Surveying Arizona's Third through Fifth Grade Teachers about their Confidence in

Teaching the Cognitive Demands of the Common Core State Standards to All Students

by

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A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

Approved November 2014 by the
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ARIZONA STATE UNIVERSITY

December 2014

ABSTRACT

The purpose of this descriptive study was to gain an understanding of the confidence level held by third, fourth, and fifth grade teachers as to their preparedness for teaching the cognitive demands of the Common Core State Standards (Arizona's College and Career Ready Standards) to all students, in particular Hispanic students living in poverty, who occupy close to a third of all classroom seats in Arizona. The achievement gap between Hispanic students living in poverty and non-Hispanic students of non-poverty status is one of the largest achievement gaps in Arizona, which has existed with minimal change for more than 12 years. By gaining an understanding of the teachers' confidence in teaching critical thinking skills, further support and professional development is suggested to link a teacher's knowledge to instructional practice that in turn increases the academic achievement of Arizona's poor Hispanic students.

The process of gaining this understanding was by using a multi-dimensional survey with 500 third through fifth grade teachers in two uniquely different, but representative, Arizona school districts. Approximately one-third of those teachers responded to the multi-dimensional survey about teaching the critical thinking (CT) skills of Arizona's College and Career Ready Standards for English Language Arts. The survey asked teachers to rate their levels of preparedness for teaching CT to several types of students, to choose a CT definition,

describe the relationship of CT and reading, explain how they teach CT to students who are reading below grade level, express the support they need to teach CT to those students, and rate the effectiveness of several CT classroom vignettes for different types of students. Although the questions involved several types of students, the primary focus was on exploring the teachers' position with teaching CT to Low SES Hispanic students.

A disconnect was revealed between the teachers' perception that they had the ability and knowledge necessary to teach critical thinking skills and their ability to identify ineffective critical thinking instructional practices. This disconnect may be interfering with the link between the professional development teachers are currently receiving to implement Common Core State Standards and teachers actively engaging in learning what is needed to effectively teach critical thinking skills to their students.

DEDICATION

I would like to dedicate this dissertation to all who have believed in my ability to do this at this stage in my life. It has been a goal and dream that I have had my entire life; to learn what is needed to help those students whose voices are not being heard and acted upon.

To my husband Allen, you have always been my biggest cheerleader. You encourage me to act on my goals and take care of the minutia in our lives, so I can focus on them. You are my BEST friend and I am thankful that we married more than 38 years ago. You have been one of the biggest blessings in my life. Thank you!!!

To my children, Carrie, Lee & Travis, as well as my grandchildren, Griffin & Kenzingten, without you in my life there wouldn't be as much inspiration and initiative for me to strive to help those children's voices. Thank you for your unconditional love and support!

To my parents, you have always told me that I could do anything and when I choose to do anything to do it to my best of my ability! Mom, thank you for so steadfastly supporting me in all that I do and strive to do.

To my friends, you have been both my cheerleaders and my sounding board. You encourage me when I get discouraged and help me think through my ideas, concerns, and conclusions. You have highlighted for me achievements I have made and helped me see that I am truly

making a difference. Elisa, over the last 4+ years you have been willing to help me process so many ideas and thoughts that part of your head must be filled with my conversations. Thank you so very much for all you have done to keep me going!!! Sherry, you and I have walked this journey together. Thank you for helping me make it through each stage and encouraging me to accomplish this. Julie, you have encouraged me greatly since the day I became a teacher more than 20 years ago. I consider you my mentor. You have helped me see my path and shown me that I can walk it. You gave me a great gift as a mentor and have also supported me one more time by editing this dissertation. Thank you!

ACKNOWLEDGMENTS

Thank you to my dissertation committee for guiding me in my learning about research. You challenged me to go deeper into a topic that I am passionate about, so that my research would mean more than a process to earn a degree. What I have learned I feel confident to share and encouraged to keep on digging for meaning and solutions. Our at-risk students need a voice to influence the changes that must happen in order to enable them to reach beyond their dreams. I intend to help their voices be heard.

TABLE OF CONTENTS

LIST OF FIGURES

Chapter 1 -- Introduction

According to the Arizona Department of Education's *October1, 2013 Enrollment Report* (Arizona Department of Education, 2013), Hispanic students are Arizona's highest percentage of minorities with a 44% composition of all Arizona students. Just under 13% of Arizona's Hispanic students are English Language Learners (ELL) and 60.7% of Hispanic students have low socio-economic status[1] (SES). Figures 1 and 2 display this information. With low SES Hispanic students being 26.7% of Arizona's student population, the academic achievement of these students impacts a significant portion of Arizona's human capital. This descriptive research surveyed Arizona's third through fifth grade teachers about what they believe they need in order to teach low SES Hispanic students the critical thinking skills of Common Core State Standards (CCSS) that were fully implemented during the 2013-2014 school year.

A majority (71.4%) of the 167 teachers who responded to the survey felt confident teaching the critical thinking skills of CCSS to all types of students. The lowest confidence level was with low SES students. When asked to rate the effectiveness of vignettes depicting effective and ineffective examples of critical thinking objectives, tasks and assessments, a majority of the surveyed teachers were less confident identifying ineffective examples. In particular, teachers were least confident in identifying the vignettes' effectiveness with low SES students.

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[1] Low SES is a category of students whose family income qualifies them to be eligible for free or reduce-priced school lunch. For example, a family of three would qualify if their yearly income was $31,500 or less. (USDA: Food and Nutrition Service, 2012)

Although 71.4% of respondents have had more than 20 hours of professional development on CCSS, there remains a high level of uncertainty (43.29%) when determining effective critical thinking instruction for different types of students.
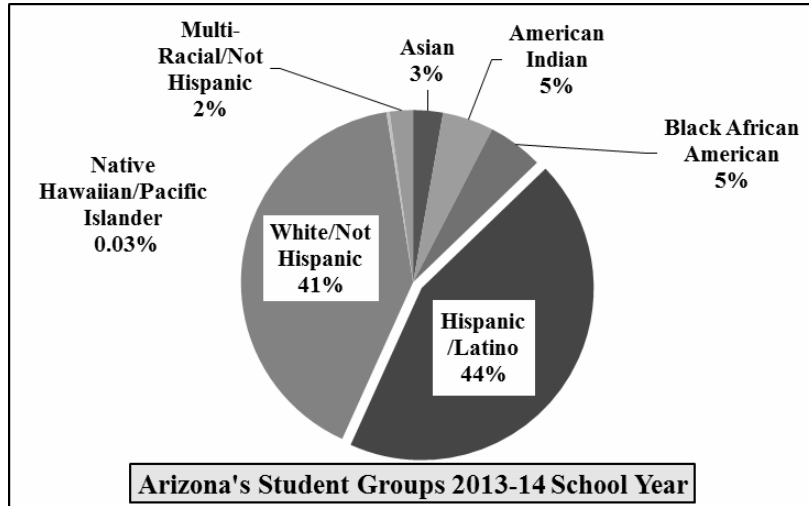
Figure 1. Arizona October 1, 2013 Enrollment Report Retrieved on September 10, 2014 from http://www.azed.gov/research-evaluation/arizona-enrollment-figures/
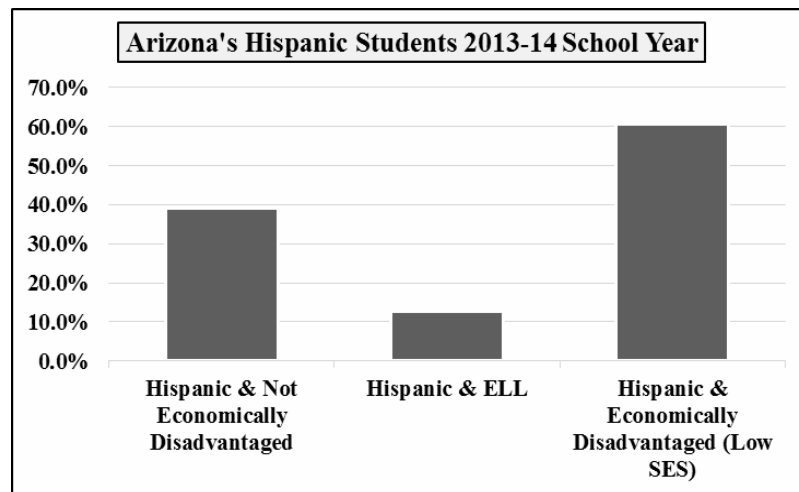
Figure 2. Arizona October 1, 2013 Enrollment Report Retrieved on September 10, 2014 from http://www.azed.gov/research-evaluation/arizona-enrollment-figures/

Background

The implementation of Common Core State Standards (CCSS) is refining

what it means to achieve academically. Along with 42 other states, the District of

Columbia, U.S. territories, and the Department of Defense Education Activity

(DoDEA), Arizona is shifting instructional focus toward CCSS. The CCSS are

academic standards for English Language Arts, math, social studies, and science

developed collaboratively between the Council of Chief State School Officers

(CCSSO) and the National Governors Association Center for Best Practices

(NGA Center) in 2010. The CCSS are not federally-mandated, although there are

federal funding incentives for implementing these standards or standards with a

similar level of expectations. Each state has some room in the CCSS initiative for

adding specific state standards. In an effort for some additional local autonomy

and the need to ease the public's misconceptions about the initiative being

federally controlled, the name of the Arizona CCSS was changed. On September

20, 2013, Arizona's Governor Jan Brewer issued an Executive Order mandating

the standards be called Arizona's College and Career Ready Standards

(AZCCRS). Full implementation of the AZCCRS began with the 2013-2014

school year (Office of the Governor, 2013). This study uses both acronyms to

refer to the same standards, with CCSS being used in holistic references to the

standards and AZCCRS used when Arizona specificity is needed.

Some of the purposes of these standards are to provide consistency across

state lines for transient populations and opportunities for professional

collaboration between educators. The goal of these standards is to prepare all

students for what they need to be successful with their college and career choices. With the English Language Arts portion of the CCSS, a larger focus is being placed on the comprehension of informational text, multiple sources of text, and using critical thinking skills to analyze what is read, as well as determining what has value and explaining why. Are Arizona's teachers prepared to teach low SES Hispanic students the higher cognitive demands of Arizona's version of CCSS?

Statement of the Problem

Looking at achievement trends for fourth graders on the NAEP[2] (National Assessment of Educational Progress) provides some insight as to how students are currently performing. In Arizona, there has been a persistent academic achievement gap between the different SES levels of fourth graders on the reading section of the highly regarded NAEP (Figure 3). The National Center for Education Statistics reported that in 2013 only 15% of Arizona's 4th graders, who were from families with low socio-economic SES, scored at or above "proficient" and 54% scored below "basic". This was in stark contrast with the 43% of Arizona's higher SES[3] fourth graders, who scored at or above "proficient" and 24% who scored below "basic". This achievement gap is

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[2] NAEP assessments are conducted periodically with a statistically significant sample of 4th and 8th grade students throughout the United States. It is a project authorized by U.S. Congress and overseen by the U.S. Department of Education.

[3] Higher SES is determined by those students who are not eligible for free or reduce-priced school lunches.

particularly grim when considering that as a whole only 27% of Arizona's students scored at or above "proficient," which is lower than 41 states or jurisdictions in the nation.
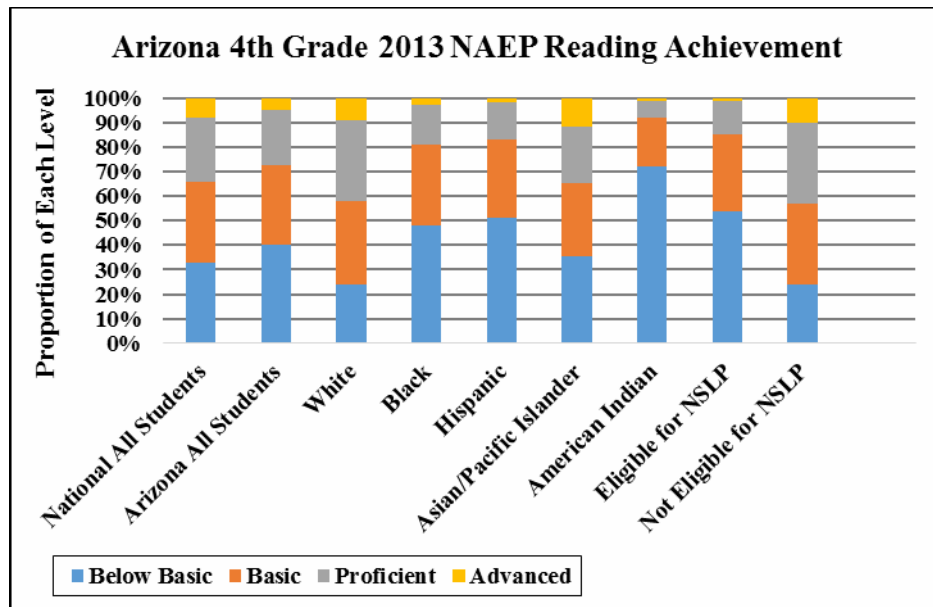
Figure 3. Disaggregated NAEP 4th Grade Reading Proficiency Scores
Source: Arizona Dept. of Education State Report Card 2013

Figure 4 shows that except for American Indian, the widest achievement gap is between low SES and higher SES students. Although most ethnic and SES groups were performing better than the first assessment year of NCLB's implementation in 2002, the gap in Arizona between low SES and higher SES groups remained consistent with a 25-30 point difference in average scale scores for reading. This mirrors the gap nationally which fluctuated between 26-28 scale points. Interestingly, the Arizona achievement gap between low SES and higher SES students has basically remained stagnant over the last eleven years

having been 29 scale points in 2002 and 27 scale points 2013 (The Nation's

Report Card, 2013). There has been minimal gap reduction.
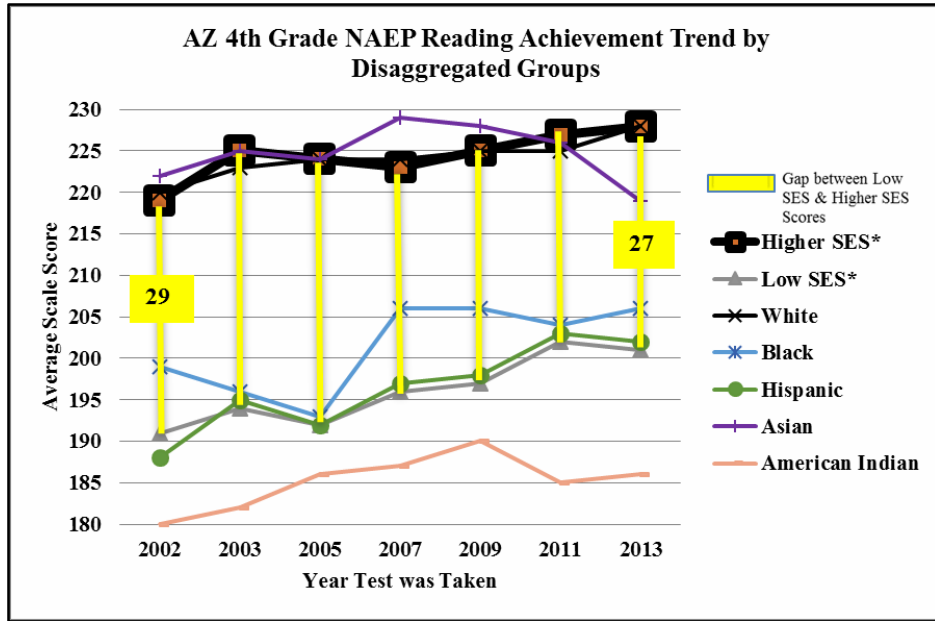
Figure 4. Data Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002, 2003, 2005, 2007, 2009, 2011 and 2013 Reading Assessments.

* Low SES is represented by those students who are eligible for free or reduce-priced school lunch. Higher SES is represented by those not eligible for free or reduce-priced lunch.

Looking at student performance on NAEP provides some basis for

predicting what student achievement may reflect when the AZCCRS are

assessed in 2015. Comparing the Reading Framework for the 2011 NAEP and

the PARCC (Partnership for Assessment of Readiness for College and Careers)

Model Content Framework for ELA/Literacy[4] (2011), a close alignment of

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[4] PARCC has been Arizona Department of Education's reference for developing and choosing the state's annual assessment of academic achievement based on CCSS.

expectations can be found between the two assessments. Several areas, but in particular critical thinking (CT), play a major role in both of these assessments. With the 2011 NAEP, 70% of the 4th grade reading items tested cognitive targets of integrate/interpret or critique/evaluate, which require students to use their CT skills. With PARCC-like assessments, the goal is to have 65% of the written responses require the analytical levels of CT. This close correlation of the two assessments suggests that the 2011 NAEP results in Figure 4 are potentially predictive of student achievement results with the PARCC-like assessments of CCSS, along with the continuing gap that exists between low and higher SES student reading achievement. This gap in student achievement needs to be narrowed.

Research Questions

Broadly, the focus of this descriptive research was to find out, through teacher survey responses, if teachers felt prepared to teach critical thinking skills to disadvantaged students, in particular, low SES Hispanic students. The specific research questions were:

1. What do third through fifth grade teachers know about teaching critical thinking?
2. What do third through fifth grade teachers believe about their own ability to teach critical thinking skills during ELA instruction to low SES Hispanic students?
3. What do third through fifth grade teachers believe about their low SES

Hispanic students' ability to use critical thinking skills when reading and/or writing?

4. What are the opinions and beliefs of Arizona's third through fifth grade teachers about what they need to teach the critical thinking skills that are included in Arizona's Career and College Ready Standards (AZCCRS) for English Language Arts, to low SES Hispanic students?

Purpose of the Study

Building human capital by preparing our youth to be productive citizens has become a complex task that requires more than helping them earn a high school diploma. Academic achievement and career readiness will no longer be measured solely by a student's ability to recall facts or choose the best answer on a high-stakes, multiple-choice test (City et al., 2010; Darling-Hammond, 2010; Schleicher, 2010). CCSS has ignited this need for higher cognitive expectations in the standards, but one of the primary reasons that CT is receiving this attention belongs to the work force expectations of today's employers. In 2010, OECD's Education Directorate, Andreas Schleicher, expressed this need in the following statement:

> The skills that are easiest to teach and test are also the skills that are easiest to digitize, automate and outsource. When you could still assume that what you learned in school will last for a lifetime, teaching content and routine cognitive skills was at the centre of education. Today, where you can access content on

Google, where routine cognitive skills are being digitized or

outsourced, and where jobs are changing rapidly, the focus is on

enabling people to become lifelong learners, to manage complex

ways of thinking and complex ways of working and to live in a

multi-faceted world as active and responsible citizens.

(http://www.oecd.org/general/thecasefor21st-

centurylearning.htm)

The standards that reflect critical thinking skills in CCSS will be taught

and measured by using a combination of results for responses demonstrating the

mastery of reading foundational skills and comprehension. These responses will

require students to critique, reason, argue, and defend their responses by citing

textual evidence from complex text. Based on the work force expectations

previously mentioned, ensuring that instruction shifts in the direction of CCSS

could increase our development of human capital and the future potential

earnings of individuals. Changing this instructional paradigm in the classroom

will not be an easy shift. It has been well documented that the opportunities to

learn vary by social class with those who need it the most, our children of

poverty, receiving it the least (Anyon, 1981; Duke, 2000; Harris, 2012; Logan,

Minca, Adar, 2012; Martinez, et al, 2010; Oakes, 1995; Sanacore & Palumbo,

2009). By denying children of poverty the much needed opportunities to learn,

we provide opportunities to remain poor. What do our teachers need in order to

provide the opportunity to learn the higher cognitive standards?

The current professional development offered by the Arizona

Department of Education to prepare teachers for teaching AZCCRS for English Language Arts (ELA) includes critical thinking strategies. Some recent examples include:

- *2013 Arizona State Literacy Conference: "Deep Readers, Critical Thinkers, Thoughtful Writers,"*

- *Common Core Standards ELA Workshop: Module 3: Rigor*— "Participants will be able to understand Cognitive Demand and Depth of Knowledge,"

- *Close Reading in the Classroom – Arizona's Common Core Standards English Language Arts Phase II:* "…demonstrate a close reading routine…help them become independent readers and thinkers about text…Participants will receive *The Thinker's Guide to How to Read a Paragraph – The Art of Close Reading* by Paul and Elder."

Critical thinking is not explicitly defined in the CCSS nor is it explicitly defined in AZCCRS for ELA. Instead of clearly defining critical thinking, AZCCRS uses critical thinking skill terms like: "drawing inferences," "compare and contrast," "analyze multiple accounts of the same event or topic," "explain how an author uses reasons and evidence to support particular points in a text," "describe how a narrator's or speaker's point of view influences how events are described," and "delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence." Based on these skills listed in the language of the AZCCRS for ELA and the professional development guidance that the Arizona

Department of Education (ADE) is providing, critical thinking in the area of ELA involves using the aforementioned skills while reading closely, making judgments about the reading, and supporting them with textual evidence and evidence from other sources. (Arizona Department of Education, 2010)

ADE's references used in development of professional development for AZCCRS for ELA highlight some major influences of what CT is and how it is expected to be taught and assessed. Two of the most prominent in the current professional development offered stem from Norman Webb's *Depth of Knowledge* (D.O.K., 2002) and Elder and Paul's *Critical Thinking Guide* (2008). Verbs that define CT with these viewpoints are "explain/elaborate", "analyze", "generalize/infer", "connect", and "prove". These are also the skills students need to master as they become the critical thinkers who employers seek to hire.

Looking at the professional development that is being offered for AZCCRS and the persistent gap in achievement which continues to exist for low SES Hispanic students, is the professional development being offered preparing teachers to meet the needs of these students? Do teachers believe the current professional development for AZCCRS is what they need to teach low SES Hispanic students critical thinking skills?

Definition and Key Terms

Academic Achievement: How students score on standardized tests, such as NAEP, PISA, AIMS, SAT, ACT, which is then compared to the scores

obtained with other groups (by school, district, state, nation, or internationally) who took the same test during a specific time period. The scores obtained can be disaggregated, so that the academic achievement of specific groups (ethnic, SES, etc.) can be compared. In some cases, the scores are averaged to determine the achievement level of a school, district, state, or country. Individual scores for some of the standardized tests are used to determine qualifications for eligibility for college admissions, scholarships, and other programs.

AIMS: Arizona Instrument to Measure Standards (writing, reading, mathematics, and science)

AZCCRS: Arizona College and Career Ready Standards

CCSSO: Council of Chief State School Officers

CCSS: Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects K-5

Children of poverty: based on annual income and family size it ranges from $11,170 for a family of 2, with $7,565 or less being "extreme poverty" to a family size of 8 earning $38,890, with "extreme poverty" being an annual income of $19,445 or less (U.S. Department of Health and Human Services. 2012. *Prior HHS Poverty Guidelines and Federal Register References*. http://aspe.hhs.gov/poverty/figures-fed-reg.shtml)

Critical thinking (CT) skills: the ability to evaluate evidence, arguments, and actions in order to problem solve, make decisions, and form judgments; critical thinking is a skill needed in several areas of the CCSS, but it is strongly needed in *Anchor Standard 8: Integration of Knowledge and Ideas* – "delineate

and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence" (Common Core State Standards Initiative, 2012)

ELA: English Language Arts

Equitable: a fair distribution of resources (funding, teacher quality, educational tools, time, standards, expectations, opportunities) that provides students the resources according to what they need to be college and career ready

Free or reduced lunch: eligibility for a free or reduced-price for school lunches is determined by USDA's *Free and Reduced School Lunch Guidelines* (2012)

Foundational skills: basic skills such as computation in math or phonics and knowledge of print in reading

Gap: the comparison and difference between the academic and or income achievement of specific groups (ie; race, ethnicity, SES, disability, gender, age)

Higher socio-economic status: students who are not considered to be living in poverty according to the U.S. Department of Health and Human Services or are not eligible for free or reduced price school lunch

High-stake tests: standardized tests that states use to determine the academic achievement of students with state standards and the instructional

effectiveness of teachers, schools, and districts, which is reported to the public and in some cases used to determine grade-level promotion, high school graduation, funding, and employment

Low socio-economic status: students who are considered to be living in poverty or extreme poverty according to U.S. Department of Health and Human Services or students who are eligible for free or reduced price school lunch "Children from families with incomes at or below 130 percent of the poverty level are eligible for free meals. Those with incomes between 130 percent and 185 percent of the poverty level are eligible for reduced-price meals, for which students can be charged no more than 40 cents. For the period July 1, 2012, through June 30, 2013, 130 percent of the poverty level is $29,965 for a family of four; 185 percent is $42,643." (USDA, 2011)

NAEP: National Assessment of Educational Progress

NAEP scale scores: a 0-500 scale that is assigned to the percentage of questions answered correctly which determines a level of achievement to be either Basic, Proficient, or Advanced on the NAEP (National Assessment Governing Board, 2011)

NAGB: National Assessment Governing Board

NCLB: No Child Left Behind Act of 2001, Public Law 107-110
http://www2.ed.gov/nclb/landing.jhtml

NGA: National Governors Association

NSLP: National School Lunch Program

Proficient (on NAEP): a scale score that "represents solid academic performance…competency over challenging subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter." (National Assessment Governing Board, 2011)

Reading foundational skills: print concepts, phonological awareness, phonics and word recognition, and fluency (Common Core State Standards Initiative, 2012)

Socio-economic status (SES): determined by eligibility for free or reduced price of school lunch

Struggling students: students who have not met proficiency on assessments of achievement or have a history of inconsistently meeting proficiency

Significance of the Study

The information gathered from the survey can be used by staff development to plan professional development which meets the needs of teachers who teach a significant portion of Arizona's student population, low SES Hispanic students. It can also be used by administrators to implement support that their teachers may need to meet the needs of his/her students. Raising a teacher's self-efficacy is one of the initial steps in the process of implementing change (Hattie, 2009), which in this case is the focus on teaching the critical thinking skills of AZCCRS. If a teacher feels confident in teaching

critical thinking, their students will experience more opportunities to learn

critical thinking skills, which may lead to higher academic achievement with

ELA assessments (Law & Kaufhold, 2009). Higher academic achievement by

low SES Hispanic students could narrow the persistent achievement gap in

ELA. In addition, enabling low SES Hispanic students to master critical

thinking prepares these students for career skills employers are seeking in their

employees (Schleicher, 2010).

Chapter 2 –A Review of the Literature

Levels of critical thinking and rigor were not the main foci in the former Arizona state standards, but are some of the main foci in the AZCCRS when adopted in 2010: "Not only are close reading and comprehension a focus, but using analysis and critical thinking to communicate opinions and support in arguments is also paramount in the 2010 Standards." (Arizona Department of Education, 2010, pp. 2) "Thinking" is mentioned 136 times and "rigor" is mentioned five times in the *2010 Arizona English Language Arts Standards & Literacy in History/Social Studies, Science and Technical Subjects: Standards Explanations and Examples for K-12*. The introduction of the document includes this statement: "The major differences between the 1996, 2003, and 2004 Arizona Standards and the 2010 Arizona ELA Standards are reflected in the depth, the complexity, the rigor, and the emphasis on comprehension, text analysis, and critical thinking that leads to College and Career Readiness."

Teaching Critical Thinking Skills

There are a variety of theories of thought about teaching CT skills. In some schools of thought, in particular philosophically speaking, critical thinking skills can be taught as early as kindergarten (Facione, 1990; Arter & Salmon, 1987; Arter, 2011). In 1989, Facione brought together discussions and recommendations of 46 national experts on CT skills through the use of the Delphi Method. The Delphi Method gathers experts who share their knowledge, experiences, research, and opinions. The goal of this sharing was

to form consensus agreements about a concept and collaboratively produce statements and recommendations on that concept. In this case, philosophical experts were brought together to develop a consensus agreement as to how critical thinking is conceptualized, developed, and applied to the instruction of K-12 students. They believed that CT should be taught in preparation for college and society.

The philosophical discussions focused on questions such as: What are skills and dispositions that can be learned in order to be a good critical thinker? How should critical thinking be taught and assessed in K-12 schools? The following is a sample of their consensus statements as to when students should be taught CT skills:

> From early childhood people should be taught, for example, to reason, to seek relevant facts, to consider options, and to understand the views of others. It is neither impractical nor unreasonable to demand that the educational system teach young people the habits of mind which characterize the good critical thinker, reinforce those practices, and move students well down the path toward their attainment. (Facione, 1990, p. 30)

> Explicit attention to the fostering of critical thinking skills and dispositions should be made an instructional goal at all levels of the K-12 curriculum. The cultivation of critical thinking dispositions and an insistence on giving and evaluating reasons

should be an integral part of elementary school education. In middle schools and high schools, instruction on various aspects and applications of critical thinking should be integrated into all subject area instruction. (Facione, 1990, p. 33)

Another theory is held by cognitive scientists, like Willingham (2008) who believe critical thinking skills can only be taught in domains of which a student has sufficient knowledge. Willingham conducted a meta-analysis on the impact of CT instruction. His conclusion was that 25 years after *A Nation at Risk* and a focus on teaching critical thinking in schools, the programs which have been used have not made an impact on the critical thinking skills of high school graduates. The cognitive theory his meta-analysis reinforced is that students can be taught to be critical thinkers within domains of knowledge where they have sufficient background knowledge. Meta-cognitive skills can be taught and applied in multiple situations, but only in situations where the student has enough domain knowledge. Children as young as three and doctoral level scientists can think critically in areas where they have sufficient knowledge, yet fail to use the same critical thinking skills in domains where they do not have sufficient knowledge. A teacher who follows this cognitive theory would most likely not teach critical thinking skills until a student has mastery of the prerequisite skills for the content area of study. With students who are far behind in foundational skills for reading, this could mean that they experience fewer opportunities to learn critical thinking skills.

