homogenous purposive sample, which Patton (1990) defines as participants with a commonality that will lead to "information-rich cases" (p. 169) for in-depth study. A purposive sample is a non-probability sample selected because of the characteristics of a particular study. In the case of this action

research, I wanted to know how a focus on fairmindedness affected the critical thinking skills of gifted high school students. This problem of practice stemmed from my experience with this specific group of students who need an appropriate academic enrichment in order to reach their potential as gifted learners and as future college students.

In the third grade, I was identified as gifted and I was in gifted programs throughout elementary and middle school. I missed that experience of targeted gifted interventions in high school, when we were expected to just take harder classes. I have been teaching for fifteen years and in that time, my time has been evenly split between courses at all levels: IB and AP, honors, and standard. I have always embedded critical thinking tasks into all of my classes. I use group work and discussion on a daily basis, and students know there are rarely easy answers in my classroom. Early in my career I became certified in differentiation for gifted and talented students because I felt a connection to this population. In the last two years, I have served as the director of the Scholars Academy, which identifies gifted eighth grade students and creates a cohort program for their high school experience. I lead the seminar that occurs each year of the Scholars Academy and this allows me to develop a close relationship with each cohort. My relationship with this group of sophomores is strong, and they have explicitly requested additional support in critical thinking skills and debating fairly, which is one reason for this qualitative case study: I am directly tailoring instruction to their needs.

When research has gone past the investigative and analytical phases and is released from the hands of the researcher and published to the world, the audience deserves to have a reasonable expectation of truth. It is naturally of deep significance

that researchers make their best efforts to establish rigor and trustworthiness so that peers and the general public can be skeptical, push back against the findings, and still find a level of credibility in both the research and the researcher. In quantitative research, this is more commonly established through reliability, validity, transferability, and generalizability. These terms become a little fuzzier in qualitative research, and because language matters, the terms we use to represent these concepts in qualitative research are different. Considering that the samples tend to be far smaller and not possible in a statistical sense (Merriam & Tisdell, 2016), it may be more useful to consider authenticity rather than how generalizable the findings of qualitative research are.

Qualitative researchers have their own expectations for good action research, but these are essentially variations on the same theme: that the research hold up to intense scrutiny, demonstrating rigor, and they show trustworthiness, or credibility. This must be true for all stages of the qualitative research process, including the selection of participants. The selection of these participants demonstrates democratic and catalytic validity (Herr & Anderson, 2015). Democratic validity, or the collaborative relationship between researcher and participants, is demonstrated through the teacher/student relationship at the basis of this research. This is also called relevancy (Watkins, 1991) which connects the problem of practice to the participants. Because the problem is specific to the needs of gifted learners, this research is relevant to these participants, who have all been identified as gifted. Catalytic validity “highlights the transformative potential of action research” (Herr & Anderson, 2015) by highlighting the ways in which the researcher and the participants change their perceptions as a result of the research. In my time as the director of the Scholars Academy, these students have challenged my

perceptions of them and I know they have been changed through this program. By participating in this research, they will be strategically and systematically challenged and any changes will be recorded through the action research process.

Research Design and Intervention

Action research is a cyclical process of discovery in which a researcher identifies a contextual problem and then studies that problem in a systematic manner (Herr & Anderson, 2015). The participants in action research are insiders in the process and are a natural and essential element of the defined problem of practice (Efron & Ravid, 2013). The spiraling cycles that occurred in this action research include planning, action, observation, and reflection (Herr & Anderson, 2015). This process is essential to effective action research because of the interaction between the researcher and the participants. The very nature of action research encourages collaboration with the research subjects as a way of thinking about the relationship of power and positionality of the researcher (Efron & Ravid, 2013).

The design for the action research I have undertaken is a concurrent quantitative and qualitative mixed methods action research study design (Ivankova, 2015). This type of action research is identified by a mixed methods approach, in which the qualitative and quantitative data are collected and analyzed separately, and then they are merged for the final interpretation. This last step allows for the two different types of data to validate the conclusions of each other.

Interpretive research is rooted in a social constructivist approach, which assumes that knowledge is not given or received passively but rather created or ‘constructed’ by the participants (Merriam & Tisdell, 2016). The terms “interpretivism” and

“constructivism” are often used interchangeably (Creswell, 2013) and express a subjective understanding about the world. I am asking my students to create personal meanings of fairmindedness and critical thinking, and to be cognizant of that creation through metacognition. Their subjective meaning of these constructs will be compared to mine as I seek to understand how they evaluate these terms.

The problem of practice concerns giving gifted high school students appropriate academic enrichment to reach their full potential. The approach for this action research involves challenging their critical thinking skills by emphasizing one element, fairmindedness, and providing students with a framework for understanding it and offering them opportunities to practice it. The intervention for this action research involves uncovering the students’ current understanding of fairmindedness and then guiding them through a series of assignments that ask them to investigate their ability to apply fairmindedness. The assignments include class discussion, rubric creation, and a series of blog posts in which they will examine a news article and analyze it for the criteria of fairmindedness.

Interpretivist, qualitative action research has established expectations of quality criteria independent of positivistic, quantitative research because the two types of research should not be judged the same way (Merriam & Tisdell, 2016). According to Herr and Anderson (2015), quality validity criteria for qualitative action research links to the five goals of action research: (1) the creation of new knowledge, (2) achieving outcomes of the research, (3) demonstrated learning from the participants and researcher, (4) results that can be applied to the setting, and (5) a methodological approach that is “sound and appropriate” (p. 67). This action research demonstrates quality criteria in at

least three ways: outcome validity, democratic validity, and catalytic validity (Herr & Anderson, 2015). This is a qualitative case study using purposive sampling to address a problem of practice in my context, so the results will be relevant to this setting. This demonstrates democratic validity. Both the participants and I as the practitioner-researcher will be engaging in a process of learning and reflection which shows catalytic validity. Finally, outcome validity is shown through the goal of this research in demonstrating whether an instructional focus on fairmindedness as an element of critical thinking results in stronger critical thinking among gifted high school students.

Constructs. The constructs that are central to this action research are gifted and talented identification, critical thinking, fairmindedness, and metacognition. Gifted and talented addresses the selected participants in the study and critical thinking, fairmindedness, and metacognition are interwoven through the problem of practice. According to the state Department of Education, gifted and talented students are those who demonstrate exceptional ability or performance academically or in the arts and who “require an educational program beyond that normally provided by the general school program in order to *achieve their potential*” (SCDOE, 2018, emphasis added). This emphasis on the potential of gifted students is central to the problem of practice in this action research. Critical thinking, as defined in chapter one, is disciplined, systematic thinking that is purposefully tested and therefore improved through the application of multiple intellectual standards, including fairness (Paul & Elder, 2007). Fairmindedness as an element of critical thinking is a conscious attempt to remove bias or prejudice from decision-making (Paul & Elder, 2011). The practice of fairmindedness requires that we acknowledge our position and privilege in critical

thinking, which requires metacognition. Metacognition is an awareness of the process for critical thinking (Coutinho, 2006).

Bordage (2009) and Green (2014) illustrate the necessity of establishing a conceptual framework. Green (2014) acknowledges that it can be difficult for novice researchers, but developing a conceptual framework should be seen as a tool to help focus the research rather than as a burden that impedes progress. Bordage (2009) takes a more critical view; not only are frameworks beneficial to the researcher and the design process, they should be seen as essential because of the researchers' "responsibility to make their assumptions explicit to the readers" (p. 313). Therefore, I was critically thoughtful and considerate of my personal and professional perspectives in an intentional and analytical manner.

Data Collection Measures, Instruments, and Tools

This case study used classroom observation, audio/video recordings, student-generated artifacts, rubrics, and pre- and post-instruction assessment in order to triangulate the data. In other words, I used multiple forms of evidence to support my conclusions (Efron & Ravid, 2013; Merriam & Tisdell, 2016). Qualitative action research collects data that addresses a question or problem of practice directly from the classroom. These instruments have been selected in order to provide the most holistic depiction of the learning experience for both myself as the researcher-practitioner and for the participants, my students.

Classroom observations. Observation is looking with purpose in order to provide authentic insight into the world of a particular setting (Merriam & Tisdell, 2016), in this case, a classroom. By using a camcorder to capture the discussion, I observed my

own classroom during small group discussions in order to gain an understanding of how the students are processing the concepts of critical thinking, fairmindedness, and metacognition. My goal was to look at my classroom as an objective observer so that I could “make the familiar and known new and unexpected” (Efron & Ravid, 2013). In order to do this effectively, I also recorded small group discussions so that I could evaluate what I witnessed directly and what happened when I was directly observing other groups. I then compared my field notes to the recordings to gain a broader picture of the life in the classroom. I received permission from all participants prior to recording.

Socratic Seminar. Socratic seminars have a long history in education, going back to their namesake of Socrates (Chowning, 2009). Socratic seminars are based around purposeful questioning, a common text, and engaging discussion amongst the participants (Grafwallner, 2017). Research studies support the argument that Socratic seminars and Socratic questioning improve students’ critical thinking skills (Polite & Adams, 1997; Houshmand, 2015). As an intentional element of collaborative instruction, Socratic seminars were implemented weekly to offer the students an opportunity to ask questions about the assigned selection from Paul and Elder (2012), and to engage and challenge each other’s perspectives and biases. The discussions were ten to twenty minutes long and typically began with a round robin question: one question that I asked that each student answered briefly. After that, the discussions were shaped by our reading and news stories from that week.

Student-generated documents. Documents are an important part of qualitative research data collection that “allow teacher researchers to construct a layered and

contextual understanding” (Efron & Ravid, 2013). Personal or episodic documents like reflections and blogs reflect the participant’s point of view and can provide an authenticity and insight that may be missing from an observation of external behaviors (Merriam & Tisdell, 2016). While an entire qualitative study may be based on personal documents, they serve to triangulate the data for this action research by directly presenting the participants’ perspectives.

In the course of this study, students produced six written reflections. Two reflections are part of the assessment process and four reflections are independent essays submitted as blog posts. These artifacts serve as records that allowed me as the researcher to create a multi-layered and rich depiction of the students’ understanding of the key constructs: critical thinking, fairmindedness, and metacognition (Efron & Ravid, 2013). Throughout the blog posts, the students selected a news article on a given current events topic and responded to specific questions, outlined in the next section.

In order to conduct a performance assessment of student development in the constructs of fairmindedness and metacognition, a weekly writing assignment was given which was posted on the EduBlogs website. Fifteen news media sources were selected from the Media Bias Chart 4.0 (Otero, 2018) and students were assigned a source at random by selecting a slip of paper from a cup with the media source’s name on it. Each week during the intervention period, the class discussed the most prominent news stories of that week. This discussion allowed for a common theme to emerge for the blog posts, and students selected an article from their source that connected to that news story. In order to ensure that such a wide variety of media sources would have at least one article,

the topics selected each week were usually news stories with national attention. For each blog post, students responded to the same prompts:

1. In your blog post, your first paragraph should be an objective summary of the article. Identify the topic, the argument presented, and any necessary background about the author or topic. Provide hyperlinks as needed.
2. Your following paragraph(s) should be an analysis of the article. What is the point of view of the author? Is the thesis of the argument implicit or explicit? What kind of evidence does the author use, and do those sources have agendas? Were there any points/claims raised in the article that were new to you?
3. The last paragraph should demonstrate metacognition: reflect on your initial reaction to the article and then how you thought of it after going through the process of fairmindedness. Can you accurately represent the author's perspective even if it doesn't match your own? What would you challenge the author on if you could? If the author's perspective does align with your own, what is the counterargument?

A rubric is a detailed scoring guide that breaks the elements of an assignment into distinct components and can provide a reliable assessment for complex performances of a task (Reddy & Andrade, 2010). In order to increase the critical thinking challenge and as an additional element of collaborative instruction, students created their own rubrics for evaluating fairmindedness and metacognition. These rubrics were initially developed in week two based on their initial criteria for these concepts and then were revised in week four after additional instruction. The instruction for the rubrics was basic, but students were required to define at least three measurable criteria for assessing fairmindedness, one measurable criteria for metacognition, and three categories to identify the level of accomplishment for that descriptor. Students worked in small groups to develop their rubrics, presented them to the class, and created one final rubric based on input from all fifteen participants. The criteria for the rubric were clearly defined and explicated through a whole group discussion (see appendix A).

Teacher-created rubric. Rubrics are a common tool in education, used for both formative and summative purposes. A meta-analysis of formative assessment rubrics by Panadero and Jonsson (2013) provides evidence for the claim that student metacognition is improved through the use of rubrics. Andrade (2000) argues that rubrics can improve metacognition and self-assessment of learning. In order to assess student understanding of fairmindedness as an element of critical thinking and metacognition, I created a rubric to assess student understanding and development on these constructs, separate from the rubric created by the students. I wanted to see what elements they valued versus what I valued, and how they compared in terms of achievement. My past experience tells me that students are harder on each other than teachers are, so I want to see if that is true for rubric development. I evaluated all of their submissions according to the teacher-created rubric and compared that to the student-generated rubric.

The assessment was scored by a rubric I created based on three constructs of fairmindedness and one category for metacognition (see Appendix A), rated on a scale with four categories: not met, novice, adept, and exceeding. Each category was assigned an ascending point value from one through four so that students could earn a maximum of sixteen points on any given performance assessment.

The three constructs of fairmindedness were weak/strong sense thinking, bias, and intellectual standards. The operational definitions of these terms were based on Paul and Elder's work (2012) that also served as the central text for this unit. Paul and Elder (2012) argue that "strong-sense critical thinkers are not easily tricked by slick argumentation, by sophistry and intellectual trickery. The striking characteristic of strong-sense critical thinkers is their consistent pursuit of the fair and just...they work to

empathize with the viewpoints of others...they change their views when faced with better reasoning” (p. 3). Weak-sense thinking is rooted in arguing to win a debate regardless of whether it is ethical or considerate of other points of view. The category of bias was scored on a range from demonstrating clear bias and rejecting other points of view outright to “consider[ing] all relevant viewpoints equally, without reference to one’s own feelings or selfish interests” (Paul & Elder, 2012, p. 6). The last construct of fairmindedness is based on adhering to Paul and Elder’s (2012) intellectual standards of fairmindedness, which are humility, courage, integrity, empathy, perseverance, confidence in reason, and autonomy. Paul names their opposites as hypocrisy, arrogance, unfairness, laziness, disregard for justice, distrust of reason, cowardice, self-centeredness, and conformity. The more students showed the former than the latter, the higher their score for the category.

The final rubric category was metacognition, which is simply defined as thinking about one’s thinking (Coutinho, 2006). The significance of including metacognition as part of this rubric is to emphasize the relationship between metacognition and critical thinking skills. Fadel, Bialik, and Trilling (2015) argue that one reason that high-achieving students are more successful in academic settings is because of the metacognitive process, which they describe as a self-improving feedback loop. The students use metacognitive techniques, which then increases their feelings of accomplishment and benefits their performance. The authors argue that this loop continues in order to demonstrate continual improvement.

Teacher journals. Throughout the course of this study, I kept a reflection journal as the practitioner engaged in this research. Journals, in addition to the student

reflections, are another example of personal documents that represent a first person narrative revealing “the inner meaning of everyday events” (Merriam & Tisdell, 2016, p. 166). While they are subjective, they show the perspective of the participant and aid in triangulation of data to produce a more authentic, trustworthy depiction of the research. The structured journals serve as documentation of my thought processes through the six week action research period. These journal entries were written at least twice each week; once before the instruction and once after. The questions I answered as part of the pre-lesson reflection include:

1. What are the lesson goals regarding fairmindedness and metacognition?
2. How do I predict the students will react to the information?

The post-lesson reflections addressed the following questions:

1. Were my lesson goals achieved regarding fairmindedness and metacognition?
2. Did the students react according to my prediction? Why or why not?
3. How do I need to adjust my next lesson in order to reach the goals of increased fairmindedness and metacognition?

Research Procedure

The study occurred over a six week period from March to May 2019. In order to answer research questions 1 and 2 and address the constructs of critical thinking, fairmindedness and metacognition for gifted learners, I created a pre-test/post-test design (Creswell, 2012) with three intervening action research cycles in order to measure their growth over time (Herr & Anderson, 2015).

Cycle one: pre-assessment and week one intervention. The pre-test and post-test assessments share the same structure: two articles from reputable news sources that demonstrated opposing viewpoints were selected. In the first lesson plan of this research cycle, students were asked to read both articles and then write a response. The student reflections were based on the guidelines in Table 3.1.

Table 3.1 Performance Assessment Guidelines

	Student Reflection Guidelines
1.	Objectively summarize the argument from each article.
2.	Which article used better evidence? Explain the criteria that make the evidence better, in your opinion.
3.	How do your personal views align with the arguments presented in each article?

As this action research is seeking to understand student critical thinking, metacognition, and fairmindedness, these questions get to the heart of those constructs. First, I wanted to evaluate the students' ability to objectively summarize a subjective piece. Paul and Elder (2011) argue that this is challenging because humans are inherently egocentric and it is difficult to strip personal bias away from our thinking. As a pre-test, I sought to evaluate the students' ability to apply fairmindedness without any instruction or guidance. I also tested their metacognition by asking them to explain their criteria for evaluating the evidence from each article. This required them to think about their thinking and to analyze what makes one argument more believable than the other. This was assessed using the teacher-created rubric (see Appendix A).

The date for the pre-assessment was March 27, 2019, and the college admissions scandal dubbed “Operation Varsity Blues” had recently been made public (Bogost, 2019; Wai, Brown, & Chabris, 2019). Part of the public shock around the scandal, in which wealthy families allegedly paid a company for illegal and unethical advantages to get their children into top colleges, was that students’ ACT and SAT scores were manipulated either through answer correction or identity fraud. The two articles selected presented different perspectives on whether the standardized tests were a part of the problem of corruption or were a way to make college admissions more egalitarian.

After giving the students twenty minutes to read and respond to the articles, a class discussion followed. The intention for the class discussion was to have students share their personal perspectives of the articles and to evaluate whether they used fairmindedness in their initial evaluation of the articles. The directions for the class discussion were for all students to share their opinion as to which article used better evidence, then a student-led conversation about the perspectives from the articles and their personal opinions followed. As the students discussed, I sought examples of strong sense thinking, bias, Paul’s intellectual standards, and metacognition in their utterances as examples of a priori coding (Cresswell, 2014).

