The Effect of Richard Paul's Universal Elements and Standards of Reasoning on Twelfth Grade Composition

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by

J. Stephen Scanlan

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Abstract

This proposal describes the procedures used by a student teacher in a San Diego area twelfth grade Rhetoric and Composition class that were designed to improve the critical thinking (CT) skills of his students. Emphasis was placed on improving the CT skills of the students by incorporating researcher Richard Paul's "Elements and Standards of Reasoning" into all standards-based curriculum, which included persuasive essays on the topics of child abuse, language, gender and culture, and the value of life. Students were identified as high-range, mid-range, low-range achievers, or ELL's. The progress of each group was measured through a progressive series of rubric assessments of their writing, examining five key areas important in rhetorical composition: Clarity of Writing, Analysis of author's argument, Use of supporting information, Organization, and Grammar and Syntax. Through the introduction of this focused critical thinking training, student composition improved dramatically in all of the five key areas, among all the groups. The researcher proposes to introduce focused CT practices in a trial set of Language Arts classes within the district at large, modeled on this action research.

Chapter 1: Problem Identification

Background of problem

Some of the earliest, most detailed efforts humans made to record our history were focused on communicating, analyzing and teaching how we think. These efforts are represented by codified laws and philosophy, and critical commentaries that accompany both. Effectively, the history of Critical Thinking begins in Athens circa 430 B.C. when Socrates, opposed by the intellectually shrewd but arrogant Sophists, introduced a method of inquiry in which he examined his antagonists with probing questions designed to challenge their epistemological foundations. What he revealed was that most of what we knew—or rather *believed* we knew—had no basis more reliable than hearsay, speculation and assumption. Unfortunately, not much has changed in the 2,500 years since Socrates' death.

Long after the Greeks, Critical Thinking remained on the minds of Western philosophers. Scholastic, Renaissance and Enlightenment thinkers, such as Thomas Aquinas, Francis Bacon and Immanuel Kant (respectively) dedicated themselves to the pursuit of true, defensible knowledge. By cutting through the jungle of assumptions that choke intellectual progress, these men followed the tradition pioneered by Socrates, devoting themselves to methodically re-considering common beliefs and explanations, sifting them through the lens of reason in order to distinguish between those that were well-established in logic, and those which lacked an evidentiary foundation. Among the results of this

progressive, structured inquiry were democracy, capitalism, and the rise of the middle class.

Despite its prestigious beginnings and long history in the West, Critical Thinking (CT) is almost something of a relic, today. While eighty-nine percent of teacher-preparation instructors in California claim that CT is a primary focus of their instruction, only nine-percent say that they clearly teach critical thinking (Paul, 1993). The students seem to be learning from their instructors, as roughly the same percentage of secondary school teachers (ten-percent) report *using* methods that consciously teach CT— though they communicate similar attitudes about its importance.

The simple fact is that while the CT virtues Socrates emphasized in reasoning—namely clarity, logic and consistency—remain important in theory, they simply are not making their way into the classroom; they are rarely incorporated into American K-12 public school curriculum, where 76% of American children receive their education (NCES, 2005). At best, CT is taught as a separate and distinct component in *some* classes rather than as an integral part of *all* of them. The result is education that separates learning and thinking.

Statement of problem

Internationally, studies indicate that the United States has steadily been falling behind industrialized nations, in terms of critical thinking skills, over the past decade and-a-half (NCES, 2005). Domestically, employers are complaining that they cannot find enough native labor that has the critical thinking and communication skills their companies need in order to compete

against companies from the advancing nations (Hall and Wessel, 1989). The result is that American companies are outsourcing jobs in order to find people with the skills they need, which threatens the United States' future position as a world economic leader.

That American students do not have the critical skills necessary to compete is not in itself a crippling predicament— were the conditions right, the problem could be easily and quickly remedied. However, there looms under the surface a more daunting beast. The lack of critical thinking in students is an *institutional* problem, reflected in the attitudes and policies of educators. Teachers believe they are already teaching critical skills, and students believe they are already learning critical skills, and both groups are resistant to change (Durr, Lahart & Maas, 1999). The most troubling aspect, though, is that teachers themselves lack CT skills (Paul, 1993), and therefore are in no position to teach CT skills, even if the curriculum demanded it.

So whether we consider the future of our students in an international or domestic context, we cannot avoid the conclusion that there is a problem: students aren't learning the critical skills they need, and teachers are resistant to learning and teaching them. If we are to avoid economic disaster at both the individual and national levels, we need to start training our students to think critically; and we simply don't have the time for bureaucrats to make the necessary changes that will affect our kids, and their kids' kids, *et al*. The teachers who have the ability need to start incorporating CT training in their lessons *now*, while their districts catch up.

Purpose of study

This project will research the effect of focused Critical Thinking training on the composition skills of twelfth graders, specifically through educational techniques developed and advocated by Richard Paul—his "Elements and Standards of Critical Thinking" (E&S').

The purpose of this study is to demonstrate that Paul's techniques can be effectively taught to and used by twelfth grade students of diverse skills and language abilities to improve their critical thinking and composition skills as measured in five areas:

1. Clarity of Writing
2. Analysis of author's argument
3. Use of supporting information
4. Organization
5. Grammar and Syntax

The target audience of this study is secondary Language Arts teachers, who can incorporate critical thinking methods into their curriculum *today*, and administrators, who can make CT training an integral part of the standard curriculum and practices of tomorrow.

Importance of study

It would be difficult to underestimate the importance of this study. As Richard Paul states, the fundamental characteristic of the twenty-first century is ever-accelerating change:

> [A] world in which information is multiplying even as it is swiftly becoming obsolete and out of date, a world in which ideas are continually restructured, retested, and rethought, where one cannot survive with simply one way of thinking, where one must continually adapt one's

> thinking to the thinking of others, where one must respect the need for accuracy and precision and meticulousness, a world in which job skills must continually be upgraded and perfected — even transformed (1995).