Those who study brain research, such as Eric Jensen (Jensen, 2009),

believe students living in poverty are prepared for instruction of higher cognitive skills due to the resiliency and adaptability they have had to use as they learn to survive their adverse background conditions. In addition, Jensen presents a case that low SES students can improve their cognitive abilities by having schools educate and encourage parents to support educational experiences for their children in spite of a deficit in resources and negative neighborhood influences and by enriching the student's school experience. In the area of thinking skills, Jensen uses data from a California study (Williams et al., 2002) to support his position that thinking skills can be taught and by doing so it can positively impact academic achievement for students, especially low SES students.

Teaching Low SES Students

During eleven years of observing and coaching teachers, this researcher's notes indicated that a majority of classroom teachers with low SES students, in one of the subject districts, practiced with Willingham's cognitive position. Frequently, during coaching or providing professional development to teachers, teachers commented they cannot teach students to think because of the large amount of outside factors inhibiting the students' learning of foundational skills. Therefore, the instruction of high-level skills appears to be unnecessary.

This researcher's philosophical view point is closely related to the CT theories of philosophers and brain researchers. Young children can be taught CT

skills, and children of poverty can improve their cognitive abilities with support from schools. Students do not need to be limited by their genetics, their environment, nor their experiences. This train of thought was recently highlighted on the U.S. Department of Education's Official Blog: *Homeroom* (November 30, 2012). The blog is titled: *Beating the Odds (and the Naysayers)* by Laurie Calvert, who wrote about the success achieved at Graham Elementary School in Austin, Texas. The school is 94% Hispanic and 95% low SES. They achieved "Exemplary" status in 2011 and were named by the U.S. Department of Education as a National Blue Ribbon School. The school's principal believes deliberate focus on what schools can control what teachers do in the classroom contributed to their success; whereas focusing on the deficits in the students' backgrounds in previous years hindered the students' academic progress.

Regardless of an educator's position on critical thinking, it is now becoming part of the K-12 curriculum for the states, like Arizona, who have adopted CCSS. With this being the first time states have collaborated to develop common standards, it may be possible to study how the focus on standards impacts what is actually taught in the classroom. How do states, districts, and schools provide the professional development necessary to prepare teachers to focus their instruction on CCSS? Will CT have a more prominent focus in their instructional practices? Will it look different in classrooms with primarily low SES Hispanic students? Does CCSS, particularly CT, need to look different in these classrooms in order to positively impact the student achievement of low SES Hispanic students? Is

21

this what is needed to disrupt the poverty trajectory for students of poverty that results in obstacles of future attainment of higher levels of education and socio-economic status as adults? This study focused on the first step in this chain of questions – professional development.

Professional Development and Educational Reform

Looking back at the implementation of NCLB and high-stake testing, the *Title I Part B* portion of NCLB (2002) pushed professional development with *Reading First*. *Reading First* was a federal initiative, supported by research from the National Reading Panel (2000) that focused on scientifically-based reading instruction and assessment for K-3 students. The initiative increased spending on K-3 reading from the $300 million spent for *Reading Excellence* in 2001 to $900 million in 2002 for *Reading First,* which grew to over $1 billion/year by 2004. The main goal was to increase reading achievement, so 100% of students were reading on grade level by the end of third grade. One of the pathways set to achieve this goal was a strong focus on professional development. Results of the Center of Education Policy's *2005 State Survey* (Rentner et al., 2006) illustrated that 42 out of 50 states reported offering professional development through *Reading First* as either done to "a great extent" or "moderately". In the *Reading First Impact Study Final Report* (Gamse et al., 2008), teachers reported participating in just under twice as much professional development for *Reading First's* promotion of the five components of reading instruction (phonemic awareness, phonics, fluency, vocabulary, comprehension) than teachers from non-Reading First schools

(average of 25.8 hours vs. 13.7 hours).

According to *Results of the Center of Education Policy's 2005 State Survey* (Rentner et al., 2006) 38% of state officials surveyed credited the *Reading First* initiative and implementation for increases in student achievement in reading. Unfortunately, even though gains in reading achievement have been made, the achievement gap between low-SES students and higher SES students, still exists. By March of 2013, 44 states recognized the ambitious goals of NCLB and *Reading First* were not going to be met. Therefore, these states have been approved for waivers delaying any punitive actions for not meeting this goal. Arizona's waiver focuses on academic growth and professional growth.

Reading First was an ambitious initiative focused on the five big ideas of reading: phonemic awareness, phonics, fluency, vocabulary, comprehension. Although reading comprehension was one of them, CT was not a priority. In addition, the *Reading First Impact Study Final Report* (Gamse et al., 2008) reported *Reading First* did not significantly impact student achievement, as measured by comparisons of SAT 10 assessments in grades 1, 2 and 3 during the 2005, 2006 and 2007 school years, in the area of reading comprehension. Several reports claimed the comprehension portion of the *Reading First* initiative in its hierarchal nature was too focused on decoding, leaving little time for comprehension, which was dominated by the explicit instruction of strategies and not enough on developing independent thinking about what was read (Cassidy et al., 2010; Yatvin, 2002). With this in mind, focusing on CT

during the professional development for implementation of the ELA standards of CCSS may benefit student achievement of reading comprehension.

The Achievement Gap and Opportunities to Learn

Does professional development for teachers of low SES Hispanic students need to be differentiated to impact the students' academic achievement? Looking at historical trends highlights there is a continuous problem with inequitable opportunities for learning beyond basic skills and implies teachers need more training on how to increase opportunities for students to learn high cognitive skills.

More than three decades ago Jean Anyon (1981) demonstrated that there is a social stratification in students' access to knowledge with her study on comparisons of curriculum and instructional methods in second and fifth grade classrooms with different socioeconomic levels. Jeannie Oakes' influential study *Keeping Track* (1995) documented how the common practice of tracking and ability grouping secondary-level students are overt displays of minimizing opportunities to learn for minority and disadvantaged students. Nell Duke's *For the rich, it's richer…* study (2000) compared the literacy environments of first grade classrooms located in schools that varied by socioeconomic status. She demonstrated differences in opportunities to learn start early, and in the long run, limit students' opportunity to develop the necessary literacy skills to build their semiotic capital (the knowledge of systems that makes one literate).

More recent studies demonstrate this problem continues to be an issue

today and those inequitable opportunities to learn impact the achievement gap.

Martinez, et al (2010) highlighted the opportunity to learn gap between 4th

grade English Language Learners (ELL) and native English learners' exposure

to academic language during science instruction. Sanacore and Palumbo (2009)

cited issues with limited exposure to informational text and content-specific

vocabulary for low-income students in comparison to middle-income students

when studying the achievement gap between the two groups starts to widen

during fourth grade.

The 2012 Schott Foundation's Report, *Opportunity to Learn Campaign:*

Federal Recommendations highlights data on the "opportunity gap" and pleads

for federal policies to narrow the gap. In 2008, the foundation used their

Opportunity to Learn Index (OTLI) to measure the current opportunity for all

students to learn by comparing states' NAEP achievement data and equitable

access to resources to produce the report: *Lost Opportunity: A 50 State Report*

on the Opportunity to Learn in America (Schott Foundation, 2009). The

instrument measured and compared four components of resources needed to

provide every student the opportunity to learn: 1) high-quality early childhood

education, 2) highly qualified teachers and instructors in grades K-12, 3)

college preparatory curricula that will prepare all youth for college, work and

community, and 4) equitable instructional resources. Their results claimed that

53% of low SES students have an opportunity to learn compared to White,

non-Latino students. Among the report's recommendations include providing

the resources necessary to have teachers prepared to provide opportunities to learn for all students. Although professional development is not directly referenced, the implications are training is necessary to making this happen.

Prior to the 2009 and 2012 reports, the Schott Foundation published a report on professional development: *Peer-led professional development for equity and diversity: A report for teachers and administrators based on findings from the SEED Project (Seeking Educational Equity and Diversity)* (Deshmukh Towery et al., 2007). From 2003 to 2007, the Schott Foundation implemented a model of SEED professional development model and evaluated its results on equity and diversity with teachers and its impact on instructional changes. The three year-study used data from 35 semi-structured interviews and 80 teacher surveys in a Boston-area high school, as well as 20 semi-structured interviews and 63 teacher surveys in a Boston-area middle school. The conclusion was by providing peer-led professional development focused on self-reflection of instructional practices and attitudes; teachers can recognize and change their beliefs and actions that limit equitable opportunities for all of their students to learn. In other words, professional development can impact the instruction provided to at-risk student populations, like low SES Hispanic students.

A teacher makes a major impact on learning (Stevens & Grymes, 1993; Boudett, City & Murnane, 2005). *In Teaching with Poverty in Mind* (2009) Eric Jensen makes a case that educational intervention can make a positive difference in the academic development and achievement of children living

with the adverse effects of living in poverty. Acknowledging that a child's background factors (SES, neighborhood, language, parents' education and job status, health, living conditions, etc.) play a major role in the academic success of a child and that schools and teachers cannot fix the problem of poverty from within the walls of the school building does not excuse educators from providing equitable opportunities to learn to all children. Educators do not need to be another contributing factor that sets the trajectory for a child of poverty to have an adult life of poverty. Teachers must teach critical thinking skills to all students. All students need to know how to use critical thinking skills across content areas and in everyday situations, so what is it that teachers need in order to do this? Does professional development need to focus on attitude and overcoming a teacher's deficit approach toward low SES Hispanic students, or is there a need for pedagogical content learning?

According to Boykin and Noguera in *Creating the Opportunity to Learn* (2011), there are strategies teachers can employ that are beneficial for all students, but have a bigger impact on the academic achievement of minority and low SES students. These strategies can be taught with professional development and promoted through follow-up to ensure teachers are implementing them: active student engagement, self-efficacy, self-regulated learning, incremental ability beliefs, teacher-student interpersonal relationships, collaborative learning, meaningful learning, cultural relevance, and explicit instruction of high-cognitive strategies.

Trish Howard conducted a study in 2007 to discover the qualities of teachers who produced high levels of student achievement and low rates of learning disability referrals with low SES elementary students. What Howard discovered is related to the strategies outlined by Boykin and Noguera (2011); building positive relationships with students and their families, assessing progress with formative and summative assessments, engaging students by connecting prior knowledge to new, developing skills that can be used across content areas, and establishing a risk-free, safe, and positive classroom environment. Whereas Boykin and Noguera stressed the importance of student autonomy with these strategies, Howard promotes more of the responsibility on the teacher. In either case, extended professional development opportunities with follow-up is the most effective way to implement these practices.

In answering the question of whether teachers of low SES Hispanic students need different professional development, the answer appears to be both yes and no. Yes, in that cultural aspects and funds of knowledge need to be present in order to build an effective and culturally responsive learning environment. No, in that these strategies are effective strategies for most students. In *Poverty is NOT a Learning Disability: Equalizing Opportunities for Low SES Students* (Howar, Dresser, & Dunklee, 2009), the point expressed is it is not that these strategies are exclusive; it is that when used together and more deliberately they make a stronger impact on at-risk students.

Impact of Professional Development on Student Achievement

Given that research linking professional development directly to impacting student achievement needs further research, there have been studies that link professional development to parts of the process toward student achievement. There are several models on the influence of professional development. One commonly agreed upon model starts with educational reform in the areas of standards, curricula, accountability, and assessments being the overall drivers of professional development. The process of using professional development to implement the educational reform is a linear-reciprocal path from professional development to teacher knowledge and skills to classroom teaching and to student achievement, which after the achievement results are analyzed, could revise the professional development needed and repeat the process (Correnti, 2007; Desimone et al., 2002; Desimone, 2009; Fishman, Marx, Best, & Tal, 2003; Yoon et al., 2007). The premise in this model is that linking professional development to student achievement requires correlations across four actions: providing professional development, learning by the teacher, implementing changes in instructional practice, and increasing student achievement. Assuming that the professional development is linked to what students need to learn, any breaks in this linear-reciprocal model keeps the professional development from impacting the ultimate goal of increasing student achievement. At this point, research has not shown that student achievement increases without this continuous flow. With this in mind, this study will be through the lens that professional development in the teaching of

29

critical thinking skills cannot impact student achievement if it bypasses the teacher learning or the teacher making instructional changes.

This study concentrated on the link between professional development and teacher learning. One of the components necessary for any learner to learn is the belief that what is being presented meets the needs of the learner – a) perception of her needs and if she feels that the professional development fulfills her needs (Chamberlin et al., 2008; Darling-Hammond et al., 2009; Eksi & Aydin, 2007; Jang & Tsai, 2012; Paik et al., 2011). Another is if the teacher-learner feels that she has the content knowledge and content pedagogy necessary to teach the content to her students – b) self-efficacy (Abe et al., 2012; Bruce & Ross, 2008; Buczynski & Hansen, 2010; Chen & Chang, 2006; Correnti, 2007, Desimone et al., 2002; Duran et al., 2012; Guskey & Yoon, 2009). Ultimately, the teacher must also believe that her students are capable of learning the content – c) student expectations (Anyon, 1981; Boudett, City, & Murnane, 2005; Hattie, 2009; Howard, Dresser, Dunklee, 2009; Law & Kaufhold, 2009; Rosenthal & Jacobson, 1968; Rubie-Davies, 2010). A teacher's belief that these three components are in place impacts the teacher's willingness to participate in the professional development and her openness to learn from it. Perception of value, self-efficacy to teach the specific content, and expectation that students can learn the content are some of the conditions that need to be met in order for educational reform to move from the presentation of the professional development to the next step in the professional development model, which is to change instructional practices

based on what was learned. (Bruce & Ross, 2008; Darling-Hammond et al., 2009; Gallimore et al., 2009; Heck et al., 2011; McDougall et al., 2007).

Conceptual Framework

A teacher's self-perception about his/her ability to teach and belief in his/her students' abilities to learn, impact student achievement. In 2009, Law and Kaufhold tested this theory in their comparison study *An analysis of the use of critical thinking skills in reading and language art instruction*. In this study, the teachers' self-perception of their ability to teach critical thinking impacted student achievement. The third grade students in the study, who were provided consistent opportunities to learn critical thinking skills, performed higher on end-of-year state testing for reading in 2007. The study surveyed a sample of 50 third grade teachers from high, middle, and low performing schools in a large urban southern school district. The survey about the teachers' perceptions of critical thinking was compared to their students' reading achievement. The results confirmed there was a positive correlation between a teacher's perception and student performance. The higher the teachers' self-perception of their ability to teach critical thinking coincided with a higher perception of their students' ability to learn critical thinking, which in turn resulted in more critical thinking instruction and higher levels of reading achievement on the state's annual standardized reading test.

If a teacher's self-perception in his/her ability to teach a skill impacts student achievement, can professional development increase it? John Hattie's

Visible Learning: A synthesis of over 800 meta-analyses relating to achievement (2009) reviewed studies on professional development for teachers that lead to a change in student achievement. The impact of professional development moves from what a teacher believes about the professional development to what they learned from it to changes in their behavior to student learning (pgs. 119-121). The first step in impacting student achievement is to provide professional development that teachers believe enables them to increase their knowledge and skills to teach their students.

In *Scaling Up Professional Development in an Era of Common State Standards* (Marrongelle, Sztajn, & Smith, 2013), the authors concluded with several recommendations for further research of professional development on the CCSS. Although the authors were discussing CCSS for Math in their study, their intention was to make recommendations that include professional development in other content areas as well. Two of the recommendations are directly related to the purpose of this study as well as tied to recommendations from Heck, Weiss, and Pasley (2011): "We need studies that open the black box of professional development and provide rich descriptions of the nature of the work in which teachers engage that does or does not lead to improved knowledge, beliefs, or habits of practice…We need measures of teachers' knowledge –Did teachers learn what was intended in the professional development and has their practice changed so that it is more aligned with the CCSS?"

The following figure demonstrates the conceptual framework and lens for this study:
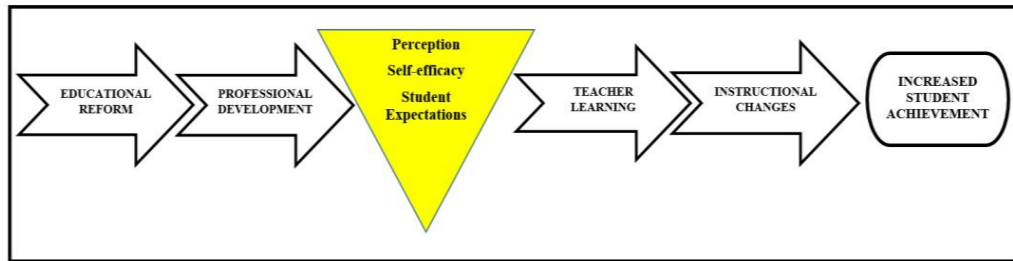
Figure 5. Conceptual Framework for this Study

Chapter 3 – Research Design and Procedures

This descriptive study was used to describe the current perception of teachers regarding the teaching of CT skills for ELA AZCCRS. The objectives of this study were to

- Investigate teachers' knowledge of critical thinking instruction
- Explore teachers' beliefs about their ability to teach critical thinking
- Explore teachers' beliefs about the ability of low SES Hispanic students to learn critical thinking skills

In the *Publishers' Criteria for the Common Core State Standards in English Language Arts and Literacy, Grades 3-12* (Coleman & Pimentel, 2011, p. 3), the authors stress the need to provide "extensive opportunities" [tasks] that require all students, including those who are considered struggling readers, to "…think deeply about texts, participate in thoughtful discussions, and gain world and word knowledge." Based on the importance that the CCSS are placing on rigor and critical thinking in order to prepare students for college and careers and the persistent achievement gap between low SES students and higher SES students, I chose to investigate and describe the teachers' perception of teaching CT for Arizona's version of CCSS; ELA Common Core Standards (AZCCRS) in relation to the area of critical thinking.

Chall, Jacobs, and Baldwin demonstrated in *Reading Crisis: Why Poor Children Fall Behind* (1990), that fourth grade is when our children of poverty start to significantly fall behind the academic achievement of their middle-

income and high-income peers. As presented in their study and others that followed (Martinez et al, 2010; Sanacore & Palumbo, 2009) some of this is credited to the move into more content-area reading comprehension and vocabulary, but this study suggests that it is also due to the lack of critical thinking experiences. This was the basis for choosing third through fifth grade teachers for this study.

What is the content knowledge and content pedagogy that third through fifth grade teachers should know about CT? According to The Foundation for Critical Thinking (2008), which is one of the primary resources that Arizona Department of Education is using for ELA AZCCRS professional development, critical thinking during "close reading" has five progressive levels or degrees: paraphrasing, explicating, analysis, evaluation, and role-playing. If a teacher is focusing on critical thinking skills during reading, questioning and discussions would have the components listed in the first column of Figure 5 (Arizona Department of Education, 2010; Elder & Paul, 2008; Learning Sciences, 2012). The second column notes the connections between the critical thinking skills components and AZCCRS. Survey questions will be drawn from these critical thinking components and AZCCRS connections.

Connections between Components for CT and 2010 Arizona ELA Career and College Ready Standards

Foundation for Critical Thinking Elder, L. & Paul, R. (2008). 5 Degrees of close reading using elements of thought. *How to read a paragraph: The art of close reading*. Dillon Beach, CA: Foundation for Critical Thinking Press, 7-11.	Arizona ELA (AZCCRS) Connections Arizona Department of Education. (2010). *Arizona's Common Core Standards – English Language Arts and Literacy in History/Social Studies, Science and Technical Subjects*. Retrieved on June 1, 2012 from: http://www.azed.gov/azcommoncore/elastandards/.
Paraphrasing	**AZCCRS**
Stating in their own words the meaning of what they just read.	Speaking and Listening Standard: 2. Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally. (4.SL.2)
Explicating	**AZCCRS**
Elaborating on what they paraphrased by giving examples or generating metaphors, analogies, pictures, or diagrams	Reading Standards for Literature 1 & Informational Text 1: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. (4.RL.1)
Analysis	**AZCCRS**
Analyzing the logic of what we are reading (8 elements of thought): Concepts – What are the author's most basic concepts? Question at Issue – What is the key question the author is trying to answer? Purpose – What is the author's fundamental purpose? Point of View – What is the author's point of view with respect to the issue? Assumptions – What assumptions is the author making in his or her reasoning? Implications and Consequences – What are the implications of the author's reasoning? Information – What information does the author use in reasoning through this issue? Interpretation and Inference – What are the most fundamental inferences or conclusions in the article?	Reading Standards for Informational Text: 2. Determine the main idea of a text and explain how it is supported by key details; summarize the text. (4.RI.2) 3. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text. (4RI.3) 6. Compare and contrast a firsthand and secondhand account of the same event or topic; describe the differences in focus and the information provided. (4.RI.6) 8. Explain how an author uses reasons and evidence to support particular points in a text. (4.RI.8) Reading Standards for Literature 2. Compare and contrast the point of view from which different stories are narrated, including the difference between first- and third-person narrations. (4.RL.6) College and Career Readiness Anchor Standards for Reading Literature & Informational Text: Integration of Knowledge and Ideas-

Evaluation	AZCCRS
	9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.
Evaluation	**AZCCRS**
Assessing the logic of what we are reading: Clarity – Does the author clearly state his or her meaning, or is the text vague, confused, or muddled in some way? Precision – Is the author sufficiently precise in providing details and specifics when specifics are relevant? Accuracy – Is the author accurate in what he or she claims? Relevance – Does the author introduce irrelevant material, thereby wandering from his/her purpose? Significance – Is the text significant, or is the subject dealt with in a trivial manner? Depth – Does the author take us into the important complexities inherent in the subject, or is the writing superficial? Breadth – Does the author consider other relevant points of view, or is the writing overly narrow in its perspective? Logic – Is the text internally consistent, or does the text contain unexplained contradictions? Fairness – Does the author display fairness, or does the author take a one-sided, narrow approach?	Reading Standards for Informational Text: 8. Explain how an author uses reasons and evidence to support particular points in a text. (4.RI.8) College and Career Readiness Anchor Standards for Reading Literature & Informational Text: Integration of Knowledge and Ideas- 7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. 8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.
Role-Playing	**AZCCRS**
Talking and responding in the voice of the author	This one is not directly reflected in the 4th grade standards

Figure 6. Connections between Components for CT and 2010 AZCCRS

Data Collection

This descriptive study used the following to collect data in order to describe the instructional needs for teachers of low SES Hispanic students. The instructional focus was the critical thinking aspects of the ELA AZCCRS instruction.

Online Survey (see Appendix A) – third through fifth grade teachers in two targeted Arizona Unified School Districts (AUSD-1 & AUSD-2)

a.   AUSD-1 is a large suburban school district

b.   AUSD-2 is a small urban school district

Survey Development

The survey was developed using survey creation and collection tools with the web-based program Survey Monkey. The survey consisted of 12 background questions (demographical), 5 informational questions about CT, and 14 CT vignettes to rate on effectiveness. The first twelve background questions were adapted from NAEP Reading and Mathematics Teacher Questionnaire 2013 Grade 4. The background questions were primarily demographical and asked respondents about their years teaching, educational degrees and certifications, gender, ethnicity, school demographics, classroom demographics, and amount of time spent in ELA AZCCRS professional development.

The background questions were followed by 5 informational questions. One of the informational questions was developed from gathering 5 critical

thinking viewpoints based on empirical research. Respondents needed to choose one of the five or they could enter their own choice. Another one of the informational questions asked respondents to rank their level of preparedness (Extremely Well, Very Well, Moderately Well, Slightly Well, or Not at all Well) for teaching critical thinking skills to students who were considered: above-grade, on-grade level, gifted, had an IEP, ELL, qualify for free or reduced-price lunch, Hispanic, or other (they provided an explanation of who "other" was if they checked it). The remaining 3 informational questions were open-ended, where the respondents could type any response to the question. One of them asked how they felt or did not feel that CT and reading comprehension were related. Another asked respondents to tell how they made adjustments to teach CT to students who are reading below grade level. The third open-ended response asked them to describe the support they needed to teach CT to students who are reading below grade level.

The 14 vignette questions were developed to measure teachers' perceptions about critical thinking skills noted in Figure 5. The CT vignettes represented situations that were ineffective and effective examples of instructional objectives, student tasks, and assessment. In addition, the vignettes were intended to highlight one of the 5 CT perspectives presented in informational question 13, where they chose a CT perspective. Teachers rated the effectiveness on a 6-point Likert-like scale.

This survey was created with several considerations. One consideration was to collect background information in order to compare the responses based

on current position, teaching experience, academic degrees, certification, gender, ethnicity, district enrollment, percentage of student roster containing low SES Hispanic students, and the respondent's participation in professional development for ELA Common Core implementation. The design of these questions emulated the questions and response choices used on the established National Assessment of Educational Progress (NAEP) Reading and Mathematics Teacher Questionnaire Grade 4 for 2013. This was done in order to represent a familiar format for the respondents and to ensure appropriate wording of background questions for reliability and validity.

A second consideration was the limitation created by selecting participants from the researcher's home school district. A majority of the participants would know the researcher as a provider of district professional development, coach, or a curriculum coordinator. In order to ensure the researcher's influence was not a primary factor in their responses, the original survey was reconstructed to ask open-ended questions, present more than one view of critical thinking, and present the respondent with classroom vignettes that allowed room for divergent responses.

Five critical thinking viewpoints were presented for the respondent's selection. Three of the five viewpoints were from researchers and authors of theories and strategies presented during the Arizona Department of Education's professional development sessions for AZCCRS English Language Arts (ELA). ADE promoted and cited these three resources during their delivery of teacher training. Those resources were P. Facione (2011), R. Paul and L. Elder (2007),

40

and K. Hess (2007). I classified these three viewpoints into the following based on the authors' quotes from their research about critical thinking: Facione – decision-making, Paul & Elder – metacognition, Hess – levels of thinking (Bloom's & Depth of Knowledge). In order to add variety to the choices of critical thinking viewpoints, I added J. Chafee (1988) – analysis and meta-cognition, and R. Sternberg (2013) – logical reasoning. Each of these viewpoints were infused into the vignettes or mentioned at least 3 times. Not only did respondents need to select a viewpoint that closely explained their view (question 13), but they were exposed to classroom vignettes that emulated each of these viewpoints (questions 18-31). This was done in order to mask the viewpoints of the survey's creator and seek the respondents' authentic opinion.

The classroom vignettes were designed to elicit responses dependent on the participant's knowledge and opinions rather than to search for one appropriate response. The details involved in the creation of the vignettes have multiple layers of comparisons. Of utmost importance was to answer the research questions pertaining to 1) the teachers' understanding about teaching critical thinking and 2) the teachers' beliefs in students' ability to learn critical thinking during reading instruction.

The vignettes were closely divided between those that were examples of effective CT instruction or CT assessment and those that were ineffective CT examples. This was determined by focusing on the five critical thinking viewpoints presented in this survey and some misconceptions teachers have of critical thinking instruction presented in R. Stopbaugh's *Assessing critical*

thinking in elementary schools: Meeting the Common Core (2013). The

survey's vignettes were written by this study's researcher and survey creator.

The following chart (Figure 7) displays the rating and reasoning for each

vignette.

Development of Critical Thinking Vignettes

Question	Example of Critical Thinking?	View
18.	No It is not effective CT assessment to discuss the exact assessment prompts in advance, especially for the typical and gifted students. It may be effective scaffolding for ELL students and somewhat effective for a SPED and/or low SES student, but it limits the effectiveness of assessing a student's CT skills.	Facione (decision-making)
19.	No Stating a definition of a word or concept is not an application of a CT skill.	
20.	Yes This asks students to use reasoning and resources to apply his/her knowledge of a concept.	Sternberg (reasoning)
21.	No Difficulty is not measured by the number of students who can recall or respond to an isolated question about facts.	
22.	Yes Applying concepts to a different time or place raises the level of thinking.	Chafee (analysis)
23.	No This is a technology skill requirement, not a CT skill.	
24.	Yes and No It is a measure of CT for 2 students: Xui Li & Sam, because it asks them to apply learning and creativity. It is not a measure of CT for Hannah and Chris because they simply repeated what was	Hess (extended thinking – D.O. K. 4 & Bloom's creativity levels for Xui Li & Sam) (recall – D.O.K. 1 for Hannah & Chris) Facione (decision-making) Sternberg (reasoning)

	already done with a change of animal. Gabrielle's CT skills were not measured in this vignette.	
25.	Yes Involves use of CT skills to consider reasoning for all 3 options, make a choice, state an opinion, and back it with reasons and evidence.	Hess (strategic thinking and reasoning – D.O. K. 3 & Bloom's analysis) Facione (decision-making) Sternberg (reasoning)
26.	Yes Students were asked to consider several characters' view points, determine which was the most reasonable, and the impact on their own view points.	Hess (strategic thinking and reasoning – D.O.K. 3 & Bloom's analysis) Facione (decision-making) Sternberg (reasoning) Chafee (meta-cognition) Paul & Elder (meta-cognition)
27.	Yes Students were asked to evaluate the opinion and credibility of several authors, choose the 2 of them to explain their reasoning for their evaluation of credibility.	Facione (decision-making) Sternberg (reasoning)
28.	No This is not an example for measuring CT skills because it only asks the students to use basic recall and remembering skills to produce a response.	Paul & Elder (analysis)
29.	Yes This is an example for measuring CT skills because it asks students to analyze the impact of different factors of an environment on its inhabitants.	Paul & Elder (analysis)
30.	Yes All 4 of these questions involve the use of CT skills to understand, reason, and make decisions, as well as explain thinking.	1) Chafee (analysis) & Sternberg (reasoning) 2) Hess (D.O.K. 2 & Bloom's Analyze) 3) Facione (decision-making) 4) Facione (decision-making)
31.	No These 4 questions do not ask students to use CT skills. The responses only require recall or low-level comprehension skills.	
Total Effective Ineffective Vignettes	**Yes – 7.5**	**No – 6.5**
	Question 24 is "yes" for 2 students and "no" for 2 students	

	CT View	Total questions
a.	Chaffee	3
b.	Facione	6
c.	Paul & Elder	3
d.	Sternberg	6
e.	Hess (Blooms and	4
	D.O.K)	4
f.	None	

Figure 7. Breakdown of Survey Development

Teachers were asked to rate the effectiveness of the vignette teacher's actions on a Likert-like 6-point scale from 1 (highly ineffective) to 6 (highly effective). This mirrors a similar factorial survey conducted by Bruce Torff (2007), which he named the *Critical Thinking Belief Appraisal* (CTBA). In his research, *Using the Critical Thinking Belief Appraisal to assess the rigor gap*, he surveyed the beliefs of 350 in-service secondary level teachers through three studies. The studies were conducted in 100 schools in New York and South Carolina. The CTBA presented vignettes in multiple content areas and asked teachers to rate its effectiveness, on a Likert-like 6-point scale, for three types of learners: low-ability, low level of prior knowledge of the topic, and learners with high motivation. One of the major results was that teachers selected more low CT activities for all learners. When high CT activities were chosen as being effective, it was primarily for the high motivation learners. Similar results occurred in this study. Ratings for effectiveness of vignettes were higher for gifted students, and ratings for Low SES students were lower than any other type of student.