After a ten minute discussion of the articles, I brought the initial conversation to a close and asked the students to consider what my purpose is in giving them this assignment. This question reflects critical thinking and metacognition, because I asked the students to think about the assignment from another perspective: mine, as an educator. Following their answers, I wrote the word ‘Fairmindedness’ on the board and asked the students to create a personal definition. This is to help focus our following

discussion on this topic, which served as the focal element of critical thinking for the following lessons.

The next phase required that students narrow down their concepts of fairmindedness and metacognition in order to create a rubric. This occurred through two discussions: small group and then large group. In the small group discussion, students were asked to define three important elements of fairmindedness and characterize those elements; in other words, how would they be identified? Small groups were also required to define metacognition. After a ten to fifteen minute small group conversation, the whole class was engaged in large group discussion about the components that were identified. Then we narrowed down and selected the language for the three most dominant characteristics of fairmindedness and for metacognition. As a class, students determined what different categories of achievement would look like, from novice, adequate, proficient, and advanced (see Appendix B).

Cycle Two: weeks two and three. Each week, participants were asked to focus on one criterion from the student-generated rubric and to generate written responses based on that focus. During week two, students focused on the first criterion of their rubric. Then based on the news topic given to them by me as the teacher, they selected a news article as the basis for their blog. The questions that the student blog addressed are:

1. Objectively summarize the argument presented in the article.
2. Identify the evidence that the author uses to support the argument.
3. Does the author consider counterarguments or any other viewpoints? Does it demonstrate strong or weak sense critical thinking?
4. Are you persuaded by the article? Explain your reasoning.

The blog assignment is the same for each week; what changed was the criterion of focus. They wrote one blog specific to each criterion from the student-created rubric (see Appendix B), which covered three criteria for fairmindedness and one for metacognition. Blogs were due each week on Wednesday. On Thursday, students read two peer blogs and scored them according to the student-generated rubric, and then there was a whole group discussion on the different articles selected and how the criterion was represented. Students created blogs last year using pseudonyms to protect their privacy, and I used those pseudonyms to maintain that protection.

Cycle three: weeks four and five. For the final week of the study, a post-test assessment was given in order to measure growth. The post-test mirrored the pre-test: two articles demonstrating opposing viewpoints on a current event were selected and students were asked to read the articles carefully and write reflections that responded to the same questions from week one. In mid-May 2019, media sources began reporting on the new SAT adversity rating index which will take into account the hardships in a student's life and create a score that would go along with an SAT score in college admissions (Belkin, 2019; Hartocollis & Harmon, 2019). Much like the pre-assessment, it was not political but has a direct impact on these students' lives and was a topic of interest to them. After a period for writing, a class discussion followed with the same guidelines as the class discussion from week one: all students would identify which article used better evidence, then a student-led discussion about the two articles and how the students assessed the element of fairmindedness. I recorded the discussion in order to gather evidence of fairmindedness and metacognition, as well as data for a priori coding.

In order to demonstrate the rigor of this research, it is important to address which validity criteria are being met through this study. This procedure meets the criteria for process, outcome, catalytic, and democratic validity (Herr & Anderson, 2015). Process validity is demonstrated through the creation of new knowledge. As the participants think critically about fairmindedness and how to define and measure it, they will be creating a new understanding of it and then thinking about their new understanding, demonstrating metacognition. Outcome validity is shown through the actions that led to a successful conclusion for the action research cycles. Throughout this process, students developed their critical thinking skills and the pre- and post-test assessment sequence demonstrated the growth that occurred as a result of these cycles. To demonstrate catalytic validity requires that the research participants have changed their understandings of the world as a result of this study. As demonstrated through the teacher journals, classroom discussions, and written reflections, both myself as the teacher-researcher and the students were changed. Finally, democratic validity is shown through the collaboration of multiple perspectives and results that are relevant to the context. While the teacher provided guidance, the participants were given control to create their own rubric for fairmindedness and that tool was used for measuring student reflections. This action research was conducted to address a problem relevant to this population of students, which was the need for an appropriate academic stretch for gifted high school learners.

Treatment, Process, and Analysis of Data

According to Merriam and Tisdell (2016), data analysis happens concurrent to the collection in qualitative research because it can shape and inform the development of the

study. In addition, the method I selected to implement reinforced this through its concurrent mixed method action research design (Ivankova, 2015). By analyzing the data as it comes in, as opposed to waiting until it is all collected, I was able to adapt the research to the valuable questions and tangents that arose. Merriam and Tisdell posit that “qualitative data analysis is primarily *inductive* and *comparative*” (2016, p. 201, original emphasis). Given that the goal of any analysis is to make sense of the data, it is important to understand how the data is helping to answer the research question at hand as the interventions continue.

I applied a priori coding terms of ‘critical thinking,’ ‘fairmindedness,’ and ‘metacognition’ to the process (Cresswell, 2014). Class discussions were recorded, transcribed, and coded for individual units, which were then sorted into dominant categories. This continued until the point of saturation, when there is nothing new being gathered from the research. This formed the basis for the Codebook (Appendix E) which describes the type of code, whether a priori or emergent, and includes a definition and a student example for each code. Interrater reliability was established by working with an external researcher to develop intercoder agreement. Intercoder agreement ensures that the coders agree on the application of the definition for a given piece of data (Cresswell, 2014), and coding consistency is considered established when there is an agreement between the researchers of at least 80 percent (Creswell, 2014). Cohen’s Kappa was also used to establish interrater reliability. Cohen’s Kappa is a statistical measurement that takes into account the role of chance, and then an equation to estimate the percentage of chance agreement, called the Kappa coefficient, is applied (McHugh, 2012).

Another part of the case study database is artifacts in the form of the student-generated rubric and student reflections. For these elements, I captured both the class discussion that produces the rubric and the document itself. The discussion was recorded for both audio and visual data, transcribed electronically, and analyzed for codes. Rubrics and reflections were captured electronically and then analyzed based on a review of the relevant literature. The results were aggregated and then coded based on patterns that developed. A final element of the case study database is my written reflections and field notes. This data was captured digitally and then analyzed for patterns and codes in order to create a full depiction of the learning in the classroom.

In order to increase trustworthiness and rigor of the findings, the research was triangulated through multiple data sources: observations, teacher journals, and collected artifacts of student work. I also was careful to consider my own reflexivity during the research process so I was aware of my own biases that might have affected the research and my interpretive analysis. The table below demonstrates the relationship between research questions and data collection tools.

Table 3.2 Relationship between Research Questions and Data Collection

Research Question	Student-generated artifacts	Classroom observations	Teacher journals
1. How does a hybrid model of direct and collaborative instruction in fairmindedness impact gifted high school students' critical thinking skills?	X	X	X

2. What aspects of performance assessment have a noticeable impact on metacognition?	X	X	X
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Triangulation ensures that the data is trustworthy by assessing the information through multiple data points (Cresswell, 2014). The table above demonstrates that there is a strong relationship between the research questions and the data collection tools and measures. Metacognition and fairmindedness as an element of critical thinking are represented and corroborated through all of the data collection tools: student-generated artifacts, classroom observation, and teacher journals.

The data treatment plan demonstrates quality criteria through process and outcome validity (Herr & Anderson, 2015). Process validity is shown through the creation of new knowledge as the result of this data analysis. Outcome validity is connected to integrity, or “the quality of data on which the action is based” (Jacobson, 1998, p. 130). This is demonstrated through the case study database and coding processes.

Summary

In this chapter, the methodology for data collection and analysis were described in detail. First, an overview of the research design and intervention were explained, including a review of the problem of practice, research questions, and foundational constructs. Then a discussion of the research setting, context of the study, and participants were presented. The data collection instruments and tools were presented, including explanations for why these data collection measures were selected. A description of the research procedure for this qualitative case study was provided, with attention to the protocols, lesson plans, and data entry. Finally, the data analysis plan was

articulated and broken down by research question, with an explanation of why these were appropriate methods for this study. Chapter four will provide an analysis of the results of the study.

CHAPTER 4

FINDINGS

The purpose of this study is to identify effective instructional practices for developing critical thinking (Paul & Elder, 2012) among high school gifted students through an instructional focus on fairmindedness and metacognition. The students themselves asked to focus on topics related to evaluating evidence, arguing fairly, and giving equal weight to different points of view. Including the student-participants in the decision making process of this study helped to establish buy-in for this work and helped deemphasize my position of authority, which is a goal in this project-based learning seminar course.

My intervention focused on the use of performance assessment (Airasian, 2001; Efron & Ravid, 2013) and a hybrid model of direct and collaborative instruction. The research questions this study sought to address were:

1. How does a hybrid model of direct and collaborative instruction in fairmindedness impact gifted high school students' critical thinking skills?
2. What aspects of performance assessment have a noticeable impact on metacognition?

To answer these research questions, I implemented a concurrent quantitative and qualitative mixed methods action research study design (Ivankova, 2015). Qualitative data was first analyzed for trends and categories and then narrative categories developed and were analyzed. Quantitative data were analyzed using descriptive statistics of the

median, and qualitative data were collected and analyzed through a priori and emergent coding (Creswell & Clark, 2018). The research took place over a six-week period and used a pre/post-assessment design (Creswell, 2012) with four weeks of cyclical intervention.

This chapter presents an analysis of the data that was collected based on the methodology outlined in chapter three. The data will be summarized through an action research cycle approach (Herr & Anderson, 2015) through three spiraling action research cycles. Each cycle was developed through the research process of planning, acting, observing, and reflecting in order to develop a deeper understanding of the research problems and the student responses to the intervention. The first cycle covers the pre-assessment and the first week of intervention, the second cycle describes the second and third weeks of intervention, and the third cycle covers the final week of intervention and the post-assessment. The findings will then be analyzed based on the research questions to determine if the data collected answered those questions, and the chapter will conclude with a general summary.

Cycle One

Planning: Students Choose Fairmindedness

The seminar in which this study took place is a project-based learning course focused on engaging students with critical thinking skills and personal interests. I began to wonder, however, if the students' critical thinking skills would improve if I provided direct instruction on a critical thinking framework rather than implicitly embedding critical thinking in tasks. After asking the students what they wanted to focus on in class,

I selected fairmindedness and metacognition as the specific elements of critical thinking that would serve as the foundation for this unit.

To begin this unit, I asked the following question of the class: “What if I asked three groups to answer the same question, but I said group 1 had to answer in a sentence in two minutes, group 2 had to perform a song and they get an hour to create, and group 3 had to make a powerpoint presentation in thirty minutes? Would that be fair?” Their responses triggered a ten minute conversation with the students about the meaning of the word “fair” and which led to an examination of critical thinking and metacognition. The immediate, classwide reaction was, “NO!” This was followed by qualifiers. Bandit said, “They’re all different levels of challenge,” while Mary argued, “Some people may not have the capacity to do a whole song but may be better at coming up with, like, interpretive dance.” Pepper countered this with, “But she (me, the teacher) is giving us the right amount of time. It doesn’t take an hour to come up with a sentence, but you need that for a masterfully created song.” Flynn argued, “Even if you give us an hour, it takes a lot more work to make up a whole song than just a sentence, you know?” This conversation with the students demonstrated their ability to consider the meaning of the word “fair” in a general context, which I then directly connected to the introduction of our critical thinking unit.

After the class discussion, the pre-assessment was administered to the students. For the pre-assessment, students were given two news articles from reputable sources on the same subject and asked to summarize the articles objectively and then state which article’s position they preferred and why. The date for the pre-assessment was March 27, 2019, and the college admissions scandal dubbed “Operation Varsity

Blues” was in the news (Bogost, 2019; Wai, Brown, & Chabris, 2019). The two articles presented different perspectives on whether the standardized tests were a part of the problem of corruption or were a way to make college admissions more egalitarian.

The assessment was scored by a rubric I created based on three constructs of fairmindedness and one category for metacognition (see Appendix A), rated on a scale with four categories: not met, novice, adept, and exceeding. Each category was assigned an ascending point value from one through four. The three constructs of fairmindedness were weak/strong sense thinking, bias, and intellectual standards. Rubric scores and coding were also substantiated through interrater reliability (Creswell, 2012) with a Cohen’s Kappa score of 92% (McHugh, 2012). The codebook (Appendix E) was established to demonstrate our common agreement for the codes.

I knew that most of the students would have at least heard of the college admissions scandal, and some of them had already formed opinions about it. In the field notes from my teacher journal on the day of the pre-assessment, I wrote, “After we had briefly discussed fairness in a general way, I asked if there were any issues with fairness in the news recently. They immediately brought up the college admissions scandal.” Several of the students were able to give details about the scandal, including the schools involved and some of the specific fraudulent activities that allegedly occurred. Students were then given time to read and respond to the two articles which were given as printed handouts without identifiers: students had the title and date of the article, but not the author or publisher. They were asked to answer the following questions:

1. Objectively summarize article A.
2. Objectively summarize article B.
3. Which article did I agree with more and why?

Based on the teacher-developed rubric, I scored each student according to four categories and added their total, with the highest possible score being 16. The median score for the total rubric was 7. The median score for individual categories was 2 on a scale of 1-4.

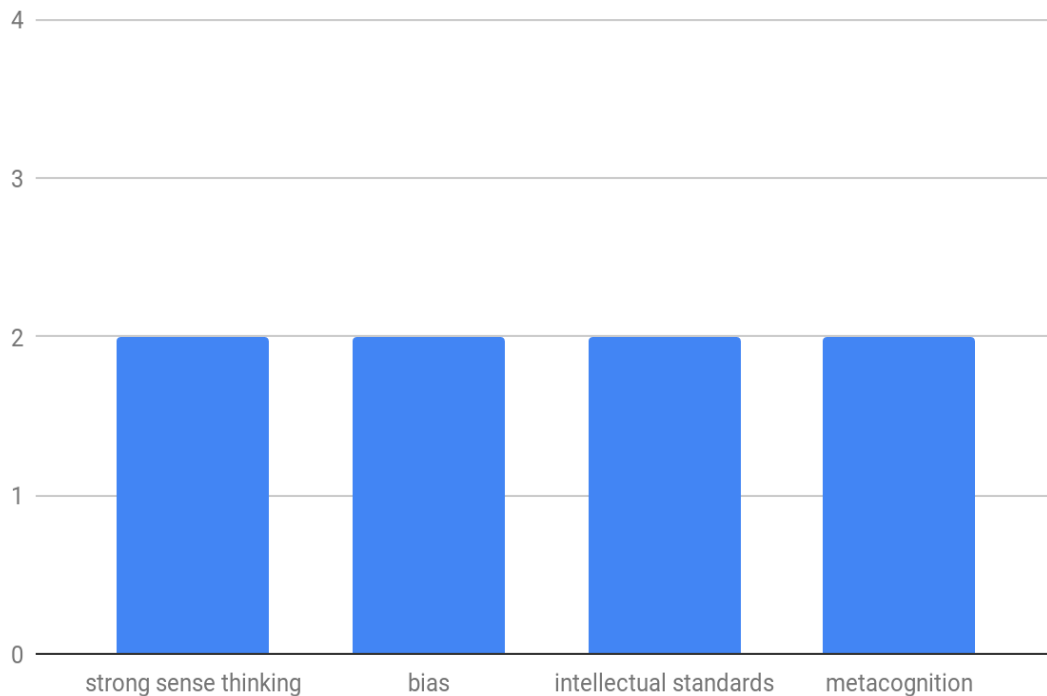


Figure 4.1 Median Student Scores for Pre-assessment

Student responses were categorized using a priori codes based on the four elements of the rubric: strong sense thinking, bias, Paul’s intellectual standards, and metacognition (see Appendix E: Codebook). The coding process was iterative and immersive as I systematically read the transcript multiple times in order to immerse myself in the students’ language, to take notes, and to code the text (Merriam & Tisdell, 2016). As I coded responses, I noticed that not all students included a demonstration of each rubric element in their writing. For example, most students demonstrated some element of bias and intellectual standards. This allowed me to establish a starting point for each student and for the class as a whole as we embark on this research. After several

rounds of coding, I found 12 examples of the category for strong sense thinking in the novice to adept rating, 18 examples of bias in the not met, novice, and adept ratings, 12 examples of Paul's intellectual standards, and 6 examples of metacognition. Part of the reason for the disparity in examples of each may have to do with length. Students who wrote longer responses tended to include a metacognitive element while those with shorter responses did not.

Overall, the students' responses scored at the novice level in the four constructs of the rubric. See the figure below for student examples in each category.

Table 4.1 Pre-assessment Student Responses

Category	1) Weak vs Strong Sense Thinking	2) Bias	3) Paul's Intellectual Standards	4) Metacognition
Examples of Student Work at the Novice level	"Though this college admissions scandal is terrible, the rich is [sic] already at a large advantage. The admissions process is rigged already."	"I prefer article two because it looks at the situation from a fairer standpoint."	"I need to do my own research before I form an opinion."	"Out of the two articles, I found myself agreeing much more with the second. It had less of a complainatory nature."

The student response referenced in category 1, Weak vs Strong Sense Thinking, represents a novice understanding of strong sense thinking because it favors weak sense thinking. It is missing a good faith acknowledgement of a point of view that contradicts its own, showing a preference for being fair over being right. The student response in category 2 demonstrates the novice descriptor of bias because it is a superficial assessment of the two articles. The student only provided one sentence of description and does not explain what he means by "fair." There is no representation of a different

point of view to counter his bias. These examples are representative of the type of thinking represented in the students' pre-assessments.

Acting: Taking Sides

Using the pre-assessment as the planning stage for this cycle allowed me to consider what aspects of the students' critical thinking skills were in their zone of proximal development (Larson & Marsh, 2015) as we began this unit. This also led me to consider what the next action steps should be to develop their critical thinking abilities by focusing on fairmindedness and metacognition. Captured in my field notes, I reflected on these aspects of critical thinking by writing, "The students assumed that article 1 [*The Atlantic* (Bogost, 2019)] was more left-leaning and article 2 [*The Washington Post* (Wai et al., 2019)] was more center-right, which was accurate. Their reasoning was interesting, too: they said article 1 was focused more on equality and tearing down the system while article 2 focused more on what the system gets right and how to fix it by working within the system." From a researcher perspective, this showed that the students were able to look carefully at the information they were presented with and consider what, if any, bias the author might have.