This modern dynamic is unique in human history, and our present national approach to education is simply not well-adapted to equipping students with the skills necessary to thrive in the emerging world. If we, as a nation, hope to maintain our present position of economic and cultural prestige, we need to act sharply and decisively; and if we as individuals hope to survive *in* it, we must direct ourselves to act the same way on a personal level. This study will demonstrate how we can *immediately* do that at the classroom level.

Moreover, while Critical Thinking is an ancient practice, its exercise has long been reserved for the elite. That needs to change. Critical Thinking is the instrument of social change, and it is imperative that it gets into the hands (and minds) of those who most desperately need change; of those who will be most affected by this changing world.

Research questions

The research questions this study answers are:

- What demonstrable value is there in incorporating Richard Paul's E&S's in regular level twelfth grade secondary Language Arts education?
- Using the E&S's, how long does it take to see measurable improvement in critical thinking skills?
- Is the improvement static or dynamic? (In other words, did the students improve at a basic level and stay there, or did they continue to improve?)

- Is there a measurable difference in effect contingent upon pre-attained student skill levels? (In other words, are the effects quarantined to high, middle or low achievers, or ELL's, or are they universal?)

Methodology

This study utilized qualitative, action-based research in which student progress (the effect of the training) was evaluated by comparing student writing samples from before the focused CT training— based on five areas of composition-centered skills— to samples from after the focused CT training, evaluating the effect on student thinking through a progressive analysis of their compositions through rubric assessment over the course of several weeks (accounting for four in-class writing assignments). Specifically, the study looked for signs of heightened composition skills, reflected by an increased clarity of writing, level of analysis, use of supporting information, organization of ideas, and accuracy of grammar and syntax, which was measured quantitatively using a rubric system.

This study measures the effects of the training in these areas on a senior level rhetoric and composition course that had spent the nine weeks prior to the researcher's introduction to the class working on senior portfolios. The course is a pilot program designed by San Diego State University in cooperation with Sweetwater Union School District. It is being expanded in the 2006-2007 school year to account for forty-percent of senior level English classes at Sweetwater High School.

The study broke the thirty-eight students into four groups (as pre-identified by the master teacher)— high achieving students, midrange students, lower-achieving students, and English Language Learner students— in order to measure the effect of CT training on each distinct group.

Chapter 2: Review of the Literature

How educators understand Critical Thinking in the modern sense will determine how they apply it; and more importantly, how to apply it *well*. W.G. Sumner provides the generally accepted foundational definition of Critical Thinking:

> "[CT is] the examination and test of propositions of any kind which are offered for acceptance, in order to find out whether they correspond to reality or not" (1906).

And CT researcher Richard Paul sharpens the definition,

> Critical thinking is that mode of thinking-about any subject, content, or problem-in which the thinker improves the quality of his or her thinking by skillfully analyzing, assessing, and reconstructing it. Critical thinking is self-directed, self-disciplined, self-monitored, and self-corrective thinking. It presupposes assent to rigorous standards of excellence and mindful command of their use. It entails effective communication and problem-solving abilities, as well as a commitment to overcome our native egocentrism and sociocentrism (2004).

In short, the purpose of CT is to weed out prejudice and bias to allow well-reasoned views to take root in order to motivate proper action.

Given that thinking is the foundation for all true education, education, then, should be assessed based on how well it develops the critical faculty in students. Sumner rightly argues that since all thinking leads to action, the ultimate aim of education should be good citizens. Sumner shared this view with Plato, who believed that those trained in rational thought would produce the best policy makers. However, Plato left this privilege/burden for the elite while Sumner believed that many could be trained in critical thinking; realizing, though, that it would require an overhaul of the educational system (1906). One century later, we still have the same hope, which is also the hope of this study.

Unfortunately, the area of action based research in the area of critical thinking in secondary language arts instruction is wide open to principal studies. I say "unfortunately" because although the area is ripe for research, it's only so because not enough research has been done. While there has been some strong action based research in the area of teaching critical thinking generally, the work usually focuses on elementary or college students (e.g. Daly, 1995)— groups that are seen as pliable and intellectually capable, respectively— and in areas other than Language Arts. For instance, critical thinking teachers Karen Dellett, Georgene Fromm, and Susan Karn with advisor Ann Cricchi (1999) have contributed foundational work in the area of teaching critical thinking to elementary school students (third- and fourth-grade). Though they've utilized several dimensions of quantitative research in their study (e.g. surveys, reflective chats and field notes), their research focused on qualitatively assessing student response journals for signs of enhanced critical skills. They found that "by incorporating thinking strategies in our classrooms we observed a shift in student behavior". The shift was demonstrated by an ability to make connections to prior knowledge, increased self-reliance, a new awareness of thinking capabilities on the part of the students, the ability to take a risk as they explored solutions to particular problems, and an emerging awareness of thinking strategies. Dellet, et al., found that a teacher's professional practices can be just as impacted by how students learn as student learning is impacted by how they learn to think. Teaching our students how to think critically, then, can not only optimize teachers' instruction by broadening the field of lessons to which students have

access, but can also affect student learning by giving them the intellectual tools necessary to access content in dynamic ways. Therefore, the emphasis in teaching students how to think should be on developing the intellectual traits that will allow them to generalize critical learning in order to access unfamiliar content. (This study does that by using techniques that make Hamlet accessible to ELL's, as will be seen.)

One of those intellectual traits is self-reliance, or 'self-direction'. Just as a body in motion tends to stay in motion, a brain that's trained to seek out the answer for oneself will tend to think this way. In her studies on using WebQuest to teach social studies to her multiage elementary school students, Sally Bryan has shown that when students take responsibility for their own learning, "the learning is richer in content and deeper in concept development" (2000). Bryan asked her students to explore selected websites, select topics of interest, and write an article to be included in the school newspaper. She found that when students were given control over their own learning, the depth to which they learned and retained their topic information exceeded that of standard lecture-based instruction. The students did not view information as obscure facts that were quickly forgotten after some test. Rather, having invested themselves in their topics, students were self-interested in retaining the content. Bryan's study suggests that a key component in teaching and learning critical thinking is student self-investment— a student must take personal responsibility for her own learning, not being dependent on a teacher to 'give her the answer', which requires and exercises critical thinking skills.