In an exhaustive search for factorial surveys on critical thinking, this was the only study that was not at the collegiate vignette level. The Torff studies were not designed to determine if teachers understood CT nor if bias toward ethnicity or SES played a role in the responses. The factorial survey for this study was designed to include variables of ethnicity and SES by creating vignettes that included popular or distinctive ethnic names for some of the students and teachers presented in the vignettes, as well as labeling specifics about the learners' abilities or limitations. Figure 7 demonstrates the distribution of these factors. The student focus with this study (low SES Hispanic) is represented at a higher rate in order to ensure that their position was involved in every possible situation. Including all types of students with an equivalent exposure would have made the survey too lengthy and may have increased the possibility of participation being rejected by potential respondents.

Variable Design of Survey

Legend: W/M = white or possibility of multiple ethnicities, H = Hispanic, B = Black, A = Asian					
Scenario Question / Ethnicity / Teacher / CT effective (Y/N)	**SPED**	**ELL**	**Low SES**	**Typical (average)**	**Gifted (above average)**
18. W/C –Mrs. Jordan –No	W/C – Jacob	H – Jose	B – Monique	A–Thuy	W/C – Brian
19. W/C – Mr. Johnson – No	W/C – Jacob	H – Jose	B – Monique	A–Thuy	W/C – Brian
20. H – Mrs. Ramirez – yes	W/C – Jacob	H – Jose	B – Monique	A – Thuy	W/C – Brian
21. W/C – Mrs. Harris –No	W/C – Julie	A – Su Lyn	H – Juanita	B – Damien	H – Alejandra
22. A – Miss Chan – Yes	W/C – Julie	A – Su Lyn	H – Juanita	B – Damien	H – Alejandra
23. H – Miss Fernandez – No	W/C – Julie	A – Su Lyn	H – Juanita	B – Damien	H – Alejandra
24. W/C –Mr. Clark – Yes & No	B – Gabrielle	W/C – Hannah	W/C – Sam	W/C – Chris	A – Xui Li
25. W/C – Ms. Simmons – Yes	B – Gabrielle	W/C – Hannah	W/C – Sam	W/C – Chris	A – Xui Li
26. W/C – Miss Marshall – Yes	B – Gabrielle	W/C – Hannah	W/C – Sam	W/C – Chris	A – Xui Li
27. W/C – Mr. Jennings – Yes	H – Miguel	B – Waheed	H – Carlos	H – Maria	B – Jazmine
28 W/C – Mr. King – No	H – Miguel	B – Waheed	H – Carlos	H – Maria	B – Jazmine
29 H – Mr. Hernandez – Yes	H – Miguel	B – Waheed	H – Carlos	H – Maria	B – Jazmine
30. H – Mrs. Gonzalez – Yes	N/A				
31. W/C – Mrs. Nelson – No	N/A				
Totals Student Count	SPED -- 12	ELL – 12	Low SES – 12	Typical (average)–12	Gifted (above average) – 12
Gender Totals	6 girl & 6 boy	6 girl & 6 boy	6 girl & 6 boy	6 girl & 6 boy	6 girl & 6 boy

Race Totals						
W/C	18	6	3	3	3	3
Hispanic	18	3	3	6	3	3
Black	15	3	3	3	3	3
Asian	9	0	3	0	3	3

Teacher Count									
Characteristic	W/C		Hispanic		Black	Asian			
Gender (F/M)	F-5	M-4	F-3	M-1	Part of the W/C	F-1	M-0		
CT Example	Y 2	N 3	Y 2	N 2	Y 2	N 1	Y 1	N 0	
							Y 1	N 0	

Figure 8. Designing Survey to Measure Potential Bias

Pilot Survey

The survey was piloted from October 23 – November 4, 2013. All but two of the respondents completed the survey within a week. Twenty-eight of the thirty-four educators who were personally invited to pilot the survey completed it. This represents an 82% response rate. DELTA IX peers were invited through the DELTA IX *Facebook* page. Based on background responses, three DELTA peers completed the survey. Phone texts and e-mails invited the three responding DELTA peers and thirty-one educators who could potentially pilot the survey. Another consideration was to invite a large portion of those who would fall into the parameters of the study 3rd-5th grade teachers. Thirty-nine percent of the respondents fit this parameter. Another goal was to gain a wide range of potential critique of the survey, which is why the pilot group included a range of K-12 teachers, instructional specialists, and administrators in the Pilot Survey invitations. The first two respondents of the Pilot Survey (an instructional specialist and an administrator) discovered 3 technical issues with it; two were typos and one question would not allow for multiple answers. In order to fix these issues, their responses had to be deleted, issues fixed, and revisions saved. Their responses are not included in the data provided by Survey Monkey. Figures 8 and 9 display the demographics of twenty-six of the pilot survey respondents.

Grade Level	Grades being Taught by the 26 Respondents (some teach multiple grades)	Percentage of Total
Kindergarten	3	6.5%
1st Grade	3	6.5%
2nd Grade	6	13.0%
3rd Grade	4	8.5%
4th Grade	7	15.0%
5th Grade	7	15.0%
6th Grade	6	13.0%
7-8th Grades	2	4.5%
9-12th Grades	2	4.5%
Specialists	4	8.5%
Administrators	2	4.5%
TOTAL	46	

(38.5% from focus group of this study)

Figure 9. Grade Level or Position of the Pilot Survey Respondents

The following provides some additional background about the Pilot Survey participants. Seventy-one percent of the pilot respondents had 11 years or more of teaching experience. Fifty-four percent have taught secondary students for anywhere from 3-20 years. Most have Master's Degrees (80%) and some have a Doctorate in education (11.5%). Twenty-four have their Standard Arizona teacher certification and two have their Provisional Arizona teacher certification. Forty-six percent of the pilot respondents have a reading endorsement. Ninety-two percent of the pilot respondents were female. Considering all of these demographics, the pilot respondents were veteran educators who have continued their own learning and over half have taught or currently teach secondary students, which might suggest they have taught higher levels of critical thinking and may have a higher level of confidence in their knowledge and ability to teach it.

The ethnicity of the Pilot Survey respondents is shown in Figure 8. A majority of the respondents were White (84%) and only 16% represent the ethnicity of our target population of students.

Ethnicity	Number	Percentage
Asian or Pacific Islander	0	0%
Black or African American (Not Hispanic)	0	0%
American Indian or Alaska Native	0	0%
Hispanic or Latino	4	16%
White (Not Hispanic)	21	84%
Non-respondent	1	4%

Figure 10. Ethnicity of Pilot Survey Respondents

Sixty-four percent of the pilot respondents were from a district with more than 25,000 students enrolled. The composition of the pilot respondents' classrooms ranged from 20-35% in each category of Hispanic classroom composition (0-25%, 25.1-50%, 50.1-75%, more than 75%). The composition of pilot respondents' classrooms varied more in the percentage of low SES students in respondent's classroom (qualifying for free or reduced lunch). It was more polarized with 40% of the respondents having classrooms of over 75% low SES versus 32% respondents having classrooms with less than 25% low SES students.

Sixty-four percent of the pilot respondents have had 15 hours or more of Professional Development for Common Core for ELA, but when they selected their critical thinking viewpoint in question 13, 72% of them chose one of the two researchers' viewpoints that have not been highlighted during the common core professional development that they have attended. They chose Chaffee or Sternberg instead of Facione, Paul and Elder, and Hess. Hess combines the

Bloom's Taxonomy and Webb's Depth of Knowledge (DOK). Bloom's has been studied in teacher preparation programs and the district's professional development for more than 20 years. DOK has been a strong focus in AUSD-1 for the last 4 years. An expectation was that Hess would have been the CT viewpoint chosen for a majority of the AUSD-1 pilot respondents, but it was not. This trend continued in the results for the final survey as well.

When the pilot respondents rated their preparedness to teach CT to low SES students and Hispanic students, 84% of the respondents felt Very Well or Extremely Well prepared to teach both groups. The pilot survey group of respondents were highly confident in their ability to teach CT to students, regardless of background and perceived limitations.

The 3 open-ended questions (14, 16, and 17) were:

1) Please explain how you (feel/don't feel) that critical thinking relates to reading comprehension.

2) How do you make adjustments to teach critical thinking skills to students who are reading below grade level?

3) What support do you need to enable you to teach critical thinking skills to your students who are reading below grade level?

The following chart (Figure 11) displays the open-ended responses and notes background information such as position, additional degrees and/or endorsements, and CT viewpoint. Although the survey was anonymous, many of the respondents revealed their identity, which allowed me to provide the following analysis.

50

Open-ended Pilot Survey Responses

Respon-dent	Position	Additional Degrees and/or Endorsement	Critical Thinking position	# 14 Response to: How are CT & reading comprehension related?	#16 Response to: How do you teach CT to below grade level readers?	#17 Response: What support do you need to teach CT to below grade level readers?
1	ELA Instructional Specialist	Masters in Elementary Education, Educational Technology Endorsement	Chafee	Critical thinking is embedded in the reading process. In order for one to make meaning of text and information presented by the author, I process the text and must apply critical thinking to determine what the author is saying and how this relates to me personally,	Assess students' needs, determine student interests and plan instruction. This is a wide open question that could go in many directions... Believe that all students can think critically. Use think aloud and student discussion to encourage students to explain their thinking with a complex text or problem to solve.	Specific instructional strategies geared to needs of students professional reading resources
2	ELA Instructional Spec.	Early Childhood, Reading	Sternberg	Critical thinking is a must for true, deep comprehension.	More scaffolding to read material that fosters critical thinking and spurs writing to showcase the evidence.	Time & materials
3	HS social studies	S.S. & Psychology	Chafee	I think it is crucial, otherwise you would not fully understand or comprehend the meaning of the text.	I work with our SPED dept. personnel and use books of a more elementary nature.	A class designed for that very purpose. Currently using our SPED dept.
4	PE K-6 teacher		Sternberg	Reading comprehension requires the reader to take time to reflect, make sense of words, phrases, sentences, and paragraphs analyzing each as the author	Model the thinking, chunk the text into shorter sections – tackle one section at a time, after student reads, teacher can read the	Assessing students' needs and focusing instruction. I'm not a reading teacher, so there is a lot to learn about teaching students to read.

Respon-dent	Position	Additional Degrees and/or Endorsement	Critical Thinking position	# 14 Response to: How are CT & reading comprehension related?	#16 Response to: How do you teach CT to below grade level readers?	#17 Response: What support do you need to teach CT to below grade level readers?
				constructed them and often comparing this meaning to their own ideas, beliefs, and understandings. We absolutely must engage in critical thinking to comprehend text.	passage aloud to help with fluency,...	
5	1st-2nd grade teacher		Hess	It is important to teach student "how" to understand and process reading comprehension	I would observe their learning styles and specific subject areas that need improvement and adjust my teaching strategies.	I believe below level students need more hands on realia and real world examples to help them process information.
6	Reading Spec.	ESL, Early Childhood, Reading	Chafee	Critical thinking is imperative as it relates to reading comprehension in order for the student to "connect" what they are reading to other text, personal experiences, or real world situations.	The strategies for critical thinking remain the same regardless of reading level.	Sufficient reading/intervention/el printed materials, hands on examples, professional development geared toward below grade level students.
7	HS ELA/ELD Teacher	ESL, Reading	Facione	I don't think critical thinking is necessary in order to have a basic level of reading comprehension when reading a text. However, it's necessary when trying to further that comprehension in order to gain a deeper	I take a reading strategy, such as analysis, and break it into a process of steps, in which I use charts to help guide students through the entire process. We also do the strategy together throughout a text so they	Additional texts at the students' grade level to also support independent reading.

Respon-dent	Position	Additional Degrees and/or Endorsement	Critical Thinking position	# 14 Response to: How are CT & reading comprehension related?	#16 Response to: How do you teach CT to below grade level readers?	#17 Response: What support do you need to teach CT to below grade level readers?
				understanding of the text.	become familiar with the strategy.	
8	K-6 ELD Pullout	Early Childhood, Reading	Chafee	Reading is more than just saying what is on the page; it is thinking. Reading is a thinking process for students to be able to construct meaning.	Helping to build background knowledge, helps to teach critical thinking.	Understanding what students are lacking and filling in those gaps.
9	4th Grade Teacher (2nd year of teaching)		Chafee	No response	No response	No response
10	6th Grade Teacher	Reading	Chafee	Reading requires critical thinking. It requires readers to assimilate information, to synthesize prior knowledge with new knowledge. It requires readers to evaluate and judge information being presented and to question its authenticity and value.	These students may be presented with text that is quantitatively below their grade level, but they still need to be required to think critically.	Access to adequate text that requires students to inference and be reflective in their reading yet allows them to read at their grade level. Finding enough text is where the support needs to be.
11	5th Grade Teacher	Reading	Sternberg	I believe that critical reading is essential to the full understanding any piece of writing. You must have investigative skills that can be backed up by evidence either from the	I have to teach basic critical reading skills to students before I can expect them to critically read on their own. I make sure their tool box is full of the needed skills and do a great deal	Not much. I need them to have a highlighter and paper. I believe practice makes perfect and effective modeling and guiding builds effective critical readers.

Respon-dent	Position	Additional Degrees and/or Endorsement	Critical Thinking position	# 14 Response to: How are CT & reading comprehension related?	#16 Response to: How do you teach CT to below grade level readers?	#17 Response: What support do you need to teach CT to below grade level readers?
				text directly or from logical inferencing.	of modeling in class for them to see how critical thinking is performed.	
12	4th/5th Grade ELD Teacher	ESL, Reading	Facione	Critical thinking relates to reading comprehension in the realm of constant reasoning and judgment is required to consider many aspects of reading. Decisions are made as we decide how we are to connect and make sense of text. This refers to strategy use, text structure, inferring, and writing about reading, paraphrasing and speaking of what we learn.	First I find their ZPD (zone of proximal development) in comprehension. This can be very different than their fluency score. Usually I aim to find that sweet spot of where they can infer information from text and/or mathematical problems. Then I build a strategy for breaking text or the problem down. I work at skills from that point. I model and always point out explicit qualities or behaviors that I see the student doing that are effective at a low reading level such as identifying a character's intentions or applying knowledge in a new situation. When the student begins to develop these skills along with accuracy and understanding in their ZPD, I tell them I believe that because	The three most important things I need to teach critical thinking are: 1. Smaller class size 2. Uninterrupted literacy block – 90 minutes 3. Kids homogeneously grouped by proficiency I may be different than others with materials. Because of teaching without materials in Mexico, I learned how to teach literacy without much. Materials can be pulled from almost anywhere to facilitate critical thinking.

Respon-dent	Position	Additional Degrees and/or Endorsement	Critical Thinking position	# 14 Response to: How are CT & reading comprehension related?	#16 Response to: How do you teach CT to below grade level readers?	#17 Response: What support do you need to teach CT to below grade level readers?
					they've shown such growth, they are ready to move and take on challenges. I model for them what that looks like and give similar but not exact situations with guided practice. Then I scaffold back even more to see if they can become independent with some types of inferring, concluding and summarizing.	
13	4th Grade Teacher	Administrator, ESL, Early Childhood, Gifted, Reading	Sternberg	You need to think critically in order to understand rigorous text.	Rephrase key information, use comparisons to something they understand, use pictures, below grade level texts	High interest, low reading ability texts.
14	K-6 ELD Pullout	Administrator, ESL	Facione	If students are purposefully taught critical thinking skills then they will have the skills to analyze and conceptualize what they read based on the evidence/conclusions they have deduced (whether inference or not).	Find resources that are on grade level and chunk the information or reword the information so that the student can work with a small group to read and discuss their understanding. When presenting new information/vocabulary I would allow the student time to make	I foresee I would need ongoing training, an open forum for collaboration among peers, leveled resources, administrative support to be open to trying new ideas and funding, parent workshops to learn with their child, parental support to be willing to follow-up at

Respon-dent	Position	Additional Degrees and/or Endorsement	Critical Thinking position	# 14 Response to: How are CT & reading comprehension related?	#16 Response to: How do you teach CT to below grade level readers?	#17 Response: What support do you need to teach CT to below grade level readers?
					connections and provide examples.	home with practicing new skills.
15	K-6 ELD Pullout		Chafee	No response	Try to determine their abilities in specific skills areas and build up those that are deficient, i.e., inferencing, drawing conclusions, main idea, etc.	I think one of the greatest needs is the time to spend with and plan for those students. I would like the opportunity to be trained to use Wilson Reading.
16	4-6th grade ELD	Early Childhood	Sternberg	I feel it does relate to the understanding of what we read. We must be able to analyze information as we read it and pull out important information for the purpose of our reading.	Helping them to pick out keep words which relate to the main idea if the passage. Explaining vocabulary and sentence structure to enhance understanding.	Just leveled materials with high interest subjects.
17	Instructional Specialist	HS Social Studies	Sternberg	Critical thinking closely relates to reading comprehension in that you cannot fully understand the author's main ideas without being able to assess whether or not that those points or claims fit in your understanding of the world. Also, to be critical of any text you have to be able to first understand what the	By scaffolding and helping them make the necessary connections to get to a level of understanding that is sufficient. Having them reread information and annotate the important points is helpful and I usually model it for them and then go back and help them read the challenging parts so they can hear it correctly and practice it.	It would be helpful to have parent support at home to reinforce what we are doing in school. I believe having access to electronic resources could help supplement the deficient skills at home. I am a firm believer in practicing something that you are struggling with as a means to overcome. I know this isn't always practical. But there isn't

Respon-dent	Position	Additional Degrees and/or Endorsement	Critical Thinking position	# 14 Response to: How are CT & reading comprehension related?	#16 Response to: How do you teach CT to below grade level readers?	#17 Response: What support do you need to teach CT to below grade level readers?
				author is trying to convey and then you must process that information and make the necessary connections in the context that applies. Many higher level complex texts draw on ideas from so many disciplines that critical thinking is imperative to comprehension, especially, in today's world where you run across information that is biased or designed to persuade if not manipulate. Our readers must develop a skill that requires them to ask difficult questions as the read. The only to fully understand something is to make sure if aligns to your current understanding and beliefs about a particular subject. When learning something new it would be helpful to follow up		always enough time at school with 30 other students to get those students the help they need. A reading coach can help as well. Other than that, more training on strategies to help those students would go a long way I think.

Respon -dent	Position	Additional Degrees and/or Endorsement	Critical Thinking position	# 14 Response to: How are CT & reading comprehension related?	#16 Response to: How do you teach CT to below grade level readers?	#17 Response: What support do you need to teach CT to below grade level readers?
				claims and cross reference to ensure that the source of information is of good quality.		
18	7th Grade ELA	ESL	Sternberg	I feel that critical thinking relates to reading comprehension by showing students how to think about what they're reading and to better understand how it relates to the rest of the world.	I use smaller groups so I can watch the critical thinking process happen to assist students along the way of their understanding of what they're reading.	It would be great to either have smaller, more manageable class sizes for small group purposes, or make sure there's always a co-teacher in the room to help with the small groups.
19	K-6 ELD Pullout	Counseling, Administrator , Early Childhood	Facione	I do feel it relates. Your prior knowledge and ability to analyze the thought process of how a selection is worded and explained all leads to the comprehension of a reading selection	Use their prior knowledge and various learning modalities to find the best way to teach them	High interest with low reading level materials
20	6th Grade	Gifted	Chafee	I think it helps the children better understand the content, make connections, and pull information.	Starting with small sections of text, model the process of pulling information to support their investigation. Then proceed on to more in-depth text as they progress.	Support materials.
21	2-3 ELD Combo	Special Education	Chafee	The amount of information you glean from a text is directly	You need to modify their instruction and questions to their oral language	I believe you can modify by reading aloud to allow students

Respon-dent	Position	Additional Degrees and/or Endorsement	Critical Thinking position	# 14 Response to: How are CT & reading comprehension related?	#16 Response to: How do you teach CT to below grade level readers?	#17 Response: What support do you need to teach CT to below grade level readers?
				related to how critically you think about what you just read.	level. That doesn't just mean for students that are considered ESL, but also for any student with lower vocabulary and background knowledge.	to still critically think about a passage they might struggle to read. I do not believe that you can present students with a passage that is above their receptive language levels.
22	7th/8th Grade Math	Secondary Math EdD Admin	Sternberg	I feel that critical thinking relates to reading comprehension by way of moving from a reproductive view of what we read to a constructive view, meaning connecting to prior knowledge, making inferences… while we read instead of just reading words on a page like memorizing.	I constantly make adjustments when I teach, to better reach the individual student. I start by meeting the students where they are and then make connections to their world and build from there with the standards as my benchmark and enrichment as my goal.	Time with resources to make an engaging plan. Motivation from the students to learn.
23	Principal	Doctorate Elem. Ed & Admin., Counseling	Facione	If a reader is going to make sense of the text she is digesting, she needs to be able to make connections to prior knowledge about the content, monitor her understanding of vocabulary and syntactical structures, - and digest the content	Students who are reading below grade level need appropriate leveled material that will enable them to increase their fluency and thereby be able to concentrate on content comprehension. It is at that juncture that we can begin to enable students to learn	I would need appropriate materials that include a significant amount of informative type text. I would also need the time each day to work with my students so that the strategies that I am modeling and guiding them in

Respon-dent	Position	Additional Degrees and/or Endorsement	Critical Thinking position	# 14 Response to: How are CT & reading comprehension related?	#16 Response to: How do you teach CT to below grade level readers?	#17 Response: What support do you need to teach CT to below grade level readers?
				so that it has meaning to her and increases her knowledge base about the topic so that she can make a reasoned analysis of the text when asked specific questions.	strategies that will support their comprehension endeavors.	demonstrating become comfortable for them. It takes a significant amount of scaffolding a struggling reader to help her develop confidence and competence.
24	2nd Grade Teacher	Early Childhood, Reading	Chafee	I teach CT by including sharing time in our whole group instruction so students explain their thinking and listen to others to increase reading comprehension	I provide daily small group instruction so that they feel more comfortable sharing and I can provide more one-on-one conferring time	I need added time in our school day (additional half hour) to provide adequate small group instruction time and allow time for conferring
25	5th Grade	ESL, Counseling, Special Education	Sternberg	Reading requires metacognition to help process information in which students are asked to find evidence from Text-based questions involving critical thinking	Differentiate reading assignments with same Learning goal, and track student progress to help with accommodation/modifications.	No response
26	Administrator	ESL, Early Childhood	Hess	Critical thinking allows the reader to analyze and synthesize the message of the reading to other contexts and/or apply the content to new situations.	I work to hold them accountable to the same critical thinking that other students are required to do but with reading at their level.	Feedback from students feedback from peers

Figure 11. Open-ended Pilot Survey Responses

Several additional cross references that were not done with this Pilot Survey data, such as years of experience or amount of students who are the target students - low SES Hispanic students - were done with the Final Survey data and discussed in the Data Analysis section of this study. In addition to the cross-references in Figure 11, Figures 12-14 are screenshots of the word analysis done (with Survey Monkey) on the pilot responses for the 3 open-ended questions.

They display the most important and frequent words used in their written responses.
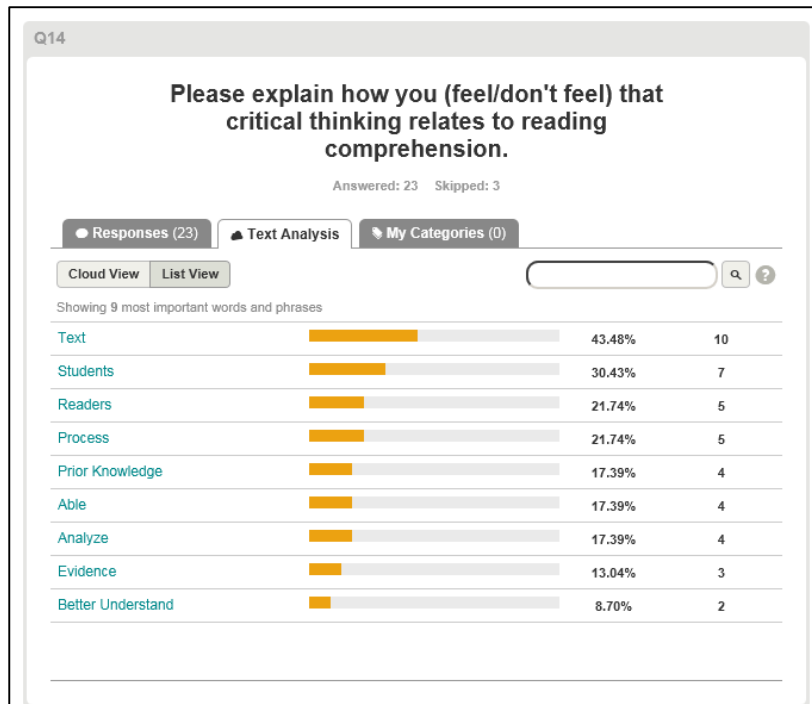
Figure 12. Question 14 Word Analysis (Pilot Survey)
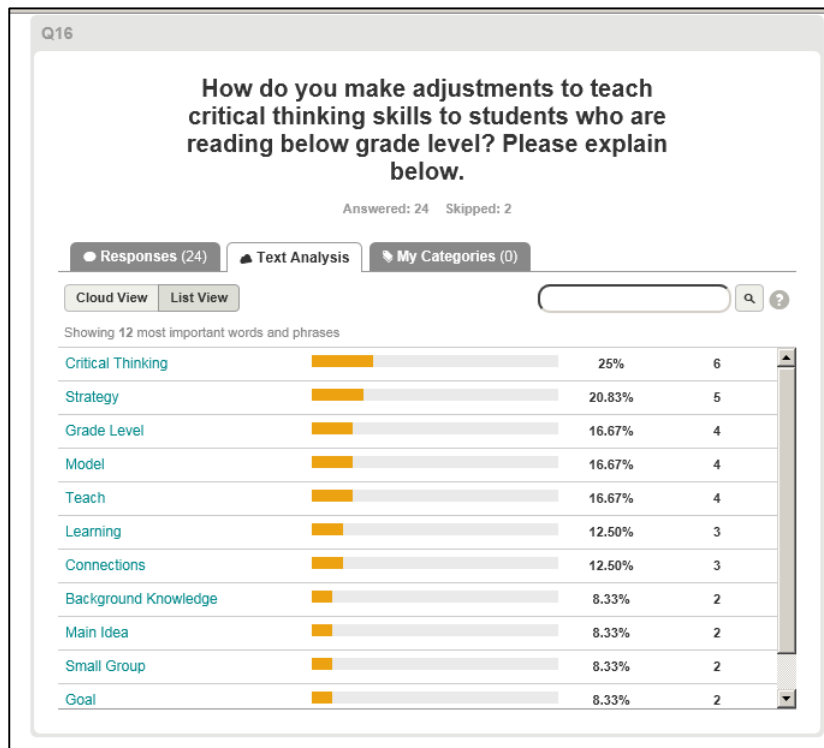
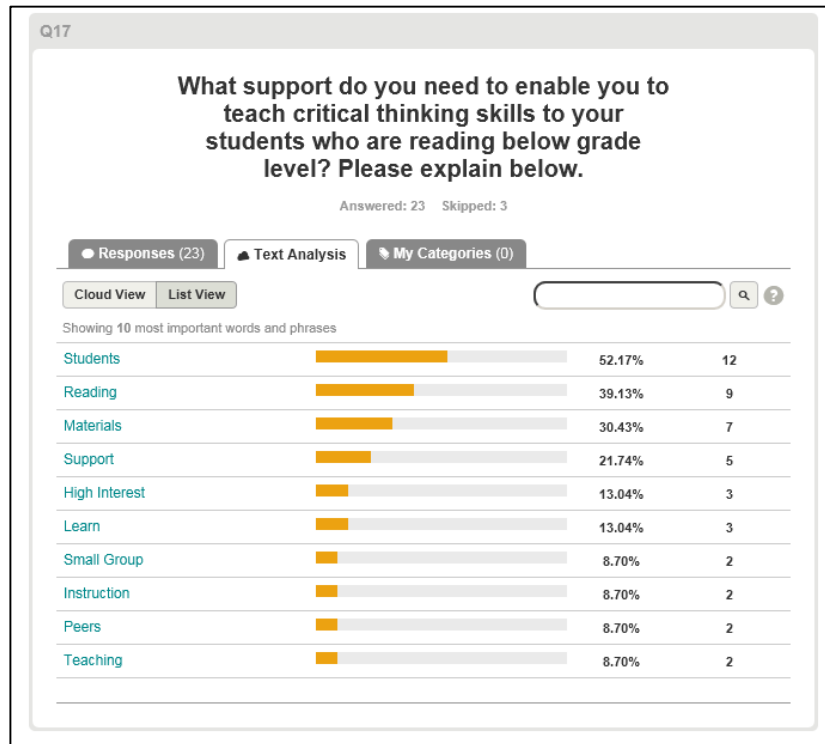*Figure 13.* Question 16 Word Analysis (Pilot Survey)

Figure 14. Question 17 Word Analysis (Pilot Survey)

In addition to using this word analysis with Survey Monkey, open-ended questions for the Final Survey were analyzed using grounded theory (Corbin & Strauss, 2008) to seek patterns and relationships in the responses. Iterative, inductive, and deductive reasoning were used to examine the relationships of open-ended responses to other open-ended responses, as well as scaled responses of the vignette questions.