After reading their responses, I had two major takeaways that would inform the action sequence of this cycle. The first was that students had no framework for discussing fairmindedness and distinguishing it from their general ideas of fairness, as was seen in the introductory discussion. In the discussion excerpted above, the students connected fairness to equality and equity, without applying the metacognitive aspect of fairmindedness. This led me to take action by explicitly distinguishing between fairness and fairmindedness in the next Socratic seminar, excerpted below.

The second takeaway was that students tended to base their reactions to the articles entirely on their personal opinions with no rationale to explain why they felt the way they did. In other words, they demonstrated very little metacognition, as evidenced in the sample responses in Table 4.1. In order to increase their metacognition, I required that students complete regular reflections while going through this process over four weeks. As we read and discussed, students wrote frequent reflections to the point that it became a joke; one student wrote “Reflection #873” on his paper. Some of them were personal and some of them were collected, but frequent reflection encouraged metacognition as a habit and was an important part of this process.

The central text for this unit was the chapter “Become a Fairminded Thinker” by Paul and Elder (2012). On the day after the pre-assessment, I gave the students the chapter and we read it in sections over the next four weeks. For the first assignment, students read and annotated pages 1-6 and then participated in a Socratic Seminar discussion based on their reaction to the ideas from that selection. These discussions were coded using a priori codes of fairmindedness and metacognition, and then reanalyzed for emergent codes of opinion and perspective.

During the Socratic seminar, excerpted below, I engaged in direct instruction of critical thinking by asking their definitions of metacognition and then getting them to participate in a round of metacognitive thinking through discussion, and by clarifying the distinction between fairness and fairmindedness. The students participated in the collaborative learning experience by speaking directly to each other, questioning each other, and challenging each other. Below is an excerpt that occurred halfway through the discussion.

TEACHER: Let me just pause right here because I want to zoom out and ask a metacognition question. First, what is metacognition again?

CLASS: Thinking about your thinking.

TEACHER: Right. So why are we doing this? Why have I introduced the concept of fairmindedness to this group of people?

FLYNN: So we can be more effective in our arguments.

PEPPER: Because if you just get in there to make your points to win, then....I feel like it's more effective if you're not just trying to win. If you think about what the other person is thinking and you consider all of the arguments, then you have a better chance of convincing people what's right.

BECKET: I don't know if effective is the right word. It's not just how effective you are. I think it's if you can grow through your discussion.

TEACHER: That relates to sophistry, right?

FLYNN: Yeah, if you're only focused on effectiveness, then it means winning by all means necessary.

PEPPER: If we actually think about the arguments and coming to the right conclusion, then we have a better chance of convincing other people.

OLIVER: I don't think the point is at all convincing others. It's more looking at other people's perspectives and their ideologies, seeing where they come from and how that developed for them and trying to understand how it all fits together rather than trying to come to a conclusion.

SCOUT: Maybe it's not enough if you're right or wrong but how you came to that opinion and the foundation of it. Every one of us has something that we believe very deeply and I know that I'm right. I'm probably not, but I know that I'm right. How do you get away from that inherent feeling that you're telling me I'm wrong when I know I'm right?

TEACHER: I'm glad you asked that question and I hope that you see now that what we're talking about is less about basic fairness than the process that you apply to different types of thinking and debates and positions. Are we applying a standard to our thinking?

BECKET: Something difficult about strong sense thinking is that even if you are willing to change your viewpoint, you can't know if you haven't found a convincing argument against your viewpoint or if you're simply not as open as you thought you were.

OLIVER: I think you have to completely let go of any idea, or to the extent that you can, let go of any idea that your mind has ever had and make it as if you've just been introduced to that concept.

BANDIT: It's less like that and more like a willingness to change your viewpoint.

FLYNN: Yeah, because you have to hold opinions. It's human nature.

BECKET: Let's say it's an idea that you already know and you've already formulated your ideas after looking at both sides and then you're discussing with people.

OLIVER: Then try to let go of that idea.

TEACHER: Part of this is thinking about who you are as a thinker. I think for a lot of us, we know there are certain things that we hold very dear, and Oliver is expressing her own point of view that it's easier for her to let go of a strongly held belief than it is for Becket or Scout. If that's your base position, that's ok. What's important is to consider the metacognitive element which is recognizing that--and, again, I'm not saying that we change on any level who you are--but if you can challenge your own thinking, that's Paul's whole thing. If there's no one else to challenge you, you have to do it yourself, which can be really difficult.

This selection from a class discussion highlights how quickly the students incorporated Paul and Elder's (2012) language into their thinking: referring to "strong sense" and "weak sense" thinking and "sophistry" are from the initial pages of the chapter they had just read. These initial codes of "strong sense," "weak sense," and "sophistry" emerged after transcribing the data for the first time. Upon multiple examinations of the transcript, codes were grouped into categories and themes that developed and united under the a priori and emergent codes of fairmindedness, metacognition, bias, and perspective.

This discussion is evidence of how direct and collaborative instruction can be interwoven to focus on critical thinking skills like fairmindedness and metacognition. For example, I used direct instruction when I asked the students to "zoom out" and think about metacognition. Collaborative instruction is demonstrated when the students begin to engage each other, like when Scout asked a question and Becket and Oliver answered. The discussion was student-led and showcased their ability to challenge and push each other's thinking, particularly near the end in the interaction

between Becket, Oliver, Bandit, and Flynn. Their discussion showed that one student, Becket, was struggling with how to embrace strong sense thinking when there haven't been any serious challenges to an idea. Oliver advocates for a position of intellectual humility by encouraging Becket to "try and let go of that idea" in order to be open to other points of view. Flynn and Bandit both temper that position by arguing that might be too extreme because "it's human nature" to have an opinion. Oliver, however, maintains her position that the best way to develop strong sense thinking is to release any attraction to a certain point of view in order to be open to others. This interaction demonstrates both an attempt at fairmindedness and metacognition by illustrating how the students are thinking about their thinking.

Students created their own rubric for fairmindedness and metacognition that they would use to score each other for the weekly assignment which is another example of collaborative instruction (Dillenbourg, 1999). The intention was to have the students spend time with the elements of fairmindedness and metacognition in order to develop their critical thinking; thus the process of creating the rubric was a learning experience in itself. Students were divided into four groups and each group created a rubric with four categories and four descriptors. After small groups developed their individual rubrics, the class came together to make whole-group rubric (see Appendix B). My only input was as a notetaker. This rubric served as the scoring model for students to use on each other for their weekly assignment, which was an analytical blog post.

The whole class-generated rubric serves as an artifact that demonstrates the students' collective starting point as this action research began. After having just read a few pages on fairmindedness from the chapter, the students took the main ideas and put

them into their own words, then created categories through which they would demonstrate competence at increasing intervals. Their ability to create categories and descriptors in small groups and then bring their ideas to a large group and agree on a model for scoring themselves shows an ability to think critically and reflectively.

Blog post 1. The first news story was selected during the first week of April 2019 and concerned allegations against Joe Biden touching women without their consent. Each media source had at least one story regarding the allegations and Biden’s response, and students selected an article from their assigned media source that served as the basis for their blog post, which was also a performance assessment.

An additional element of the collaborative instruction for this unit involved the students implementing the rubric they created. Students scored two of their peers each week using the student-created rubric and they provided a rationale for why they rated each category as they did. Below are the rationales from two students who scored the same blog post for the categories on the student rubric.

Table 4.2 Peer Scoring Rationale for Blog Post 1

	Scorer 1	Scorer 2
Perspective	This is Exceeding in perspective. Admitting that they delved into the article expecting something that was extremely right-sided, they found that the article used sources to its fullest potential and provided opinions that they could understand and/or get behind. They even admitted they have learned that “even on an extremely conservative news source, there can still be unbiased articles”.	Perspective: exceeding He does a good job understanding the perspective of the article. He even agrees with the author’s opinion of Biden, however, he also recognizes a counterargument that could be made.

Factual Reasoning	<i>Factual reasoning: adept</i> He does a good job of using the evidence to support his judgments of the Article. He uses quotes in his blog but ultimately fails to use morals to support his own opinion. There was an attempt, but no real argument or opinion existed within this blog.	Factual reasoning: exceeding He includes many hyperlinks that include references to the accusers original comments and the video Biden released in response to those statements. I don't believe he makes any comments that are unsubstantiated.
Bias	<i>Bias: adept</i> The author clearly states his bias, putting it inside of his post. Bias can be seen and/or perceived in the article.	Bias: exceeding He doesn't really have bias on this particular issue. He acknowledges the fact that he did not know much about this topic before doing the project. I think this was good because it allowed the reader understand that he did not originally have a particular stance.
Metacognition	<i>Metacognition: novice</i> The author finds a basis for the content of the article, thus examining the thinking of another. Does not attempt to ask more complex questions, and keeps things simple. Does acknowledge his own opinion but does not analyse it.	Metacognition: novice I don't think his metacognition piece was very clear. I would have liked him to examine why he ultimately agreed with the author of the article. Or maybe even why he does not care much about the news.

This representation of the student artifacts builds on their work from rubric creation. This product represents an application of critical thinking by using the rubric they created. These scorers agreed on two of the four categories and were separated by one point in the remaining two categories. Their comments were similar regarding the categories and reflect an understanding of the core constructs of fairmindedness, metacognition, bias, and perspective. Examining the student scores and rationales provided more data to show how students were processing fairmindedness and metacognition.

Observing: Digging Deeper

The observation stage of this action research cycle came from reading, scoring, and coding the student blog posts using the teacher-created rubric, which was also used for the pre-assessment.

Teacher Rubric. For the first blog post, students were scored on the same teacher-created rubric that was used for the pre-assessment. The median score for the fifteen participants was a 9 on a total scale of 16, which is two points higher than the class median for the pre-assessment. The median scores for each category are displayed in Figure 4.2.

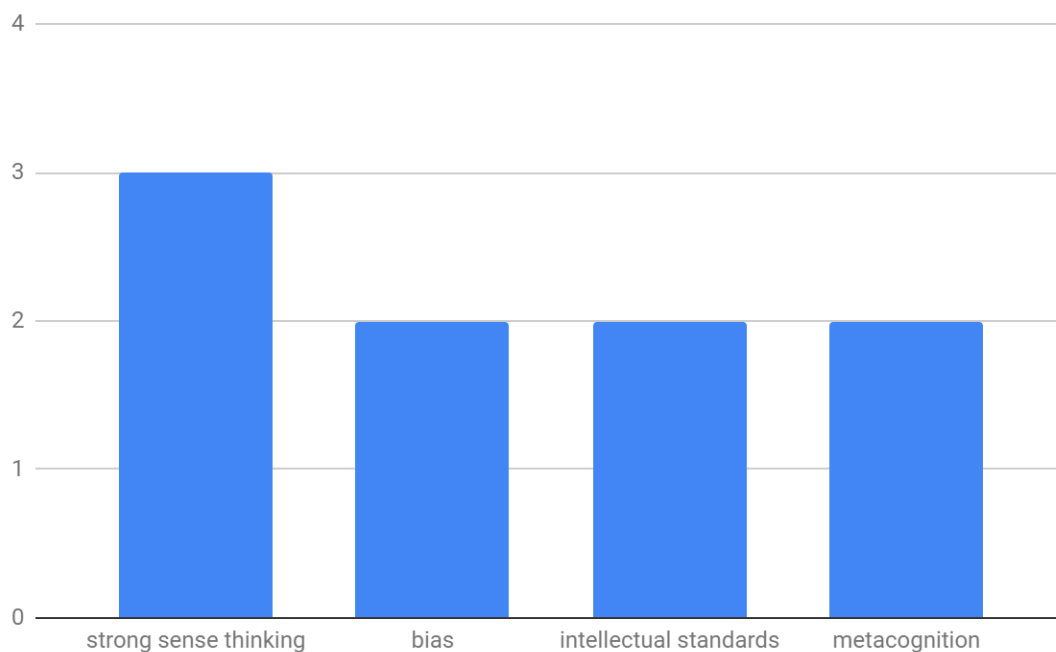


Figure 4.2 Median Student Scores for Blog Post 1

Coding. The coding process for student blog posts was identical to that for the class discussion transcript in that it was a systematic, iterative process. I read the student posts multiple times to the point of saturation, when no new information was gathered

from the process (Ivankova, 2015). The student artifacts were coded using the a priori categories from the rubric: strong sense thinking, bias, Paul’s intellectual standards, and metacognition. The students consistently scored the highest on strong sense thinking and were typically at the “novice” level for the remaining categories. This was confirmed through inter-rater reliability using Cohen’s Kappa statistic, measuring the inter-rater agreement at 95%.

Weak vs Strong Sense Thinking was the category in which students scored the highest with a median score of 3 out of 4. Two student examples are highlighted in Table 4.3 below.

Table 4.3 Adept Student Responses in Category 1 for Blog Post 1

Category: Weak vs strong sense thinking	Student 1	Student 2
Student responses rated as adept	“I expected a biased article about how these actions were extremely inappropriate and would completely disqualify him from the presidency. When I started to read through it, however, I saw a well written and unbiased article that came to a reasonable conclusion.”	“I chose this article specifically because of the author. In order to avoid unintentionally choosing an article based on personal bias, I chose one written by The Federalist’s VP. The logic being if any one article were to most accurately reflect the opinions of the organization it would be one written by an executive.”

In student 1’s response, the student demonstrates a willingness to consider other perspectives and to change, as well as an ability to learn from his news source. Student 2 demonstrates strong sense thinking by explaining her selection of this article with a clear preference for being fair and for considering other perspectives from her source--

specifically one that she believes would represent the source accurately in that the author is the vice president of the organization. Both students demonstrated the adept descriptor for strong sense thinking.

The median score for the category for Bias was at the novice level, mostly due to a superficial examination of bias or attempts to rationalize bias. Two examples are provided in Table 4.4 below.

Table 4.4 Novice Student Responses in Category 2 for Blog Post 1

Category: Bias	Student 1	Student 2
Student responses rated as novice	“I can see where the writer comes from, though. She claims that most Democrats are female and strong--feminism kicking in--which isn’t wrong.”	“For the most part, I agree with the points in the article. However, I do not think his actions were as acceptable as the article was treating it.”

In this response from student 1, the student tries to see the writer’s point of view, but he also qualifies it by assuming it comes from feminism, which is not mentioned anywhere in the article. Student 2 focused on the difference between her opinion and that of the author. She assumes that the article takes a nonchalant attitude toward the situation being discussed without much support, which demonstrates a superficial representation of the author’s perspective. She also counters this with her own opinion, which she rationalizes by claiming she agrees with the article’s main ideas.

Regarding the third category, Paul’s intellectual standards, most students received a median score of 2 out of 4 by demonstrating some of the intellectual standards but also showing their opposites, without a clear preference for the former. Two student examples are shown in Table 4.5 below.

Table 4.5 Novice Student Responses in Category 3 for Blog Post 1

Category: Paul's Intellectual Standards	Student 1	Student 2
Student responses rated as novice	"The article does a good job of staying unbiased in reporting the evidence, but I don't feel confident that the evidence is actually true."	"The article focuses too much on comparing how good Democrats are when compared to Republicans, and it should be dropped entirely."

Without any demonstration of research or evidence, student 1 just didn't "feel confident" that the media outlet's evidence was accurate. In this response, the student attempts to demonstrate intellectual autonomy, but also shows a distrust of reason and perhaps unfairness. Student 2's response shows that he wants to be fair, but he also does not provide an argument for why the author's point of view should change to meet the student's personal standards.

For the final category, metacognition, students also received a median score of 2 out of 4 for demonstrating a novice ability to show their thinking and explain it.

Table 4.6 Novice Student Responses in Category 4 for Blog Post 1

Category: Metacognition	Student 1	Student 2
Novice student responses	"But when looking at this through the process of fairmindedness, we can have an opinion, but it is ultimately up to the people that feel violated by Biden to decide how to act on the matter, even though I agree with the authors."	"I have the same viewpoint [as the author], though a possible counterargument would be that Biden is just trying to be friendly or loving."

The response from student 1 clearly demonstrates an attempt to be metacognitive, but it is not successful because the student does not explain why she agrees with the authors. Her response relies on a vague reference to having an opinion. There is a similar problem with student 2's response. The student identified his perspective and suggested a counterargument, though both parts are weak and could use more explanation in order to be rated as adept.

Reflecting: Taking Stock

When considering the first two weeks of this intervention, I was left with two impressions that would inform future cycles. First, I thought the unit had a successful beginning but that demonstrated students needed continued, targeted support in the constructs of fairmindedness and metacognition in order to improve their critical thinking skills. The pre-assessment and blog post both demonstrated an acquaintance with the concepts, but their scores on the teacher-created rubric at the novice level in three out of the four categories shows that there was still a lot of potential for growth. I was eager to see how the students developed in their thinking over the next few weeks.

The second takeaway was that based on the reactions to this cycle, the Paul and Elder text (2012) was a good choice. It has depth but it also has structure, which, according to student comments, helps them to "organize [their] thoughts." I considered having the students read the whole chapter at once, but I think that sticking with the original plan of reading a short selection each week allowed the students time to digest the material, discuss it, and apply it. Their reaction to the first week's selection validated my decision-making in regards to their reading schedule and gave me the confidence to stick with the plan of reading a few pages each week.

Cycle Two

Planning

Cycle two covers the second and third weeks of the intervention. After evaluating the students' weaknesses from cycle 1, it became clear that they needed more support in the areas of metacognition, bias, and Paul's intellectual standards. For week two, I planned for students to read pp. 6-11 in the Paul and Elder (2012) chapter which included a more thorough description of fairmindedness and addressed one specific component of fairmindedness in intellectual humility. The blog post for week two was based on the full Mueller report which was released in early April of 2019. As in week 1, the students discussed what they had heard about the story, and then they found an article from their assigned media source that had been written that week. Week three was structured similarly; students read pp. 11-16 of the chapter and then completed a blog post on an opinion article from their individual media sources in order to get a sense of any perspective or bias that might be found through their source. This section of the text reviewed several intellectual standards that inform fairmindedness, such as empathy, integrity, and perseverance (Paul & Elder, 2012). According to the text, intellectual empathy is the ability to inhabit someone else's point of view in order to understand them (Paul & Elder, 2012). Intellectual integrity is maintaining disciplined standards for proof and evidence and "honestly admitting discrepancies and inconsistencies in one's own thought and action" (Paul & Elder, 2012, p. 13). Intellectual perseverance is the drive to tackle difficulties in the thought process and an acceptance of the struggle that comes with methodical reasoning (Paul & Elder, 2012).