Bryans' findings are echoed and expanded in a study by Randy Bomer, who used journaling as a critical lens for teaching thinking to high school social studies (2000). Bomer had his students journal daily in notebooks, sharing their thoughts and experiences. He then had them expand these entries by considering them in the context of social dynamics. For instance, when students wrote about not getting picked for a team or being excluded from a social event, Bomer encouraged them to extrapolate those personal experiences to relate to the experience of those who are excluded in other social contexts— e.g. the oppressed and socially powerless. In doing so, Bomer considers three modes of teaching: demonstrations (modeling), assisted performance (cooperative learning), and reflective conversation (using guiding questions). Though the use of journaling is already an appreciated and established technique of experiential learning (Bennion & Olsen, 2002), Bomer's use of reflective conversation to get students to apply their thinking to issues outside themselves, paired with his process of investing students in their learning by making them an integral part of it, makes his study a notable contribution to the field of teaching critical thinking (Dyment & O'Connell, 2003).

Barbara Guthrie, a GED teacher in Southwest, Virginia, has done work in the area of using journaling and class discussion as a means of documenting the higher level critical thinking skills that were occurring in her classes prior to any focused CT training (2000). (Using Bloom's Taxonomy, she identified six levels of thinking present in her students' writing and speech— knowledge, comprehension, application, analysis, synthesis, and evaluation.) She asserts

that whether we teach it or not, critical thinking is going on in our students' work, particularly in discussion; we only need to listen and contribute empathy and praise and we'll recognize it. Guthrie's study, while heartwarming, almost seems to ignore the issue of declining CT performance in students by insisting that they already have the skills; that teachers are just not trained to recognize them. However, the value of Guthrie's study is that it alerts researchers to the possibility that even in the absence of formal training, students may informally and unconsciously develop rudimentary CT skills on their own. If so, CT training may not need to begin from ground zero, for some students. For them, educators may just need to identify and sharpen these pre-existing skills.

Researchers Sue-san Ghahremani-Ghajar and Seyyed Abdolhamid Mirhosseini have investigated the question of how dialogue writing ("written conversation") may provide opportunities to bring critical pedagogy and foreign language education together in critical thinking practice (2005). Assessing six-hundred journal entries from thirty 16-year old English students in Tehran, the researchers looked for themes relevant to "empowerment" and "critical writing" as indicators of developed CT skills. The study revealed that dialogue journal writing led to gains in critical self-reflective ELL writing abilities. This study is valuable in that it's one of the few to have looked at the effect of CT training in a non-native language among language learners. Given that a growing number of American students are ELL's, the possibility that they will not fall behind their native-language peers by technical, focused CT instruction is encouraging. It means that when effective pedagogical practices are identified, instructors can

be confident that the skills can be communicated to language learners as effectively as any other content.

Kristina Hedberg (2002), a reflective fourth grade ESOL teacher, has provided an illustration of critical thinking instruction in the classroom that focuses on helping students access prior knowledge when learning and analyzing new material (Chamot & O'Malley, 1994). Hedberg found that using the SQ3R strategy helped her students reference their backgrounds to attach meaning to new concepts. Once they had acquired this new meaning, her students were able to apply the new concepts to other aspects of their learning, and even to newer, unfamiliar material. Through a triangulation of data, Hedberg showed that the reason her students retained more information was that they were interacting with the material in a way that was meaningful for them. The students didn't view the concepts as uninteresting abstract ideas; the concepts were part of who the students were, because they spoke to their experiences. Hedberg's study, then, insists that a significant part of learning critical thinking is that the learner be self-involved.

Teachers' attitudes have also been shown to be an important factor in the effect of CT training. Researchers Edward Warburton and Bruce Torff have investigated the effect of teachers' beliefs about critical-thinking activities on different populations of CT learners. They administered the Critical Thinking Belief Appraisal to 145 secondary teachers, who rated both high-CT and low-CT activities as more effective for high-range learners than low-range ones, thus demonstrating strong 'advantage effects'. The instructors also rated high-CT

activities as more effective than low-CT ones for both high-range and low-range learners, demonstrating 'pedagogical-preference effects' stronger for high-range learners than low-range ones. Although their results are inconsistent with the general impression that teachers favor low-CT activities over high-CT ones for low-advantage learners, the results suggest that low-advantage learners may receive fewer high-CT activities in schools, hindering their academic development and performance. This study is significant in that it warns instructors of the negative effects of prejudicial instruction inherent when instruction is guided by performance expectations. Therefore, CT instruction must be done by critically-conscious teachers who approach each student with their assumptions in check.

Further, in his study on the origin of reflective thought, Samuel Shermis has argued that any educational evaluation stems from the educational purposes specified in advance of instruction (2000). Therefore, if educators expect students to learn critical thinking skills, the purposes, goals, and objectives must be geared towards demonstrating that sort learning. Shermis argues that this necessarily precludes evaluation that emphasizes rote memorization. Therefore, effective CT training will focus on expressive projects that require learners to develop and assess ideas (e.g. evaluating rhetorical documents), rather than answer choice-based queries (e.g. multiple choice, true/false). Further, students must be explicitly aware of the expectations and guided in strategies for fulfilling them.

Perhaps the most relevant study to address the issue of improving critical thinking in high school language arts classes was done by Arlene Pullen (1992). In her study, Pullen collaborated with a fifteen teacher English department to improve the critical thinking skills of students towards the goal of allowing students greater autonomy in their learning. Her methods included teacher networking and staff development through individual planning, as well as school, district and state workshops. She reports that through this effort, the English department at her New Jersey high school was successful in fostering greater CT skills, reflected by improved student test scores and increased student autonomy. Significant differences between this study and Pullen's are that this study reflects the efforts of a single student teacher working without the support of a department, to bring about significant, assessable change in the critical thinking skills of high school seniors relying on Richard Paul's "Elements and Standards of Reasoning" as the chief instrument of instruction.