Validity of the Pilot Survey. Did the vignette questions provide a distinction between those participants who understood teaching and assessing CT skills? Looking at the responses for the "typical/average" student who

scores an average of 80% on reading assessments, Figure 14 provides some indication of whether the vignettes performed this task with the Pilot Survey. The typical/average student was chosen to reduce the influence of most limiting factors or biases that might be associated with the other students noted in the vignette choices.

The vignette for question 24 involved pairs of students, so the results of both pairs are noted. The vignette was effective for one pair but not the other pair. This vignette was an opportunity to check for differentiation between types of students and what they produced. Some participants recognized that the one pair was not assessed accurately for their assignment, but a majority still scored it as being effective; not as much as the other pair, but enough to make it a majority of responses that were inaccurate scores of the CT assessment for the ELL/Typical paired students.

Question 28 highlighted the possible misconception that some teachers think that adding an essay component to a question automatically raises the level of thinking. The essay component of this vignette involved a low level of thinking. The objective was a CT level of analysis, but the product only required a paraphrasing or elaboration level of thinking process. The essay component of the vignette in question 29, asked for an essay that involved transfer of understanding of multiple locations and groups of people in order to provide a connection and purpose for each connection, so it was an effective example of using an essay to raise the engagement of students in critical thinking.

Based on the high percentage of respondents who chose scores of 3 or 4 (a range of 16.5-71.5%, with a median of 44%), the crossroad between leaning toward a vignette being an effective or ineffective example of CT, it appears that the respondents were not clear about effective examples of CT instruction and assessment in most cases. The Final Survey demonstrated a similar pattern of high number of these scores as well.

Exceptions to the high percentage of middle scores are questions 22, 25 and 26 of which a higher percentage of respondents determined the vignettes to be effective (74%, 83.5%, and 71%). Perhaps, they were described more clearly than the others and/or involved examples that they connected to higher levels of thinking. There was a high percentage of uncertainty or low commitment with responses on Questions 30 & 31. It may be that they were experiencing survey fatigue near the end of the survey. Signs of survey fatigue include rushing, quitting, and non-discrimination of responses. Out of the 26 respondents, 34.6% may have responded due to survey fatigue (3 quit and 6 may have been non-discriminatory by choosing the same response for the last 3 vignettes [9, 30, 31]).

Variances of Responses for Typical/Average Student for Pilot Survey

Vignette Question	CT Example	% of Respondents scoring from highly ineffective (1) to ineffective (2)	% of Respondents scoring from effective (5) to highly effective (6)	What might this mean? *slightly unsure = scores of 3 or 4, which doesn't commit the responder to effective or ineffective scoring
18	Ineffective	12.5%	25%	62.5% were unsure*
19	Ineffective	39%	13%	48% were unsure & 39% recognized that it was ineffective
20	Effective	8%	54%	38% were unsure & 54% recognized that it was effective
21	Ineffective	58%	8%	34% were unsure & 58% recognized that it was ineffective
22	Effective	0%	74%	36% were unsure & 74% (the second highest accurate measurement) recognized that it was effective
23	Ineffective	56.5%	4%	39.5% were unsure & 56.5% recognized that it was ineffective
24	Effective (low SES/ Gifted)	13% / 13%	43.5% / 52%	There does not appear to be a significant difference in responses here except that respondents did not appear to recognize the difference in CT effectiveness between the students
	Ineffective (ELL / Typical)	13.5% / 13%	32% / 48%	
25	Effective	0%	83.5%	Only 16.5% were unsure & this was the highest accurate measurement by respondents of CT
26	Effective	0%	71%	39% were unsure & 71% recognized that it was effective
27	Effective	4%	56.5%	39.5% were unsure & 56.5% recognized that it was effective
28	Ineffective	0%	56.5%	43.5% were unsure & 56.5% did NOT recognize that it was ineffective
29	Effective	9%	61%	30% were unsure & 61% recognized it as effective
#30 & #31 did not have responses designed to determine bias based on student type – these two questions were just to determine CT knowledge				
30	Effective	11.5%	24%	64.5% were unsure & 24% recognized it as effective
31	Ineffective	15.5%	13%	71.5% were unsure & 15.5% recognized it as ineffective

Figure 15. Variances of Vignette Responses (Pilot Survey)

What do high levels of uncertainty tell us about the validity of the vignette questions? It could be that some vignettes were not clearly described or not exemplar examples of CT practices. Another possibility is that the respondents did not clearly understand how to teach and assess CT. It is likely that with some or many of the survey respondents, they chose the middle scores in order to fulfill satisficing (reducing your cognitive load). According to Barge & Gehlbach (2011), other than rushing or quitting a survey, another way of satisficing is choosing the same scores for most of the responses or choosing the neutral scores. Looking at the pattern of responses, 9 out of 26 (34.6%) had a pattern of the same responses through the last 3 vignettes. Sixty-five percent of the participants did not have the response-choice satisficing behavior patterns. In addition, a pattern of rushing or quitting was not evident in those same 65% of the respondents who completed the Pilot Survey.

Reliability of the Pilot Survey. A reliability analysis was done to see if the survey consistently measured whether teachers understood CT instructional practices and if it consistently measured whether teachers had different expectations of different types of students with their CT instructional practice. This was calculated using Cronbach's Alpha with the data analysis program Statistical Package for Social Sciences (SPSS). Based on the .953 & .941 scores, the survey consistently measured the same criteria.

Cronbach's Alpha for Survey Questions 18-29 and 30-31

Scale: ALL VARIABLES	
Case Processing Summary	

		N	%
Cases	Valid	19	73.1
	Excluded[a]	7	26.9
	Total	26	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.953	60

Figure 16. Questions 18-29

Scale: ALL VARIABLES	
Case Processing Summary	

		N	%
Cases	Valid	20	76.9
	Excluded[a]	6	23.1
	Total	26	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.941	8

Figure 17. Questions 30-31

Feedback on Pilot Survey. Pilot Survey participants were asked to let me know how long the survey took, if they had any technical issues with it, and if they had any suggestions or comments about the survey. The average time to take the survey was 25 minutes, most took 16-20 minutes, and 4 took 30-40 minutes. Based on these suggestions and comments, there were no changes made to the final survey.

Comments and suggestions were:

"Had to read and reread vignettes to choose. Fascinating development of questioning. Love it!" (target participant)

"Easy to follow. Liked that. Could maybe reduce it by 2 vignettes to make it shorter." (She took 23 minutes to complete the survey.) (target participant)

68

"I couldn't connect with the last two. I needed more background references. For responding to the vignettes, I look at my kids as kids, so I don't limit their potential." (target participant)

"Vignettes were hard to understand and seemed subjective." (target participant)

"It was a thinker!"

"They made me think! Background information on my school took some time to look up."

"Enjoyed the questions."

"Reliable and valid. Made me think and caused me to go back to earlier questions in survey and change my responses."

Chapter 4 – Findings and Results

The purpose of this descriptive study was to collect a sample of opinions from third, fourth, and fifth grade teachers as to whether they felt prepared to teach the critical thinking standards of CCSS to Low SES Hispanic students. This study sought the teachers' opinions about their confidence in teaching the students as well as their perceptions of the students' ability to learn critical thinking skills. In addition, this study collected what the teachers thought they needed to effectively teach CT skills to students who were reading below grade level. The inclusion of effective and ineffective CT vignettes for teachers to rate effectiveness for different types of students provided some insight into the teachers' knowledge of CT instruction and their beliefs concerning different types of students' abilities to learn CT skills.

The results of the study will provide topics to consider when planning the next phases of professional development for AZCCRS, in particular in the area of differentiating instruction for Low SES Hispanic students while maintaining the rigor needed to instill critical thinking skills. A possible extension of this study could add to the discussion of implementing professional development that impacts instructional practices for at-risk students.

A survey collected data from 167 teachers of two uniquely different school districts. The survey had multiple layers of data collection including demographical and background information, confidence ratings, open-ended feedback, position ratings, and factorial scorings of CT classroom vignettes.

Procedures for Data Collection of Final Survey

1) Obtained permission from AUSD-1 and AUSD-2 to conduct the study and survey from the districts' Superintendents (Appendix B).

2) Obtained permission for the study from the AUSD-1 and AUSD-2 school site principals (E-mailed request & responses Appendix C).

3) Obtained IRB approval to proceed with research study.

4) Used the AUSD-1 and AUSD-2 email systems to e-mail the survey to 502 third through fifth grade teachers in both school districts during the first week of March 2014. The goal is to obtain a minimum of 80 responses during a 6-week window.

5) In order to further entice teachers to participate and thereby increase the rate of participation, offered a $1 donation to each district (for classroom grants) for each completed survey. This procedure is based on the work of Szelenyi, Bryant and Lindholm (2005), who found that prepaid monetary incentives enhanced response rates.

6) Used Survey Monkey to analyze the scaled responses in order to determine patterns and trends as a whole group and disaggregated groups (based on responses to background questions 1-13):

   A) each of the four categories for classroom population of Hispanic students versus the whole group of respondents

71

and comparisons of each category to each of the other

three categories, and

B)   each of the four categories for classroom population of

students qualified for free or reduced-price school lunch

versus the whole group of respondents and comparisons of

each category to each of the other three categories

7)   Used grounded theory (Corbin & Stauss, 2008) to sort open-ended

responses and discover patterns. Used iterative, inductive, and

deductive reasoning to examine the relationships of open-ended

responses to other open-ended responses, as well as open-ended

responses to the scaled responses.

Target Participants of Final Survey

The target group was 502 third through fifth grade teachers in AUSD-1

and AUSD-2. The sample was selected from two school districts in the state of

Arizona. There were approximately 390 third through fifth grade teachers in

AUSD-1 and 120 in AUSD-2.

AUSD-1 is one of the twenty largest K-12 districts in the state of

Arizona. The school district is located in the southeast part of the Phoenix

metropolitan area and covers eighty square miles. It is one of the fastest

growing districts in the state of Arizona. It has twenty-nine elementary schools

(K-6), seven junior high schools, four high schools, and two alternative schools.

When evaluated by the state through *Arizona Department of Education's A-F*

School Accountability Letter Grade System (ADE A-F), AUSD-1 was awarded a grade of A for the fourth year in a row by earning 149 out of 200 points (AZED, 2014).

AUSD-1 has an enrollment of approximately 41,000 students with a large range of socio-economic levels. Seventeen (59%) of the schools have less than 20% of their students on free or reduced-price lunch, seven schools have 31%--60% of their students on free or reduced lunch. There are five Title I schools, which have 92% of their students qualifying for free or reduced- priced lunch and 85-89% of the student population is Hispanic. Across the district, five percent (5%) of the district's students are ELL.

AUSD-2 is a small urban Kindergarten through eighth grade school district located in the center of the Phoenix metropolitan area. It has eleven schools, which are seven Kindergarten to fifth grade elementary, one Kindergarten through eighth grade school, two sixth through eighth grade schools, and one preschool. When evaluated by the state through *Arizona Department of Education's A-F School Accountability Letter Grade System (ADE A-F)*, AUSD was awarded a grade of D 98 out of 200 points. AUSD-2 ranked in the lowest 20% of school districts in Arizona (AZED, 2014).

AUSD-2 has an enrollment of approximately 7,000 students with a narrow range of socio-economic levels. Every school has Title I status. The district's Hispanic student population is 96%. Ninety percent (90%) of the

students qualify for free or reduced- price lunch. Fifty percent (50%) of the district's students are ELL.

Procedure for Analysis of Results

The results of the survey are being used to provide a description of teachers' perception of their ability to teach critical thinking skills to low SES Hispanic students.

First, will be a description of the participants of the survey and discussion their similarities and differences, including the demographics of the students in their classrooms. Second, a report on the responses chosen for the instructional and critical thinking questions 12, 13, and 15. Third, a description of patterns and comparisons that emerged from the instructional and critical thinking open-ended questions 14, 16, and 17. Fourth, a disaggregation of the open-ended responses by comparing responses to key factors in the background responses answered in questions 1-13, such as years of teaching experience, ethnicity, classroom demographics (Hispanic, low SES), and critical thinking perspective chosen in question 13. Fifth, an analysis of the accuracy and confidence of responses chosen to measure critical thinking instruction and assessment in vignettes for questions 18-31. The purpose of the vignettes was to measure the teachers' knowledge of critical thinking and how to teach and assess critical thinking during AZCCRS ELA instruction.

Data Collection

The survey was open from March 10, 2014 to April 17, 2014. Of the five hundred and two invited to participate in the survey, one hundred sixty-eight responded for a response rate of 33.5%. The response rate from AUSD-1 was 33.8% and AUSD-2 was 31.9%. Some questions in the survey have a lower response rate, with the vignette questions being the ones that 42-48% of the participants chose not to respond (Figure 18). According to Iarossi (2006), the overall response rate is not related to the length of the survey or lower response rate of the items near the end of the survey. With this in mind, the quality of the responses in questions 1-17 are not impacted by the lower response rate of the vignette questions 18-31. In addition, the length of the survey, measurement of time to take the survey and number of pages, does not appear to impact the quality of the resulting survey data until reaching 75 minutes or 20 pages (Iarossi, pg. 79-80, 2006). Only 11 (6.5%) participants took longer than 75 minutes. Looking at individual start and stop times, these participants started the survey during the school day, left it open while teaching, and returned to it after school. Only 15.5% (including the fore mentioned 6.5%) of the participants took longer than 30 minutes to complete the survey, thereby reducing the possibility that length of the survey impacted the lower response rate for the vignette questions 18-31. The page length of the entire survey, including introduction and directions, was 14 pages with an average of 2-3 questions per page.
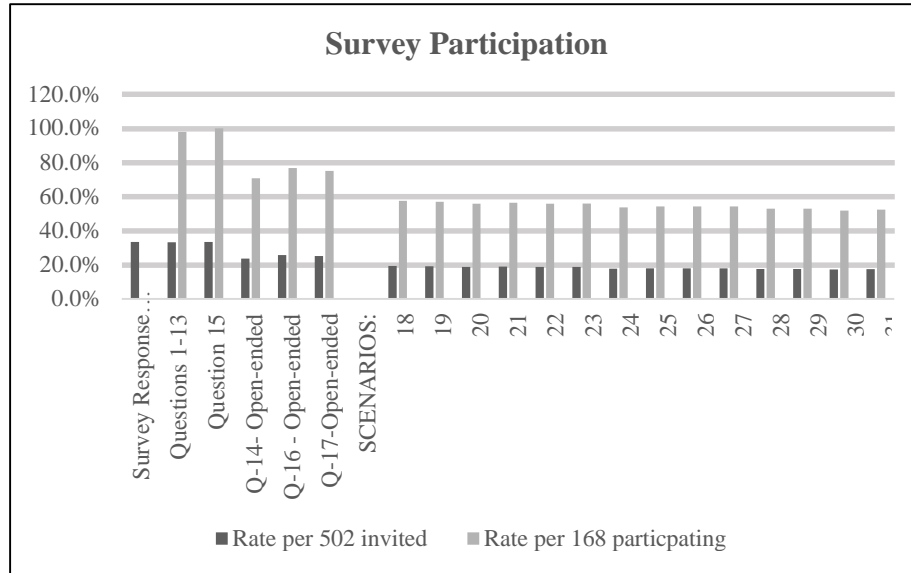
Figure 18. Final Survey Response Rate

Demographics and Background of Respondents

This survey was a non-probability sample. One of the districts chosen was the researcher's district of employment and the other was a district of some of her Delta IX peers. The 3rd-5th grade teachers, who were invited and responded, were from two uniquely different school districts: AUSD-1 is a unified K-12 school district with approximately 41,000 students, 26% are Hispanic and 28% are considered low socio-economic students, of which 56% are Hispanic (6,700 students). Of the approximately 6,700 low SES Hispanic students, 25.4% (1,700) were the target population of this project (3rd-5th grade low SES Hispanic students). The second district, AUSD-2 has a much higher concentration of Hispanic and Low SES students. It is a K-8 school district with

approximately 7,000 students, 96% are Hispanic and 90% are considered low socio-economic students (*Figure 19*).

Comparing the percentage of Hispanic teachers who responded to this survey to the percentage of Hispanic teachers in each of the two school districts surveyed (Arizona Department of Education, 2013), produced similar results for AUSD-2 (54% vs. 45%), with a balance of 9% more responding to this survey. For AUSD-1, the gap appears closer, but the amount of Hispanic teachers for AUSD-1 is much fewer than AUSD-2. Having 4% respond compared to the 7% of Hispanic teachers in the district presents a lower proportion of Hispanic respondents for AUSD-1; almost 50% less than those Hispanic teachers who are teaching in AUSD-1 (4% vs. 7%). On the other hand, part of the differences could be the balance of Hispanic teachers in each district. The state reports used to determine the proportion of ethnicity for each district's teachers do not break it down by grade level, only by elementary and secondary. It is possible that the difference is related to the grade levels that the teachers are teaching (K-2 instead of 3-5 or vice versa). In either case, as shown in *Figure 19*, teachers' ethnic population is not proportional to the ethnic population of the students. Even so, 15% of the survey's respondents represent the ethnicity of this study's target student population.
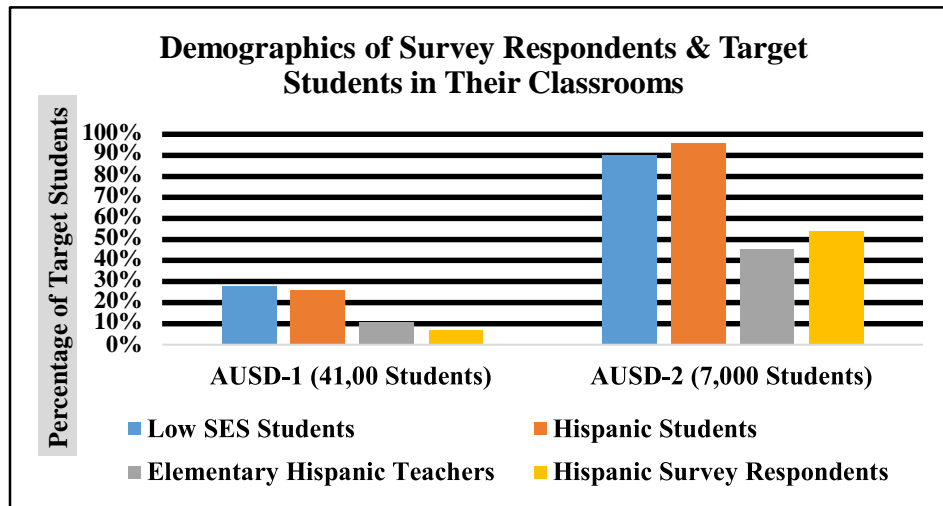
Figure 19. Low SES Hispanic Student Demographics of Respondents

Based on the pilot survey where several respondents did not answer the district enrollment correctly, usually responding with their school enrollment instead of district enrollment, two separate collectors were created in order to have an accurate representation from each district. Because the student demographics (Hispanic and Low SES) of each school district were on different ends of the spectrum, some of the data comparisons and disaggregation highlight similarities and differences between the responses of the two districts.

The following figures describe the background information of all of the Final Survey respondents from both school districts. In the *Figure 20*, the grade level that the respondents were currently teaching were a similar representation of the five hundred two invited to participate. (The respondents who selected grades outside the target group, teach multiple grade levels, including the target group.) The similarity of the invitees and participants, in this case, are in the

pattern of there being more third grade than fourth grade and more fourth grade than fifth grade teachers in both the group invited and the group who participated. This indicates that the respondents may be a representative grade-level sample of the two districts being surveyed. When numbers were compared proportionally, the proportion of third grade teachers who responded was 7% higher than the proportion of those invited, making the weight of respondents, who teach third grade, closer to half rather than just over a third of the population that they represent (third through fifth grade teachers in AUSD-1 and AUSD-2). The survey questions were not dependent on grade-level knowledge and experience other than being a teacher of the third-fifth grade range. Thus, having 7% more third grade respondents than the targeted survey invitees should not skew the data significantly.

Having a fairly representative grade-level sample of the targeted survey invitees lessens the potential of nonresponse error. It is noted that its potential exists, but current research suggests that even a high nonresponse rate does not necessarily impact the data results of a well-constructed survey (Stoop et al., 2010).
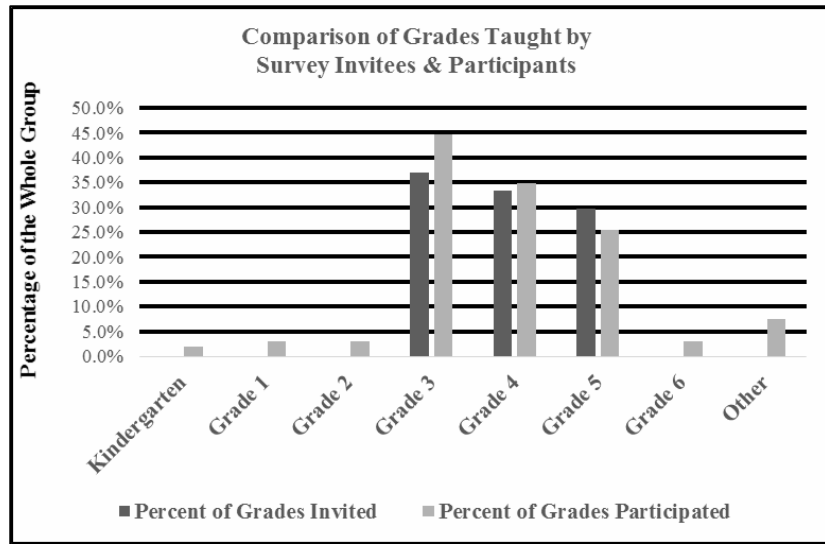
Figure 20. Current Grade Levels: Invitees vs. Participants

One of the goals of selecting these two districts was to obtain a representative sample of Arizona public school classrooms. Statewide, classrooms have various compositions of low SES and Hispanic populations, with Title I schools having the highest percentage. As shown in *Figure 2* of Chapter 1, 26.7% of Arizona's students are both low SES and Hispanic, which results in 60.7% of Hispanic students being Low SES. *Figure 20* displays the Hispanic and low SES population of the classrooms of the survey's respondents, by showing how many of the respondents in each district have a composition of the study's target group of students. The line across the columns displays the percentage of Hispanic, and low SES students statewide. The most notable comparison on Figure 20 is the distribution of Hispanic and low SES students between AUSD-1 and AUSD-2. All of AUSD-2's survey respondents have a

composition of more than 75% of the study's target students, whereas most of the respondents from AUSD-1 have 25% or fewer of the study's target students in their classrooms. This is not surprising, since AUSD-1's student population in the 2014 school year was 26.7% Hispanic, 29.4% low SES, and 16.5% were low SES Hispanic students. AUSD-2's student population in the 2013-2014 school year was 94.1% Hispanic, 99.9% low SES, and 94% low SES Hispanic students (Arizona Department of Education, 2013). Due to this difference between the two districts, responses for critical thinking related questions were compared by district. Any notable differences have been included in the data analysis.
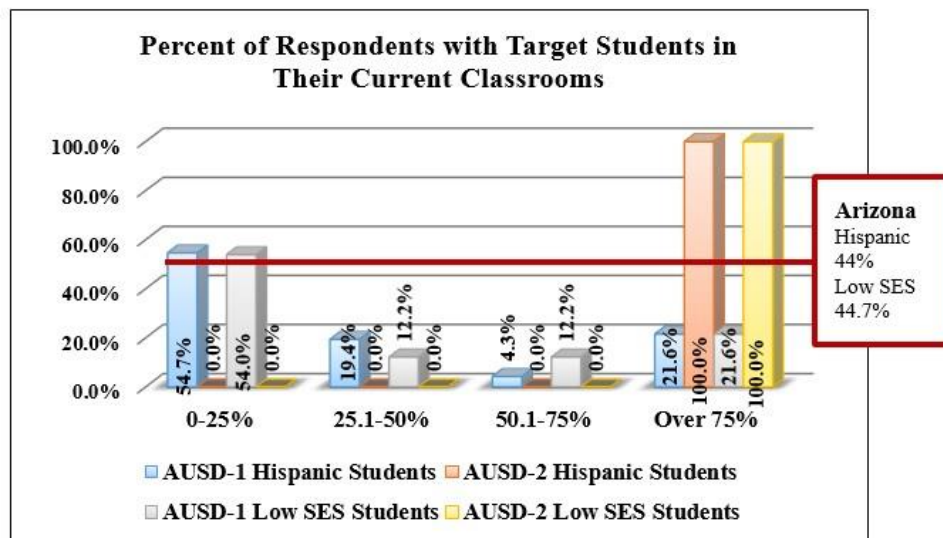
Figure 21. Comparing Classroom Composition of Final Survey Respondents by District. Source: Arizona Department of Education, 2013

What was interesting about the demographics of the survey participants (refer to *Figure 22*) was the percentage of those who have been teaching eleven or more years (53.9%). Based on a frequent message in education that Title I

schools have the least qualified or experienced teachers, an expectation was that there would be a much greater difference between AUSD-1 (56.6%) and AUSD-2 (41.3%), in as much as there would be limited participation from teachers with more than ten years of teaching experience. Nationally, 64.5% of the teachers in 0-34% low SES schools have more than ten years of experience, and 54.5% of teachers in a 75% or more low SES school have more than ten years of teaching experience (Goldring, Gray & Bitterman, 2013). It is not known if the respondents' years of experience are a representative sample of their districts' teachers or an indication that more teachers with more than ten years of experience are more likely to respond to surveys.
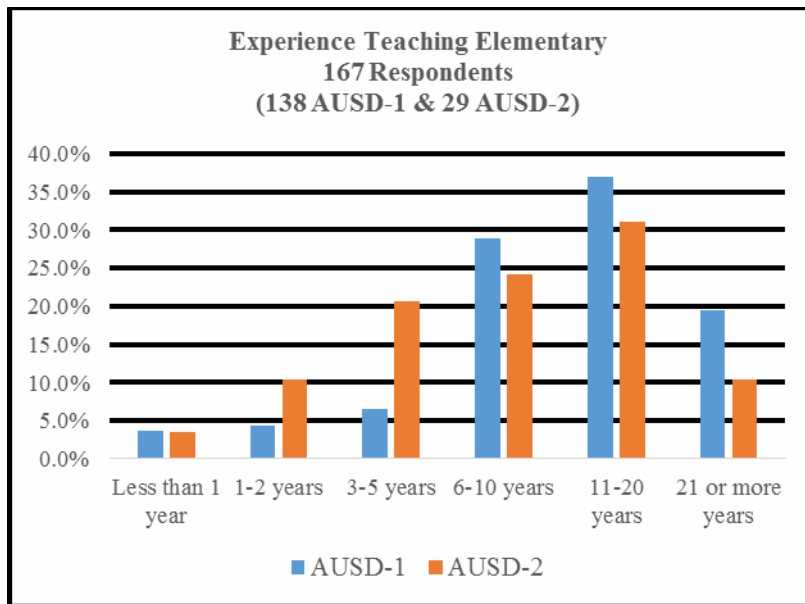
Figure 22. Experience Teaching Elementary

Figure 23 displays the percentage of survey respondents from each district, with AUSD-1 being the district with more than 25,000 students (82.7%) and AUSD-2 having less than 10,000 students (17.3%). The survey responses have a heavy majority of responses from AUSD-1 because it has a higher enrollment of students and teachers. Even so, the balance of the response rate was comparable (33.8% vs. 31.9%).

District Enrollment of Survey Participants

17.3%

82.7%

■ More than 25,000 students
■ 5,000-9,999 students
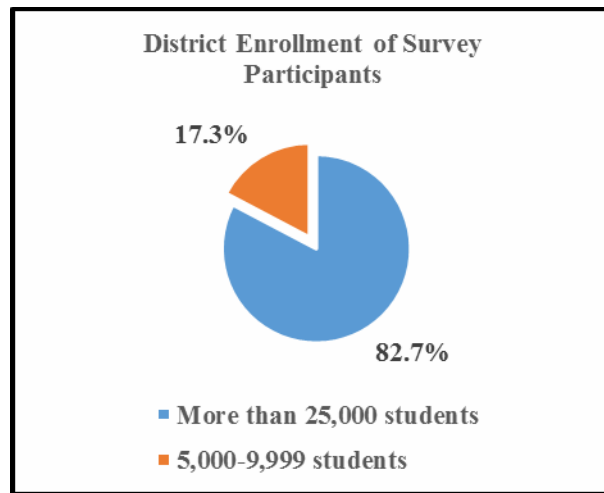
Figure 23. District Proportions of Respondents

Several questions provided more background information about the survey respondents in reference to their background, education and teaching certification. The following is a combination of both districts. Out of 167 who responded to the gender question, 13 were male and 154 (92%) were female. This survey was slightly skewed toward the female teacher perspective, but not enough to significantly impact the results. Nationally, 89% of elementary teachers are female (Goldring, Gray & Bitterman, 2013).

Considering the ethnicity of the survey's respondents (*Figure 24*), the respondents were primarily White (not Hispanic) teachers (84.7%). The next highest ethnicity of participants was Hispanic or Latino with 14.7%. Comparisons were done with the data to discover any notable differences, but no significant differences were found. The sample of Hispanic or Latino participants was most likely too small (24 out of 163) to be comparable.