Acting

What follows are excerpts from our Socratic Seminars from week 2 and week

3. They were coded and analyzed to demonstrate how their conversations were shaped by the reading for each week.

Collaborative instruction: week 2. During week two, students read and discussed the chapter excerpt in small groups. Then there was a Socratic Seminar that was analyzed using a priori codes for fairmindedness and metacognition and then reassessed for emergent codes of belief, opinion, and perspective. Below is an excerpt which occurred near the end of the discussion.

TEACHER: Alright, anything else to add?

FLYNN: Oh, I also thought about when you brought up blindly trusting certain people, like in the church or my family or friends. I know that I do that a lot... I guess it is my confirmation bias but especially with people that I look up to, whether it be a big figure or somebody as simple as my father or something, if he was to tell me something I would be less likely to question it than if [other student] was like, "Hey, you're wrong." I thought that was kind of interesting to think about would never in question my dad, but if somebody else was to do it, I would react differently.

TEACHER: So then what's on the other extreme of that?

SCOUT: "Oh, Fox News said that? Can't be true."

TEACHER: Yeah, so just absolute skepticism for everything, right? Everything is cynical. I'm not gonna believe you even with support because I'm sure that it's been twisted.

PEPPER: Like you're just wrong, you as a person, you're always wrong.

TEACHER: So that comes down to, again, the ad hominem attack: because of the man, not because of the argument. There was a lot of that, I think, and that's how some of you approached this at the beginning it was this kind of extreme cynicism or skepticism. Well, if this isn't true, then nothing can be true.

SCOUT: Why are you looking at me? (Class laughter)

TEACHER: Okay, so group five, choose one thing you agree or disagree with in this selection and elaborate on it.

SCOUT: Basically I said that there should be two different categories of what gets questioned and what's not. Like there's a category of things that can change based on new evidence, that's brought forth to your attention, and there's another category of things that aren't based on evidence. They're based on your moral beliefs, things that... It's just about how you feel. And then we talked about Christian existentialism.

TEACHER: That was my fault. So what do you guys think of that, or what did the group of thing of that? Was everybody on board with that idea?

RICKY: Okay, there is definitely a separation. Things like anti-vaxxers. There are plain facts to dispute that. But then when it comes to things like religion, and you think morally that is right or morally you think that is not right.

MARY: It's more just what you gravitate towards.

TEACHER: Good, anything else on as a group that you wanted to raise, agree or disagree?

SCOUT: That was something I kind of disagree with.

BANDIT: It was like he [author Richard Paul] was saying change your opinion.

TESSA: I didn't feel like he was saying you must change your opinion, I just felt like he was saying, you should strongly consider it, everything can be strongly considered to change. But like if blue is my favorite color, why should I reconsider that? What's the value that I gain from reconsidering that?

SCOUT: But, on the other hand, I think the bigger thing to take from it is seeing other people's opinions and approaching them without just saying, "You are wrong," and I think that's how the same category, things that are moral issues and beliefs. I don't think it's about convincing anybody about what is right and wrong because no one's right and no one's wrong, it is just you believe. But on the other hand, I try to say that, but I think somethings are just fundamentally wrong.

TEACHER: Was there anything that you guys wanted to add to that, anything that you put for number five, that you felt if you wanted to get out in the open?

PEPPER: The point where he was saying, You should identify as a fair-minded thinker not as a Christian or as an atheist. I did not like that. I think that it's important to identify with a group and run in circles with people who you're like-minded with and I think there's a value to that, and I think that there's a value to that for society. And it didn't seem like Paul recognized that.

FLYNN: He said to separate your identity from your beliefs, but your beliefs ARE your identity. Who you are is what you believe and it influences what you do on an everyday basis whether it be something as big as Christianity versus atheism. What you believe is what you do, and it is tied to we are in your identity. So I don't think it's fair that you could to separate them. How can you apply morals and apply your own bias while seeking out other biases when you're separating your identity from what you believe?

BECKET: I think a lot of it was saying you can have your own beliefs, obviously, and you can apply them to what you're thinking, but you shouldn't put a name to that and say, "this is what I do believe, this is what I have believed, and this is what I will believe," because that can lead to a lot of not-fairminded thinking because you're going to be...

FLYNN: Stuck in where you are.

BECKET: Yeah, stuck in where you are and say this is part of who I am and the group I am with, so this is what I need to believe.

PEPPER: In some cases, though, it's fine to do that. If a Christian is going to say, "I'm a Christian and that's what I believe and I'm never going to change that," then I'm not going to be like, "Intellectual coward!"

OLIVER: If you tie your beliefs to your identity, how do you change your beliefs without changing yourself? It creates a much more massive change. You have to confront who you are as a person to change a belief and I think that's what he's trying to avoid.

SCOUT: I think it just depends on the kind of person you are. If you're the kind of person who thinks a lot about how you feel and approaches life with your beliefs, then we're not just going to want to change our beliefs. If you're the kind of person who doesn't think a lot about your beliefs and your thoughts and just kind of approaches life as like, "Oh well, that makes sense, or "that makes sense," then that's the kind of person you are. I think he's that kind of person, and I'm the kind of person who's like, "Well this is what I believe in, that's how I'm approaching life."

This Socratic Seminar based on pages 6-11 of Paul and Elder (2012) demonstrates a slight shift from the first one. There was a little more collaborative learning and a little less direct instruction, as suggested by this excerpt. I guided the students through the discussion and ensured that each group got a chance to speak, but the students were more

willing to speak directly to each other more regularly, perhaps due to an increased comfort level with the material.

Several of the students participate in a discussion about beliefs, which became an emergent code in addition to the a priori codes of fairmindedness, metacognition, bias, and perspective. This discussion revealed a willingness to wrestle with some of the elements of the text. The focus of the conversation shifted from Flynn's agreement about blindly trusting certain authority figures in her life to Pepper and Scout's challenge about beliefs, which directly connects to the first discussion and the concept of intellectual humility. This conversation shows a deeper understanding of the concepts, as evidenced by Pepper referencing "intellectual coward[ice]" and the interaction about how beliefs relate to identity.

Collaborative instruction: week 3. Following week 2, quantitative analysis showed some improvement in bias but in needing additional support in the intellectual standards and metacognition. Students read pages 11-16 of Paul and Elder's "Become a Fairminded Thinker" chapter (2012), participated in small group activities, and then contributed to a whole group discussion after writing their blogs for the week which focused on an opinion piece from their news source. The following selection from the round robin discussion was exhaustively coded for fairmindedness, bias, perspective, and metacognition.

TEACHER: Did anybody else find that to be similar or different? Were your opinion pieces equally as well sourced [as the news articles] or not?

OLIVER: I was basically the opposite. It seems like it's basically just conversational pieces back and forth between the authors, like a long chain of dialogue through different articles. It was kind of weird. And a lot of it isn't very well-sourced and it doesn't appear to be incredibly well thought out, it's just kind of somebody's putting their opinions out there for people to look at.

CHARLIE: I had Fox News and there were literally one or two sources throughout the entire article because there was a lot of fact-based stuff in the article, but none of it was sourced, and I even wrote about it in the blog. You have to take it with a grain of salt because you don't know where it's coming from.

PEPPER: I said the same thing. I had trouble understanding one of the quotes and I could not find it anywhere, I couldn't find any of the quotes online, I searched it and there was no link, there was one link, and it was to the Washington Post stock page for business that was mentioned in a quote. I felt like I couldn't trust the article. It's very well-researched if all the research is really true.

BANDIT: My source is Vox and their whole big thing is to explain things...they have their basic articles that are just reporting, they have the support and the evidence. The opinion piece I read, the major difference was that they involved their opinion, they specifically said, "I believe," that kind of thing, unlike normal articles, but I found that it supported itself really well and there was a ton of evidence which is like the whole big ideal of the new source.

EDWARD: I have the Atlantic and I kind of agree with [Scout] because like she said, it was just kind of to get their opinions out there because there were no hyperlinks or quotations or anything in my article, it was just the author talking basically, and so kind of like with [Pepper], it was hard to research anything about it and check the facts and like [Charlie] said there was no citation so I hadn't had to take it with a grain of salt.

MARY: I had The Washington Post, and I was very similar to [Bandit] because it's the same idea that everything is very well researched and very well-backed up and they even state both sides and why they believe this and how they come to this, and then they say what they think and what they could do to fix it.

BECKET: Mine was pretty good, too. It had about four or five different hyperlinks to different things. Three of them are probably the primary sources, and one was a YouTube video. And then two of them links to articles on other websites. I'm not certain about one of them, but I know one of them was definitely opinion piece, which I found very weird at the time.

PEPPER: A lot of the opinion pieces on the Wall Street Journal weren't actually opinions. Like when [Bandit] said your source said, "I believe," that wasn't really what was going on in my article, it was more explaining something. A lot of them, of course, there's outliers, it's a big source, but most of them were just explaining something, but with a lean. So the article I chose it was about the rise of liberalism in California and so they explained why it happened, but they were like, this is a bad thing that's happening. So they explained this happened, the immigration policies used to be good, we used to kick all the immigrants out, and

now they are sanctuaries, which is bad. And so it's just the language that makes it an opinion piece, in my opinion.

FLYNN: Kind of the same thing as [Pepper], except for opinion pieces on food and TV and stuff all the more... there were very few bloggers that regularly gave their opinion pieces on Mother Jones and whenever they did, they were short because they paid for words. In this article about how Donald Trump was gonna lose the election and he was just writing the report and talking about the report and how they gather data at the end. He was like, "wouldn't it be nice if Donald Trump lost the election"... So that's a little bit of bias right there.

SCOUT: Something opinion contributors seem to be doing on The Hill, is picking a broad topic like climate change or something like that, and then talking about a very specific part of it, so that they could give their opinion and I don't think most people would be able to combat that because it is not something you really know. I had to read my article about climate change like 10 times to understand what this guy was trying to say 'cause it was like it so, so specific. And I finally looked at all this reference everything. And he is on the board of directors of this climate change organization or whatever and I realized that he was just basically copying what his organization said in this article and I wouldn't have understood that if I had clicked on every single link and been like, where is he getting all of this? Because he had a bunch of facts and he was backing it all up with hyper-links, but I was like, this is a very interesting specific opinion to have, and to write an article about... And eventually, it just seems like he just wants more people to join his group.

TEACHER: So I think the expectation would be that you would see less evidence of fair-mindedness, in an opinion piece. Do you think that's accurate?

CLASS: Yes.

TEACHER: What are some of the elements of fairmindedness that we've been talking about?

TESSA: Confidence in reason.

PEPPER: Multiple perspectives.

RICKY: Empathy.

SCOUT: Integrity.

RICKY: Autonomy.

TEACHER: So all these things that Paul and Elder talk about. So was that presumption proven true or false? Was there less fairmindedness in the opinion

pieces? How many of you say, yes, there was less fair-mindedness, I agree with that statement? One, two, three, four, five, six, seven, eight total. Okay, we're split down the middle.

TESSA: Well, I don't know how to answer that because of a lack of opinion pieces. My source literally... There are no opinion pieces. And I looked at the kind of stories they were reporting and I'm still a... They don't lean one way or the other, they don't report badly about Democrats and report positive things that the Republican Party or vice versa, they say hurdles that the Democratic candidates have to overcome, but also what's looking good on their side, so it doesn't lean any way, so I just saw that was interesting.

TEACHER: So would you argue then that Axios is fair-minded in their presentation of the news?

TESSA: Yes. They just give you the facts. They're not trying to enforce their opinion, they clearly want you to make up your own mind about it, but they want you to understand the facts, too.

TEACHER: So do you think that sources are benefited by having distinct categories for news and opinion?

CLASS: Yes.

TEACHER: Why is that important?

BANDIT: Because it gives a distinction between, "Hey we're trying to persuade you to our opinion and if you all like this opinion or you wanna know more about this opinion, you can read this." It's like I think someone mentioned earlier, they're trying to pull you over in camouflage with those normal reporting pieces.

PEPPER: I might have said that the opinion articles are less fairminded, but because they're so separated, there's... In the article, it says the top of the page, WSJ, you're on the home page. It says WSJ/Opinion if you're on an opinion article. So they make it very clear that you were reading someone's opinion and you can tell in the price that I read, you can tell where it's their opinion and where it's their facts. So I felt like it was the same, there was no links in either any of the articles that I read, there was very little sourcing, so I don't know if that's just a Wall Street Journal thing, but... So, I didn't find either one to be more fair-minded than the other.

When coding this selection, there were more examples of metacognition which suggests an improvement in their ability to see and understand the ways in which they are thinking about cognitive processes, both for themselves and for their news sources. Students were

willing to look carefully at their sources and not agree or disagree with them superficially, which shows growth from week 1.

The most interesting information to result from this discussion was that the students did not fall prey to the presumption that opinion pieces were, by default, less fairminded than the reporting pieces. While they acknowledged that there is value to distinguishing between opinion and fact, the class was split in half when asked if there was less fairmindedness in the opinion pieces.

Blog post two. The second blog post came at the beginning of April and this was when the second version of the Mueller report on possible interference from Russia into the 2016 presidential election was released. Given the anticipation and media attention awarded to this report, each of the media sources had multiple articles about it, allowing the students to choose which story they wanted to analyze in their second blog post. The posts were peer-scored according to the student-generated rubric, with each student scoring two peers. What follows is an example of two peers scoring the same student blog.

Table 4.7 Peer Scoring Rationale for Blog Post 2

	Scorer 1	Scorer 2
Perspective	Adept; He is able to identify more than one side of the topic at hand, and tries to consider them in his analysis. He tries to put himself into Trump’s shoes, and practice intellectual empathy, by saying, “I could see where it might be frustrating to have that go on for two years and think it was over then have the same questions after being debunked brought up again.”, but never questions the Muller report	I rated this person a 3 out of 4 (adept) because they took into account the viewpoints expressed by the article and used the article they chose to formulate their opinion. It may be evident that this person only used this article to formulate their opinion, but I cannot be for sure.

	and reactions from an opposite perspective. Also his perspective never changes.	
Factual Reasoning	Adept; The opinions that he formed were based on the article and he states that the article was mostly “fact based”. He attempts to take a moral stance by considering the emotional effects of having this in the news. He attempts to understand Trump from an emotional and moral standpoint.	I rated this person a 3 out of 4 (adept) because they did reference their article, their news source, a direct tweet from President Trump, and a biography on Trump. I am unsure as to if this used morals and ethics or not.
Bias	Novice; He is able to identify bias in the article, but does not allow it to shape the way that his opinion is formed. He does not use the bias that he identified to take a broader look at the topic.	I rated this person a 2 out of 4 (novice) because they did have a bias in their final paragraph as they did say specific points from their article and used certain wording that formulates a very obvious opinion (in my opinion).
Metacognition	Novice; He analyzes the opinions and thought processes of the authors by saying he picked up on a bias, but does not talk about how it impacted his opinions. He admits that he did not have solid opinions on the topic before reading the article and that his opinions have changed, but does not go into the why or how. I do not see any signs of intellectual perseverance.	I rated this person a 2 out of 4 (novice) because they do sort of demonstrate a thinking process though I do not currently see complex questioning.

The students independently agreed on the scoring for this blog post, even though their rationales varied slightly. For example, in the final category of metacognition, scorer 1 claims not to have seen intellectual perseverance in the blog post, while scorer 2 focuses on the lack of complex questioning.

Blog post three. The third blog post topic was an opinion piece or editorial from the student's news source. Most of the students had a wide variety of topics to choose from, but a couple of students had news sources that had no labelled opinion pieces. These students looked at the type of stories that were being reported and to try and determine if there was bias being presented in that way. The student presented below was scored by two peers who agreed on all of the criteria except for one.

Table 4.8 Peer Scoring Rationale for Blog Post 3

	Scorer 1	Scorer 2
Perspective	Adept; She is able to identify both sides presented in the article. She says that the counterargument is presented, and she analyzes it. She talks about the one percent and how this plan for pardoning student loan debts could make the rich and 1 percent mad. She is able to put herself in the shoes of the more that 90 million Americans that, her article says, will benefit from the loan forgiveness.	Adept: She did a really good job about acknowledging the different viewpoints that were expressed both in Warren's proposal as well as the author's commentary. However, she did not incorporate these ideas into her own beliefs, which is fine, however it warrants an adept over an excelling score.
Factual Reasoning	Adept: Her article is full of links that are very reliable. Although she makes no mention of the links in the article she wrote, the links are used by her to analyze the original article. She identifies and presents a counterargument.	Exceeding: Her opinion is plainly stated and includes morals and ethics. She follows a line of reasoning that is logical, and makes sense. For this reason, she gets an excelling score.
Bias	Adept; She is able to identify that the article has heavy bias and considers that when she talks about the argument and the counterargument that the article presents.	Adept: She does acknowledge a bias in her response, however, she also states the opposing viewpoint and demonstrates that there are many interpretations to the issue and that different solutions can all be beneficial.

Metacognition	Adept; She identifies the bias that is found in the article. She is willing to challenge the opinions found in the article. She says that she isn't sure that free tuition at public colleges will help the issue, and explains why she believes that. She shows use of metacognition by questioning and thinking further about the opinions of the article.	Adept: She mostly analyses the author's thought process, however, there are a few points in her third paragraph where she states an opinion and why she feels that way about it, and whether or not it agrees with the commentary provided in the article. However, because she did not fully flesh out her own metacognitive reasoning, she gets an adept score.
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In the peer scoring, the two students agreed on an adept score for all of the categories except for "factual reasoning," in which Scorer 1 rated the post as adept and Scorer 2 rated it as exceeding. Both scorers present strong rationales for the category's score and could be seen as accurately interpreting the rubric. From analyzing these two sets of scoring rationales, it appears that the students understand the rubric they have created because they are united in their scoring. Their rationales demonstrate similar thinking.

Observing

This round of observation for cycle two is based on the teacher rubric scores and coding for blog posts two and three.

Teacher rubric. On blog post 2, the total median score went up one point from blog post 1, from 9 to 10 out of 16 total points for the fifteen participants. Scores for Paul's intellectual standards and metacognition remained at a median of 2 for each category, while both strong sense thinking and bias were at a median of 3 for the class. The one point increase from week 1 to week 2 occurred in the category of bias.