Richard Paul's "Elements and Standards of Reasoning" are outlined in several publications, as well as on his website (Paul & Elder, April 1997). Paul argues that there are two essential dimensions of thinking that students need to master in order to learn how to upgrade their thinking. They need to be able to identify the "parts" of their thinking, and they need to be able to "assess" their thinking. Paul refers to the "parts" as the "Elements of Reasoning" which he assesses through the "Standards of Reasoning" (hereafter referred to at the E&S').

Paul and Elder describe eight Elements of Reasoning (1997):

1. All reasoning has a **Purpose**. In order to understand some proposition, one must be able to clearly define its Purpose (e.g. to persuade, inform, etc.).

2. All reasoning is an attempt to answer some **Question At Issue**—e.g. to figure something out, to settle some question, to solve some problem. It is important to identify that Question. In order to understand the Purpose.

3. All reasoning is based on **Assumptions**. Effective thinking seeks to clearly identify the writer's assumptions and determine whether they are justifiable, and how they are shaping the author's point of view.

4. All reasoning is done from some **Point of View**. Clear thinking seeks to Identify the author's Point of View.

5. All reasoning is based on **Information**—e.g. data and evidence. Clear thinking seeks to identify the writer's Information, and make sure that all information used is clear, accurate, and relevant to the question at issue. It also assess whether or not the writer has gathered sufficient information.

6. All reasoning is expressed through, and shaped by, **Concepts** and **Ideas**. Therefore, it's important to Identify key concepts and explain them clearly. An example would be when discussing the topic of "love", to understand what the writer means by "love".

7. All reasoning contains **Inferences** or **Interpretations** by which we draw **Conclusions** and give meaning to data. It's important to only Infer what the evidence implies.

8. All reasoning leads somewhere, or has **Implications** and **Consequences**. It is important trace the Implications and consequences that follow from one's reasoning, searching for negative as well as positive implications, considering all possible Consequences.

Paul and Elder also describe eight Standards of Reasoning used to assess the Elements of Reasoning (1997):

1. **Clarity**. Is the Element being considered **Clear**? For example, "Is the Purpose Clear? Or is it vague? Is the information Clear? Or is it ambiguous?" For instance, the Question "What can be done about the educational system in America?' is unclear. In order to address the question adequately, one would need to have a clearer understanding of what the person asking the question is considering the "problem" to be.

A clearer question would be "What can educators do to ensure that students learn the skills and abilities which help them function successfully on the job and in their daily decision-making?"

2. **Accuracy:** Is the Element (e.g. Information) really true? (A statement can be Clear but not Accurate, as in "Most dogs weigh over 300 pounds").

3. **Precise**: Is the Element Precise? (A statement can be both Clear and Accurate, but not Precise, as in "Jack is overweight". We don't know how overweight Jack is—he could be one pound or 500 pounds overweight.)

4. **Relevant**: Is the Element Relevant? A statement can be Clear, Accurate, and Precise, but not relevant to the question at issue. For example, some students believe that their grade should reflect the amount of effort they put into an assignment, though effort is usually irrelevant to the issue of whether or not an assignment is done properly.

5. **Depth**: Is the Element sufficiently Deep, or is it superficial?

6. **Breadth**: Is the Element sufficiently broad, or do we need to consider a wider scope of data? (E.g. "Are the Conclusions mentioned in a report exhaustive, or are there other possible conclusions the author fails to mention?")

7. **Logic**: Does the Element make sense? Is it sound? (E.g. Are the Assumptions Logical?)

It is these two dimensions to thinking that forms the foundation of this current research project.

Finally, in his study geared towards the design of "a new kind of school—one that will prepare students to succeed in the 21st century, not the 19th" (Basset, 2005), Patrick Basset proposes a learning environment that incorporates cross-content CT strategies in every classroom. Although he doesn't suggest specific CT training strategies, Basset's study is interesting in that it makes recommendations designed to promote skill-expressed CT training for both vocational and collegiate academic success. In other words, CT is an

important factor in the success of the 21st-century individual, whether she's on the job or in school.

While there's a slowly emerging body of literature in the field of specialized CT training, there's still a dearth of recent, relevant action research. This absence is alarming, since the application of best pedagogical practices must ultimately be assessed in the classroom—where the rubber meets the road—rather than in the academic journal. This study sought to contribute to the underrepresented body by sharing the results of a brief but encouraging CT training program designed to not only to improve student thinking, but also to provide a framework to help teachers see how such a program *has* been used in the classroom, and how it *can* be used in *their* classrooms.

Chapter 3: Project Description

Based on the findings of the above researchers, this study works from the principle that the purpose of critical thinking is to motivate action; and from the demonstrated understanding that an emerging awareness of thinking strategies on the part of the learner leads to an awareness of thinking capabilities, which are reflected by an ability to make connections to prior knowledge, increased self-reliance in terms of educational pursuits, and a willingness to take a risk in order to explore solutions to problems.

This research was carried out by a student teacher, under the supervision of a master teacher, concurrently enrolled in California Teacher Credentialing and Master of Arts in Education courses.

Site Description

The research for this project was carried out at Sweetwater High School in National City, California. Sweetwater High School is a low-income, heavily Hispanic campus of 2,673 students—79% Hispanic, 13% Filipino, 3% African-American, 3% White, 1% Pacific Islander, 1% Asian— roughly seven miles south of downtown San Diego. Identified as an under-performing school by the state of California, Sweetwater has an API score of 605 with only 72.7% of the potential Class of 2006 having passed the English/Language Arts portion of the CAHSEE exam as of Spring 2005. Although the school has shown dramatic improvements in API scores over the past four years (from 523 to 605) under provisions of 'No

Child Left Behind', the school is in danger of being taken over the by the federal government.

The thirty-eight students studied for this research project roughly mirror the school-wide demographic. They were chosen at random—they were the students in the classrooms to which the researcher was assigned as a student teacher.

The school is on year-round block schedule, giving instructors five hours of instructional time each week, broken up over three days.