Ethnicity	AUSD-1	AUSD-2	Percentage
Asian or Pacific Islander	1	2	1.8%
Black or African American (Not Hispanic)	1	0	0.6%
American Indian or Alaska Native	0	0	0.0%
Hispanic or Latino	9	15	14.7%
White (Not Hispanic)	125	13	84.7%
Other: Mixed European Heritage, Hispanic & White, Nod	3	0	1.8%

Figure 24. Ethnicity of 163 Participants Responding

When asked about experience teaching secondary students, 32.5% of all survey respondents have taught secondary students, with 83% teaching secondary for one to two years. Most of the respondents' highest degree was a Master's in education (73.8%). All had Arizona teaching certifications with only 12% having provisional level certificates. About 25% were lacking a full Structured English Immersion endorsement, which is required to convert a provisional certificate to a standard, unless the teacher has a Bilingual or ESL

endorsement or degree, which 28.5% of the respondents have. The other endorsements that could have impacted a respondent's understanding of this study's topic were Early Childhood (31.1%) and Reading (18.5%).

Critical Thinking Responses

Based on 71.4% of the respondents having more than 20 hours of professional development for AZCCRS (*Figure 25*), the expectation was that their confidence level for teaching critical thinking skills would be similar. In order to judge whether the possibility for a correlation existed, respondents' responses for the amount of AZCCRS professional development they had received was compared to their actual responses to how prepared they were to teach CT to on-grade level students. Later discussion focuses on their responses to other types of students. The on-grade level students were the group that most respondents rated the highest confidence level in teaching CT. In addition, the on-grade level group represents the group with limited competing variables.

Figure 26 displays no apparent pattern of relationship between amount of professional development for AZCCRS and confidence in teaching CT to on-grade level students. (Note that no participants in AUSD-1 had participated in the first two categories of hours.) What does this tell us about the confidence of the teachers? Was their confidence inflated? Was it unrelated to professional development? Did the respondents understand what was needed to teach CT effectively? Was 1-3 hours of AZCCRS effective enough to build confidence in teaching CT? Did the professional development have a diminishing rate on

returns or did it negatively impact confidence levels by building awareness of the unknown or confusing participants or some other factor? These questions cannot be answered with the data of this study, but could be investigated with further study by using teacher observations or analyzing their course content.
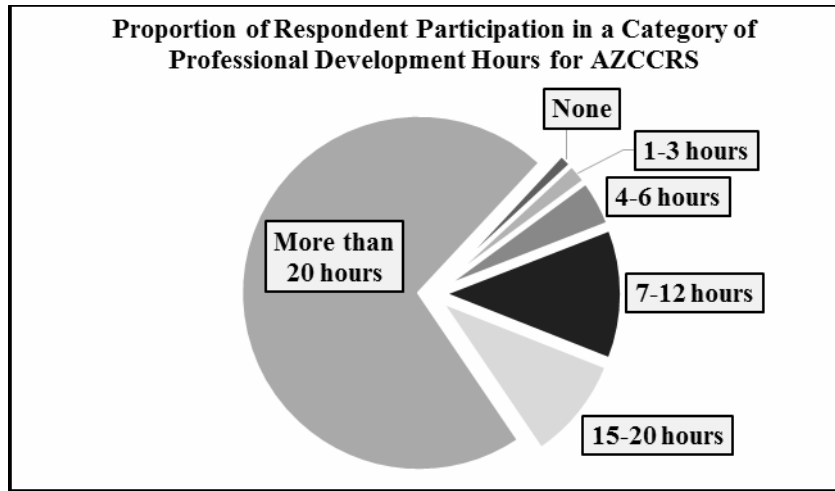

Figure 25. Number of hours spent in AZCCRS Professional Development
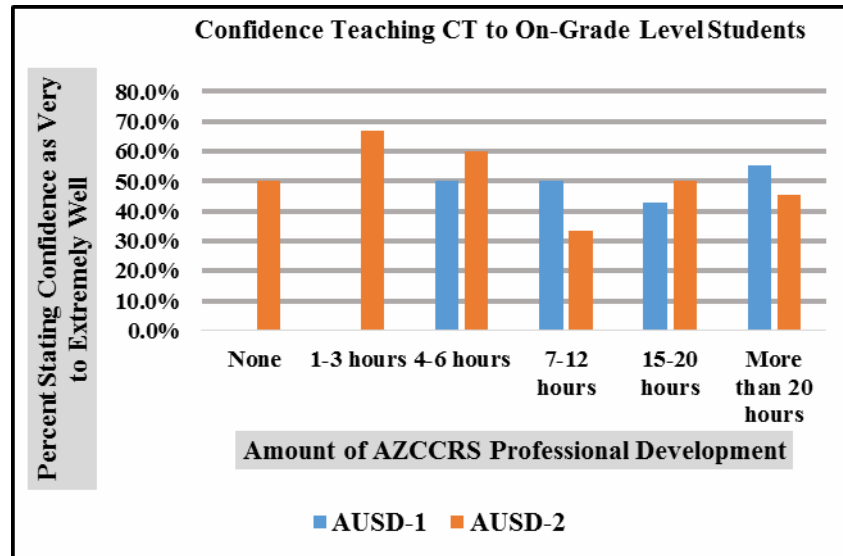

Figure 26. Comparison of Confidence Teaching CT and Hours of AZCCRS ELA Professional Development

With survey question 13, participants were asked to choose a critical

thinking perspective or definition that most closely matched their own. There

was no wrong or inaccurate choice to be made with this question. All of the

choices had connections with the ELA AZCCRS and all were labeled and sited

with the originator. The most popular choices for 61.6% of the respondents

were Sternberg's and Chafee's definitions of critical thinking (*Figure 27*). This

was interesting because the Common Core professional development that they

have taken over the last two years was primarily based on Facione's, Hess' and

Paul & Elder's definitions, but these were not chosen as frequently. The Pilot

Survey had similar results where Sternberg and Chafee were overwhelmingly

chosen more often than the others (72%). Any of the choices for defining

critical thinking could have been correct. The differences in the definitions were

not significant in meaning, but there were some differences in approach or

emphasis. Sternberg and Chafee were the most frequently chosen with 31.7%

and 29.9% respectively. Sternberg's definition emphasized reasoning. Chaffee's

definition focused on analysis and meta-cognition. Chafee's definition was

similar to Paul and Elder's definition, which also emphasized analysis and

meta-cognition. Together Chafee and Paul and Elder were chosen by 32.9% of

the survey participants. Paul and Elder's critical thinking stance was introduced

to AUSD-1 teachers during the 2013-14 school year's ACCRS training, ELA

AZCCRS Phase 2 Course 2a, which focused on close critical reading. It is

possible that participants were attempting to choose what they most recently

learned, but did not remember the source. It is unknown how often the CT

researchers were mentioned or discussed during the presentation of the professional development. If the CT researchers were not emphasized, then the choices made were primarily based on the participants' understanding and not due to recall of a source from their professional development course.
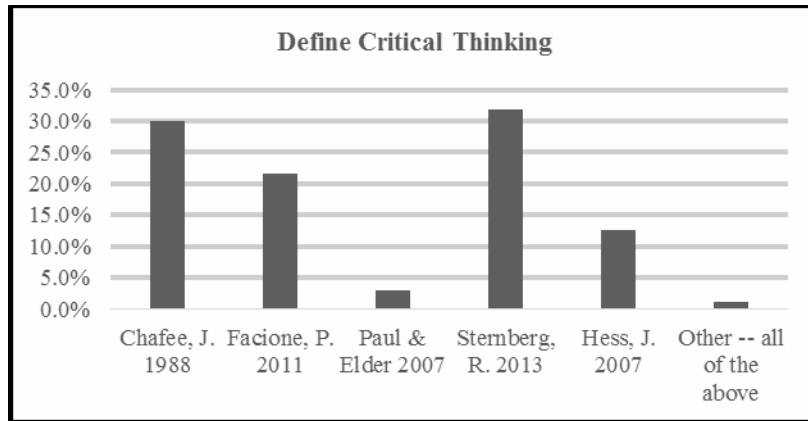

Figure 27. Participants' Chosen Definition of Critical Thinking

What was most surprising was how few of the participants chose Hess' definition for critical thinking (12.6%). Hess and components of Hess' definition promote viewpoints from two of the most prominent sources on critical thinking in professional development at AUSD-1, which is Bloom's Revised Taxonomy and Webb's Depth of Knowledge (DOK). Bloom's is studied in many teacher education programs and Webb's DOK has been a major emphasis in AUSD-1's ELA and Math benchmark assessments the last 5 years. Both have become part of the fabric of professional development and feedback of classroom observations, so the participants' decision to choose a different view raised some questions. Has the professional development at AUSD-1

88

sought "buy-in" from the teachers on these critical thinking viewpoints? Was

timing a factor with the professional development, in as much as the CT focus

with Bloom's and DOK were pre-Common Core? Did teachers feel that these

viewpoints were either obsolete or not considered to be part of AZCCRS? Have

the teachers reached a saturation point with Bloom's and DOK? These questions

were not answered in this study but are worthy of further investigation.

Question 15 asked teachers to rate how well prepared they were to teach

CT to several types of students. The results were that 55-58% of the respondents

felt Very Well or Extremely Well prepared to teach CT to low SES students and

Hispanic students (*Figure 28*). Some variance was evident when the respondents

were disaggregated between White and non-white respondents (*Figures 29 and

30*). White respondents were more confident than non-white respondents with

being prepared to teach CT to low SES students (59.6% to 53.6%), but less

confident with being prepared to teach CT to Hispanic students (55.9% to 63%).
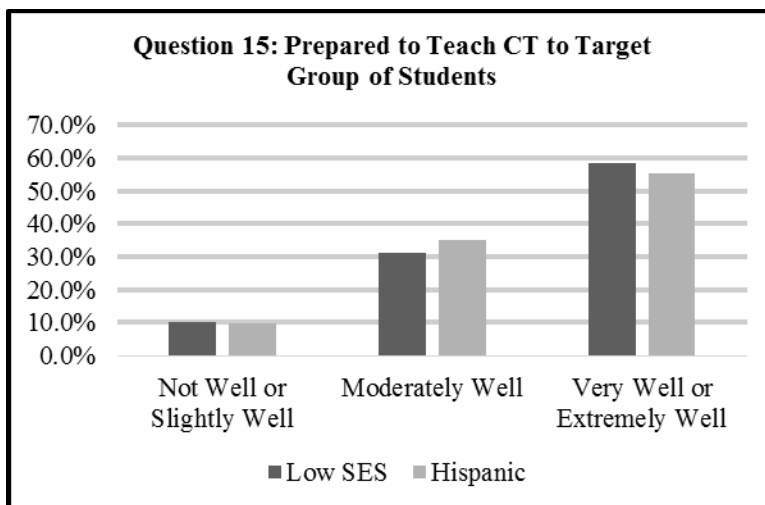
Figure 28. Participants' Confidence in Teaching CT to Targeted Research
Group of Students
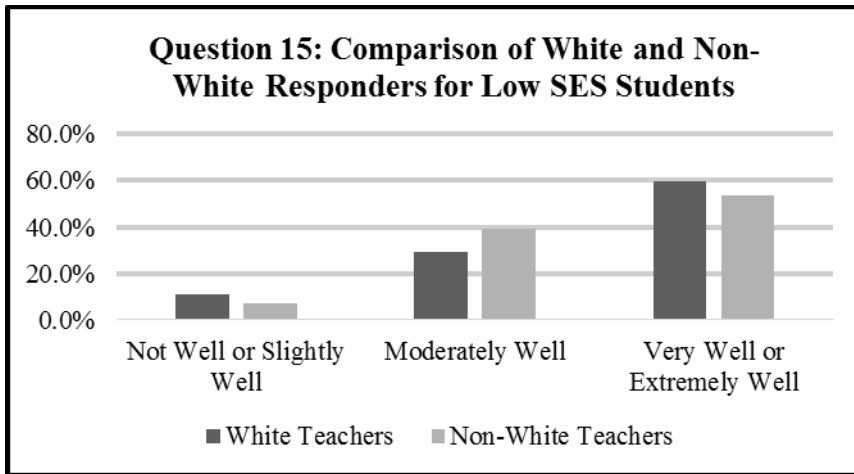
Figure 29. Participants' Confidence in Teaching CT to Low SES Students
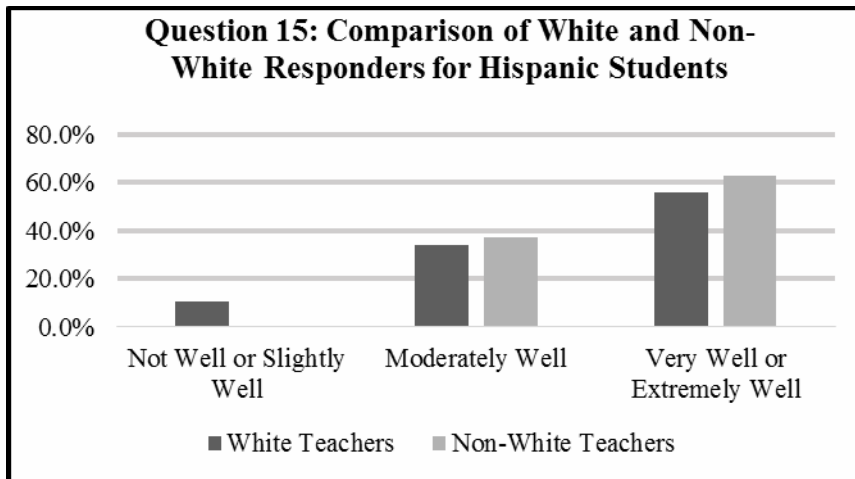

Figure 30. Participants' Confidence in Teaching CT to Hispanic Students

Another comparison was done based on the demographics of the students who the respondents were currently teaching (*Figures 31 and 32*). The demographics of one comparison was the classroom percentage of low SES students and how the different groups responded to question 15: "How well prepared do you feel about teaching critical thinking skills to students with the

90

following learning needs?" The second comparison was classroom percentage

of Hispanic students.
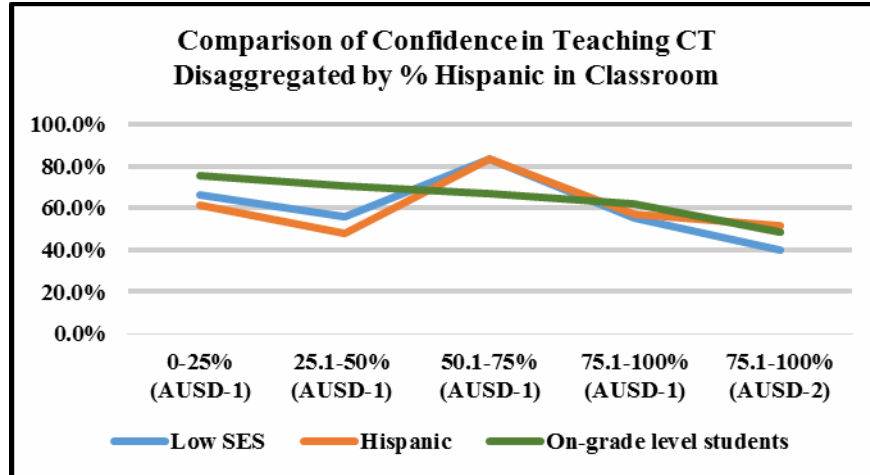
Figure 31. Comparison of CT Teaching Confidence and Hispanic Classroom
Composition
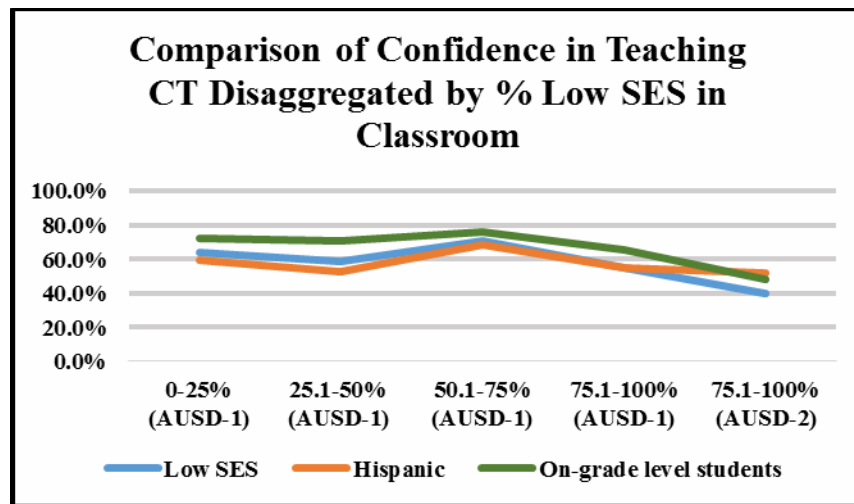
Figure 32. Comparison of CT Teaching Confidence and Low SES Classroom
Composition

AUSD-2 is only noted in the last category in both Figures 30 and 31, because all of the respondents from that district had classrooms with 75% or more Hispanic and Low SES students.

A chi-square test was done with the data displayed in *Figures 31 and 32*. No significant relationship existed between the Low SES and Hispanic population of the teacher's classroom and his/her confidence level with teaching CT to these groups of students in comparison with other groups of students rated in Question 15 (0.72553 > 0.05).

In almost every category, teachers were most confident in teaching CT to the On-Grade Level students. One exception was the AUSD-1 classroom teachers who had 50.1-75% of their students being Hispanic. They were most confident with teaching CT to the Hispanic and Low SES students (83.3%). Even so, the chi-square test found the variables to be insignificant (0.433187 > 0.05)

Another exception was the AUSD-2 classroom teachers who were most confident with teaching CT to the Hispanic students (51.7%), but less confident with Low SES students (40.0%). This 11.7% difference was the largest difference between levels of confidence for all of the teacher groups from AUSD-1 and AUSD-2 in relationship between teaching CT to Hispanic or Low SES students and the percentage of these students in their current classrooms. Again, the chi-square test revealed that the difference was insignificant (0.898568 > 0.05). Even so, it is interesting that AUSD-2 teachers rated their

preparedness for Hispanic and Low SES with an 11.7% difference since most of the students in AUSD-2 classrooms were both Hispanic and Low SES.

AUSD-2's confidence in teaching CT to On-grade level students was the lowest of any of the AUSD-1 groups' ratings and slightly below AUSD-2's confidence in teaching CT to Hispanic students. Referring to the state rating AUSD-2 as a "D" district coincides with the premise that the level of a teacher's expectations of student types may be impacted by his/her experiences with the students. With a "D" rating, AUSD-2's classrooms have a low concentration of On-grade level students. Is it inexperience with on-grade level students, the limited amount of on-grade level students in their classrooms, or the need to spend more time with below grade level students that impacts their confidence level in teaching CT to these students? Discovering this would be worthwhile to explore and cannot be answered with the data from this study.

The following are additional comments volunteered by responders to Question 15 about their preparedness for teaching critical thinking to students with different needs. These were comments that participants chose to add as an explanation of their selections for Question 15. The comments have been grouped into three categories: 1) need for training, 2) level of confidence teaching target group of students and 3) focus on student background as a limitation for teaching CT.

Responses that indicate a need for training.

"Having taught in our gifted program for 20 years, teaching critical thinking was the basis of any reading I supervised with my students. Having had little to no experience teaching less able learners or learners with disabilities, I do not have the training to provide them with scaffolding needed for critical thinking."

"I think I need more practice in bringing critical thinking skills to my students while they are reading. I am improving, but want to improve more!"

"With below grade level students, I feel like I am teaching them basic skills and not doing as well with critical thinking."

"I find it hard to know if my methods are the best. I would like to learn how to teach critical thinking in a better way."

Responses that indicate confidence in teaching CT to the target group.

"I enjoy getting children to think critically. I enjoy sharing my own thoughts about texts and seeing if that opens others to new ideas. Try not to put the labels mentioned above on my students. I find that all students are intelligent and have strengths and

weaknesses within their abilities. If we include them in challenging discussions, they all have ideas to share."

"I feel all students can be taught critical thinking skills, however some have more difficulty being able to apply that knowledge."

"Each child comes to me with different backgrounds and different understandings. I feel confident to be able to help students think critically about their learning."

"Reading instruction is a strength of mine. Critical thinking is what I require students to do. Getting them to understand that has been a goal of mine. I see where students are not used to thinking critically. It has to be taught."

"I have knowledge but not the resources."

Responses that focus on student as the source of difficulty.

"Kids who have been routinely absent and are far behind their peers are difficult to teach critical thinking."

"Other students would involve those that are FAR below grade level. I have students in my class that are at a Kindergarten level. They are not just 1 grade behind, they are 3 grades behind.

Teaching critical thinking skills to them becomes much more of a
challenge because they are focusing ALL of their efforts on just
getting the word right. They struggle deeply with comprehension
and other critical thinking skills."

Open-ended Critical Thinking Responses

The survey included three open response or open-ended questions (14,
16, and 17):

- Question 14: Please explain how you (feel/or don't feel) that critical
  thinking relates to reading comprehension.

- Question 16: How do you make adjustments to teach critical
  thinking skills to students who are reading below grade level? Please
  explain.

- Question 17: What support do you need to enable you to teach
  critical thinking skills to your students who are reading below grade
  level? Please explain.

Using grounded theory (Corbin & Strauss, 2008), these open-ended
responses were analyzed for response group frequencies of similar content to
determine patterns and trends, as well as variances and ranges of responses.
Responses were reviewed and relationships sought to answer their respective
research question of this study. Responses were also disaggregated according to
specific categories of responses to the background questions, such as percentage

of Hispanic and low SES students in classroom, White and non-white teacher responses, and critical thinking viewpoint chosen. The results were compared to the whole group and to each of the other disaggregated groups.

The first step was to check the frequency and categories of the vocabulary used in the open-ended responses. The categories and content of the statements were synthesized in relationship to the focus of the question and message presented in the participants' responses.

Question 14 was an effort to collect more data to determine the respondents' understanding of critical thinking and its relationship to teaching reading. Having respondents express their feelings about the relationship confirmed the expectation that most would express that teaching CT and reading were interconnected, but also highlighted ways they were considered connected and some differences in their understanding of CT. The following quotes of responses were grouped into two primary groups: 1) reflect the connection between critical thinking and reading comprehension and 2) express differences in understanding about critical thinking.

Responses that reflect the connection between critical thinking and reading comprehension.

"It goes hand in hand."

"Critical thinking has a direct correlation to reading comprehension as it helps to reason and analyze what is being read and then process the information and store it as knowledge."

"Critical thinking is <u>important to</u> reading comprehension because it allows an individual to analyze what they are reading and interact with what they are reading in a way that helps them to better understand what they are reading. This will in turn allow them to discuss what they have read in a logical and precise way."

"Critical thinking is <u>imperative to</u> reading comprehension."

"I think critical thinking <u>enriches and strengthens</u> a student's reading comprehension."

"Critical thinking is a <u>key component to</u> reading comprehension. If students are not able to analyze what they have read they will not be able to connect their new learning to their prior knowledge in a way that allows them to use it in context."

"Reading comprehension <u>requires thinking</u>. Without thinking, reading is simply decoding."

Responses that express differences in understanding about critical thinking.

"I think critical thinking and reading comprehension are skills that must each be taught first in order to apply them together." (taught separately)

"The more a student reads the more the student can understand and discuss." (learned by reading)

"Students must be able to 'prove' an answer. They need to be able to go back in the text, analyze what it states, and be able to show their answer is correct because it can be proven in the text." (proving answers)

"I feel it relates because a reader needs to make decisions when he/she reads. Why is that character doing that? Why is this information important? Why do these facts relate to me or the world?" (decision-making)

"Critical thinking is required of reading comprehension due to needing to read, reflect, and understand a reading selection. If students do not learn the tools at a young age, they will get to high school and college and be required to do this with more complex text and not know how. Implementing critical thinking with reading selections, students learn how to understand what the author wrote, but come to their own conclusion and find their own meaning." (start CT early --needed for college)

"I feel that critical thinking is required in all subject areas." (cross-curricular)

"I feel that critical thinking relates to non-fiction reading comprehension in that the reader must reflect upon what was read to decide what to believe, if the reading was factual and what to do with the information." (needed to comprehend informational text)

"Helps students to think outside the box and to give their own

opinions and insight to the topic." (divergent thinking)

"I feel very strongly that critical thinking relates to reading

comprehension and I feel that teachers are taught this but need

support in implementing such in the classroom." (asking for

support)

"I believe it is essential to challenge our students critically each

lesson. This will provide them with skill needed to succeed in the

future. The ability to communicate your thoughts and providing

rationale for your responses is a skill that is utilized in our lives on

a daily basis." (communication life skill)

"Students who are not able to use critical thinking skills as they

read will not be as successful when taking tests and exams as those

students who are comfortable critically thinking as they read."

(test-taking skill)

"Students need to be able to culminate an idea of what the world is.

In teaching critical thinking you are teaching students how to solve

issues." (problem-solving)

The vocabulary used in the responses are displayed in *Figure 33*. The

most frequent message was that critical thinking was necessary to comprehend

text and make connections. The frequent use of the word "order" was used as a

connector in expressing respondents' opinion and not used to describe the connection between critical thinking and reading comprehension:

> "Critical thinking is important to reading comprehension **in order to** infer meaning, process vocabulary, and increase prosody."

> "Students must understand material deeply **in order to** really comprehend material."

> "As you read, you constantly need to be asking questions and making connections to other readings and life experiences **in order to** apply the new information you have learned."

Every response indicated that there was a relationship between critical thinking and reading comprehension. Nine percent stated that they should be taught separately and brought together later as a comprehension strategy. Ten percent mentioned cross-curricular relationships. Analyzing the frequency of vocabulary used in their responses did not result in any significant additional information or differences in thought.

Text Analysis: Top Words Used in the 119 Responses
(* are the top 3 in both districts)
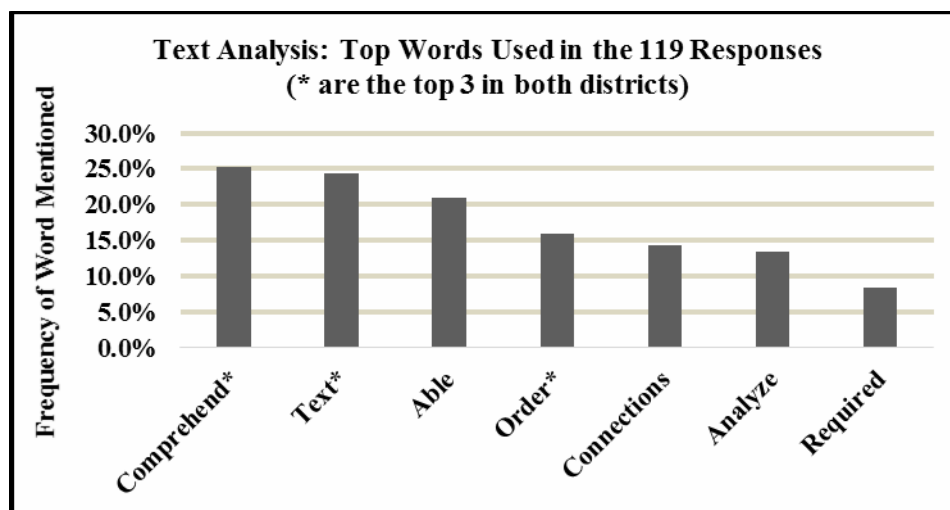
Figure 33. Reading and Critical Thinking Relationship

Responses to question 14's open-ended question about the relationship of CT and reading comprehension were disaggregated to check for relationships between CT viewpoints chosen in question 13. The most notable result displayed in *Figure 34* was that with all CT viewpoints, except Paul and Elder, the participants expressed that the teaching of CT and reading comprehension co-exist and are learned simultaneously more than the other categories. With those who chose Paul and Elder's CT definition, cross-curricular connections and teaching CT and reading separately were equally stated in their responses and stated more frequently than with the other CT viewpoints. This difference may be insignificant because there were only 5 respondents out of 116 who chose this viewpoint compared to the range of 21-53 who chose the other CT viewpoints. Even so, it could be worthy of exploring with more followers of this CT viewpoint to determine if a pattern exists and a discussion about why.
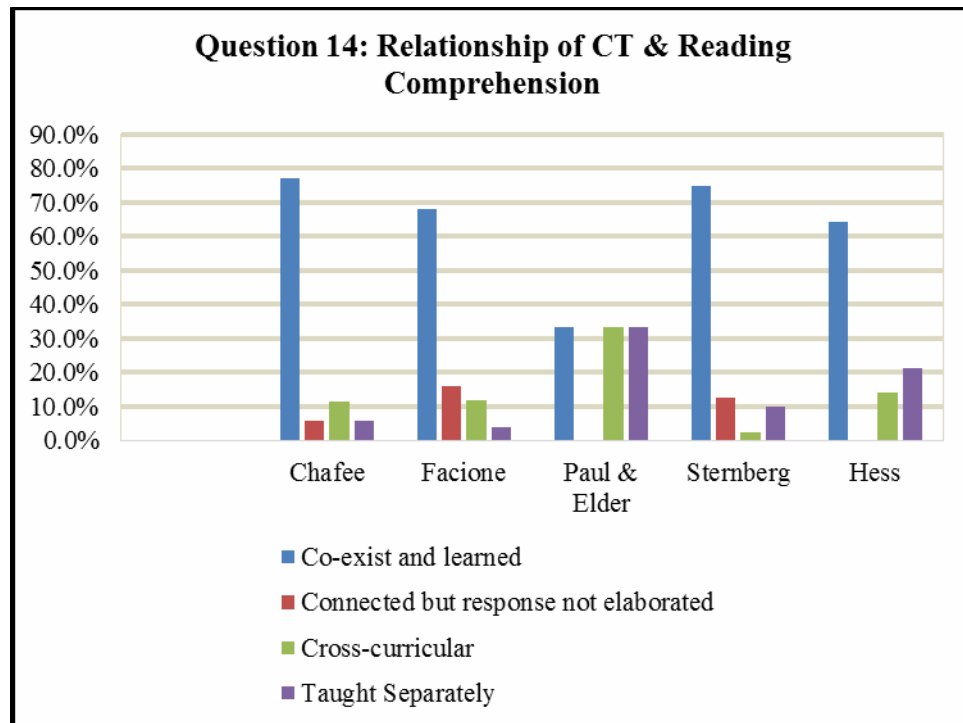
Figure 34. Question 14 Responses Disaggregated by CT Viewpoint of Respondents

Teaching Critical Thinking to Students Who Read Below Grade Level.