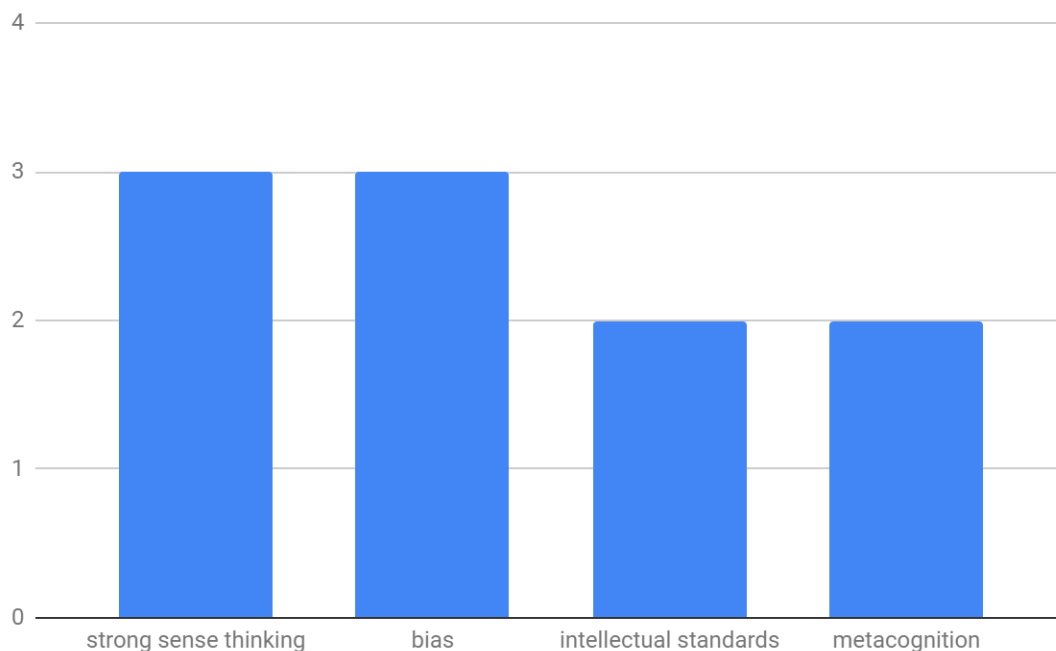


Figure 4.3 Median scores for blog post 2

For the third blog post, the median student composite score was 11, which is one point higher than the composite for week 2. This indicates that students are continuing to show improvement. Figure 4.4 demonstrates that student median scores in each category was a 3, except metacognition, which is still at a 2.

Coding. The procedure for coding the student blogs was identical to the process outlined in the first action research cycle for their first blog post. Blog posts were read and reread in order to be coded multiple times to the point of saturation, where nothing new was evaluated. The a priori coding themes were based on the rubric and included strong sense thinking, bias, Paul's intellectual standards, and metacognition.

There was class-wide growth in the category of Paul's intellectual standards from week two to week three. In week two, students were still developing their ability to successfully demonstrate and apply the intellectual standards.

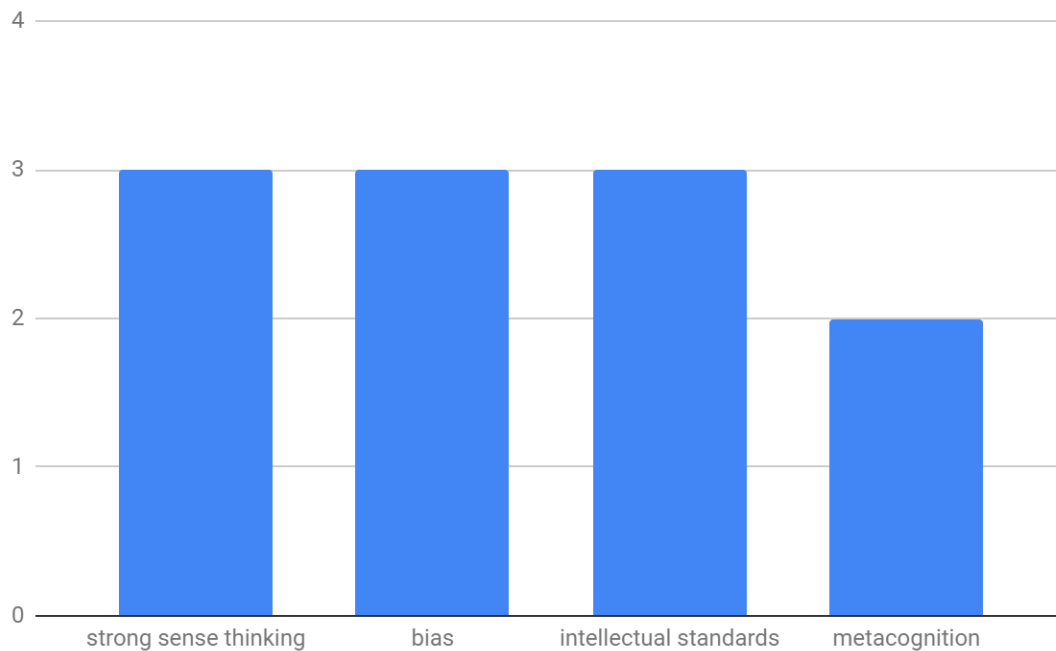


Figure 4.4 Median Student Scores for Blog Post 3

Even though they represent opposite points of view, these two responses scored at the novice level. Neither is successful at demonstrating empathy as one of the intellectual standards and show arrogance and distrust of reason, two of the opposites named by Paul and Elder (2012).

Table 4.9 Novice Student Responses in Category 1 for Blog Post 2

Category: Paul's Intellectual Standards	Student 1	Student 2
Student responses at the novice level	"While the article is mostly fact-based it comes off as hostile and mocking to President Trump. There is no directly stated opinion but based on the quotes and the way the article is written it can be seen as against Trump's beliefs."	"I think the investigation was pointless because I personally think Trump and his supporters are ruthless and will not allow for Trump's presidency to end any time soon."

By the third blog post, student responses had improved by a median of one point on the category of Paul’s intellectual standards, indicating that they were able to successfully show some of the standards and were able to mostly eliminate their opposites.

Table 4.10 Adept Student Responses in Category 3 for Blog Post 3

Category: Paul’s Intellectual Standards	Student 1	Student 2
Student responses at the Adept level	“I chose this article to see what others think about this issue of LGBTQ ideologies being accepted into churches. I was very intrigued by the way the writer talked about how scripture was often contradictory and it made sense to me, but due to the background I have in Christianity, I was too quick to refute some of his points when in actuality they had some validity to them.”	“This was an opinion-based article, but they manage to support their claims very well using an assortment of evidence. I feel like the author successfully changed my mind about people like this, but I am not convinced by the idea of the society they want.”

In the quote from student 1, the student demonstrates intellectual humility, courage, and empathy. He has also successfully eliminated their opposites and challenged his own perspective by reading an article that does not directly support his own beliefs and is open to critically investigating his own point of view. Another valid representation of an adept rating for the intellectual standards came from student 2. This student recognizes that he was persuaded by the author’s argument based on the evidence presented, which demonstrates confidence in reason. The student also hesitates to embrace everything the author has put forward, which shows intellectual autonomy. These examples are representative of the growth made in the class in the area of intellectual standards, supporting the class median of a score of three in this category.

Reflecting

During this cycle, my major takeaway was the students' willingness to wrestle with challenging material. I was impressed with the quality of class discussion and the demonstration and application of the core elements by the students. The quality of their discussion, as represented in the discussion excerpt, and their improvement in the blog posts supports the claim that their critical thinking skills are improving through a focus on fairmindedness and metacognition. My journal from this week showed my own excitement after their discussion on how beliefs can influence fairmindedness. I wrote, "They're starting to get it! They are showing growth in fairmindedness and metacognition because they are beginning to talk about their thought processes and how they arrive at conclusions. Oliver talked about this last week, but she was pretty much alone. This week, more students identified the connection between identity and belief." Upon reflection, this cycle was necessary to bridge the gap between where the students started as critical thinkers and where they would end.

Cycle Three

Planning

For the final cycle of this action research, I wanted students to be able to demonstrate what they had learned and to measure whether there were any changes in their application of fairmindedness and metacognition. Any developments might show that the direct and collaborative instruction of a critical thinking framework could be beneficial to gifted high school students. There had been demonstrable growth in their application of the core construct of fairmindedness, but they were still at the novice level in metacognition. With that in mind, I planned three components: a reflective activity in

which students would reevaluate the rubric they created, completion of their final blog post, and a post-assessment that mirrored the pre-assessment. The goal was to see an improvement in metacognition.

Acting

Following week 3, in preparation for the final blog post and the post-assessment, I evaluated the growth the students had made by examining their scores from the pre-assessment and in weeks 1, 2, and 3. I then considered what further interventions or teaching techniques might be most productive in helping them develop stronger skills in fairmindedness and metacognition. In my teacher reflection journal from that day, I wrote, “After three rounds with the rubric, I wanted to know if the students felt the same about the rubric they originally created almost a month ago. They met in small groups to review the rubric they created as a class and were tasked with discussing whether it fit their current knowledge and understanding of fairmindedness.” The goal was to re-evaluate their thinking now that they had additional knowledge and practice regarding fairmindedness and metacognition.

The students met in small groups and were free to revise the rubric in any way they saw fit. When we returned to a whole group format, I asked what they changed and Pepper responded, “We changed everything!” All of the groups made small adjustments to the rubric descriptors, and some even changed the categories. However, one group completely change the design of the rubric. About halfway through the whole group revisions to the rubric, Oliver spoke up and said:

I think it is important to change the rubric to be more reflective of the task. We modified the chart layout to more accurately represent the concept. Not everything is so black and white; it is possible to work from one issue to fair

mindedness and off to the other extreme. It is important to monitor personal progress through fair mindedness to keep oneself in check and in balance.

In the revised rubric, the categories are the same but the descriptors are altered so that each end represents an extreme position and the goal is to reach the middle. The class was incredibly supportive of this alternative and chose to revamp the class rubric to reflect the changes presented by Oliver and Flynn (see Appendix C).

The fourth and final blog post for the intervention stage of this research was based on an article that focused on foreign news, which was selected due to student request. The students wanted to investigate whether there was a difference in how their news sources presented domestic versus foreign news, and so there was a wide variety of topics from early May 2019, from the rising tariffs between the United States and China to Russian interference in the election to the Easter day bombings in Sri Lanka. The following student scorers evaluated the same blog post based on the new student-created rubric (see Appendix C).

Table 4.11 Peer Scoring Rationale for Blog Post 4

	Scorer 1	Scorer 2
Perspective	<p>Perspective: 2 He is able to identify that both sides are represented in the article. He does not dismiss any opinions in the article, and admits that he is uneducated in the topic and is willing to consider other perspectives. Despite this, he does not sound like he can be easily swayed by fabrication and biased information.</p>	<p>Perspective: 2 It is very clear that he was able to look at both sides of the story accurately, in part because they said that the article they read neutrally represented both sides. They listened to multiple perspectives, and because their article was to neutral, it was difficult for them to find a counter argument. It would be safe to assume that they recognize that other points may be valid as long as they are backed up with</p>

		evidence that has not been twisted.
Factual Reasoning	<p>Factual reasoning: 2 His opinions and reasons are valid for the amount of information he was given in his article. He is not overly distrustful of the article, but points out some inconsistencies in the presentation of the article. He says, “There were not, however, any outside citations which were used to back up the facts, nor did the quotes have an original source cited”. This one sentence tells the reader that he is conscious of the lack of sources, and admits that he does not change his mind on anything because of it.</p>	<p>Factual Reasoning: 2 He bases opinions off of information presented in a way that is fair and relevant to the information. My only concern is that they did not link to their article, which is something I usually look at just to check. I think that they do attempt to include morals in their reasoning, even though they admit to not having much interest in this topic. Their reasoning was based on previous knowledge before finding this article as well as the facts inside of the article, though they also admit that their article did not include very many if any hyperlinks for facts. This article mainly helped them become aware of the situation.</p>
Bias	<p>Bias; R1 He is apathetic to the situation. He admits that before reading the article he did not care, but after reading the article he can see how it is interesting. He does not identify any bias he could have when analyzing his article. He did not critically think about the bias that could be influencing his opinion, or lack of.</p>	<p>Bias: 2 I did not pick up on any bias when reading this blog post. Despite not having a large interest in the topic discussed (as shown when they said, “I can’t necessarily say that I am more “interested” in the topic per se, but I do think it’s an interesting subject”), he was able to put aside any possible bias in order to accurately report the events and reflect on them. This article helped them become aware of the topic in a neutral was because they were curious as to how relations with Russia had deteriorated, which most likely helped them remain neutral in writing as well.</p>

Metacognition	Metacognition: 2 He is able to show his thinking process, even though his opinions did not change. His opinion was thoughtful thought out, based on the amount of info he was given. He identifies that the authors took a straight forward thinking process and chose to take a non biased side when presenting their article. He analyzed how reading the non biased article effected his opinion.	Metacognition: 2 I rated them a 2 because they are respectful to all points of view and did not dismiss any arguments. He, in my opinion, did not have a disrespectful tone when discussing the article, and offered some constructive criticism throughout such as when they were talking about the lack of hyperlinks. It is also evident that they went through the critical thinking process because they went through the good parts and parts that could have been stronger in the article. They were not demanding proof from the authors, but maybe thought that hyperlinks to original quotes and facts would make the article stronger.
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I was concerned that the new rubric with an additional category of descriptors might make the peer scoring more difficult, but overall, students maintained a similar level of scoring and rationales. The scorers agreed on the scoring of all categories except bias, where there was a one point difference. While scorer 2 claimed to see neutrality, scorer 1 saw apathy, which is in the descriptor for bias.

Observing

For the fourth blog post, the student median score was 12 out of 16. This was an improvement of three points from the first blog post and an improvement of one point from blog post 3. The median score for each category was a 3, demonstrating an adept rating in each (see Figure 4.5 on the next page).

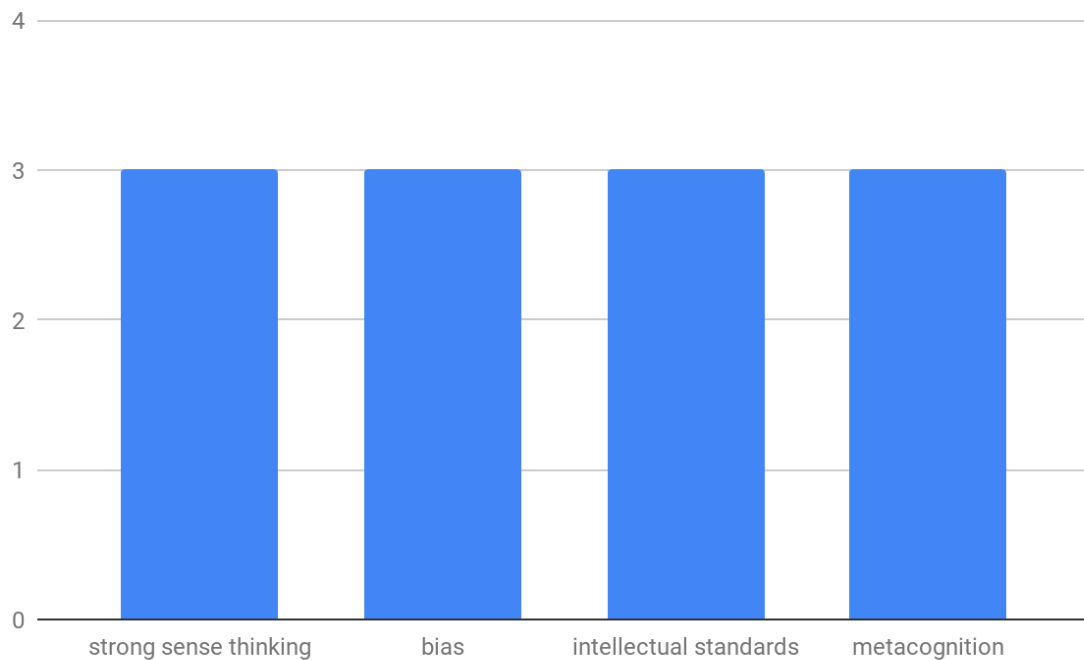


Figure 4.5 Median student scores for blog post 4

Coding: blog post four. The last set of blog posts was treated in the same way as the previous sets, reflecting the iterative and systematic nature of this action research. Each student post was read and coded multiple times until there was nothing new to be gained from the process.

The category of metacognition had been the most difficult for the students to demonstrate, but the final blog post had some strong examples that fit the descriptor for adept. This required that students demonstrate an awareness of their own thinking process, and potentially how it affects the conclusions that the student draws. One example came from Becket, who wrote: “I found myself agreeing with much of the data and opinions. My personal beliefs align with the writer’s that tariffs hurt the economy more than they benefit it. It came as a pleasant surprise that I agreed with the author of the unofficial opinion section of the article, given that NPR skews liberal more often than

not. As a broad rule, I don't usually expect to fully agree on something, so it was an interesting experience." In this section of his post, the student considers his own beliefs and bias and was able to consider how the data was presented, rather than immediately dismissing it because it came from a source that doesn't align with his personal views. Another student, Flynn, demonstrated metacognition by writing, "When I first read the title, I thought I was going to read a hard hitting piece about something wrong that Trump did. After reading the article, I had to step away from my bias and acknowledge that the piece is entirely superfluous and picks apart a tweet that does not seem as serious as the title makes it seem." Here, the student makes a realization about her own bias by thinking about her expectations of the piece, which demonstrates an attempt to think deeply.

Post-assessment

After a pre-assessment and four cycles of intervention to improve student critical thinking by focusing on fairmindedness and metacognition, the final performative assessment was the post-assessment. The post-assessment was designed to mirror the pre-assessment in order to demonstrate process and democratic validity. The date for the post-assessment was May 20, 2019. In the week prior, media sources began reporting on the new SAT adversity rating index which will take into account the hardships in a student's life and create a score that would go along with an SAT score in college admissions (Belkin, 2019; Hartocollis & Harmon, 2019). Much like the pre-assessment, this topic is not political but has a direct impact on their lives.

Student responses. After reading printed handouts of the two articles which had identifying characteristics such as author and publication removed, the students wrote

responses to the same questions as the pre-assessment (see p. 80). Student responses were scored quantitatively on the teacher-created rubric and then qualitatively coded based on the a priori categories from the rubric. Inter-rater reliability was established at 95% using Cohen's Kappa.