As stated earlier, the objective of this project is to ascertain the effects of teaching/learning Richard Paul's "Elements and Standards of Reasoning" on twelfth grade composition in the areas of clarity of writing, analysis of author's argument, use of supporting information, organization, and grammar and syntax. The time frame for this study was March 15, 2006 through May 11, 2006.

All critical thinking instruction was done by the researcher. In order to reduce bias associated with teacher expectations of students involved in CT research (Warburton & Torff, 2005), all assessments were done by the master teacher without knowledge of what the researcher was specifically studying. Similarly, in order to limit possible data contamination by students trying to 'learn to the test', the students were not aware of the rubric that was being used to assess their CT development. Rather than seeing their progress on the rubric, they were assessed points on their essays by the researcher.

Before Focused Critical Thinking Training

Assignment 1: Childhood Love Lessons

When the initial observation period began (during which the researcher observed the class under the instruction of the master teacher), the students were nearly finished with a unit that focused on an essay by the author bell hooks titled "Justice: Childhood Love Lessons" (hooks 2000). In her essay, hooks argues that abuse and neglect have no place in a loving relationship— especially between a parent and child. Her main thrust is that any physical punishment towards a childhood constitutes child abuse, which is dangerous not only for the physical damage it can cause to the child, but also for future damage the self-perpetuating action usually brings about (i.e. children learn to love based on how they're treated by their parents, causing an abused child to eventually abuse their spouse and children in return). The students were given the long essay by their teacher and put into eight teacher-assigned groups based on scaffolding practices that favored placing students with like-performing peers. By highlighting sections with various colored markers and pens, the students were given the assignment of identifying the author's thesis, her supporting evidence, the background information she uses, and were asked to state three questions they would ask the author if she were present. The students were given two and-a-half two hour periods to complete the assignment for a total of five hours.

After the two and-a-half class periods, the students were given the following in-class writing assignment:

> hooks claims that "No one can rightfully claim to be loving when behaving abusively" (paragraph 11). Write a well-developed argument that shows the degree to which you agree and/or disagree with this assertion. Use carefully chosen evidence to support your reasoning.

The students were given two hours to complete the assignment. All work had to be done by hand (no computers were allowed) and in pen. This was the standard procedure for the class.

Results of Assignment 1

The assignment was assessed by the master teacher based on a 1-5 rubric (designed by the researcher) that examined five aspects of writing and analysis:

1. Clarity of Writing
2. Analysis of author's argument
3. Use of supporting information
4. Organization
5. Grammar and Syntax

The results are summarized in the following table:

Average	3.25	2.75	2.75	2.375	2.75	13.875
High-Range Achievers	4	3	4	3	4	18
Midrange Achievers	4	3	2	2	3	14
Lower-Range Achievers	2	2	2	1.5	2	9.5
ELL's	3	3	3	3	2	14

Table 1-Assignment 1 Assessment Summary

The results from this first assignment provided a good snapshot of where the students were in terms of the five points of measurement before the focused CT training. It called attention to the areas that needed improvement (Use of Supporting Information, Organization, Grammar and Syntax) and provided a strong point of reference in measuring the effect of the E&S' on the students' composition.

Focused Critical Thinking Training

Teaching *Why* to Think

Learning only begins when teachers challenge students with real questions that demand a solution (Moeller, 2005), and critical thinking is best observed when students see the value in it and are self-motivated (Dellet, et al.). Therefore, this study placed a high priority on helping students see *why* critical thinking is important to them, and quickly applying it to questions that are interesting and relevant to their lives (Bomer, 2000), rather than spending a lot of instructional time on uninteresting abstract concept learning.

On the first day of the research, the students were given a questionnaire that asked what they know about critical thinking (see Appendix A). Not surprisingly, most of the students believed they had a firm grasp of what critical thinking is, believing they had been taught it "since freshman year". This belief mirrored research done by Richard Paul, which showed that most students

believe that they've been trained how to think critically, though the reality is quite different (1993).

Also not surprising was that very few of the students had a coherent grasp of what CT is, and what it involves. Question 1 of the questionnaire ("What is critical thinking?") yielded respectable responses (e.g. "Not believing everything you hear", "Thinking things through", "Asking questions"), but the questions that asked the students to be more specific made plain their unfamiliarity with formal CT practices. For instance, out of the thirty-eight students, only nine (24%) were able to name a component (or "Element") of critical thinking (as defined by Paul). However, when asked "What Standards do you use when you evaluate someone's thinking?", thirty-four students (90%) were able to name at least two standards that roughly matched descriptions used by Paul in his "Standards of Reasoning". Popular answers were "logical", "true", and "enough information", which correspond to Paul's "logical", "accurate" and "broad" Standards, respectively.

Having gotten the students' brains working on *what* critical thinking is, the researcher asked "Why is it important to understand how to think critically?" Their answers were predictably unfocused and cliché— "To learn how to think", "To understand the world", "To appreciate life", "To get right answers". (One particularly Platonic-minded student answered, "To understand yourself".) Interestingly, not a single student personalized the importance of learning critical thinking skills—e.g. "So that *I* can learn how to think… So that *I* can understand

the world… So that I can know myself". This fact perhaps reflects the students' general lack of CT skills (Dellet, Et. Al, 1999 and Bomer, 2000).

Next, the class was given a series of questions to educe thoughtful responses. Some of those questions were:

Is murder right or wrong?
Is theft right or wrong?
Is child abuse right or wrong?

These questions were designed to elicit an obvious answer: "They're wrong!" But when the students answered this way, they were asked to explain *why* these actions are wrong. After a great deal of struggle and unsubstantiated assertions, the students found that though they generally fancied themselves to be trained critical thinkers, they had no reasons for why they held to certain moral principals. The cognitive dissonance set in, and they were then thrown aback when the researcher introduced arguments *in favor* of murder, theft and child abuse. Finding themselves intellectually baffled in 'easy-case' ethical questions, the students (who live in a neighborhood where murder, theft and abuse are commonplace) got a glimpse of the importance of critical thinking, and how it applies directly to their lives. Critical Thinking wasn't just an abstract thing they thought they had learned—it became real life.