Question 16 was used to determine if and how teachers differentiate instruction with students who are having difficulty reading on grade level. Historically, a majority of Hispanic students and low SES students in the state of Arizona fall into this group. As shown in *Figure 35*, only 17% of Hispanic and 15% of low SES (Eligible for NSLP) students were proficient or advanced on the 2013 Fourth Grade NAEP Reading Assessment (Arizona Department of Education, 2013) and only 16% in 2012. In 2013, on Arizona's standardized test, AIMS, only 69% of Hispanic fourth graders scored at Meets or Above.

Only 68% did in 2012. Third grade Hispanic students and Low SES students

scored similar to the fourth graders (within 2%) during the same years on

AIMS.

Reading Standardized Test Results: Percent of Students Scoring Proficient

Students	NAEP 2012 – 4th	NAEP 2013 – 4th Grade	AIMS 2012 – 3rd Grade	AIMS 2013 – 3rd Grade	AIMS 2012 -- 4th Grade	AIMS 2013 -- 4th Grade
White Students	39	42	86	86	86	87
Hispanic Students	16	17	67	67	68	69
Low SES Students*	16	15	67	68	67	69
Achievement Gap between White & Target Students	-23	-25 to -27	-19	-19 to -20	-19 to -20	-18
*Low SES Students= NAEP: Eligible for NSLP (National School Lunch Program), AIMS: Economically Disadvantaged						

Figure 35. Arizona's Student Achievement on NAEP and AIMS

Figure 36 contrasts the achievement gap between Arizona students who

are not Low SES (NSLP Not Eligible) and those who are eligible for NSLP

(Low SES) and those who are Hispanic. The 24-34% achievement gaps have

existed for many years. After thirteen years, the increase in scale scores has

been more substantial for Low SES and Hispanic students (14-15 points vs. 6

points), but the achievement gap (24-25%) continues to be wide and progress

has been slow.

NAEP Grade 4 Reading: Average Scale Scores Over Time

Year	AZ NSLP Not Eligible	AZ NSLP Eligible	AZ Hispanic	Achievement Gap
1998	221	189	188	-32 to -33
2002	219	191	188	-28 to -31
2003	225	194	195	-30 to -31
2005	223	192	192	-31
2007	224	196	197	-27 to -26
2009	225	197	198	-27 to -28
2011	227	202	203	-24 to -25
AZ NSLP Eligible = Low SES Students				

Figure 36. Arizona NAEP Grade 4 Reading: Average Scale Scores Over Time. Source: Reading_G4_average scale scores over time with NP, Arizona Department of   Education http://www.azed.gov/assessment/naep/

Due to the similarity in performance scores, it is likely that many of the students who the survey respondents considered to be performing below grade level with reading are the Low SES Hispanic students. This is reinforced by the demographics of AUSD-2, where only 4 Hispanic students were not considered Low SES students.

Responses for question 16 were coded and placed in categories of either 1) differentiation/intervention time, 2) use of reading and comprehension strategies, or 3) do not know how to or do not make adjustments (*Figure 37*).

Question 16 (119 responses): Adjustments Made to Teach CT to Students Reading Below Grade Level
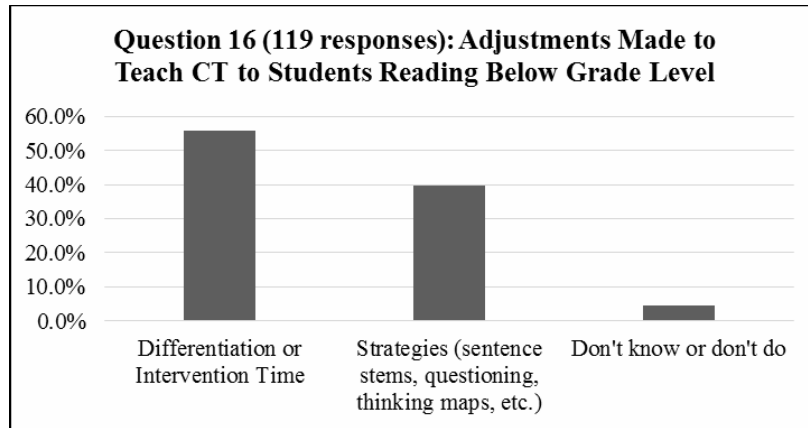
Figure 37. Teaching CT to Students Reading Below Grade Level

A majority of teachers (55.8%) responded that they used differentiation (lower leveled books and high level questioning, etc.) or provided intervention time (one-on-one instruction, leveled or skill assigned small group instruction, tutoring, etc.) to teach CT to their students who were reading below grade level. Strategies such as using sentence stems, thinking maps (graphic organizers), or scaffolding questions, were mentioned by 39.5% of the respondents. Thus, most of the teachers responded with instructional practices that provided students opportunities to improve both their reading and critical thinking skills. Six out of the 116 respondents stated that they either do not know what to do to teach CT to students reading below grade level or do not make adjustments for the students (*Figure 37*). The following quotes are samples of the three types of responses.

Differentiation/Intervention Examples.

"I basically chunk the information given to the lower students. I model for my average and higher-level students."

"Scaffolding and modifying so that the students are learning within their ZPD."

"The critical thinking process is the same for my below-level readers. I adjust their text, not their thinking."

"Working with differentiated texts, providing smaller groups of students, adjusting the quantity/length of the assignments, and developing vocabulary. I have worked with a problem solving program for several years and although it is directed towards the nine mathematical strategies for problem solving it does support logical reasoning for other subject areas. It also provides students with common language for solving problems."

"Teach foundation skills and partner students. Bring in meaningful texts in a range of genres. Scaffold standards so students can reach conclusions based on evidence."

"I make adjustments to the pacing of my lesson, use of new vocabulary, and use books at their reading level."

"You must find the level they are at and from that point help them to think. Students who may be reading at lower levels may be able to critically think at a higher level."

"Critical thinking strategies remain the same but are taught at a pace that marries the text and the learner simultaneously."

Strategy Examples.

"Most of the time I use a lot of visualization to help them to understand what they are reading, which in turn allows them to be able to think beyond just the words."

"Read aloud (both teacher and student) as much as possible to help with fluency. Stop and consider meaning/analysis of events, etc. as much as practical. Help students develop skills and confidence to self-evaluate as soon as possible."

"We do a lot of annotating to help low students really be able to understand and find answers."

"Re-ask the question in a way they understand at their level."

"Pair them with an on-grade level students. Read and share with them or chunk out the information presented."

"Teach them strategies to help 'dig deeper' into the text by chunking the text or giving smaller parts. Students are also not required to read everything independently."

Don't Know or Don't Do Examples.

"No adjustments need to be made because if we lower our

standards we lower our expectations for success."

"This is an area in which I struggle as a teacher. I tend to focus on

improving their reading skills and use of strategies, rather than on

developing their ability to apply critical thinking."

 "I honestly don't know what to do."

The data for question 16 was disaggregated to see if there were

differences or patterns seen in how teachers responded to this question in

reference to the CT viewpoint that they chose in question 13. In making

adjustments to support CT instruction for students reading below grade level,

respondents who chose four of the five CT viewpoints mentioned the use of

differentiation or intervention time more than the use of strategies or nothing

(*Figure 38*). It would be interesting to know why those who chose Hess'

viewpoint chose strategies about twice as much as the use of intervention or

differentiation. One thought is that Hess' CT viewpoint combines Bloom's

Taxonomy and Webb's DOK, which are leveled from simple recall to higher

levels of complex thinking, so the differentiation lies within the structure of

Hess' CT viewpoint and the intended focus of instruction with it.
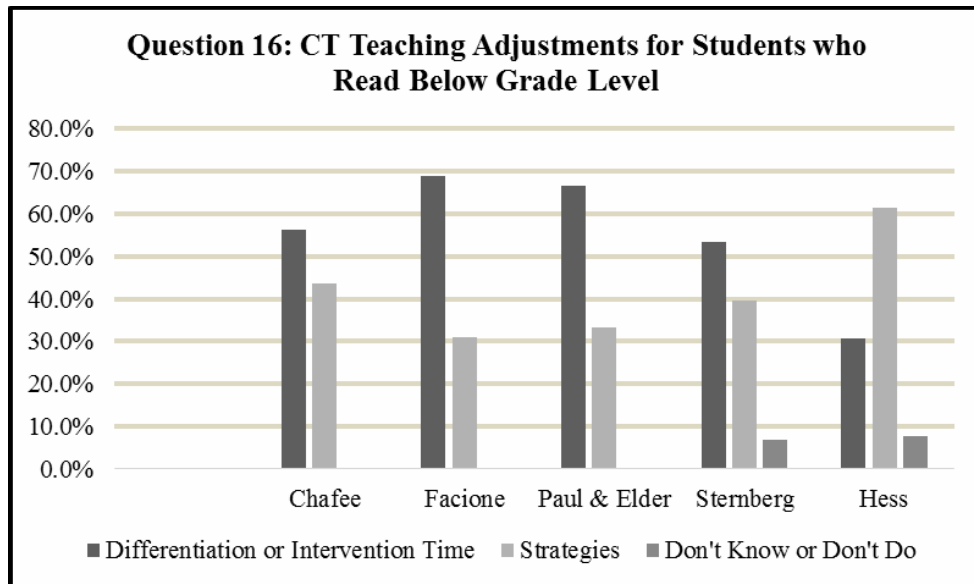
Figure 38. Question 16 Responses Disaggregated by CT Viewpoint of Respondents

Support Needed. Question 17 asked: What support do you need to enable you to teach critical thinking skills to your students who are reading below grade level? Responses were coded and placed in categories of 1) materials and resources 2) training and professional development 3) strategies 4) collaboration with peers, or 5) home support (*Figure 39*). Some of the responses included more than one category, so they were included in each group. Interestingly, both districts had similar results, and are combined in the following chart. Materials and resources were the overwhelming ways that teachers wanted support, with it ranging from hiring additional staff to purchasing more leveled classroom books.
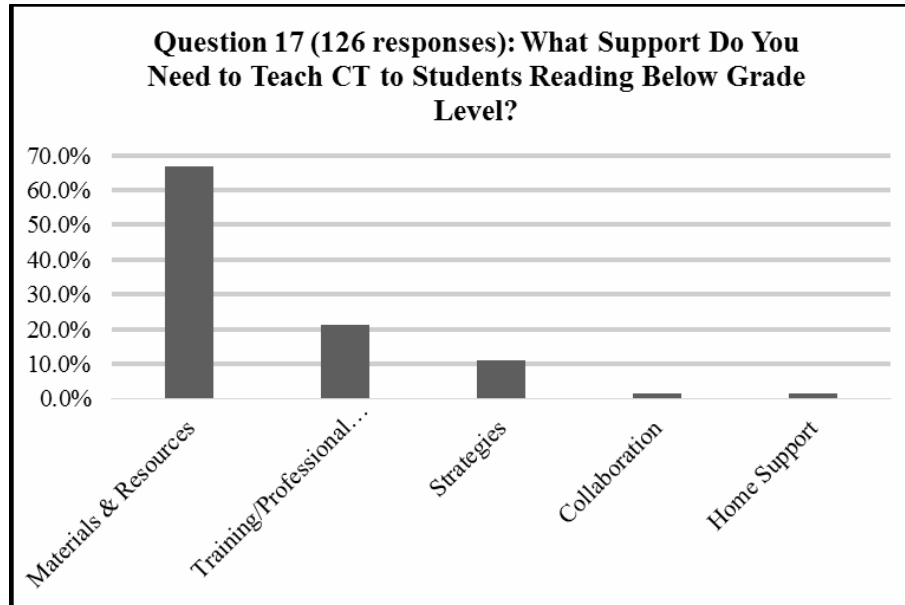
Figure 39. Support Needed to Teach CT to Below Grade Level Readers

When question 17 was disaggregated by CT viewpoint chosen in question 13, materials and resources, whether it was physical items or personnel, were mentioned by a majority of respondents of every CT viewpoint group (*Figure 40*). Training or professional development was noted by every group, except Paul and Elder's group. In contrast to responses for question 16, Hess' group did not mention the need for more strategies.
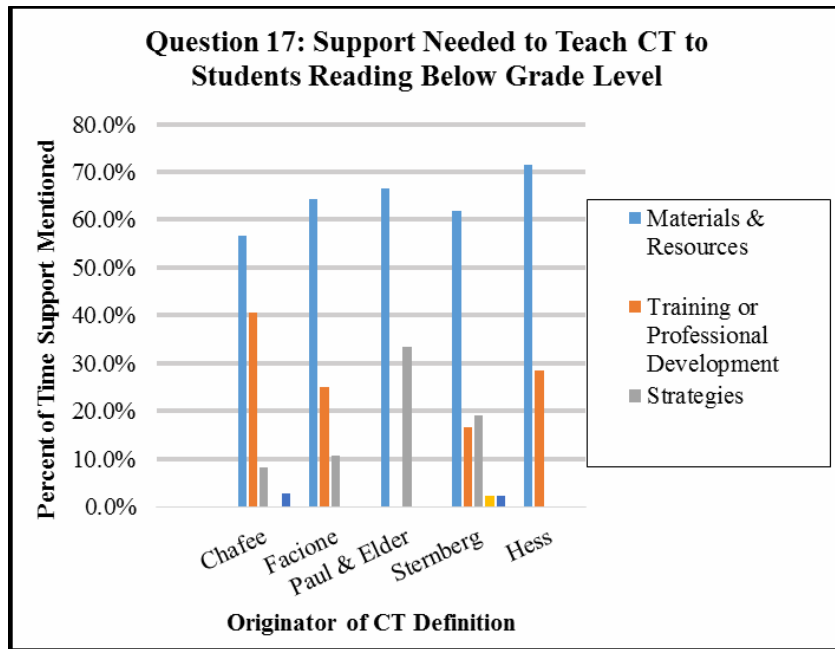
Figure 40. Question 17 Responses Disaggregated by CT Viewpoint of Respondents

Validity of Final Survey

Did the vignette questions provide a distinction between participants who understood teaching and assessing CT skills and those who did not? Looking at the responses for the "typical/average" student who scores an average of 80% on reading assessments, the following provides some indication of whether the vignettes performed this task (*Figures 41 & 42*).

Research on Likert scales suggests that when using an odd number of choices, the middle number becomes the neutral or "do not know" response, but when using an even number of choices, the middle numbers require the respondent to make a commitment to a choice (Rea & Parker, 2005). This

112

study's survey used an even number of six choices for the CT vignette questions. A choice of a 3 = slightly ineffective and a choice of a 4 = slightly effective. The scale on the choices only labeled that a choice of 1 = highly ineffective and a choice of 6 = highly effective. Choices of 2, 3, 4, and 5 did not include a label that described their intended meaning. It is not clear if the respondents understood the meaning behind choosing a 3 or 4. An informal inquiry of a few known respondents indicated that they used a score of 3 or 4 if they were not quite sure how effective the CT instruction or assessment was in the vignette. Based on this and the potential that a choice of a 3 or 4 was interpreted differently by the respondents, the vignettes were analyzed using both possibilities:

1)   Choosing a score of a 3 or 4 indicates a respondent was unsure of whether to choose ineffective or effective, or

2)   Choosing a score of a 3 is rating the item as slightly ineffective and choosing a score of a 4 is rating an item as slightly effective

The final results had little variance. In both cases, the ineffective vignettes 18, 24, and 31 were scored as effective by a majority of the respondents. The one significant difference was with ineffective vignette 28. It was inaccurately scored as effective by the majority when a response of 3 or 4 was considered a definitive choice (*Figure 42*). Whereas, when a response of 3 or 4 were considered "neutral" (*Figure 41*) the majority of respondents were uncertain. In either case respondents' appeared to have difficulty determining the effectiveness of CT assessment with the vignette in question 28.

Variances of Responses for the Typical/Average Student

A view that suggests that scores of a 3 or 4 indicate a neutral position or uncertainty about whether the vignette is an effective or ineffective example of critical thinking

Vignette Question	CT Example	Assessment Objective Task	% of Respondents scoring from highly ineffective (1) to ineffective (2)	% of Respondents scoring from effective (5) to highly effective (6)	Observation
18	Ineffective	Assessment	15.5%	40.2%	44.3% were neutral
19	Ineffective	Objective	36.5%	21.9%	41.7% were neutral
20	Effective	Objective	3.2%	48.9%	47.9% were neutral
21	Ineffective	Assessment	69.5%	7.4%	23.2% were neutral
22	Effective	Objective	7.4%	59.6%	33% were neutral
23	Ineffective	Objective	46.8%	16.0%	37.2% were neutral
#24 *There doesn't appear to be a significant difference in responses here except that respondents did not appear to recognize the difference in CT effectiveness between low SES students and Typical students and a majority of respondents were neutral or unsure about the effectiveness of the assessment for the Sped student.*					
	Effective low SES	Assessment	6.7%	52.2%	41.1% were neutral
	Effective - Gifted	Assessment	5.6%	62.2%	32.2% were neutral
	Ineffective -ELL	Assessment	10.0%	41.1%	48.9% were neutral
	Ineffective - Typical	Assessment	5.6%	53.3%	41.1% were neutral
25	Effective	Task	2.2%	64.8%	33.0% were neutral
26	Effective	Assessment	2.2%	47.3%	50.5% were neutral
27	Effective	Assessment	7.7%	48.4%	44% were neutral
28	Ineffective	Assessment	12.4%	30.3%	57.3% were neutral
29	Effective	Assessment	5.6%	62.9%	31.5% were neutral
#30 & #31 *did not have responses designed to determine bias based on student type –these two questions were to determine CT knowledge and check for bias based on teacher ethnicity.*					
30	Effective	Task	6.9%	52.9%	40.2% were neutral
4 question s	Effective	Task	13.8%	26.4%	59.8% were neutral
	Effective	Task	23.0%	34.5%	42.5% were neutral
Hispanic female teacher name	Effective	Task	10.3%	47.1%	42.5% were neutral
31	Ineffective	Task	25.0%	27.3%	47.7% were neutral
4 question s	Ineffective	Task	27.3%	21.6%	51.1% were neutral
	Ineffective	Task	21.6%	19.3%	59.1% were neutral
Non-ethnic female teacher name	Ineffective	Task	16.3%	45.3%	38.4% were neutral

Figure 41. Variances of Vignette Responses for Typical Students (Scores of 3 or 4 Neutral)

Variances of Responses for the Typical/Average Student

Alternative view of scores of a 3 or 4 – consider them to be choices of slightly ineffective or slightly effective

Vignette Question #	CT Example	% of Respondents scoring from highly ineffective (1) to slightly ineffective (3)		% of Respondents scoring from slightly effective (4) to highly effective (6)		Notes
		AUSD-1	AUSD-2	AUSD-1	AUSD-2	
18	Ineffective	30/86	5/11	56/86	6/11	Mrs. Jordan/Thuy **Majority inaccurate**
19	Ineffective	52/85	6/11	33/85	5/11	Mr. Johnson/Thuy
20	Effective	18/83	3/11	65/83	8/11	Mrs. Ramirez/Thuy
21	Ineffective	69/83	11/11	14/83	0/11	Mrs. Harris/Damiem Highest accuracy for AUSD-2
22	Effective	16/83	5/11	67/83	6/11	Miss Chan/Damiem
23	Ineffective	56/84	8/10	28/84	3/10	Miss Fernandez/Damiem
24	Effective Low SES	18/77	3/11	61/77	8/11	Mr. Clark/Gabrielle
	Effective Gifted	15/79	1/11	64/79	10/11	Mr. Clark/Sam
	Ineffective ELL	25/79	3/11	52/79	8/11	Mr. Clark/Chris **Majority inaccurate**
	Ineffective Typical	21/79	1/11	58/79	10/11	Mr. Clark/XuiLi **Majority inaccurate**
25	Effective	5/79	5/12	74/79	7/12	Ms. Simmons/Chris Highest accuracy for AUSD-1
26	Effective	15/79	4/12	64/79	8/12	Miss Marshall/Chris
27	Effective	27/79	6/12	52/79	6/12	Mr. Jennings/Carlos
28	Ineffective	28/77	3/12	49/77	9/12	Mr. King/Carlos **Majority inaccurate**
29	Effective	13/77	3/12	64/77	9/12	Mr. Hernandez/Carlos
#30 & #31 did not have responses designed to determine bias based on student type –these two questions were just to determine CT knowledge						
30	Effective	10/75	4/12	65/75	8/12	Mrs. Gonzalez Slight difference in majority scoring between the 2 districts
		31/75	7/12	44/75	5/12	
		32/75	5/12	43/75	7/12	
		21/75	2/12	54/75	10/12	
31	Ineffective	37/76	7/12	39/76	5/12	Mrs. Nelson Examples 1 & 4 **Majority inaccurate,** BUT almost an even split decision for examples 1-3
		45/76	6/12	31/76	6/12	
		40/76	6/12	36/76	6/12	
		21/74	3/12	52/74	9/12	

Figure 42. Variances of Vignette Responses for Typical Students (Scores of 3 or 4 Definitive)

Of the seven ineffective vignette situations, 57% were accurately scored by a majority of the respondents. In comparison, 100% of the effective vignette situations were accurately scored by a majority of the respondents. It is interesting that only the ineffective vignettes were scored inaccurately as being effective when they were ineffective CT examples. Also interesting to note is that with the inaccurately scored vignettes there was a high percentage of 3 or 4 scores. A selection of a 3 indicates a score of being slightly ineffective, whereas a 4 indicates slightly effective. Could this signal a high level of uncertainty of how to score from the respondents? If so, was it reflective of the respondents' lower confidence in recognizing ineffective examples of CT instruction and assessment?

The high levels of potential uncertainty were detected in a few of the vignettes representing effective CT instruction or assessment as well. In 5 of the 8 effective CT vignettes, more than 40% percent of scores were a 3 or 4. This may indicate that a majority of the respondents were unsure of the difference between ineffective and effective CT objectives, instruction, and assessment. However, it could also indicate that these vignettes had errors in clarity of content or connection to effective CT.

The respondents were most confident (39.5% of scores were a 3 or 4) in the area of CT objectives and the least confident (46% of scores were a 3 or 4) in the area of deciding if a CT task was effective (*Figure 41*). Most of the task responses were at the end of the survey, so tiredness may have impacted their uncertainty with this group of vignettes. There was a similar pattern of high

uncertainty with the Pilot Survey. In both the Final and the Pilot Survey, the respondents' inaccuracy was in rating ineffective CT assessment or tasks as being effective.

Comparing *Figure 15* (Pilot Survey) and *Figure 41* (Final Survey), Final Survey respondents were most confident and accurate with their responses to vignettes 22 (59.6%), 25 (64.8%) and 29 (62.9%). Pilot Survey respondents were most confident with almost the same vignettes 22 (74%), 25 (83.5%) and 26 (71%). Question 29 was high in certainty (61%) for the Final Survey respondents as well. The exception in similarity between the two surveys was question 26. The Final Survey respondents were 47.3% confident and accurate for question 26, with 50.5% scoring the vignette as a 3 or 4. There is a 23.7% difference in certainty and accuracy between the Pilot Survey respondents and the Final Survey respondents for question 26. The vignette for question 26 was an effective CT task and assessment. The assessment was scored using the Hess Cognitive Rigor Matrix, which is a complex combination of Bloom's Taxonomy and DOK. Approximately 23% of the Pilot Survey respondents have been involved in delivering the AZCCRS professional development, so they may have a clearer understanding of Hess' scoring system than the Final Survey respondents.

The high uncertainty respondent scores for question 28 suggests that some teachers were unclear as to whether adding a writing task to a reading task increases a student's engagement with critical thinking.

Measurement of Central Tendency of Frequency for the CT Vignettes

Another method of analyzing the vignettes is to use central tendency. According to Rea and Parker (2005), when using scale scores or ordinal numbers, using the median to describe the central tendencies is the most accurate way to describe the intention of the data. In the following *Figures 43-49*, green shading indicates the number of responses that were accurate ratings of effectiveness for the CT vignette. More green indicates the central tendency of the respondents was congruent with the intended effectiveness rating of the CT vignette. Less green indicates the central tendency of the respondents was incongruent with the intended effectiveness rating of the vignette. Gray shading represents one of two possibilities; 1) the tendency of respondents to consider a vignette to be slightly effective or slightly ineffective, or 2) the tendency of the respondents to be unsure or indecisive about the vignette's effectiveness. The larger the gray shaded areas, the greater the central tendency is toward non-commitment in the scoring of the vignette or the greater the possibility that the vignette is unclear or poorly designed.
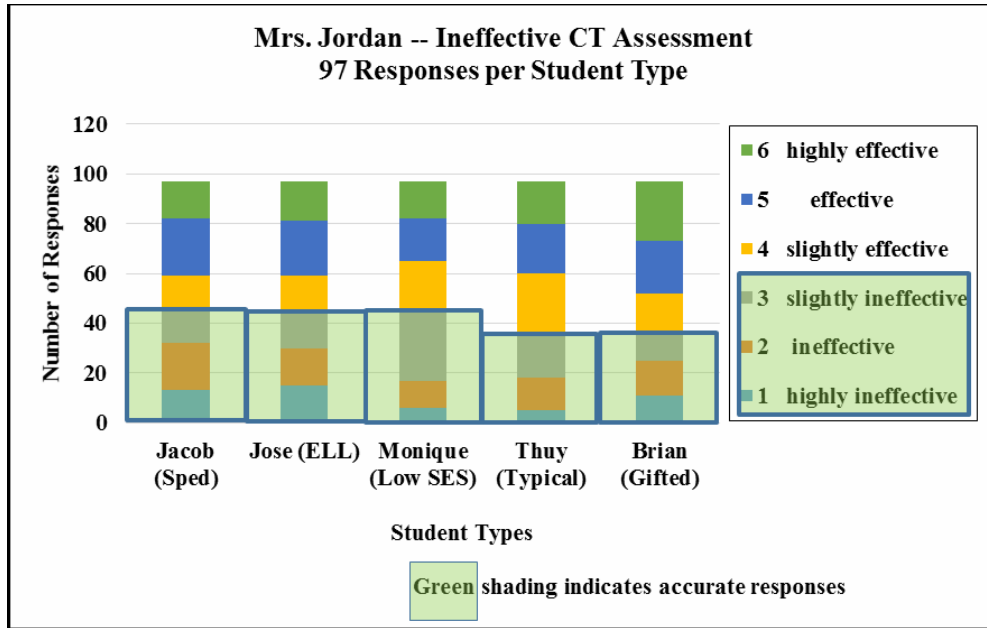
Figure 43. Questions 18 -- Vignette 1 -- Majority of Inaccurate Effectiveness Scoring
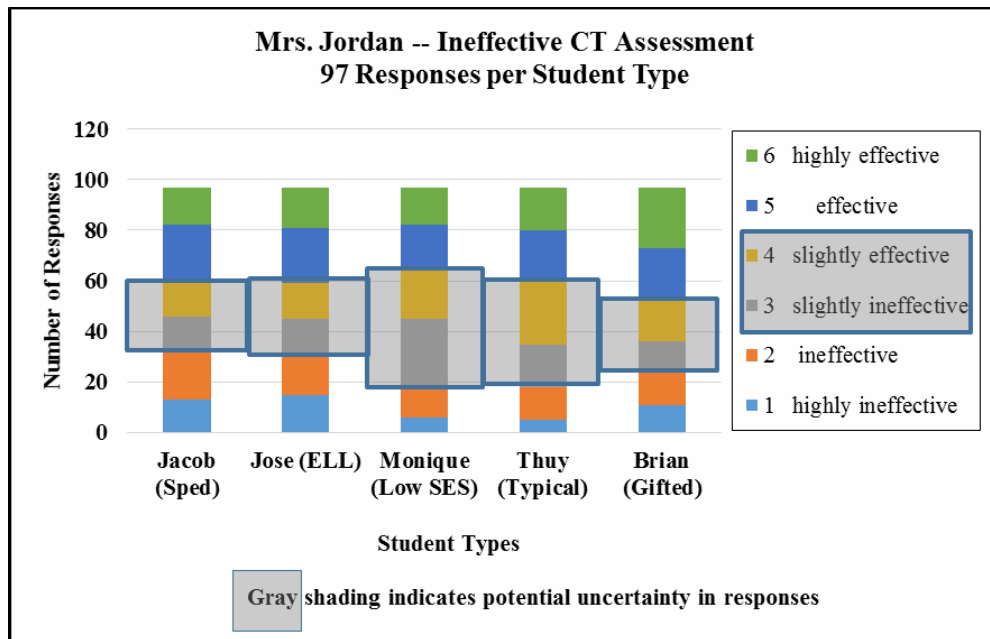
Figure 44. Question 18: Vignette 1 - Size of Potential Uncertainty

The vignette with question 18 was an ineffective example of CT assessment. In *Figure 43*, the green shading shows an almost even decision for the first three types of students and a more firm decision that it was effective for the typical and gifted students. In this vignette, one of the major reasons that it was ineffective CT assessment was due to the students discussing their responses prior to the assessment. This may be an appropriate scaffolding strategy when learning the content, but it does not necessarily determine divergent critical thinking. Instead it encourages convergent thinking. It limits the students' use of their individual critical thinking skills.

Figure 44 demonstrates the potential level of uncertainty that respondents had when rating this vignette. There may be a conflict between providing access to content through the use of scaffolding and assessing a student's use of critical thinking skills, especially when the respondents considered if it was an effective CT assessment for Low SES students, which had the largest shading of gray with scores of slightly ineffective and slightly effective.