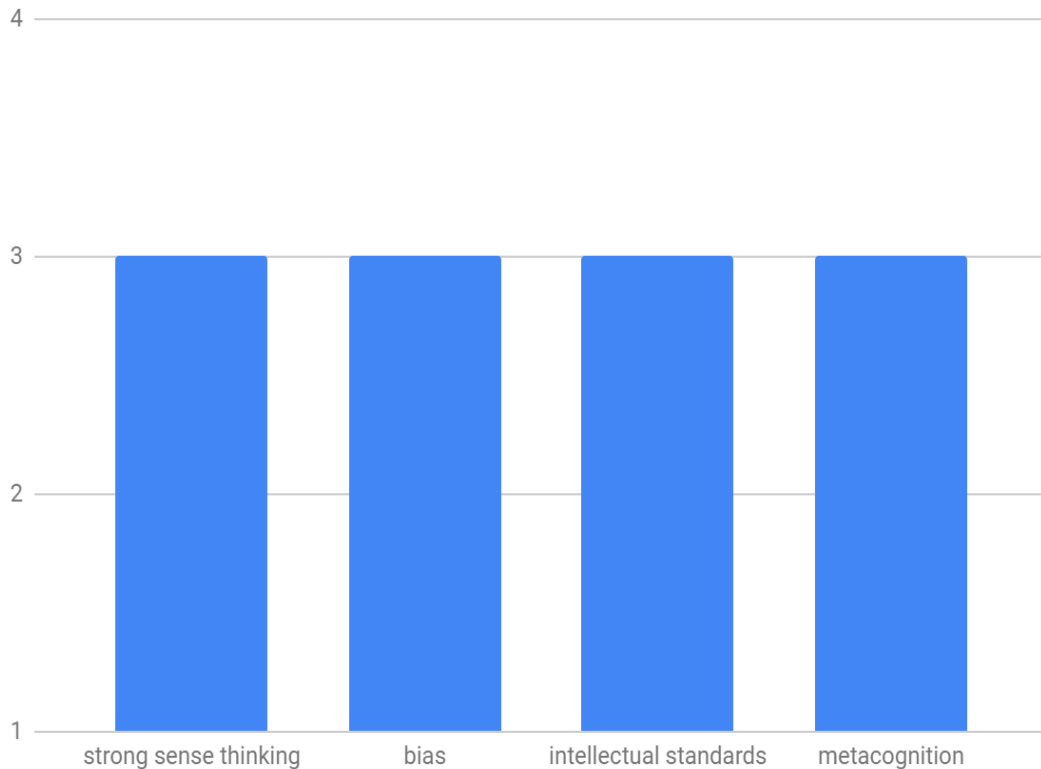


Figure 4.6 Median Student Scores for Post-Assessment

For comparison, on the pre-assessment, the student median score was 7 total points out of sixteen. The individual category median score was 2 points out of four. On the post-assessment, the student median score was 12 points out of sixteen, demonstrating five points of growth over the last four weeks of inquiry cycles. The median category score was a 3 for each of the four categories, demonstrating improvement of one full point in each category, from novice to adept.

Table 4.12 Adept Student Responses on the Post-Assessment

Category	1) Weak vs Strong Sense Thinking	2) Bias	3) Paul's Intellectual Standards	4) Metacognition
Examples of Student Work at the Adept level	“Article A used more conclusive evidence in their description. They used more statistics as well as more quotes from various sources. I feel like article I is simply written better and makes more sense. Article B is based more on opinion and A is more about statistics and fact.”	“Article B used better evidence as it provided quotes and sources that not only supported the tool, but also the counter-argument for why it may not be as useful for solving racial diversity issues.”	Both articles used a lot of evidence to support their prospective positions. Article A was a little shorter than B but it seemed to reference facts and quotes throughout the entire article. All of the information seemed to be relevant to the adversity score itself.”	“My personal views are conflicted. Racial diversity is good, but the point of racial diversity is to enroll students from various social and economic backgrounds that enrich the culture and atmosphere of a campus.”

The student responses in the post-assessment are longer and more detailed than the responses from the pre-assessment. Overall, they demonstrated the criteria for the adept level more consistently on this writing assignment than on any of the previous ones. The student response in category 1, Weak vs. Strong Sense Thinking, shows a consideration of other perspectives and does not show a need to be right, which is why it was scored as adept. Category 2, Bias, is also rated as adept because the student addresses a preference for the article that presents a counter-argument, showing a control of personal bias and reflecting on multiple points of view. The final category, Metacognition, meets the criteria for an adept response because the student demonstrates an awareness of her own thinking and does not hide the fact that she is conflicted about

the viewpoints presented in the two articles. These student examples demonstrate a marked improvement in the quality of their thinking from the first assessment six weeks ago.

Reflecting

At the end of the third cycle, my most significant takeaway was regarding the revised student rubric. I was so impressed with the way the students tackled the process and then came together to completely restructure how the rubric worked. The students were proud of themselves as well. One student wrote, “I think the format change really shows our complex understanding that we have about the different aspects of each category. I think we changed from trying to apply it during arguments to applying it to ourselves in everyday lives, and I think that's something we'll all be better off by. Richard Paul would be proud of us!” It would not have been possible for the students to have created this type of rubric during cycle one because they had not practiced the critical thinking skills required to do so. However, after four weeks of intervention, weekly Socratic Seminars, multiple performance assessments and other student-created documents, they had a framework for understanding fairmindedness and had developed the metacognition to realize the type of improvements that would make the rubric better. That was my proudest moment of this process.

Discussion of Findings

This section will be organized by research question and will discuss how the data collected during this action research provides a reasonable basis for the resulting findings. The data sources are broken into two major categories: student artifacts and teacher artifacts. The student artifacts occurred in the form of class discussion utterances,

student-generated rubrics, blog posts, blog scoring rationales, and written reflections. Teacher artifacts include the teacher-created rubric, blog post scoring, and comprehensive coding of the student artifacts. The triangulation of these data sources provided valuable insight in affirming the results of this research and answering the two research questions.

Research Question One. Regarding research question one, the data indicates that through direct and collaborative instruction, students can develop fairmindedness and this enhances their critical thinking skills. The multiple data sources support this finding and the analysis of the data sources provides a roadmap to their improvement through the three cycles of inquiry.

The data collected from student discussions served as the best representation of their growth in critical thinking skills as a result of a hybrid model of direct and collaborative instruction, and it is reinforced by acknowledging the improvement in their blog posts. As students read more from Paul and Elder (2012), their knowledge about this approach to fairmindedness grew and they became more comfortable with the framework.

One realization I made upon reviewing the transcripts from the student discussions is that over the course of the cycles, I spoke less and the students spoke more and for longer periods of time. At the beginning of this process, I spoke more frequently to ask and answer questions or to redirect the discussion and keep it on topic. By the last class discussion, however, I spoke very little and the students spoke to each other, asked questions, and led the discussion much more naturally than at the beginning of the intervention.

In the audio recording from March 27, on the first day of this intervention, I examined a four minute clip of discussion. In those four minutes, students spoke for 65% of the time while I spoke 35% of the time. On April 8, the students spoke 68% of the time while I spoke 32% of the time, which shows a minor change. However, by April 27, the students spoke 74% of the time and I spoke 26% of the time. By May 3, our final class conversation, a four minute clip revealed that the students spoke 80% of the time and I spoke 20% of the time. This demonstrates a 15% shift in recorded student utterances.

The coding process was exhaustive and exhausting, but also revealing. I established a priori codes the moment I completed the teacher-generated rubric, and those categories revealed some interesting thoughts from the students. The difference between the pre-assessment and post-assessment student artifacts revealed a five point median increase from the teacher rubric, but the quantitative data only tells half of the story. The qualitative data that came from the coding showed that students had a much deeper understanding of these terms, revealed specifically through their frequency and elaboration. On the pre-assessment, the fifteen participants wrote a total of 1759 words for an average of about 117 words per person. The post-assessment, which was identical in structure and timing to the pre-assessment, resulted in 3550 total words from the class. The average per student was about 237 words each, which is just more than double the pre-assessment. While length is not a desired outcome in and of itself, it reveals an ability to write with more specificity and detail on a very similar topic after four weeks of intervention.

Research Question Two. The second research question is answered by evaluating student artifacts such as their blog posts and peer scoring rationales, and to a lesser degree, their class discussions and reflections. These data sources support the claim that performance assessments contribute to the development of metacognition in gifted high school students.

The theme of metacognition was one of the categories in both the student-generated and the teacher-created rubric, so the students were aware that it was a goal of this unit. The quantitative data collected from the teacher rubric shows that it was the last category to see improvement, as the median class score rose in week four from the descriptor of novice to adept. This data that was collected over the course of the four weeks of intervention serves to support the affirmation that performance assessments can improve student metacognition.

Multiple data sources were qualitatively coded for metacognition, including the pre- and post-assessments, blog posts, class discussions, and reflections. The improvement in metacognition was slow but seemed to change significantly during week four, which was after the student-generated rubric was revised. The process of revising the rubric in small groups and then as a large group demonstrated metacognition in action, as students had to discuss what changes they would make to the rubric and why. Students described the process as “very valuable” and one said, “It is beneficial for us to revise the rubric because nothing is perfect and if we can come up with better standards when applying it to our life, we can become more fair minded individuals.” These comments demonstrate the value of the activity on their thought process. Improving the rubric itself was a form of performance assessment, as the two processes

gave the students an opportunity to create original work, learn more about the topic, and then re-examine their original work and make substantive changes.

This chart was the most exciting moment of the data collection process. This suggested a significant shift in the students' thinking process and demonstrated that their core critical thinking skills were improving through a focus on fairmindedness and metacognition. This was supported through their written reflections on the rubric revision process. Their responses were analyzed using a priori codes for improvement and metacognition, with emergent coding for further refinements. The first category of coding, improvement, were identified when students specifically commented on the improvements made between the first rubric and the second: "I think this process was important because it allowed us to comprehend the flaws in the original design. We had more depth of knowledge going into the redesign of the rubric." Another significant category was metacognition, demonstrated through comments like, "I also think the format change really shows our complex understanding that we have about the different aspects of each category. I think we changed from trying to apply it during arguments to applying it to ourselves in everyday lives, and I think that's something we'll all be better off by." There were a few students who felt that the new rubric needed continued refinement, especially as it would relate to grades: "The only thing I don't like about this style is that its very all or nothing. You either get a 33, 66, or a 100. If you do not achieve that 2 rating by even the smallest amount you are put at almost failure." Grading was never the point of the rubric, but this indicates how much pressure students put on themselves to be seen as successful in the teacher gradebook. However, most student reflections focused on how much they appreciated the revision process and the

transformation that the rubric underwent to be more reflective of the critical thinking standards.

Summary

This study sought to understand the following concepts: how do direct and collaborative instruction and performance assessments in fairmindedness and metacognition affect the development of critical thinking skills in gifted high school students? By implementing a concurrent quantitative and qualitative mixed methods action research study design (Ivankova, 2015), data was gathered over the course of six weeks and three cycles of intervention based on an action research methodology that was cyclical and iterative. The steps for each cycle included planning, acting, observing, and reflecting (Herr & Anderson, 2015).

Based on this study, the data indicates that a hybrid model of direct and collaborative instruction in fairmindedness can improve the critical thinking skills of gifted high school students. This was supported through the collection of student artifacts, specifically class discussions but also written responses and reflections. Additionally, the data affirmed that performance assessments can be used to show improvements in student metacognition, which is another important element of critical thinking. Based on a teacher-created rubric, students demonstrated a median improvement of one point on a four point scale in the category of fairmindedness from the beginning to the end of this data collection. Exhaustive coding of qualitative data was done to support and explain the quantitative results.

This chapter has served to illustrate the findings from the proposed research questions that inform this action research. I followed an action research process of

planning, acting, observing, and reflecting during the iterative cycles of this study, and I will continue that process in the next chapter. Chapter five will provide a discussion of this study's limitations, thoughts on equity, and implications for further research.

CHAPTER 5

REFLECTIONS AND IMPLICATIONS FOR FUTURE RESEARCH

The purpose of the study was to identify effective instructional practices for developing critical thinking among high school gifted students. The study was conducted over a period of six weeks in the spring of 2019 and involved a combination of direct and collaborative instructional strategies with a curricular focus on fairmindedness and metacognition. In my unique position as the director of a small in-house program designed to challenge our high school gifted learners, I had the opportunity to create an honors elective seminar for these students. The course is rooted in project-based learning in order to allow students to pursue their personal interests, but it also allows for student choice in terms of what we study as a whole class. When polled at the beginning of the semester regarding what topics we should cover, one common theme was how to debate fairly and considering multiple sides of an argument. These fit well with both our prior year's introduction to metacognition and with my goal of teaching a framework for critical thinking as a way to enrich these gifted students.

Critical thinking is a phrase that is frequently used but rarely defined or explained. As educators, we hear that critical thinking skills are important. They help with college and career readiness (Conley, 2008), that k-12 students should be more familiar with them and that college students don't have a firm grasp on them (Arum &

Roksa, 2011), but also that they are important to employers (AACU, 2013), lead to more positive life outcomes (Franco & Almeida, 2015), and contribute to a stronger democratic society through citizenship (Gormley, 2017). Despite all of this, a framework for applying critical thinking skills is not usually taught in k-12 education for a variety of reasons (Wright, 2002). Teachers have content and high stakes tests to prioritize (Ku, 2009; Smith & Szymanski, 2013), they might not feel confident teaching such a broad concept (Stedman & Adams, 2012), and some have argued that public education is simply not interested in creating independent critical thinkers (David, 2018).

Recognizing these aspects of instruction and student learning related to critical thinking, I developed a hybrid instructional approach that integrated direct instruction into my facilitation of collaborative learning. The following research questions were developed to guide this study:

1. How does a hybrid model of direct and collaborative instruction in fairmindedness impact gifted high school students' critical thinking skills?
2. What aspects of performance assessment have a noticeable impact on metacognition?

Student progress was assessed based on a pre-/post-assessment model with four weeks of intervention. The key text for our study was the chapter "Become a Fairminded Thinker" by Paul and Elder (2012), and the construct for critical thinking was based on the definition and terms from that text. Students were randomly assigned an online media source that served as the basis for their four weeks of intervention. Each week, we discussed a major news story as a class and then the students selected one article from

their source to read and analyze for fairmindedness. Students were also assessed by each other on fairmindedness and metacognition.

I collected multiple types of data, both qualitative and quantitative. I created a rubric that served as the foundation for the entire project and that measured the categories of weak sense thinking, bias, Paul's intellectual standards, and metacognition. This rubric, however, was kept private from the students and was used by me for quantitative and qualitative analysis. The students created their own rubric for scoring each other on their weekly blog posts, which they completed along with providing a rationale for their scores.

As evidenced through the data collection and analysis in chapter 4, the students targeted for this research demonstrated improvement in both metacognition and fairmindedness as through the critical thinking curriculum and the hybrid instructional approach. These improvements were demonstrated through their written performance assessments and in their recorded class discussions.

In the remainder of this chapter, I will reflect on the key findings that were presented in chapter 4, as well as the use and importance of action research as a framework for developing interventions as a practitioner. I will also reflect on the limitations of this research in terms of the challenges I faced during intervention and data collection. Finally, I will discuss the plan for implementing this unit again in the future now that I have completed it once and know better what to anticipate in the future, particularly relative to the utility of the hybrid instructional approach.

Metacognition and Critical Thinking: The Impact of Curriculum and Instruction

On the first day back to school in the fall, one of my students from the program came up to me and said, “I just wanted to tell you that I’m so glad we did that critical thinking unit! My summer reading book was so biased, but I wouldn’t have noticed it if we had not done all of that work analyzing fairmindedness. So thank you.” Hearing that this student was able to apply what we had learned during the unit solidified my belief that it was an effective intervention in making students more critical thinkers. This provided evidence that the impact of the critical thinking curriculum I implemented was positive and the instructional approaches used were effective.

While a few media sources have always and will continue to be exploitative and even false, contemporary American culture is engaged in an “age of fake news” that is currently under intense scrutiny (Eberhart, 2019), even in regarding how to distinguish different types. Molina, Sundar, Le, and Lee (2019) published a journal article that explicated the multiple types of misleading or controversial tactics that fall under the broadening umbrella of “fake news.” One outcome goal of this action research was to expose students to the techniques that are employed by sources practicing disingenuous journalism and, by thinking fairmindedly, to encourage them to evaluate their media consumption more critically.

This research was conducted in pursuit of a terminal degree in curriculum and instruction, and upon reflection, these two terms form the invisible foundation of this work. Curriculum is a blueprint for providing learning experiences (Egan, 1978). More specifically, it is a program of studies designed to enhance the learning experience by designating particular courses taken in a certain pattern, and it can be a unit, a course, or a

program of study (Oliva & Gordon, 2013). Instruction details the methods used to convey those learning experiences to the student (Oliva & Gordon, 2013). The early courses that I took in this degree program helped to provide the understanding necessary to create an action research proposal which investigated the impact of a critical thinking curriculum and a hybrid instructional approach for gifted learners.

In chapter 2, I reviewed the literature on the ways in which critical thinking skills can be embedded, taught, and assessed in the classroom. Research conducted by Ku, Ho, Hau, and Lai (2014) and Marin and Halpern (2011) demonstrate the improvement that occurs when students are given indirect and direct instruction regarding a framework for critical thinking, with direct instruction showing the greatest gains for student understanding. That provided the basis for my own intervention, which involved a hybrid instructional approach that integrated direct instruction with collaborative learning strategies in order to facilitate the ambitious framework for critical thinking developed by Paul and Elder (2012). It centered on fairmindedness as the key curricular concept, along with metacognition as a necessary component of critical thinking growth (Halpern, 1998; Magno, 2010).

In chapter four, I presented the data from my research study which showed that students were able to show improvement in their critical thinking, particularly fairmindedness and metacognition, after using a hybrid model of direct and collaborative instruction. Additionally, the students completed performance assessments which showed a demonstrable impact on metacognition, specifically through their blog posts over a four week period and through the pre- and post-assessments given six weeks apart. All of the student-generated writing was assessed using the teacher-created rubric, which

served as a common factor to measure their growth before, during, and after the intervention.