The students were then encouraged to write their own questions for discussion on the board, some of them were:

Is the war in Iraq good or bad?
Is abortion right or wrong?
Is it OK to steal if you're hungry?
Should we give blood?
Are the Raiders the best football team?

After a brief instructor-led lecture about the importance of CT (which consolidated the ideas they had expressed a few minutes earlier and a promise that each and every one of their questions, even about he Raiders, could be answered through critical reasoning), the students seemed ready to learn how to think. In fact, one said, "OK, then let's get started!"—a teacher's dream!

Teaching *How* to Think

Having gotten the students' brains thinking about *what* critical thinking is, and gotten them to see its importance, the researcher moved to establish the correct ideas of what critical thinking is by introducing Richard Paul's E&S'. The researcher handed out a sheet that included a pie chart listing the Elements, and a listing of the Standards at the bottom. (This sheet would later become Appendix B).

Following research by Diane Painter, who argues that in teaching critical thinking it is "important to provide many opportunities for varied learners to make sense of ideas and information" in a context where challenge is moderate (2000), the E&S' weren't immediately defined for the students; rather, the students were put into their established groups and asked to develop their own understandings of the concepts on the page, based on their prior knowledge of the definitions of the words (Hedberg, 2002). The groups then shared their definitions in front of the class. These definitions were combined and shaped into accurate definitions that were compiled onto a single sheet and distributed the next meeting period (see Appendix B).

Teaching *to* Think

At the beginning of the next class meeting, each student was presented with a copy of the "Elements of Reasoning and Universal Intellectual Standards" (Appendix B). The sheets were hole-punched, and the students were told to keep them in their notebooks, which they were required to bring to class everyday. The students were advised that we would be using the E&S' on every assignment as a tool to keep focused on the practice of critical thinking.

In order to practice using these new CT tools, the class was engaged in a discussion. Towards promote the trait of intellectual autonomy (Bryan, 2000), students were encouraged to make suggestions about what topic the class should, and were then allowed to vote on the topics that were suggested. The topic the class chose was "abortion". The class was roughly split down the middle on whether or not the practice should be legal.

The classroom has four large dry erase boards, so the pro-choice students were sent to two board and the pro-life students were sent to the other two. Both groups were given ten minutes to write their reasons for holding their positions on their boards. At the end of the ten minutes, the two sides cross-examined one another using the E&S' to assess *why* the other side held the views they held (i.e. Purpose, Information, Point of View, etc.), and whether those reasons stood up to assessment (i.e. Logical? Accurate? Clear?). The students were then allowed to revise their boards before another cross-examination. The students found this exercise to be a lot of fun, taking great delight in their CT new tools that would allow them to assail their peers'

positions… The key, though, was to get the students to explicitly use the E&S' by name, and establish the expectation that they use them in all future exercises.

As guided and focused journaling has been shown to increase critical pedagogy and improve critical literacy practice (Ghahremani-Ghajar & Mirhosseini, 2005), "quickwrites" were used during this period as a daily warm-up exercise at the beginning of class meetings—much like a runner might warm-up by running a mile. These assignments got students thinking about questions that were relevant to the day. For instance, on the day that the May Day rallies were being held (May 1, 2006), the students were asked to explain what was going on. In doing so, they were required to use at least three Elements, and to assess those with at least two Standards.

After Focused Critical Thinking Training- the Assignments

Assignment 2: Language, Gender and Culture

After the initial introduction and training in Paul's E&S', the students were introduced to two essays under the unit heading "Language, Gender and Culture". The first essay, by Deborah Tannen, titled "His Politeness Is Her Powerlessness" (Tannen, 1990), the students read about the differences in cultural expectations between how women and men are supposed to speak, and how those differences enforce established power dynamics between the sexes. In reading this essay, the students went through the short nine paragraph text and answered the following questions:

1. What is Tannen's **Purpose**? Is her Purpose **Clear**?

2. What is Tannen's **Point of View**? Is her Point of View **Logical**?
3. What **Information** does Tannen use to support her view? Is her information **Accurate**? Is her information sufficiently **Broad**?

This exercise took one two-hour class session to complete.

Next, the students were given a much longer section of text—an excerpt from *The Woman Warrior: Memoirs of a Girlhood Among Ghosts* by Maxine Hong Kingston (Kingston, 1973). The students were given the same assignment as for the Tannen essay (see above), but due to the length of the reading, they were given two and-a-half class periods to complete the assignment.

The students had a much more labored go at answering the questions for this essay than the Tannen piece. The reason the students gave for the difficulty was not the length, but rather that they found the selection really quite boring. (The researcher could not disagree.) Be that as it may, the students were given their next in-class writing assignment:

> Considering both Tannen's and Kingston's texts, what sort of cultural expectations about how to speak and behave do American women face? Do you think women in your generation largely follow these cultural expectations, or are such expectations and practices changing? Explain.

In accordance with the established classroom practices, the students were given two hours to complete the assignment, which had to be done by hand.

Results of Assignment 2

The assignment was again assessed by the master teacher based on a 1-5 rubric that examined the same five aspects of writing and analysis as the first essay. The results are summarized in the following table:

	Clarity	Analysis	Support	Organization	Grammar	Totals
High-Range Achievers	4	3	4	3	4	18
Midrange Achievers	4	3	2	2	3	14
Lower-Range Achievers	3	3	3	3	2	14
ELL's	3	3	3	3	2	14
Average	3.5	3	3	2.75	2.75	15

Table 2-Assignment 2 Assessment Summary

Though the class-wide gains in Clarity, Analysis, Support, Organization and Grammar were modest (only 1.375, or roughly 10%), the results of the initial CT training were encouraging for one particular group— the Lower-Range Achievers who saw their average score go from 9.5 on the first essay to 14 on the second! In other words, the Lower-Range Achievers (whose attitudes about the Kingston essay were consistent with those the other students) emerged from 4.5 points behind their ELL and Midrange-Achieving classmates to equal these two groups in terms of overall achievement.

Although the success for the Lower-Range Achievers was encouraging, modifications needed to be made before the second assignment in order to obtain similar gains among the rest of the class.