Figures 43 and 44 both highlight that the respondents felt that the CT assessment in the vignette was more effective for gifted learners. This coincides with Torff's results in his study (2007), which noted that teachers selected CT activities as being effective primarily for the "high motivation" learners and low CT activities for "low-advantage" learners.

Figure 45 highlights a non-differentiation issue in the vignette for question 24. This vignette was an example that required respondents to differentiate between the types of learners, not due to their limitations or typical performance, but due to their performance on the CT vignette's assessment. Students worked with a partner to create a product that demonstrated their use of CT. The performances of the two pairs were not equal, but the teacher in the vignette rated their products as if they were. Since a majority of the Final Survey respondents rated the vignette as effective for all four students, they did not appear to notice the difference. This was true for the Pilot Survey respondents as well where only 13% of the respondents rated the assessment to be ineffective to highly ineffective for all four students.

Why respondents rated the vignette's effectiveness similarly for all four students cannot be determined from this data and would need further clarification. It could be that the respondents did not recognize the different levels of student production or do not understand CT assessment well enough to recognize the differences. It could be that the differences were not clearly described in the vignette. On the other hand, *Figure 46* highlights that there was potentially a high amount of uncertainty as to how to score the effectiveness of this vignette.
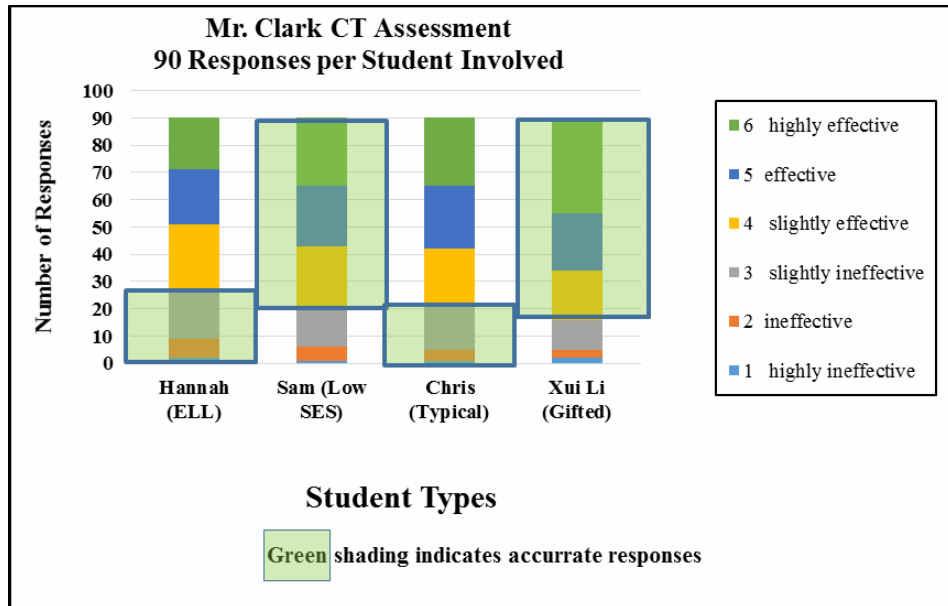
Figure 45. Question 24 - Scenario 7 CT Assessment: Effective (2 Students) Ineffective (2 Students)
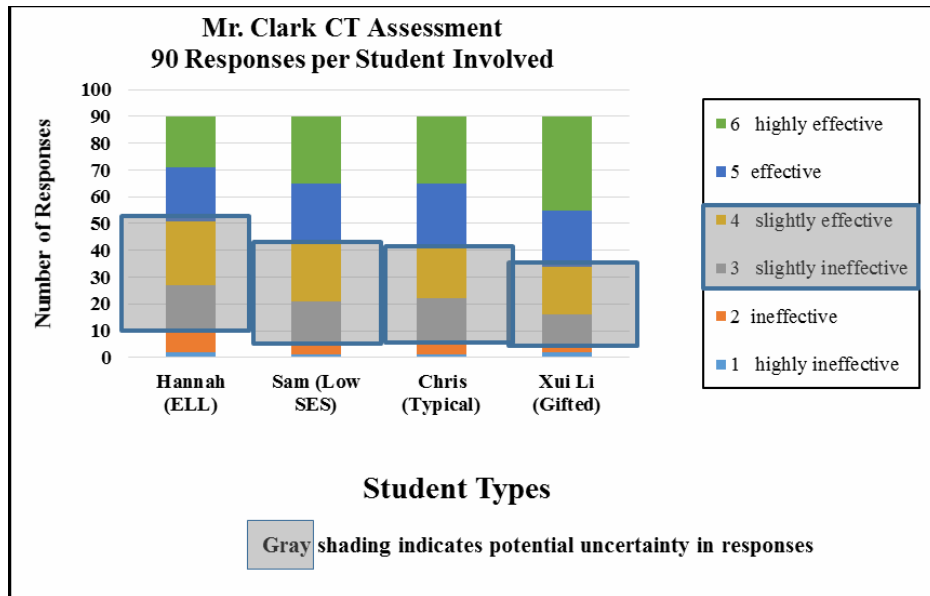
Figure 46. Question 24 – Scenario 7 – Size of Potential Uncertainty

The vignette in question 28 was the one CT vignette that when scores of a 3 or 4 were viewed as a definitive choice of it being ineffective or effective, the majority of responses were inaccurately scoring it as effective. When a score of a 3 or 4 was considered neutral, a majority of the respondents scored it accurately as an ineffective example of CT assessment. *Figure 47* highlights how large the potential uncertainty was of the responders. This vignette was an ineffective example of CT assessment because it only required basic recall from the students to produce a response. The level of potential uncertainty was not as pronounced with the Pilot Survey results (43.5% vs.57.3% scores of a 3 or 4), but the example was clearly not high in rigor. This may be a case where teachers consider the addition of a written response or essay to indicate high leve ls of thinking, but a more critical look at the expectations of the task should signal a low level of thinking was required in this example: "What is the relationship between the environment and elevation levels in Arizona?"
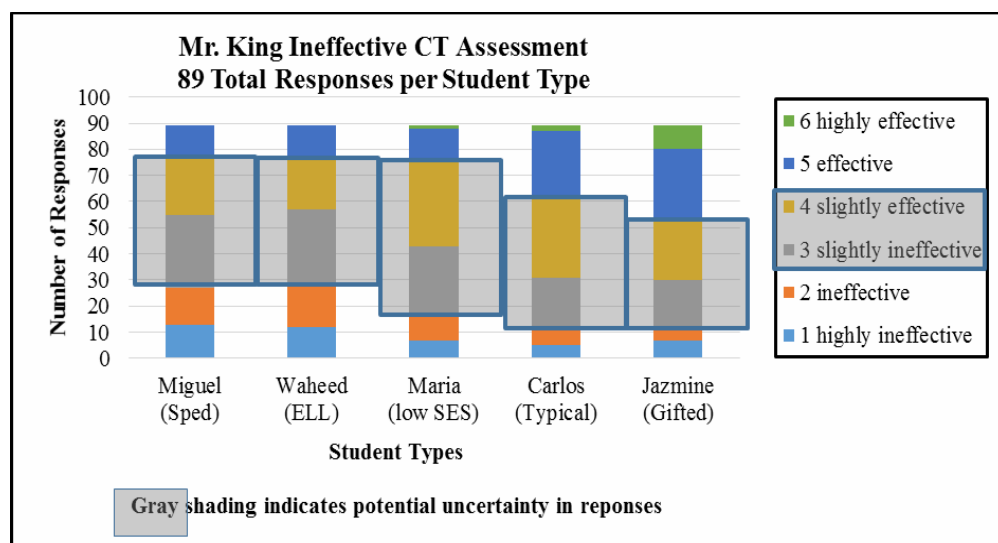
Figure 47. Question 28 -- Scenario 11 Majority of Responses were Scores of 3 or 4 (57.3%)

Survey questions 30 and 31 had two purposes; 1) was bias evident based on the ethnicity of the teacher in the vignette and 2) could respondents determine the difference in levels of critical thinking required by students to respond to different questions, thereby signaling their understanding of critical thinking. Based on the similarity in scoring the two sets of questions displayed in *Figures 48 and 49*, there was no bias involved in their scoring. The levels of potential uncertainty ranged from an average of 46.5% for Mrs. Gonzalez's questions to 49.08% for Mrs. Nelson's questions. Some questions within each collection were rated more toward being effective than the others in the collection, but each collection was designed to be either collections of all effective CT questions or all ineffective CT questions.

There are several possible reasons for the high levels of potential uncertainty in the ratings for questions 30 and 31. One could be survey exhaustion since it was the end of the survey. Another could be satisficing and related to survey exhaustion, with the desire to finish the survey and less concentration on deciphering the differences in the CT levels of the questions. This possibility of satisficing in this manner might be eliminated since if this was a cause, one would expect the results to look more similar for all 8 questions involved in these two vignettes. Another possibility for the high levels of potential uncertainty might be that about half of the respondents do not understand CT well enough to decipher the differences between questions that engage students in high levels of critical thinking and those that engage students in low levels of thinking.
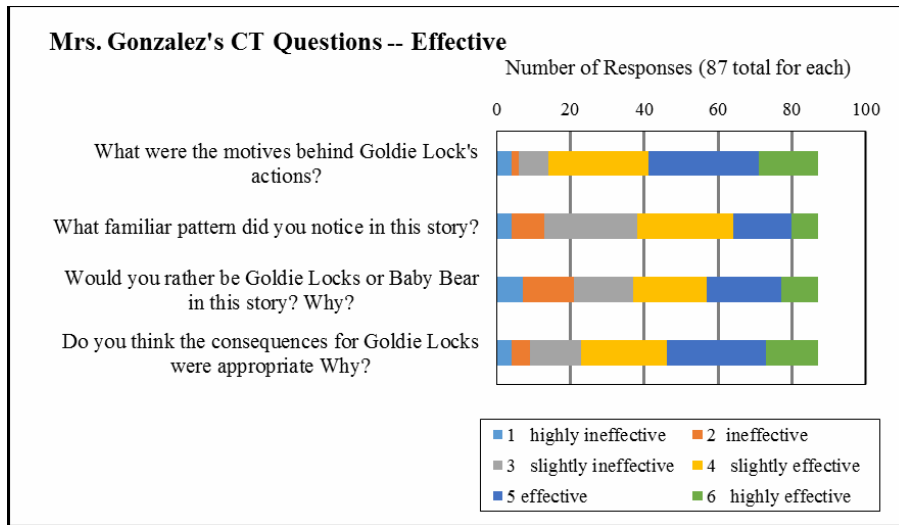
Figure 48. Question 30 -- Vignette 13 High Percentage of Potential Uncertainty
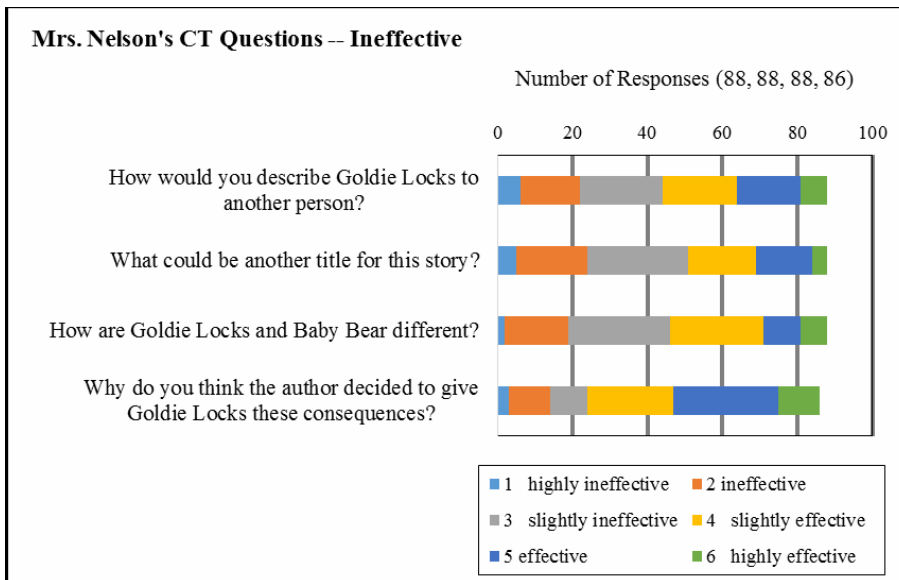
Figure 49. Question 31 -- Vignette 14 Majority Inaccurately Scored and High Levels of Potential Uncertainty

Reliability

During the analysis of the Pilot Survey, a reliability test was done with Cronbach's Alpha to see if the survey consistently measured whether teachers understood CT instructional practices and if it consistently measured if teachers had different expectations of different types of students with their CT instructional practices (Figures 15 and 16). Based on the .953 & .941 scores, the Pilot Survey consistently measured the same criteria. Other than correcting a couple technical issues with the working of the online survey, nothing changed in the content or questioning of the survey, so the reliability of the Pilot Survey remains in effect for the Final Survey.

Quality of Data

Satisficing, the impact of respondents taking short cuts to complete the survey, has the potential to reduce the quality of the survey's data. According to Barge and Gehlbach (2011), there are several behaviors that survey respondents most likely engage in during surveys, in order to reduce the effort of responding to a survey. The behaviors include rushing, skipping items or quitting. The one considered having the greatest impact was rushing, which can be determined by comparing the amount of time individuals spent on each item and/or the rate of non-differentiation in individual's scaled responses.

The collector used for this survey did not supply the data to determine rushing on particular items, but it did provide the amount of total time spent on the survey. The average amount of time spent was 15-20 minutes total. A third

126

of the participants took 20-30 minutes to complete the survey, which was similar to the average amount of time taken by the Pilot Survey participants (most of whom were making an effort to fully participate and help me test the survey's usability and value). Based on this information, rushing does not appear to have been a factor that may have impacted the quality of the data.

The rate of non-differentiation can be determined by analyzing the patterns of each respondent's choices on the vignette questions 18-31.Some of the respondents' data could be grouped into more than one type of pattern, so the percentages used in this section will total more than 100% when combined. One of the patterns that emerged was scoring the effectiveness of a vignette the same for each student type in the vignette, but not scoring each vignette the same. This could indicate that the respondents took time to determine the effectiveness of each vignette and either remained bias-free with the student types or did not see the students' individual needs as a factor. This pattern was observed in approximately 30% of the responses. Although in this pattern non-differentiation does not appear to be a factor for rating the effectiveness of the vignette, it could be a factor for matching the effectiveness of the vignette with the type of student. Non-differentiation cannot be determined for the data from these respondents.

Another pattern that emerged was scoring every item either a 3 or 4. This signals a high probability of non-differentiation (Barge and Gehlbach, 2011) or a lack of knowledge about teaching critical thinking. This pattern was

observed in 25% of the responses, and its impact on the quality of the data needs to be considered a limitation of the data.

A third and the most common pattern discovered was the scoring of types of students. Many times a vignette's effectiveness score for the Sped and ELL students were the same (i.e., 3 and 3) and at the same time the On-Grade Level and Gifted students were scored the same as each other (i.e., 5 and 5), but differently than the Sped and ELL students. The Low SES student scores varied between participants with this pattern. Some scored them with the same pattern as the Sped and ELL students, and some scored them with the same pattern as the On-Grade Level and Gifted students. This pattern could indicate that the participant differentiated according to their perceived needs of the students or that bias and lower expectations were a factor in their effectiveness scoring for some of the student types. This pattern was observed in approximately 70% of the responses and indicated that non-differentiation was most likely not a factor for this group of respondents' data.

Another pattern was a mixed pattern, where there was a mix of patterns one and three (i.e., 5-5-5-5-5, 4-4-4-6-6, 2-2-2-2-2, 4-4-5-5-5). With this pattern about half of the vignette ratings were the same for every student and the other half of the ratings differed between the Typical and Gifted students and the disadvantaged students (Sped, ELL, Low SES). The patterns of different scores between vignettes suggests that non-differentiation was not a factor. The patterns of differentiation between student types suggest that students' needs were considered when rating either half or all of the vignettes. Non-

differentiation for these respondents' data cannot be ruled out as a factor, but it is more likely that it was not a factor. This pattern was seen in 30% of the respondents' data.

Analyzing the data to determine if non-differentiation was a factor in the quality of the data was not conclusive, but based on the high probability of the second and third pattern analysis, there is some confidence that at least 70% of the data could be quality data. Investigating other potential signs of satisficing, the quality of the data does not appear to be impacted by satisficing due to skipping items or quitting early. Most respondents who chose to quit early chose to do so before scoring the vignettes. Skipping or quitting early in the first part of the survey does not impact the results as much as it would if it happened part way through responding to the vignette questions 18-31. It does not appear that there is any indication that satisficing was significantly present in the gathering of this study's data.

Limitations and Delimitations of this Study

Limitations

- The original proposal included Focus Groups as a follow-up to the Survey, but the volunteers were limited and not a representative sample of the Survey Respondents, so it was not conducted. Conducting Focus Group discussions with a representative sample may have provided some insight to questions raised about the survey responses during the analysis.

- Responding to the survey was voluntary and the characteristics of those

who did respond may not be an accurate representation of Arizona's third to fifth grade teachers.

- Teacher self-reporting on the survey was more subjective than objective in nature.

- Survey responses were limited to the perspectives of Arizona teachers and may not be generalizable to other states and situations.

- This study did not consider the cognitive scientist's point of view about the need for background knowledge before use of CT, because the implementation of the CCSS is in process and the AZCCRS using CT are based more through the philosophical lens than the cognitive scientist's lens.

- The definition of critical thinking that this study applied was limited in order to closely align with the AZCCRS ELA strands. In addition, the components of critical thinking were too numerous to use as a focus within the time frame of this study.

- According to Thomas Sticht (1979) – "regardless of intelligence and formal education the ability, interest, and over-all effectiveness and application of cognitive skills (reading, critical thinking, problem-solving) is drastically affected by the developmental or nurturing role taken by the immediate family and social environment." (Transfer of Cognitive Skills) Although this study acknowledged that family and environment can impact the acquisition of critical thinking skills, it was devoted to collecting evidence of how instructional opportunities impacted student learning.

- Opportunities to Learn (OTL) in its broadest definition includes access to curriculum, standards, curriculum resources, technology, highly-qualified teachers, and support services. (Darling-Hammond, 2010) In this research, OTL was limited to access to the content and practice provided through the instructional practices of teachers.

- The conceptual model of the study presented professional development as the pathway to implement educational reform and increase student achievement narrowed the focus of the results by not including other models of increasing student achievement for educational reform.

Delimitations

This study was conducted with public-school teachers of third to fifth graders enrolled in the state of Arizona and in two Arizona Unified School Districts during the 2013-2014 academic year. Because of this, the findings and results may or may not necessarily generalize to other subpopulations, locations, or time periods.

Summary of Findings

The primary finding of this study was that most of the teachers' perceptions of their knowledge of critical thinking instruction was not congruent with their ability to recognize ineffective critical thinking instructional practices. In addition, the teachers' ability to identify effective critical thinking instructional practice had a notable level of uncertainty (Figure 50).
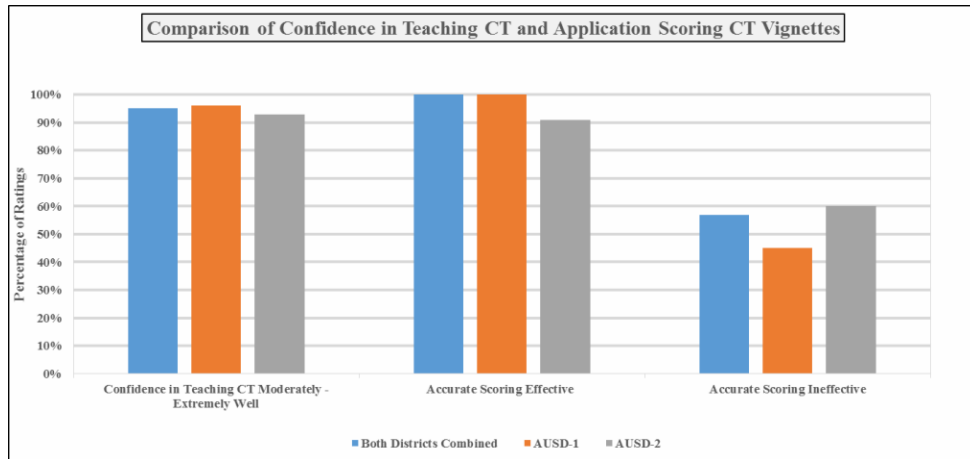
Figure 50. Summary of Findings

Chapter 5 – Conclusion and Recommendations

The purpose of this descriptive study was to gain an understanding of the confidence level held by third, fourth, and fifth grade teachers as to their preparedness for teaching the cognitive demands of the Common Core State Standards (Arizona's College and Career Ready Standards) to all students, in particular Hispanic students living in poverty, who occupy close to a third of all classroom seats in Arizona. The achievement gap between Hispanic students living in poverty and non-Hispanic students of non-poverty status is one of the largest achievement gaps in Arizona, which has existed with minimal change for more than 12 years.

The process of gaining this understanding was by surveying 500 third through fifth grade teachers in two uniquely different, but representative, Arizona school districts. Approximately one-third of those teachers responded to the multi-dimensional survey about teaching the critical thinking (CT) skills of ELA AZCCRS. The survey asked teachers to rate their levels of preparedness for teaching CT to several types of students, to choose a CT definition, describe the relationship of CT and reading, explain how they teach CT to students who are reading below grade level, express the support they need to teach CT to those students, and rate the effectiveness of several CT classroom vignettes for different types of students. Although the questions involved several types of students, the primary focus was on exploring the teachers' position with teaching CT to Low SES Hispanic students.

133

The lens through which the development and analysis of this research study was conducted was the ambiguous link between professional development and reforming instructional practices. A teacher's perception, self-efficacy, and expectations can determine whether his/her participation in professional development impacts beyond the training room into the teacher's classroom (Darling-Hammond et al., 2009; Guskey & Yoon, 2009; Hattie, 2009; Rosenthal & Jacobson, 1968). Educational reform is reform in name only if it does not reach the classroom and produce a narrowing of the achievement gaps.

Teachers' Knowledge of Critical Thinking Instruction

The teachers in this study had a perception that they had the ability and knowledge necessary to teach CT skills to all students, including this study's target group of low SES Hispanic students. This study found that the teachers' perception was not congruent with their ability to recognize ineffective CT instructional practices. Additionally, the level of uncertainty for most of the vignettes was high enough to question the respondents' level of confidence in determining the effectiveness of many of the effective CT vignettes as well. These teachers believed that what they needed to teach CT to students was materials and resources. Very few of the teachers mentioned a need for more professional development. They either do not feel that they have a need to learn more about teaching CT skills or feel that there is no professional development available to them that could further their ability to teach CT skills. The following outlines how this conclusion was determined.

134

The teachers stated beliefs that critical thinking was needed to comprehend text at a level that goes deeper than decoding and reading fluency and that it should be taught as part of teaching reading comprehension. Teachers described instructional practices and strategies for teaching critical thinking with reading comprehension that was congruent with best practices for teaching CT. However, based on the high level of respondents inaccurately scoring the CT vignettes' effectiveness and the potential uncertainty of the scoring for most of the CT vignettes, respondents may not be able to identify that practice in classroom situations. This signals that the teachers' knowledge about CT instruction may be incomplete.

Teachers did not seem to recognize that their knowledge about CT instruction was lacking the ability to apply it. When asked about support needed to teach CT skills to below level readers, only 21.4% of the respondents indicated that they needed more professional development and training. With almost 80% not indicating this need, an assumption could be made that the respondents felt confident in their understanding of how to teach CT skills to below level readers. Respondents were more concerned about having the materials and resources to implement the instruction effectively (66.7%). This suggests that a disconnect exists between a teacher's confidence in what he/she knows about teaching CT skills and what he/she is able to recognize as effective CT instruction.

In addition, there was no correlation found with the amount of AZCCRS professional development experienced and the respondents' confidence levels in

teaching critical thinking skills. It is unknown whether this lack of correlation is due to amount of actual CT content in the professional development they have received or the amount of CT content that led to teacher learning due to the professional development. To discover the lack of correlation requires more investigation into the CT content of the professional development and an assessment of the teacher learning produced from it.

Referring back to the conceptual framework of this study, this disconnect between a teacher's belief in what she feels she knows about CT instruction and what she is able to apply to identify effective CT instruction, demonstrates a broken link between professional development and teacher learning. A teacher needs to believe that she needs to learn a particular content and feel that the professional development will fill the content learning need before a teacher can be open to learning from the professional development. With this study's conceptual model, teacher learning is required before change becomes evident in their instructional practices.

Teachers' Beliefs about their Ability to Teach Critical Thinking

More than half of the teachers felt that they were very well-prepared to extremely well-prepared to teach critical thinking skills to low SES students and Hispanic students, regardless of their ethnicity or the demographic background of their own classroom of students. A small group of teachers, who had 50.1-75% of low SES Hispanic students in their classrooms, were notably more confident teaching these students than any other group of teachers. Practically

every teacher described ways that they use differentiation or strategies to support teaching CT skills to students who are reading below grade level (many of these being Low SES Hispanic students). In addition, as noted previously, a few of the respondents mentioned a need for more professional development or training to teach CT skills to below level readers, so it is likely that a high majority of this study's respondents are confident in their ability to teach critical thinking skills during ELA instruction to Low SES Hispanic students. This high confidence level paired with the teachers' high confidence in their knowledge of CT instruction signals that the teachers' perception of their CT knowledge and ability to teach students is high regardless of the student type, including low SES Hispanic students.

Teachers' Beliefs about Low SES Hispanic Students' Ability to Learn CT

This study did not clearly discover whether teachers felt differently about a low SES Hispanic student's ability to learn CT. There was an attempt to discover bias or differentiation in instructional practices by using ethnic names in the classroom vignettes and by asking respondents to rate the vignettes' effectiveness for teaching different types of students, but the variation in responses was too limited to determine any significant beliefs about the ability of low SES Hispanic students' ability to learn CT, except the possibility that the beliefs were similar across the student types used in the survey.

Exploring the teachers' beliefs about the ability of students to learn CT skills did raise some additional questions. How well prepared a teacher feels to

137

teach CT to different groups of students may have a relationship to their confidence in groups of students to learn CT. Some of this confidence may be related to a teacher's experience teaching these students. As mentioned earlier, the confidence in teaching CT to the target group of students was highest in classrooms that had 50-75% percent of the target students in their classrooms. However, that confidence did not continue into the over 75% group, which fell dramatically by 13-20% for AUSD-1. Is there a point where having a higher concentration of at-risk students diminishes a teacher's confidence in his/her success teaching them or their students' ability to learn? How does this relate to the deficit model research suggesting a teacher's lower academic expectations of poverty students in urban schools? (Harris, 2012, Kozol, 2005)? The number of survey respondents fitting this profile was too limited to suggest a correlation in this study. This is an area that may need further study as it relates to urban Arizona schools.

Responses to how teachers provide instruction to below level readers indicated that a majority (95.3%) of the teachers had a plan for teaching CT to these students. Their plans described how they provided differentiation and intervention time for these students. This may indicate a confidence in students' ability to learn CT skills or in their own self-efficacy to teach CT skills to below level readers. In a study by Ross, Cousins & Gadalla (1996), a finding was that a teacher, with high self-efficacy for teaching, used and planned instructional activities (scaffolding and differentiation, small group instruction) to meet the needs of their at-risk students, whereas a teacher with low self-efficacy for

138

teaching did not tend to use or plan differentiation for at-risk students.

Stating that one plans differentiated instruction for at-risk students does not necessarily equate with a teacher having high expectations for these students. Instructional observations are needed to determine if the differentiation and grouping of the students demonstrate high expectations for the students. If students are experiencing minimal heterogeneous grouping or the differentiation includes low expectations, it would signal low student expectations of the teacher (Rubie-Davies, 2008).

Further investigation is needed to determine if the respondents' were providing a plan for students with needs because they held high student expectations and hopefulness in an at-risk student's ability to learn. Determining this is particularly important for the target group of students in this study because a teacher's expectations for students has a higher impact on student achievement for K-5th grade students (Kuklinski & Weinstein, 2001), minority students and low SES students (Rubie-Davies, 2008) .

Teachers' Beliefs about Support Needed to Teach Critical Thinking

Teachers felt strongly that they needed more materials and resources to teach CT to students reading below grade level. These resources included (in order of response frequency) more high interest, leveled texts; CT and differentiation curriculum; additional personnel (paraprofessionals, reading specialists); time to plan, collaborate, tutor; and technology. The need for more high interest leveled texts was mentioned the most frequently by nearly half of the respondents. It was mentioned twice as much as any other resource.

Professional development was seldom mentioned, which supports this study's conclusion that teachers perceived they had enough knowledge and ability to teach CT skills to low SES Hispanic students, as well as the other types of students listed in the survey. Instead, teachers felt materials and resources were the most important support needed to teach CT skills to students.

Voices of desperation or defeat were not indicated in the teachers' responses to support needed to teach below level readers, although those who expressed the need for more time and personnel support did signal a higher sense of urgency:

"Additional time in the reading block."

"I need to see less than 30 students in the classroom at a time or I need an aide."

"More time, more time, more time, and smaller, frequent incursions with these students."

"It would be great to have a high quality paraprofessional to help monitor or work with on-level kids while I give extra attention to those below level students."

"At a school where there may be a higher level of below reading students, there should be more reading specialists and assistants to help teachers meet all the students' needs. Reading specialists should be working with students who are below reading level to

help get them where they need to be."

"I would think an army of trained aides with appropriate materials
is what we need!"

"It's difficult to find time to work in small groups and have the
other students working productively."

"More readers like aides, parents, and peers!"

"Reading specialists. More time and smaller class especially at the
primary levels."

"Resources! Paras!!"

"Materials, aid support, small group instruction time."