From the pre-assessment, students demonstrated some understanding of the rubric elements, but it was not shown at a competent or sophisticated level. This is clear from the composite score of 7 points earned out of sixteen on the rubric. Throughout the intervention, students read sections from Paul and Elder's chapter, "Become a Fairminded Thinker" (2012) each week for a period of four weeks. Additionally, they wrote a detailed blog post based on a recent major news story from their randomly assigned media source. These blogs were scored by me using the teacher-generated rubric as well as by the students themselves, who used a student-created common rubric based on the critical thinking elements of perspective, factual reasoning, bias, and metacognition. Over the course of the four week intervention, student rubric scores grew from a composite of 9 points to a final composite score of 12 points out of sixteen. On the post-assessment, students scored 12 points out of sixteen, which represents five points of growth throughout the six week action research study.

Over the course of the study, students demonstrated a growth in comfort with the critical thinking framework by increasingly using the terminology and concepts from Paul and Elder (2012). This was demonstrated through the increase in identified terms that fit into the qualitative coding process. The chapter contains vocabulary specific to their model for critical thinking and particularly for the construct of fairmindedness. As we dove deeper into the chapter and applied the framework to the performance assessments, students became more comfortable with using the terminology and using it correctly. Students developed a more nuanced understanding of bias, where it appears,

and how it can influence an audience, and this was shown through their improvement in metacognition.

Throughout the research, students were empowered to speak more in our weekly Socratic Seminars about the readings. Each week, the students read a selection from the chapter and then we discussed how that impacted their evolving thoughts on fairmindedness. These discussions were structured to begin as direct instruction and shift into collaborative learning. One result that I wasn't looking for appeared after a thorough examination of the data. I noticed that in the transcripts, students began speaking more than I did. I did a quantitative analysis of the number of times the students spoke in the four weekly Socratic Seminars and, from the first discussion to the last, calculated a 15% increase in the number of times they spoke as compared to the number of times I spoke. This finding was not one I expected, but demonstrated their growth in confidence on the subject matter and in their ability to participate meaningfully in a class discussion. This is further discussed in the following section on action research and reflection.

These findings are significant to this action research as they answer the research questions I set out to address. The goal of any research is to benefit not only the researcher, but to contribute to a larger body of research for the benefit of others as well. To this end, I have considered the transferability of this action research which asks, to what extent can the findings of this study be applied to other situations (Merriam & Tisdell, 2016)? While these results may not be generalizable in a statistical sense, they are important to this research because of the purposeful sample and the depth of understanding that resulted in making me a better, more responsive practitioner. I also hope that the conditions described in this study encourage another educator to consider

the benefits of teaching a critical thinking framework to her students as a way to deepen understanding of fairmindedness and metacognition.

As someone deeply invested in the creation, development, and application of curriculum and instructional strategies that will positively impact all learners, I am pleased to point to this research as an example of the benefits of teaching a critical thinking framework at the secondary level. While the target population for this research was high school gifted learners, the benefits gained from a hybrid approach of direct and collaborative instruction can be reaped from students at all levels. Ultimately, most educators want to produce students who are ready to tackle the challenges of college, career, and civic life (Gormley, 2017). This unit contributes to those stages by engaging students in the type of thinking that will make them more prepared for college level critical thinking (Conley, 2008), more flexible in the type of thinking that is valuable to employers (AACU, 2013), and good citizens who value a well-functioning democracy (Gormley, 2017).

Action Research: The Power of Reflective Practice

Action research was selected as the research design for this study for several reasons, but a primary reason is its cyclical, iterative nature (Herr & Anderson, 2015). Action research requires a researcher who is willing to work collaboratively with the participants, and the researcher's knowledge of the participants helps to define the problem of practice (Efron & Ravid, 2013). The specific design for this study was a concurrent qualitative and quantitative mixed methods action research study design (Ivankova, 2015), which collected both qualitative and quantitative data, analyzed them

separately, and then merged the two data sources to see if their results supported each other.

Further reflection on the results, particularly those that I did not plan for, led me to think more deeply about the hybrid instructional model I used. This reflection is a necessary part of the action research cycle, which reinforces its iterative, adaptive nature (Herr & Anderson, 2015). When I began this process, I found research that favored the use of a direct instructional approach when teaching a critical thinking framework (Marin & Halpern, 2011; Ku et al., 2014). My approach, particularly with this population of gifted learners, has been rooted in project-based and collaborative learning, encouraging students to create meaning for themselves (Dillenbourg, 1999). I believe that good teaching is based on a combination of research, teacher's experience, and knowledge of their students, and that is what I used when planning this research. I also took into account the literature that recommended direct instruction for this type of work, which is heavily conceptual in nature, in planning my approach, which resulted in a hybrid approach of direct instruction and collaborative learning.

As I progressed through the unit with the students, I did not notice until after the unit was complete that as the weeks went on, the students became more confident in their use of the framework. I did not plan for or expect this result, but it was demonstrated in the increase in the number of times the students spoke versus me in our recorded class sessions, resulting in a 15% increase from week 1 to week 4. What this means to me now, six months after the conclusion of the research study, is that the use of direct instruction acted as a scaffold to support the students while they developed confidence with the framework. Even though the use of direct instruction was intentional, the

students relied on it less over time, and I naturally pulled back on the direct instruction to allow for their growth. I believe that the use of direct instruction remains an important feature of this research. However, given the importance of collaborative learning, I have recognized that I can reduce the need for direct instruction as the students become more capable, and that is an ideal outcome for an educator.

Ultimately, the research demonstrated three types of quality criteria: outcome validity, democratic validity, and catalytic validity (Herr & Anderson, 2015). Outcome validity is present when the problem of practice is addressed by the actions taken during research (Herr & Anderson, 2015). Given that I wanted to investigate effective methods for teaching metacognition and fairmindedness to gifted high school students and that my results show improvement in both constructs, these criteria were met. Democratic validity considers the relationship between the researcher-practitioner, the participants, and the problem. I researched a concern specific to this group of gifted high school students for two reasons: 1) they specifically asked for it, and 2) it reflected a problem I had noticed in the literature. I also used tools like Socratic Seminar and student artifacts to represent their authentic voices in the data collection process, thereby accurately representing multiple perspectives. Finally, catalytic validity is demonstrated through a transformation that occurs as a result of the research. Throughout the process, the students and I engaged in a process of learning and reflection that resulted in an improvement in critical thinking skills, specifically in fairmindedness and metacognition.

Limitations

This action research study contains limitations that should be evaluated and considered prior to further implementation. Limitations are the potential weaknesses of the study as identified by me as the researcher (Creswell, 2012). The dominant limitation to this study centers around confirmation bias, which is the phenomenon of seeking out evidence or interpreting it in such a way that it supports previously held conclusions or beliefs (Nickerson, 1998). Given that I was working with a population of gifted students, this result does not surprise me, but certainly will make me more cautious when I teach this unit in the future.

It's important to note that while this type of critical thinking instruction has been supported by research for post-secondary learners (Ku et al., 2014; Marin & Halpern, 2010), this particular action research was created for and conducted with gifted high school learners within an elective course. These two components are significant to the data collection and research findings, as well as to any further applications. The students in this cohort program have all been identified as gifted by the state and the program was created specifically to provide additional academic enrichment for high-achieving gifted students at the high school level. The National Gifted Programming Standards (Kettler, 2014) acknowledge instruction in critical thinking as an evidence-based practice that will further enrich gifted learners, and my findings support that perspective. However, any teachers wanting to use a research-backed critical thinking curriculum may need to make adjustments to this plan prior to implementation. I was able to devote six weeks of class time to this research because it is an elective course, and most teachers will not have that kind of time in a content-based course. Properly scaffolding and integrating a critical

thinking framework into an academic course would be a necessary component of applying this research to other educational contexts.

The students were highly interested in the topic, having requested a specific unit on how to be more fair in political and other opinion-based discussions. They actively engaged in the process and respectfully pushed back in Socratic Seminar, following and using the tools from Paul and Elder (2012). However, on more than one occasion, I witnessed the students having conversations that were not part of an official class discussion and they seemed to fall back into old habits. In these spontaneous discussions, which I observed three times over the course of the unit, the students would use weak sense thinking (Paul and Elder, 2012) in that they failed to genuinely consider different perspectives and the speaker seemed more concerned with being right than with understanding. This showed me that some students were able to turn fairmindedness off and on, like a switch. They instantly considered the context and the audience for a given situation and then employed the most expedient tactics for success. When I was actively listening, the students clearly practiced elements of fairmindedness and metacognition. However, they had difficulty carrying that over into personal conversations. One explanation for this could be confirmation bias, because the students told me what they knew I wanted to hear. However, it could also be that they simply needed more practice in applying the framework for critical thinking and when they were not being specifically guided, they fell back into old habits.

The Action Research Cycle Continues

The final stage of action research is reflecting with intention regarding future planning and further action (Herr & Anderson, 2015). As the program director for these

students, I intend to implement this action research in the sophomore year of the program for future cohorts. This provides context and immediacy to this implementation plan. Having completed this cycle once, I have a better understanding of what I would like to do in the future and the changes I would like to make. In the following section, I will highlight these changes, the reasons for making them, and the expected differences in outcomes.

The next time I use this unit, I would like to change how the unit is introduced. When I began it as described in chapter 4, I introduced the main concepts by asking the students to think about what is fair, and then I made the leap to fairmindedness. I think that was a mistake on my part, because fairness and fairmindedness are similar but different. The way in which a new topic or unit is introduced to students can have an impact on its overall success (Lynch & Warner, 2008), and good teachers reflect on how their lessons are structured and consider methods of improvement for the future (Johnson, 2000). I think the topic would be better served if I were to begin with students considering their own biases. High school students are less aware of their biases and are more likely to act on them without intervention (Babad, Peer, & Hobbs, 2012). One of the most difficult parts of this unit was getting students to confront their own perspectives and I think that it may be more effective if the study begins by not confusing fairness and fairmindedness but by asking them to think about ways in which they let bias affect them.

Another change I would make would be to have students select their media source differently. Student autonomy has been associated with higher levels of intrinsic motivation and academic performance (Brooks & Young, 2011). I had been concerned

with a randomized selection when pairing students with their sources, but I think it might have been more effective to have students investigate a source that they do not believe to be accurate or fair. While some of the students randomly got sources that prompted them to consider bias, other students received sources that they implicitly trusted because either they or their parents relied on that source for information in the past. If I had the students list 3-5 sources that they go to for news and 3-5 sources that they don't trust to be accurate, that might have created a more interesting dynamic in encouraging students to investigate fairmindedness as it applies to online media sources. This also could have added another collaborative learning opportunity by getting students to generate the initial list of media sources.

Conclusion

The primary result of this action research study has been to give me an opportunity to become a more reflective practitioner. In addition to guiding students through the practice of fairmindedness and metacognition, I had to consider my own perspective and biases in terms of what I value and how I process information. It was difficult to ask teenagers to engage in a task at this level of intellectual complexity without first fully thinking through it myself. I realize that I have students who are more fairminded than I will ever be, and that there are students who are not developmentally ready to consider bias, despite their status as gifted learners. Ultimately, however, I engaged in this research in order to make sure I was preparing this group of students to be as ready for college, career, and civic life as well as I possibly could. These students are very smart, but many of them are first generation college students and I want them to be

ready for the challenges of college-level critical thinking, and I believe that this research demonstrates that they will be.

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APPENDIX A: TEACHER CREATED RUBRIC

	Not Met	Novice	Adept	Exceeding
<u>Weak vs. strong sense thinking</u> ¹ (Paul, pp. 2-4)	Student demonstrates “weak sense thinking” (Paul, p. 2) and argues only to win, not what’s fair.	Student uses both weak and strong sense thinking skills and seems more concerned with being right than with learning or being fair.	Student uses mostly strong sense thinking skills (is ethical, considers other perspectives, and are willing to change) and does not demonstrate a need to be right.	Student uses strong sense thinking skills and incorporates the perspectives of others in their own thinking; shows a clear preference for being fair.
<u>Bias</u> ² (Paul, p. 6)	Student shows demonstrable bias and no attempt to counter that bias with any other points of view.	Student shows bias but also attempts to counter their bias with other points of view, though unsuccessfully or superficially. Student tries to rationalize bias.	Student demonstrates control of personal bias and an honest attempt to demonstrate multiple points of	Student “considers all relevant viewpoints equally, without reference to one’s own feelings or selfish

¹ “We call the thinking “weak” because, although it is working well for the thinker in some respects, it is missing certain important, higher-level skills and values of critical thinking. Most significantly, it fails to consider, in good faith, viewpoints that contradict its own viewpoint. It lacks fairmindedness” (Paul, p. 2).

² “Strong-sense critical thinkers are not easily tricked by slick argumentation, by sophistry and intellectual trickery. The striking characteristic of strong-sense critical thinkers is their consistent pursuit of the fair and just. These thinkers strive always to be ethical—to behave in ways that do not exploit or otherwise harm others. They work to empathize with the viewpoints of others. They are willing to listen to arguments they do not necessarily hold. They change their views when faced with better reasoning. Rather than using their thinking to manipulate others and to hide from the truth (in a weak-sense way), they use thinking in an ethical, reasonable manner” (Paul, p. 3).

			view with some depth.	interests...it implies adherence to intellectual standards” (p. 6).
<u>Paul’s intellectual standards</u>	Student demonstrates none of the intellectual standards (humility, courage, integrity, empathy, perseverance, confidence in reason, autonomy).	Student demonstrates an attempt at a few intellectual standards, but also demonstrates some of the opposites (hypocrisy, arrogance, unfairness, laziness, disregard for justice, distrust of reason, cowardice, self-centeredness, conformity).	Student demonstrates success in some intellectual standards and is mostly successful in eliminating their opposites, though there may be some vestiges remaining.	Student demonstrates success in most of the intellectual standards and has successfully avoided their opposites.
<u>Metacognition</u> ³	Student demonstrates no awareness of his/her own thinking.	Student demonstrates an attempt to understand his/her own thinking, but it is superficial.	Student demonstrates awareness of his/her own thinking process and attempts to think deeply.	Student clearly demonstrates awareness of his/her own thinking process and demonstrates an understanding of how it affects conclusions.

³ “Students who have higher levels of self-efficacy (more confidence in their ability to achieve their goals) are more likely to engage in metacognition and, in turn, are more likely to perform at higher levels. This strongly indicates a positive feedback loop for high-achieving students—they are more successful by using metacognitive strategies, which increases their confidence and in turn leads them to continue to increase their performance. Metacognition is an integral part of this virtuous learning cycle, and one that is *amenable to further improvement through instruction*” (Fadel, Trilling, & Bialik, 2016, emphasis added).

APPENDIX B: WHOLE CLASS-GENERATED RUBRIC, VERSION 1

	Not Met	Novice	Adept	Exceeding
Perspective	Immediate dismissal of other viewpoints and demonstrates an unwillingness to change.	Hears and tries to understand, but does not validate other perspectives.	Hears and understands other viewpoints but remains unchanged by them.	Listens and understands multiple perspectives and incorporates them into their own beliefs.
Factual Reasoning	Opinions and reasonings have no factual proof. Does not recognize logical fallacies.	Uses unreliable sources to formulate reasoning. Twists the facts to fit the argument. Arguments stem from a strictly moral/ethical place.	Opinions and reasonings use reliable and relevant sources. Attempts to include ethics and morals.	Opinions and reasons are based on reliable and relevant sources. Includes ethics and morals in reasoning.
Bias	Unaware of biases and refuses to acknowledge the bias.	Acknowledges bias, but is not willing to change their stance.	Acknowledges a bias, and accepts that it does not make you right because other arguments might be valid.	Can put the bias aside for a discussion. An outsider could not perceive bias.

Metacognition	Interrupts to further their own argument and is only arguing to win. Does not demonstrate consideration of a thinking process.	Examines the thinking of others' but does not demonstrate their own thinking process.	Uses more logical reasoning and asks more complex questions. Occasionally demonstrates a thinking process to self and others.	Demonstrates a thinking process and respectfully considers the thinking of others.
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APPENDIX C: STUDENT-CREATED RUBRIC, VERSION 2

	L/0	L/1	2	R/1	R/0
Perspective	Immediate dismissal of other POV; demonstrating stubbornness and sophistry	Attempts/ begins to present understanding of multiple POV but ultimately works to disapprove rather than understanding	Listens and understands multiple perspectives and acknowledges that other POV might be just as valid and correct as their own	Attempts to form personal views but lacks intellectual integrity and perseverance and ultimately relies on other POV's	Easily influenced by other POV's and doesn't practice intellectual autonomy or perseverance
Factual Reasoning	Threatened by and rejects factual reasoning that undermines/ opposes their own argument; refuses to recognize some facts as established; logical fallacies not considered	Sources are cherry picked to fit personal argument; not threatened by, but does not believe other sources	Opinions and reasons are based on reliable and relevant sources, including ethics and morals in reasoning; practices confidence in reason	Uses some facts to support argument, but still based on emotional reaction; Morals serve as only foundation	Refuses to examine basis for personal beliefs and emotions are the sole basis for arguments; facts are irrelevant
Bias	Thinks their opinion lacks bias, refuses to consider how bias might affect position	Acknowledges personal bias but sees it as validation of their argument.	Can put bias aside for argument and/or has been considered through critical thinking skills	Has selective bias but doesn't acknowledge it and ultimately is apathetic.	Lacks bias entirely and does not care or practice intellectual empathy for other points of view.

Meta-cognition	Does not practice any intellectual humility. This person does not care how conclusions are reached and believe they are always right and refuses to examine process.	Demands intellectual integrity/ proof of metacognition from others but not oneself.	Demonstrates an intellectual courage is point of view and respectfully considers the thinking of others and is able to articulate thinking process uses.	Demonstrates natural and critical thinking but doesn't value or apply meta-cognition.	Only demonstrates natural/ impulsive thinking; demeans critical thinking process.
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APPENDIX D: RESEARCHER JOURNALS

3/26/2019

Pre-assessment reflection: I am going to begin my research tomorrow! I am very nervous but also excited to start this process that will take place over the next six weeks.

Regarding question 1, the lesson goals for the pre-assessment are to determine how students evaluate fairmindedness when given a news topic. I am giving them two articles on the recent college admissions scandal and I'm interested to see what they think and how they react. I'm taking all identifiers off of the articles (no publisher or author) so as to limit presumptions based on those elements. They will read the articles, write a brief reflection, and then we will have a class discussion, which I will record. After that, students will break into groups to create a rubric that defines three major components of fairmindedness AND will address metacognition. The rubric must have at least three steps for novice, developing, and mastery. Then we will compare student rubrics and work on one master rubric for the class. We will revisit it each week as we learn more about the topic.