Assignment 3: Value of Life 1

Research by Barbara Guthrie has shown that students give subtle hints about what they want to learn, and that taping a lesson and viewing it in retrospect can help a teacher decode these subtle, often missed messages (Guthrie, 2000). With this in mind, the researcher videotaped a classroom session in which the students and researcher talked about "controversial" topics that interest them. Because some students are too socially reserved to speak up during class, reviewing this tape allowed the researcher to pick up on some of these cues (e.g. quickly sitting upright, quick glances, etc.), and consider this non-verbal feedback when designing the options for the lesson that would lead into Assignment 3. The researcher's hope was to avoid the lack of interest the students exhibited in the second reading of the previous unit, believing that it was responsible for the modest gains among some of the groups.

To again encourage the trait of intellectual autonomy, the students were given four choices of what to study, based on the in-class discussion and review of the tape. The four choices were (see Appendix C):

1. Value of Life
2. Racial Profiling
3. Juvenile Justice
4. Bullying at School

The students were asked to rank these choices in order of preference—1 being the most interesting to 4, the least. By an overwhelming majority, the students chose topic one—Value of Life.

The texts for this unit were Hamlet's famous "To be or not to be" soliloquy (Act III, scene 1) and an excerpt from Lance Armstrong's biography "It's Not About the Bike" (Armstrong & Jenkins, 2000). For the Hamlet section, the students were again put into their groups and given the text to analyze. The groups were given the assignment of answering two main questions:

(a) *What* is the question? (based on the opening line "To be or not to be, that is the question"), and

(b) "What is Hamlet's view of the Value of Life?

Utilizing the E&S' as their analysis tool, every group was able to decipher the nearly 500-year old text.

Initially, the students were resistant to reading Shakespeare. Their prejudice said that his language is too difficult. But with a little encouragement, the students got about the task of analyzing the text, even if cautiously. They were told to use all eight Elements as their analysis tool to figure out what the argument of the passage was. After they figured out what Hamlet was saying, the groups then had to assess his argument (that life is nothing but pain and suffering) using the Standards. This assignment took one two hour period.

At the end of the lesson, the overwhelming majority of students had a firm handle on the soliloquy. One student, who was initially among the most vocal opponents of reading Shakespeare, was found after class explaining the

soliloquy to another student, who had missed the assignment because of a school activity and had come in during the last two minutes of class. The former critic acknowledged that once he *understood* Shakespeare, his attitude towards Shakespeare changed.

Next, the students were given an excerpt from Lance Armstrong's biography "It's Not About the Bike" (Armstrong & Jenkins, 2000). The four page text described Armstrong's fight against testicular cancer. Just as with the Shakespeare piece, the students were instructed to find out what Armstrong's view of the Value of Life is, using the Elements, and assess it using the Standards. This part of the assignment took one two hour period.

The following period, the class discussed the two texts, sharing ideas and debating the issues raised by them. They were then encouraged to develop an outline that could be used in writing their next in-class writing assignment. They were only told that the essay would be a compare/contrast essay, as the last one had been, and that they would be able to use that outline as a guide during the in-class assignment. Working together, they developed the outline represented by Appendix D.

For their assessment, the students were given a copy of the outline they had developed, and the writing prompt represented by Appendix E. In short, they were to compare and contrast Hamlet and Armstrong's views of the 'Value of Life' (with reference to the Elements), and assess them using three of the Standards.

In accordance with the established classroom practices, the students were given two hours to complete the writing assignment, which had to be done by hand. The results were so impressive that the researcher increased the point value of the essay from 50 to 75 as a reward for a job well done.

Results of Assignment 3

As were the previous two assignments, this third assignment was assessed by the master teacher based on a 1-5 rubric that examined the five aspects of writing and analysis in which this study is interested. The results are summarized in the following table:

	Clarity	Analysis	Support	Organization	Grammar	Totals
High-Range Achievers	4	4	4	4	4	20
Midrange Achievers	4	3	3	3	3	16
Lower-Range Achievers	3	4	3	4	3	17
ELL's	3	4	4	4	2	17
Average	3.5	3.75	3.5	3.75	3	17.5

Table 3- Assignment 3 Assessment Summary

First, it's worth pointing out that nearly all of the students improved from assignments two to three, and not one student's performance in any of the five measured areas declined. Though many remained static, the general gains seen in assessment three were remarkable.

The class-wide growth in the five key areas between the second and third assignments was obviously encouraging. Although Clarity remained static at 3.5, and Grammar showed only minor gains (from 2.75 to 3), Analysis improved from 3.0 to 3.75, Support grew from 3.0 to 3.5, and Organization jumped from 2.75 to 3.75. Especially encouraging was that every group improved at least two points overall.

Assignment 4: Value of Life 2

The fourth and final assignment covered by this research project also brought the 'Value of Life' unit to a close. Using all of what they'd learned in terms of critical analysis, the class would now apply their thinking to one of the most controversial issues of the past decade: the Terri Schiavo case.

The researcher designed this entire section of the unit from scratch, selecting all texts and teaching materials. The texts used for this section were "Terri Schiavo: Can Terri Die In Peace?" by Faye Girsh of the World Right to Die Societies (Girsh, 2005), and excerpts from "End of Life Ethics: A Primer" by Melinda Penner of Stand to Reason (Penner, 2005). The texts represented pro-death and anti-death positions, respectively.

The first day of the section was a short day, so the class was given a short introduction to the Terri Schiavo case. To begin, the students were put into their groups, and after a brief lecture by the researcher/instructor, they were given excerpts of the Wikipedia biography on Terri Schiavo. They were then encouraged to send one group representative to use one of the eight classroom

computers to do an internet search on the case to gather information, which they then took back to their groups. This exhausted the class period.

The next class period was a full two hour block. The students were again assembled into their groups, after which the class was engaged in a discussion using the "KWL" strategy to uncover student knowledge and desired knowledge. After approximately fifteen minutes, the students were given the Faye Girsh piece. They were given very little direction from the researcher on how to approach the article. They were simply told, "OK, get to work on the article… use your Elements and Standards". The students used most of two-hour period (about ninety minutes) dissecting the article to uncover the author's Purpose, Point of View, etc.