Recommendations for Professional Development

Based on the apparent disconnect between what teachers think they know
about teaching critical thinking skills and their incongruent ability to recognize
the difference between ineffective and effective critical thinking instruction and
assessment, it is recommended that 1) have teachers complete a self-assessment
to measure their ability to recognize effective and ineffective instructional
practices for CT with the intent to provide the teachers awareness of whether
they need to learn more about teaching CT skills and 2) follow up with
professional development focused explicitly on how to provide effective critical
thinking experiences for students and job-embedded coaching for the
implementation of the practices in the teachers' classrooms. Job-embedded

141

coaching normally consists of teacher-driven and administrator-driven

observations, modeling done by an instructional expert, attempts by the teacher

to use the recommended practice, feedback by the instructional coach or

administrator, teacher reflection and then the cycle repeats until the teacher and

coach or administrator are satisfied with the instructional performance of

targeted growth by the teacher. When teachers did mention the desire for more

professional development, they focused on the need to be shown examples and

given job-embedded support:

> "Perhaps a better definition of what critical thinking is, the
>
> expectations and some example exercises to teach it.

> "Training in HOW to adapt problem solving skills in order to
>
> accommodate students with lower reading skills."

> "Staff development where I can first see an excellent lesson and
>
> then teach those parts to my students."

> "The opportunity to collaborate more with other colleagues would
>
> be very helpful."

> "Modeling lessons of how it is done with my students."

> "Classes that teach teachers how to teach critical thinking skills to
>
> address the diverse needs of our students."

> "Examples of exemplary strategies of teaching critical thinking
>
> skills to students who are reading below grade level."

"Watching someone else – coaching."

"I would like to someone to see my students during a reading lesson where they show skills of critical thinking as they read, in order to help me become a better teaching of critical thinking next year."

Teachers, who suggested job-embedded professional development, were voicing a position that has been posited in recent research. In "Exploring literacy teachers' self-efficacy beliefs: Potential sources at play" (2010), Tschannen-Moran & Johnson surveyed 648 elementary and middle school teachers in 26 schools to measure the effect of a teacher's efficacy for literacy instruction. The study found that the most powerful way to influence a teacher's self-efficacy was to provide coaching in the teacher's classroom with the teacher's current students. They termed it providing "vicarious experiences." There were some variables and factors that impacted the level of the effect on a teacher's self-efficacy for literacy instruction, such as years of teaching experience, ability to provide instructional strategies for differentiation, classroom management, and student engagement, but the impact was more beneficial when professional development included vicarious experiences. Tschannen-Moran & Johnson's 2010 study supports this study's recommendation to provide job-embedded professional development to build teachers' self-efficacy with teaching CT skills during reading instruction.

Another recommendation is to study whether professional development,

as it currently exists, is the most appropriate process to bridge the gap between a teacher's perception and application of effective instructional practices in order to narrow the achievement gaps between students. In other words, is the conceptual model of educational reform for this study the most effective path to closing the achievement gap?

Recommendations for Research on Low SES Hispanic Students

The methods used in this study did not provide results that clearly made the connection between low SES students and low SES Hispanic students. Because of this, questions still remain as to whether teachers have different beliefs about the ability of low SES Hispanic students to learn CT and if their beliefs impact a student's opportunity to learn CT. It is recommended that further study be developed to explore whether this is occurring.

A second recommendation is to research whether raising the opportunity for low SES Hispanic students to learn and practice critical thinking skills impacts their student achievement on NAEP and high stake state reading assessments enough to narrow the achievement gap that has existed for more than a decade. This achievement gap in Arizona is critical as it impacts close to a third of Arizona's students and in turn impacts Arizona's building of human capital.

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APPENDIX A

ONLINE TEACHER SURVEY

Thank you for your participation in this survey. Your participation is voluntary and confidential. You are allowed to skip any questions. It is estimated to take about 20•30 minutes to complete.

For every survey that is completed, $1.00 will be donated to your school district's educational funding for teacher mini• grants.

The purpose of this survey is to research teachers' perception of their ability to teach Arizona's College and Career Ready Standards' (AZCCRS) critical thinking skills during literacy instruction. One of the ways the results may be used could be to determine professional development n e e d s .

Elementary Teacher Survey on Teaching Critical Thinking Skills

1. What grade do you currently teach? (Mark all that apply)

☐ Kindergarten

☐ Grade 1

☐ Grade 2

☐ Grade 3

☐ Grade 4

☐ Grade 5

☐ Grade 6

Other (please specify)

_____

2. Excluding student teaching, how many years have you taught elementary students?

○ Less than 1 year

○ 1-2 years

○ 3-5 years

○ 6-10 years

○ 11-20 years

○ 21 or more years

3. If applicable, how many years have you taught secondary students (grades 7-12)?

○ Less than 1 year

○ 1-2 years

○ 3-5 years

○ 6-10 years

○ 11-20 years

○ 21 or more years

What content areas did you teach?

_____

Elementary Teacher Survey on Teaching Critical Thinking Skills

4. What is the highest academic degree you hold?

- ○ High school diploma
- ○ Associate's degree/vocational certification
- ○ Bachelor's degree
- ○ Master's degree
- ○ Doctorate

What was the focus of the degree?

[   ]

5. Do you have a Provisional or Standard Elementary Arizona teaching certificate?

- ○ Provisional
- ○ Standard

Other (please specify)

[   ]

6. Do you have any additional teaching certificates or endorsements? (Mark all that apply)

- ☐ Administrator (Principal or Superintendent or Supervisor)
- ☐ Bilingual or ESL (English as a Second Language)
- ☐ Career or Technical
- ☐ Early Childhood
- ☐ Gifted
- ☐ Mathematics
- ☐ Middle Grade (5-9)
- ☐ Reading
- ☐ SEI (Structured English Immersion)
- ☐ Special Education

Other (please specify)

[   ]

7. What is your gender?

- ○ Female
- ○ Male

Elementary Teacher Survey on Teaching Critical Thinking Skills

8. Which of the following best describes your ethnicity?

- ☐ American Indian or Alaska Native
- ☐ Asian or Pacific Islander
- ☐ Black or African American (Not Hispanic)
- ☐ Hispanic or Latino
- ☐ White (Not Hispanic)

Other (please specify)

[   ]

*9. Which of the following best describes your school district's enrollment?

- ○ 1-299 students
- ○ 300-599 students
- ○ 600-999 students
- ○ 1,000-4,999 students
- ○ 5,000-9,999 students
- ○ 10,000-24,999
- ○ 25,000 or more students

*10. What percentage of the students you teach are Hispanic?

- ○ 0 to 25%
- ○ 25.1 to 50%
- ○ 50.1 to 75%
- ○ Over 75%

*11. What percentage of the students you teach qualify for free or reduced-price school lunch?

- ○ 0 to 25%
- ○ 25.1 to 50%
- ○ 50.1 to 75%
- ○ Over 75%

Elementary Teacher Survey on Teaching Critical Thinking Skills

12. Approximately how many hours have you spent in professional development sessions for the Arizona's College and Career Ready Standards (AZCCRS) for English Language Arts (ELA) adopted in 2010?

- ○ None
- ○ 1-3
- ○ 4-6
- ○ 7-12
- ○ 15-20
- ○ More than 20

13. Which of the following definitions reflects your understanding of critical thinking?

- ○ Critical thinking is "our active, purposeful, and organized effort to make sense of our world by carefully examining our thinking, and the thinking of others, in order to clarify and improve our understanding." (Chafee, J. 1988)

- ○ "Critical thinking is purposeful, reflective judgment that manifests itself in giving reasoned and fair-minded consideration to evidence, conceptualizations, methods, contexts, and standards in order to decide what to believe or what to do." (Facione, P. 2011)

- ○ "Critical thinking is the process of analyzing and assessing thinking with a view to improving it." (Paul, R. & Elder, L. 2007)

- ○ "Critical thinking is the application of logical principles, rigorous standards of evidence, and careful reasoning to the analysis and discussion of claims, beliefs, and issues." (Sternberg, R. 2013)

- ○ Critical thinking is a combination of Bloom's Revised Taxonomy and Webb's Depth of Knowledge (D.O.K.) as described in Hess' Rigor Matrix for D.O.K. levels 3 & 4. (Hess, K. 2007)

- ○ Other (please specify)

  [   ]

14. Please explain how you (feel/don't feel) that critical thinking relates to reading comprehension.

[   ]

158

Elementary Teacher Survey on Teaching Critical Thinking Skills

15. How well prepared do you feel about teaching critical thinking skills to students with the following learning needs?

	Not at all well	Slightly well	Moderately well	Very well	Extremely well
Above-grade level students	☐	☐	☐	☐	☐
On-grade level students	☐	☐	☐	☐	☐
Below-grade level students	☐	☐	☐	☐	☐
Gifted students	☐	☐	☐	☐	☐
Students with an IEP	☐	☐	☐	☐	☐
ELL students	☐	☐	☐	☐	☐
Students who qualify for free or reduced-price lunch	☐	☐	☐	☐	☐
Hispanic students	☐	☐	☐	☐	☐
Other student needs (describe below)	☐	☐	☐	☐	☐

Please explain

16. How do you make adjustments to teach critical thinking skills to students who are reading below grade level? Please explain below.

17. What support do you need to enable you to teach critical thinking skills to your students who are reading below grade level? Please explain below.

Elementary Teacher Survey on Teaching Critical Thinking Skills

Please respond to the following educational scenarios by rating the effectiveness of the critical thinking instructional activity or assessment for five types of students.

Elementary Teacher Survey on Teaching Critical Thinking Skills

18. Mrs. Jordan revised her reading assessment to incorporate evaluation of her 4th grade students' critical thinking skills with prompts like: "Determine the best course of action or decision based on a set of criteria." The day before the assessment she had the students discuss possible responses to the specific prompts that would be on the assessment. To what extent would this be effective for assessing critical thinking skills for...

	1 highly ineffective	2	3	4	5	6 highly effective
...Jacob (a student with special education needs in the area of reading)	○	○	○	○	○	○
...Jose (an English language learner)	○	○	○	○	○	○
...Monique (qualifies for free lunch)	○	○	○	○	○	○
...Thuy (typically scores 80% on reading assessments)	○	○	○	○	○	○
...Brian (qualifies for gifted program)	○	○	○	○	○	○

19. Mr. Johnson wrote the following objective in his lesson plan: "The student will be able to explain in his/her own words the definition of anarchy." To what extent would this be effective for teaching critical thinking skills to ...

	1 highly ineffective	2	3	4	5	6 highly effective
...Jacob (a student with special education needs in the area of reading)	○	○	○	○	○	○
...Jose (an English language learner)	○	○	○	○	○	○
...Monique (qualifies for free lunch)	○	○	○	○	○	○
...Thuy (typically scores 80% on reading assessments)	○	○	○	○	○	○
...Brian (qualifies for gifted program)	○	○	○	○	○	○

20. Mrs. Ramirez wrote the following objective in her lesson plan: "The student will be able to explain in his/her own words a reason-based solution for a leader faced with anarchy among his/her followers." To what extent would this be effective for teaching critical thinking skills to ...

	1 highly ineffective	2	3	4	5	6 highly effective
...Jacob (a student with special education needs in the area of reading)	○	○	○	○	○	○
...Jose (an English language learner)	○	○	○	○	○	○
...Monique (qualifies for free lunch)	○	○	○	○	○	○
...Thuy (typically scores 80% on reading assessments)	○	○	○	○	○	○
...Brian (qualifies for gifted program)	○	○	○	○	○	○

Elementary Teacher Survey on Teaching Critical Thinking Skills

21. Mrs. Harris asked her fourth grade students a question that only two of her students could answer. The question was: "Which of the 50 U.S. states is the biggest state in square miles?" To what extent would this be an effective way to measure assessment of critical thinking skills for ...

	1 highly ineffective	2	3	4	5	6 highly effective
...Julie (a student with special education needs in the area of reading)	○	○	○	○	○	○
...Su Lyn (an English language learner)	○	○	○	○	○	○
...Juanita (qualifies for free lunch)	○	○	○	○	○	○
...Damien (typically scores 80% on reading assessments)	○	○	○	○	○	○
...Alejandra (qualifies for gifted program)	○	○	○	○	○	○

22. Miss Chan, a fifth grade teacher, wrote the following objective on the board: "The student will be able to create a presentation on Edmodo that describes what would change if the Industrial Revolution developed in a different time or place." To what extent would this be an effective way to teach critical thinking skills to ...

	1 highly ineffective	2	3	4	5	6 highly effective
...Julie (a student with special education needs in the area of reading)	○	○	○	○	○	○
...Su Lyn (an English language learner)	○	○	○	○	○	○
...Juanita (qualifies for free lunch)	○	○	○	○	○	○
...Damien (typically scores 80% on reading assessments)	○	○	○	○	○	○
...Alejandra (qualifies for gifted program)	○	○	○	○	○	○

23. Miss Chan's fifth grade team mate, Miss Fernandez, wrote the following objective on the board: "The student will be able to create a presentation on Edmodo on the Industrial Revolution." To what extent would this be an effective way to teach critical thinking skills to ...

	1 highly ineffective	2	3	4	5	6 highly effective
...Julie (a student with special education needs in the area of reading)	○	○	○	○	○	○
...Su Lyn (an English language learner)	○	○	○	○	○	○
...Juanita (qualifies for free lunch)	○	○	○	○	○	○
...Damiem (typically scores 80% on reading assessments)	○	○	○	○	○	○
...Alejandra (qualifies for gifted program)	○	○	○	○	○	○

Elementary Teacher Survey on Teaching Critical Thinking Skills

24. Mr. Clark's assignment given to his third grade students was to create a commercial about the value of protecting an endangered animal. Xui Li and Sam created a unique commercial about white tigers that was persuasive in the need to protect white tigers. Hannah and Chris struggled but created a beautiful commercial about Humpback whales that mirrored the format of the example the class had viewed from Sea World about saving Orca whales. Using Hess's Cognitive Rigor Matrix, Mr. Clark determined that both commercials were at Extended Thinking (D.O.K. - 4) and Create (Bloom's - 6). To what extent was this an effective way to measure assessment of critical thinking skills at this level for ...

	1 highly ineffective	2	3	4	5	6 highly effective
...Gabrielle (a student with special education needs in the area of reading)	○	○	○	○	○	○
...Hannah (an English language learner)	○	○	○	○	○	○
...Sam (qualifies for free lunch)	○	○	○	○	○	○
...Chris (typically scores 80% on reading assessments)	○	○	○	○	○	○
...Xui Li (qualifies for gifted program)	○	○	○	○	○	○

25. Near the end of a unit on environmental occurrences, Ms. Simmons asked her fourth grade students to determine which one was the most devastating to the environment: fire, flooding or pollution. Before writing an explanation of their choice, they were required to create a list of reasons supporting each environmental occurrence as being the most devasting. Next, students individually wrote an opinion essay that stated reasons and cited sources for any facts used in their reasoning. Using Hess's Cognitive Rigor Matrix, Ms. Simmons designed this task to be at Strategic Thinking and Reasoning (D.O.K. - 3) and Analysis (Bloom's - 4). To what extent was this an effective way to engage her students in using critical thinking skills for ...

	1 highly ineffective	2	3	4	5	6 highly effective
...Gabrielle (a student with special education needs in the area of reading)	○	○	○	○	○	○
...Hannah (an English language learner)	○	○	○	○	○	○
...Sam (qualifies for free lunch)	○	○	○	○	○	○
...Chris (typically scores 80% on reading assessments)	○	○	○	○	○	○
...Xui Li (qualifies for gifted program)	○	○	○	○	○	○

Elementary Teacher Survey on Teaching Critical Thinking Skills

26. Miss Marshall's assignment given to her third grade students was to write a response to the following question about a fictional text they recently finished reading: "Which character's point of view was the most reasonable in the story? Explain why and how has it impacted your point of view." Using Hess's Cognitive Rigor Matrix, Miss Marshall determined that the reading comprehension task would assess the students' ability to demonstrate Strategic Thinking and Reasoning (D.O.K. - 3) and Analysis (Bloom's - 4). To what extent was this an effective way to measure critical thinking skills for ...

	1 highly ineffective	2	3	4	5	6 highly effective
...Gabrielle (a student with special education needs in the area of reading)	○	○	○	○	○	○
...Hannah (an English language learner)	○	○	○	○	○	○
...Sam (qualifies for free lunch)	○	○	○	○	○	○
...Chris (typically scores 80% on reading assessments)	○	○	○	○	○	○
...Xui Li (qualifies for gifted program)	○	○	○	○	○	○

27. After having his students read several "letters to the editor" in the local newspaper, Mr. Jennings asked his students to: "Choose two of the letters and explain the credibility of each of the author's claims." His goal was to have students work at the Evaluation level of Facione's Core Critical Thinking Skills. To what extent was this an effective way to measure critical thinking skills for ...

	1 highly ineffective	2	3	4	5	6 highly effective
...Miguel (a student with special education needs in the area of reading)	○	○	○	○	○	○
...Waheed (an English language learner)	○	○	○	○	○	○
...Maria (qualifies for free lunch)	○	○	○	○	○	○
...Carlos (typically scores 80% on reading assessments)	○	○	○	○	○	○
...Jazmine (qualifies for gifted program)	○	○	○	○	○	○

Elementary Teacher Survey on Teaching Critical Thinking Skills

28. Mr. King, always ended his reading assessments for his fourth graders with an essay question. His goal was to engage his students in Paul & Elder's third level of critical thinking skills -- analysis. This week the essay question was based on a reading about Arizona's topography and his goal was to measure the responses to identify their ability to analyze at the differentiating level: "What is the relationship between the environment and elevation levels in Arizona?" To what extent would this be an effective way measure critical thinking skills for ...

	1 highly ineffective	2	3	4	5	6 highly effective
...Miguel (a student with special education needs in the area of reading)	○	○	○	○	○	○
...Waheed (an English language learner)	○	○	○	○	○	○
...Maria (qualifies for free lunch)	○	○	○	○	○	○
...Carlos (typically scores 80% on reading assessments)	○	○	○	○	○	○
...Jazmine (qualifies for gifted program)	○	○	○	○	○	○

29. Mr.King's fourth grade team mate, Mr. Hernandez, had the same goal as Mr. King (Paul & Elder's third level of critical thinking skills -- analysis). He wrote his essay prompt slightly different: "Identify the pros and cons of Arizona's topography in the desert as it relates to specific groups of people or animals." To what extent would this be an effective way to measure critical thinking skills for ...

	1 highly ineffective	2	3	4	5	6 highly effective
...Miguel (a student with special education needs in the area of reading)	○	○	○	○	○	○
...Waheed (an English language learner)	○	○	○	○	○	○
...Maria (qualifies for free lunch)	○	○	○	○	○	○
...Carlos (typically scores 80% on reading assessments)	○	○	○	○	○	○
...Jazmine (qualifies for gifted program)	○	○	○	○	○	○

30. Principal Jones observed two second grade teachers, Mrs. Gonzalez and Mrs. Nelson. They taught similar lessons with the same story: "Goldie Locks and the Three Bears." How effective were Mrs. Gonzalez's questions with requiring her students to apply critical thinking skills?

	1 highly ineffective	2	3	4	5	6 highly effective
What were the motives behind Goldie Locks' actions?	○	○	○	○	○	○
What familiar pattern did you notice in this story?	○	○	○	○	○	○
Would you rather be Goldie Locks or Baby Bear in this story? Why?	○	○	○	○	○	○
Do you think the consequences for Goldie Locks were appropriate? Why?	○	○	○	○	○	○

Elementary Teacher Survey on Teaching Critical Thinking Skills

31. Referring to the situation described in question 30: How effective were Mrs. Nelson's questions with requiring her students to apply critical thinking skills?

	1 highly ineffective	2	3	4	5	6 highly effective
How would you describe Goldie Locks to another person?	○	○	○	○	○	○
What could be another title for this story?	○	○	○	○	○	○
How are Goldie Locks and Baby Bear different?	○	○	○	○	○	○
Why do you think the author decided to give Goldie Locks these consequences?	○	○	○	○	○	○

166

Elementary Teacher Survey on Teaching Critical Thinking Skills

Thank you for completing my survey. The data collected is a valuable part of my dissertation research. Your survey responses will remain anonymous and confidential.

If you are willing, I would like to invite you to join one of my focus groups to discuss more about your thoughts on teaching students critical thinking skills. Focus group responses are recorded confidentially and names will not be part of the recording. If you are interested in being a focus group participant, please send me an email Deborah.Fast@asu.edu to tell me if you prefer

a) a face-to-face focus group
b) an online discussion group
c) willing to do either a or b

Elementary Teacher Survey on Teaching Critical Thinking Skills

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APPENDIX B

SURVEY E-MAIL TO TEACHERS IN SUBURBAN SCHOOL DISTRICT

March 10, 2014

Dear Teacher:

This is an opportunity to share your opinion about teaching critical thinking skills and gain a contribution to the [AUSD-1] Education Foundation. I will donate $1.00 to [AUSD-1 EF] for every survey that is completed by a third through fifth grade teacher in our school district. The total donated could potentially total $350.00.

In addition to being one of your colleagues in [AUSD-1], I am a graduate student under the direction of Professor Gustavo Fischman in the Division of Educational Leadership and Innovation at Arizona State University.

I am conducting a research study to collect information from teachers in order to discover if teachers feel prepared to the teach critical thinking skills of Arizona's Career and College Ready Standards (AZCCRS) for English Language Arts (ELA) to disadvantaged students, in particular, low socio-economic (SES) Hispanic students.

I am inviting your participation, which will involve approximately 15-25 minutes of your time to complete an online survey about your opinion.

Your participation in this study is voluntary. You can skip questions if you wish. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. Even though I work in the district and we may know each other, your responses will not be traceable to you. Your responses are not reflected in any way to your job performance.

Your responses will add to the discussion of how to provide resources and/or training that teachers feel that they need in order to teach low SES Hispanic students. Third, fourth, and fifth grade teachers, like yourself, work with these students daily and understand both the challenges that these students face and the challenges you encounter as you try to meet their personal and academic needs. There are no foreseeable risks or discomforts to your participation.

Your responses will be anonymous. There are no questions that enable me, as a [AUSD-1] peer, the ability to connect your name to one of the surveys. *Survey Monkey* collects the responses, but not the location or details about the respondent any more than what is asked in the background questions 1-13. The results of this study may be used in reports, presentations, or publications but your name and the district's name will not be known. Individual details will not be shared with the data. Data will only be shared as a whole group or disaggregated group

identified by the percentage of low SES students and/or percentage of Hispanic students.

If you have any questions concerning this research study, please contact Gustavo E, Fischman at The Division of Educational Leadership and Innovation at Arizona State University, Mary Lou Fulton Teachers College, Tempe Campus, Interdisciplinary B 353 C, 480-965-5225, fischman@asu.edu. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

Submission of the survey will be considered your consent to participate.

Sincerely,

Deborah Fast, ASU Doctoral Graduate Student

Deborah.Fast@asu.edu

APPENDIX C

SURVEY E-MAIL TO TEACHERS IN THE URBAN SCHOOL DISTRICT

March 10, 2014

Dear Teacher:

This is an opportunity to share your opinion about teaching critical thinking skills and gain a contribution to the [AUSD-2] Education Foundation. I will donate $1.00 for every survey that is completed by a third through fifth grade teacher in your school district. The total donated could potentially total $150.00.

In addition to being one of your colleagues in another Arizona school district taking the survey, I am a graduate student under the direction of Professor Gustavo Fischman in the Division of Educational Leadership and Innovation at Arizona State University.

I am conducting a research study to collect information from teachers in order to discover if teachers feel prepared to the teach critical thinking skills of Arizona's Career and College Ready Standards (AZCCRS) for English Language Arts (ELA) to disadvantaged students, in particular, low socio-economic (SES) Hispanic students.

I am inviting your participation, which will involve approximately 15-25 minutes of your time to complete an online survey about your opinion.

Your participation in this study is voluntary. You can skip questions if you wish. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. Your responses will not be traceable to you or the [AUSD-2] School District. Your responses are not reflected in any way to your job performance.

Your responses will add to the discussion of how to provide resources and/or training that teachers feel that they need in order to teach low SES Hispanic students. Third, fourth, and fifth grade teachers, like yourself, work with these students daily and understand both the challenges that these students face and the challenges you encounter as you try to meet their personal and academic needs. There are no foreseeable risks or discomforts to your participation.

Your responses will be anonymous. There are no questions that enable me to have the ability to connect your name to one of the surveys. *Survey Monkey* collects the responses, but not the location or details about the respondent any more than what is asked in the background questions 1-13. The results of this study m a y be used in reports, presentations, or publications but your name and the district's name will not be known. Individual details will not be shared with the data. Data

will only be shared as a whole group or disaggregated group identified by the percentage of low SES students and/or percentage of Hispanic students.

If you have any questions concerning this research study, please contact Gustavo E, Fischman at The Division of Educational Leadership and Innovation at Arizona State University, Mary Lou Fulton Teachers College, Tempe Campus, Interdisciplinary B 353 C, 480-965-5225, fischman@asu.edu. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

Submission of the survey will be considered your consent to participate.

Sincerely,

Deborah Fast, ASU Doctoral Graduate Student

Deborah.Fast@asu.edu

APPENDIX D

AUSD-1 PRINCIPAL LETTER

March 6, 2014

Dear Principal,

In addition to being an [AUSD-1] employee, I am a graduate student at Arizona State University conducting my dissertation research. My study focuses on what teachers feel they need in order to teach critical thinking skills to disadvantaged students, in particular, low SES Hispanic students. I am surveying teachers in 2 school districts. Superintendent Dr. [___] has approved my study at [AUSD-1].

I am using *Survey Monkey* to survey all of [AUSD-1's] third to fifth grade teachers. The survey and follow up focus group (for those who volunteer) are an effort to answer the following questions:

1) What do third through fifth grade teachers know about teaching critical thinking?

2) What do third through fifth grade teachers believe about their own ability to teach critical thinking skills during ELA instruction to low SES Hispanic students?

3) What do third through fifth grade teachers believe about their low SES Hispanic students' ability to use critical thinking skills when reading and/or writing?

4) What are the opinions and beliefs of Arizona's third through fifth grade teachers about what they need to teach the critical thinking skills that are included in AZCCRS for ELA to low SES Hispanic students?

Teacher participation is completely voluntary and anonymous. By using *Survey Monkey* to conduct the survey, I will be ensuring that responses are not traceable to your teachers or your school. I will contribute $1.00 for every completed survey to [AUSD-1 EF]. The potential total contribution is $350.00.

A copy of the recruitment e-mail to teachers is attached and explains that participation and non-participation will not be reflected in teacher evaluations. In addition, if they choose to participate, they can skip questions or choose to stop at any time. During a test of the survey, participants took an average of 15-25 minutes to complete it.

I would like to thank you for your assistance with this request. Unless you notify me that you have objections, I will contact your teachers about participating in the survey next week. Please let me know if you have any questions or concerns regarding this project.

Thank you,
Debbie Fast
Fast.debbie@cusd80.com or Deborah.fast@asu.edu (480) 224-3762

APPENDIX E

AUSD-2 PRINCIPAL LETTER

March 6, 2014

Dear Principal,

In addition to being a teacher in another school district, I am a graduate student at Arizona State University conducting my dissertation research. My study focuses on what teachers feel they need in order to teach critical thinking skills to disadvantaged students, in particular, low SES Hispanic students. I am surveying teachers in 2 school districts. Superintendent Dr. [   ] has approved my study at [AUSD-2].

I am using *Survey Monkey* to survey all of [AUSD-2's] third to fifth grade teachers. The survey and follow up focus group (for those who volunteer) are an effort to answer the following questions:

1) What do third through fifth grade teachers know about teaching critical thinking?

2) What do third through fifth grade teachers believe about their own ability to teach critical thinking skills during ELA instruction to low SES Hispanic students?

3) What do third through fifth grade teachers believe about their low SES Hispanic students' ability to use critical thinking skills when reading and/or writing?

4) What are the opinions and beliefs of Arizona's third through fifth grade teachers about what they need to teach the critical thinking skills that are included in AZCCRS for ELA to low SES Hispanic students?

Teacher participation is completely voluntary and anonymous. By using *Survey Monkey* to conduct the survey, I will be ensuring that responses are not traceable to your teachers or your school. I will contribute $1.00 for every completed survey to your teacher mini-grant fund. The potential total contribution is $150.00.

A copy of the recruitment e-mail to teachers is attached and explains that participation and non-participation will not be reflected in teacher evaluations. In addition, if they choose to participate, they can skip questions or choose to stop at any time. During a test of the survey, participants took an average of 15-25 minutes to complete it.

I would like to thank you for your assistance with this request. Unless you notify me that you have objections, I will contact your teachers about participating in the survey next week. Please let me know if you have any questions or concerns regarding this project.

Thank you,
Debbie Fast
Fast.debbie@cusd80.com or Deborah.fast@asu.edu (480) 224-3762

APPENDIX F

INSTITUTIONAL REVIEW BOARD APPROVAL

EXEMPTION GRANTED

Gustavo Fischman
Division of Educational Leadership and Innovation - Tempe
480/965-5225
fischman@asu.edu

Dear Gustavo Fischman:

On 3/6/2014 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Are Arizona's third through fifth grade teachers prepared to teach the cognitive demands of the Common Core State Standards to all students?
Investigator:	Gustavo Fischman
IRB ID:	STUDY00000760
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• CUSD District Consent email, Category: Consent Form; • Isaac District Consent email, Category: Consent Form; • CUSD Teacher email, Category: Consent Form; • Isaac Teacher email, Category: Consent Form; • CUSD Principal email, Category: Consent Form; • Isaac Principal email, Category: Consent Form; • Fast_FOCUS GROUP LETTER_revised_3-6-14 (1).pdf, Category: Consent Form; • Critical Thinking and Low SES Hispanic Intermediate Students, Category: IRB Protocol; • Focus group questions .pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Survey, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions);

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 3/6/2014.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Deborah Fast
        Deborah Fast