How will they react? First of all, I'm worried about going back into CLASS mode after eight weeks of podcast creation, which is what the first part of our course focused on. Students have been in small groups, being creative and responsible for themselves for a long time. Bringing them back together as a cohesive unit may be difficult. However, beyond that fear, I think it will be good. This group of students is passionate and particularly interested in fairness. I think the focus on evidence and argument will be appreciated and thought-provoking for them. Whether it actually changes or informs their positions at all remains to be seen.

3/27/2019

I just completed day 1 of the introduction to the new unit and we are partially through the pre-assessment. Students discussed the difference between fairness, equality, and equity and then I asked if there were any issues with fairness in the news. They immediately brought up the recent college admissions scandal (March 2019), in which a federal operation called "Varsity Blues" identified over 50 people who allegedly paid for services that would help their children get into the colleges of their choice. The services included test taking/corrections and student athlete fraud. I selected two articles, one from the *Washington Post* and one from *The Atlantic* that both talked about the college admissions scandal relative to standardized testing. The students read both articles and wrote a brief, objective summary of each article. Then we had a whole class discussion on the counterarguments, evidence, and bias present in each article. The students assumed that article 1 was more left-leaning and article 2 was more center-right, which was accurate. Their reasoning was interesting, too: they said article 1 was focused more

on equality and tearing down the system while article 2 focused more on what the system gets right and how to fix it by working within the system. Tomorrow, we will work on creating a rubric for fairmindedness!

3/28/2019

We had some great conversations today even though we didn't get to the rubric. We reviewed what we talked about yesterday and I asked students, "What is fair?" I got a variety of different answers and while some were frustrated with the question, some created their own meaning, which is what I wanted. We read the first 6 pages of Paul's chapter "Become a Fairminded Thinker" and that generated some excellent discussion about hypocrisy, sophistry, and metacognition.

3/29/2019

Today was almost entirely discussion about being fairminded and how sophistry works. It was a good discussion, even if it got a little repetitive. I'm glad it was recorded because it was a lot to process. I spoke a good bit and tried to keep the students on track, redirecting back to the reading. I think they had good ideas about application, I just want to make sure they have the basic concepts down before we move too far ahead. But the conversation on sophistry as a type of weak sense thinking was powerful.

4/1/2019

Today we FINALLY got to the rubric--kind of. We reviewed fairmindedness, metacognition, sophistry, and weak vs. strong sense thinking. Students are prone to get cynical and some argue that ANYTHING might be sophistry. They also raise a valid point that being fairminded in your argument is only effective if both parties are participating, and we spent a while discussing how to reframe an argument so that you are investigating the other person's point of view rather than just pushing your own.

First, I asked students to create definitions of fairmindedness. In about 15 min, 4 of the 5 groups successfully completed the task and created definitions.

4/2/2019

I gave the students 20 minutes to finish their small group rubric samples. Then we jigsawed so that we had 3 groups of 5 and each person shared the rubric from their group and worked to create a new rubric with input from everyone. We almost finished that activity, but with just a few minutes remaining, I had students randomly select their news source that they will be working with for the next 4-5 weeks! In order to assure randomness, I wrote the sources on notecards and then folded into quarters and stapled the end. I also placed a sticky note over the wording so that no one could see what was written on the card.

4/3/2019

In class today, I gave the students 20 minutes to finish their small group rubrics for fairmindedness and then we spent the next hour working on a whole class rubric that incorporated ideas from all of the groups. The criteria that the students came up with were: perspective, factual reasoning, and bias. The last criteria is metacognition.

Students also created descriptive indicators for each category of development: not met (1), novice (2), approaching (3), and exceeding (4).

4/4/2019

I began by asking students to respond to an activity in Paul's chapter on fairminded thinking (p. 9). The activity is intended to reveal the difference in a class that represents deep vs superficial learning. I asked the students:

1. Name a class from freshman year where you got a high grade.
2. What is the main goal of studying this subject?
3. What are experts in the field trying to accomplish?
4. What kinds of questions do they ask OR what kinds of problems are they trying to solve?
5. What is the most basic (foundational) idea, concept, or theory in this field?
6. How did studying this field change your view of the world?

It was clear that most of them had only done superficial learning in their classes with high grades and they didn't know what experts in the field are trying to accomplish or what the basic concepts in their classes were. They then wrote a short reflection on superficial vs. deep learning. The rest of the class period, they had time to write their first blog posts--an overview of their media source.

April 11, 2019

The first two weeks were a little slow-going, but I think we've got a pattern now. Unfortunately, we are about to go on spring break. That is both a welcome respite and frustrating interruption.

What are the lesson goals regarding fairmindedness and metacognition?

The lesson goals regarding fairmindedness is to assess how the students are using fairmindedness in their blog posts. Today, the students will read two of their peers' blog posts and score them on the fairmindedness rubric they created.

How do I predict the students will react to the information?

I think the students will be a little perplexed at first. They will probably struggle with distinguishing between categories at first. Students tend to go too hard or too easy on their peers when scoring, and I'm interested to see how their scores compare to mine.

April 22, 2019

Coming back from spring break, I wanted to review and remind students of the work we are doing. In order to do that, I compiled all of their peer rubric scores to assess who had commented on which posts. Almost all students had two posts, but one student didn't submit (Oliver Winstonfield) and two students did poor assessments (Bret Davis and Becket Fleet). With that in mind, the students were broken into the following groups:

Tessa Barefoot and Bret Davis: Bandit Edward

Ricky Elrod, Henry Odom and Becket Fleet: Flynn Rider

Elizabeth Chastain, Pepper Freeman, and Marie Schneider: Scout Sowell

Martin Lopez and Flynn Rider: Henry Odom

Charlie Kekauoha and Edward Scruggs: Bret Davis
Bandit Edward and Scout Sowell: Ricky Elrod
(Oliver Winstonfield did not participate)

In their small groups, students were to review and discuss the post they scored and to determine to what degree they agreed on their assessment of performance. Students were reminded that rubric criteria were set based on the expectation that in the categories (not met, novice, adept, exceeding) “adept” establishes meeting the necessary criteria and “exceeding” means the post is exceptional in its presentation of that criteria. I asked them to consider whether they would change any scoring--not necessarily to agree, but what did others see in the post?

Students had 15 minutes to meet in a small group to discuss how they scored a common peer and then we discussed as a whole group. Students said that the discussion helped them to see how others interpreted the rubric and that some were too harsh while others were too lenient. Scout Sowell and Edward Scruggs raised this concern: some of the criteria are overlapping. How do we distinguish between critical thinking, metacognition, and fairmindedness? Aren't they all required in order to think critically? This point was noted and further discussion was promised.

4/23/2019

Class began with a brief review of yesterday's discussion about scoring and how it was affected by talking to another person in order to calibrate assessment. We also talked about critical thinking as an umbrella under which fairmindedness and metacognition fall.

4/25/2019

Students read pp. 11-16 of Paul & Elder and were first asked to assess themselves on a scale of 1-10 on their personal intellectual integrity, empathy, and perseverance.
put into small groups (randomized based on hair color) to discuss 4 questions.

5/2/2019

Students were to have read the last bit of the chapter from Paul & Elder for class today and have brought in two questions on the reading. We began class with a whole group discussion (REC) on how they thought their opinion article compared to the straight news articles they did. (Voice Memos: 20 min). Then we transitioned to discussing their questions: all students wrote their 2 questions up on the board, we voted on which 6 to focus on, and then split into two groups: Pepper, Scout, Mary, Henry, Bret, Edward, and Oliver discussed 1's and Elizabeth, Charlie, Flynn, Tessa, Ricky, Martin, Becket, and Bandit discussed 2's. One question in each group connected to religion and the two groups handled it differently. The 1's were on the verge of getting heated, while the 2's had a calm but interesting discussion.

5/3/2019

We began with the last question I saved from yesterday's discussion: “Which trait is most challenging for you and why?” written by Pepper Freeman. We reviewed the traits and I

created a visual that demonstrated how Paul sees the standards as being intertwined. We had a round robin in which each student chose a standard that is a weakness and explained (REC/Voice Memos: 10 min). I then showed the students the media bias chart that I used as the basis for selecting their news sources (<https://www.adfontesmedia.com/>). We discussed the different categories and the students saw where their sources were placed on the chart. Everyone agreed with the placement except for Scout Sowell, who believes that The Hill is either dead center or slightly left. We talked about how some conservatives have struggled with being anti-Trump and so they might be perceived as less conservative to others, but not to themselves. Their assignment this week is to peer score 2 others using the rubric AND to comment on 2 peers' posts. Other than momentarily losing my temper because of their constant talking, it was a good class period. I think they got a better understanding of where they are with the standards for fairmindedness.

5/8/2019

After three rounds with the rubric, I wanted to know if the students felt the same about the rubric they originally created almost a month ago. They met in small groups to review the rubric they created as a class and were tasked with discussing whether it fit their current knowledge and understanding of fairmindedness. All of the groups made adjustments to the original rubric, but one group, Oliver and Flynn, altered the structure of the rubric. They argued that over time, they have learned that there are two different extremes and that the best representation of fairmindedness rejects both and meets in the middle. So rather than a graduated rubric that escalates 1-4, their rubric runs 0-1-2-1-0. We discussed as a class and everyone preferred that to the current rubric, so we completely revised it.

I was impressed by how seriously the students were taking the revision and by the innovation of the new rubric. All of the groups made good revisions based on their understanding of fairmindedness and the chapter by Paul and Elder, but Oliver and Flynn really changed how the class looked at the evaluation itself in a valuable way. As they have developed in fairmindedness over the last month, they have realized that lack of fairmindedness is rooted in one of two approaches: pure logic or pure emotion. Both of those positions lead to poor thinking and that the best examples of fairmindedness are somewhere in the middle.

5/17/2019

Today's the day! The last day of this unit. Students will be completing the post-assessment and I will have all of my data for this project! The subject is the new SAT adversity score, which was just released to the public a few days ago. Given that our first topic was the college cheating scandal, I thought this would be an appropriate conclusion to this unit. The selections come from The Wall Street Journal and The New York Times and cover a lot of the same information but in different ways. I'm interested to see how they compare to their initial responses.

APPENDIX E: CODEBOOK

Code	Type of Code	Definition	Example
Bias	A priori	Prejudice in favor of or against one thing, person, or group compared with another, usually in a way considered to be unfair.	“I thought that was kind of interesting to think about would never in question my dad, but if somebody else was to do it, I would react differently.”
Belief	A priori	A firmly held conviction or opinion; an acceptance that something is true or exists.	“Who you are is what you believe and it influences what you do on an everyday basis whether it be something as big as Christianity versus atheism. What you believe is what you do, and it is tied to we are in your identity.”
Fairmindedness	A priori	A conscious and purposeful effort to eliminate personal or associated bias from thinking and action; an ability to consider the validity of all points of view equally (Paul, Binker, Martin & Adamson, 2008).	“I expected a biased article about how these actions were extremely inappropriate and would completely disqualify him from the presidency. When I started to read through it, however, I saw a well written and unbiased article that came to a reasonable conclusion.”

Metacognition	A priori	An awareness and understanding of one's own thought process (Coutinho, 2006).	"If you think about what the other person is thinking and you consider all of the arguments, then you have a better chance of convincing people what's right."
Opinion	Emergent	A view or judgment, not necessarily formed on fact or evidence.	"I think it just depends on the kind of person you are. If you're the kind of person who thinks a lot about how you feel and approaches life with your beliefs, then we're not just going to want to change our beliefs. If you're the kind of person who doesn't think a lot about your beliefs and your thoughts and just kind of approaches life as like, "Oh well, that makes sense, or "that makes sense," then that's the kind of person you are."
Paul's intellectual standards	A priori	Paul and Elder (2012) established the following eight characteristics as essential habits of mind for fairminded thinkers: humility, courage, integrity, empathy, perseverance, confidence in reason, and autonomy.	"I think you have to completely let go of any idea, or to the extent that you can, let go of any idea that your mind has ever had and make it as if you've just been introduced to that concept."
Perspective	Emergent	A particular attitude or point of view.	"I don't think the point is at all convincing others. It's more looking at other people's perspectives and their ideologies, seeing where they come from and how that developed for them and trying to understand how it all fits together rather than trying to come to a conclusion."

Strong sense thinking	A priori	Strong sense thinking is ethical, considerate of other perspectives, and demonstrates a willingness to change point of view based on evidence (Paul & Elder, 2012).	“I expected a biased article about how these actions were extremely inappropriate and would completely disqualify him from the presidency. When I started to read through it, however, I saw a well written and unbiased article that came to a reasonable conclusion.”
Weak sense thinking	A priori	Weak sense thinking is identified by the use of sophistry or intellectual trickery; it fails to consider other points of view made in good faith (Paul & Elder, 2012).	“Though this college admissions scandal is terrible, the rich is [<i>sic</i>] already at a large advantage. The admissions process is rigged already.”

APPENDIX F: BLOG POST SCORES

BAREFOOT	pre	BLOG 1	BLOG 2	BLOG 3	BLOG 4	post	MEDIAN
thinking	3	3	3	3	4	3	3
bias	2	3	3	4	3	3	3
standards	2	3	3	3	3	3	3
metacognition	2	3	3	3	4	3	3
TOTAL	8	12	12	13	14	12	12
MEDIAN	2	3	3	3	4	3	
CHASTIAN	pre	1	2	3	4	post	MEDIAN
thinking	2	2	2	2	2	3	2
bias	2	2	2	2	3	2	2
standards	2	3	2	2	2	3	2
metacognition	1	2	2	2	1	2	2
TOTAL	7	9	8	8	8	10	8
MEDIAN	2	2	2	2	2	3	
DAVIS	pre	1	2	3	4	post	MEDIAN
thinking	2	3	3	3	2	3	3
bias	2	2	3	3	3	3	3
standards	2	3	2	3	3	2	2.5
metacognition	1	2	2	3	2	2	2
TOTAL	7	10	10	12	10	10	10.5
MEDIAN	2	3	3	3	3	3	

EDWARD	pre	1	2	3	4	post	MEDIAN
thinking	2	2	3	3	3	3	3
bias	2	2	3	3	3	3	3
standards	2	2	2	2	3	3	2
metacognition	2	2	2	2	3	3	2
TOTAL	8	8	10	10	12	12	10
MEDIAN	2	2	2.5	2.5	3	3	
ELROD	pre	1	2	3	4	post	MEDIAN
thinking	2	3	3	3	3	3	3
bias	2	3	3	3	3	3	3
standards	2	2	2	3	3	3	2.5
metacognition	2	2	2	2	3	2	2
TOTAL	8	10	10	11	12	11	10.5
MEDIAN	2	2.5	2.5	3	3	3	
FLEET	pre	1	2	3	4	post	MEDIAN
thinking	2	3	3	3	3	3	3
bias	1	3	3	3	3	3	3
standards	2	3	2	2	3	3	2.5
metacognition	2	2	2	3	3	3	2.5
TOTAL	7	11	10	11	12	12	11
MEDIAN	2	3	2.5	3	3	3	
FREEMAN	pre	1	2	3	4	post	MEDIAN
thinking	2	3	3	3	3	3	3
bias	2	2	2	3	3	3	2.5
standards	2	2	2	2	3	3	2
metacognition	2	2	3	2	3	2	2
TOTAL	8	9	10	10	12	11	9.5
MEDIAN	2	2	2.5	2.5	3	3	

KEKAUOHA	pre	1	2	3	4	post	MEDIAN
thinking	2	2	3	2	3	3	2.5
bias	2	2	3	3	2	3	2.5
standards	2	2	2	3	2	3	2
metacognition	1	2	2	2	2	2	2
TOTAL	7	8	10	10	9	11	9
MEDIAN	2	2	2.5	2.5	2	3	
LOPEZ	pre	1	2	3	4	post	MEDIAN
thinking	2	3	3	3	3	3	3
bias	2	2	2	3	3	3	2.5
standards	2	3	3	3	3	3	3
metacognition	2	2	2	2	3	3	2
TOTAL	8	10	10	11	12	12	10.5
MEDIAN	2	2.5	2.5	3	3	3	
ODOM	pre	1	2	3	4	post	MEDIAN
thinking	2	2	2	2	3	2	2
bias	1	3	2	2	3	2	2
standards	2	2	2	3	3	3	2.5
metacognition	1	2	2	2	2	2	2
TOTAL	6	9	8	9	11	9	8.5
MEDIAN	1.5	2	2	2	3	2	
RIDER	pre	1	2	3	4	post	MEDIAN
thinking	2	3	3	3	3	3	3
bias	2	2	3	3	4	3	3
standards	2	3	3	3	3	3	3
metacognition	2	2	2	3	3	3	2.5
TOTAL	8	10	11	12	13	12	11.5
MEDIAN	2	2.5	3	3	3	3	

SCHNEIDER	pre	1	2	3	4	post	MEDIAN
thinking	2	3	3	2	3	3	3
bias	1	2	2	3	2	2	2
standards	2	2	2	3	3	3	2.5
metacognition	1	2	2	2	2	2	2
TOTAL	6	9	9	10	10	10	9.5
MEDIAN	1.5	2	2	2.5	2.5	2.5	
SCRUGGS	pre	1	2	3	4	post	MEDIAN
thinking	2	3	2	3	3	3	3
bias	2	2	3	3	3	3	3
standards	2	2	3	2	3	3	2.5
metacognition	2	2	2	3	3	3	2.5
TOTAL	8	9	10	11	12	12	11
MEDIAN	2	2	2.5	3	3	3	
SOWELL	pre	1	2	3	4	post	MEDIAN
thinking	2	2	2	3	3	3	2.5
bias	1	2	3	3	2	3	2.5
standards	1	2	2	2	3	3	2
metacognition	2	3	2	3	3	3	3
TOTAL	6	9	9	11	11	12	10
MEDIAN	1.5	2	2	3	3	3	
W'FIELD	pre	1	2	3	4	post	MEDIAN
thinking	2	3	3	3	3	4	3
bias	2	3	3	3	3	3	3
standards	2	3	3	3	3	3	3
metacognition	1	3	2	2	3	3	2.5
TOTAL	7	12	11	11	12	13	11.5
MEDIAN	2	3	3	3	3	3	