The following class meeting, the students were again grouped together, and after a twenty minute discussion about the case and Girsh piece, they were given the Penner piece with the same instruction as with the prior ("OK, get to work on the article… use your Elements and Standards"). The students used the entire period to complete the task.

Following the strategy from Assignment 3, the students were given a modified but essentially identical outline to the one they used on the Hamlet/Armstrong assignment. The results were similarly encouraging.

Results of Assignment 4

As has been the procedure, this fourth and final assignment was assessed by the master teacher based on a 1-5 rubric that examined the five aspects of writing and analysis in which this study has been interested. The results are summarized in the following table:

	Clarity	Analysis	Support	Organization	Grammar	Totals
High-Range Achievers	4	5	5	5	4	23
Midrange Achievers	4	4	4	4	4	20
Lower-Range Achievers	4	4	4	4	3	20
ELL's	3	4	5	5	3	20
Average	3.75	4.25	4.5	4.5	3.5	20.75

Table 4- Assignment 4 Assessment Summary

Once again, the class as a whole, and as individuals, exhibited encouraging gains, posting improvements in all areas of the rubric assessment for the first time since the research began. The students improved in Clarity (+.25), Analysis (+.5), Support (+1.0), Organization (+.75), *and* Grammar (+.5).

Summary of Results

The effect of focused critical thinking instruction based on Richard Paul's Elements and Standards of Reasoning, when measured by a five-point rubric, is summarized as follows.

	Clarity	Analysis	Support	Organization	Grammar	Totals
High-Range Achievers	0	2	1	2	0	5
Midrange Achievers	0	1	2	2	1	6
Lower-Range Achievers	2	2	2	2.5	1	9.5
ELL's	0	1	2	2	1	6
Average	.25	1.25	1.75	2.125	.75	6.625

Table 5- Summary of Result

Answering the Research Questions

The demonstrable value of incorporating Richard Paul's E&S's in regular level twelfth grade secondary Language Arts education is in the gains students made in terms of clarity of writing, level of analysis, use of supporting information, organization of ideas, and accuracy of grammar and syntax illustrated above (Table 5).

As the research results indicated, measurable improvements were made the very next assignment after introducing the E&S's.

The improvement in student composition skills is dynamic, with most groups improving throughout the research, never topping out. Having said that, there no doubt would be a plateau, but it would be an interesting extension of this study to find that level.

Finally, the gains were made without regard to prior level of achievement or language learner status. In short, there's no measurable difference in effect contingent upon student skill levels, except to say that the further behind a student was when the research began, the more room for improvement she had.

Suggestions for Future Work

Suggested Changes to the Research Method

The researcher would have liked to have been able to expand the study to include more classes than just one. If it could be done over, he would have approached several teachers about the research in hopes of finding a least two others with whom to work and cross reference in order to rule out teacher influence (e.g. teaching styles) as a possible variable.

Suggestion for Future Work.

Following and expanding the example set by Pullen (1992), one suggestion is to institute a concentrated school- or district-wide program emphasizing cross content critical thinking curriculum, from ninth through twelfth grades, and measure the effect such a program has on standardized test scores,

college placement tests, and first year college GPA's. Obviously, such a study would require a few years to complete, but the results could be very worth the effort.

References

Armstrong, L., & Jenkins, S. (2000*). It's Not About the Bike: My Journey Back to Life*, 1-5. Berkeley: Berkeley Trade.

Bennion, J., & Olsen, B. (2002). *Wilderness writing: Using personal narrative to enhance outdoor experience*. Journal of Experiential Education, 25(1), 239-246.

Bomer, R. (2000). Writing to Think Critically: The Seeds of Social Action. *Voices from the Middle*, *6(4)*, 2-8.

Bryan, S. (2000). *The Colonial Times: A Learning Environment for the 21st Century*. Retrieved April 29, 2006, from http://www.vste.org/communication/journal/attach/vj_1602/vj_1602_02.pdf

Chamot, A. U., & O'Malley, J.M. (1994). *Language learner and learning strategies*. In N. C. Ellis (Ed.), Implicit and explicit learning of languages (pp. 371- 392). London: Academic.

Daly, W. T. (1995). Beyond Critical Thinking: Teaching the Thinking Skills Necessary to Academic and Professional Success. The Freshman Year Experience. Monograph Series Number 17 (ERIC Document Reproduction Service No. ED390338).

Dash, J. (2000). *Survey: Skills Shortage Spurs Outsourcing. Computerworld*. Retrieved April 25, 2006, from http://www.computerworld.com/news/2000/story/0,11280,44235,00.html

Dellet, K., Fromm, G., Karn, S., & Cricchi, A. (1999). *Developing Metacognitive Behavior in third and fourth grade students*. Retrieved May 9, 2006 from http://gse.gmu.edu/research/tr/articles/Clearview/Final%20Report.html

Durr, C.R., Lahart, T.E., & Maas, R.M. (1999). Improving Critical Thinking Skills in Secondary Math and Social Studies Classes (Masters Action Research Project, Saint Xavier University and IRI/Skylight, 1999. ERIC Document Reproduction Service No. ED434016).

Dyment, J.E., & O'Connell, T.S. (2003). Journal Writing in Experiential Education: Possibilities, Problems, and Recommendations. ERIC Document Reproduction Service No. ED 479 358.

Ghahremani-Ghajar, S., & Mirhosseini, S.A. (2005). English Class or Speaking about Everything Class? Dialogue Journal Writing as a Critical EFL Literacy Practice in an Iranian High School. *Language, Culture and Curriculum*, *18(3)*, 286-299.

Girsh, F. (2005). *Terri Schiavo: Can She Die In Peace?* Retrieved April 31, 2006, from http://www.worldrtd.net/news/world/?id=725

Guthrie, B. (2000). Thinking about Students' Thinking. Practitioner Research Briefs, 1999-2000 Report Series. Virginia Adult Education Research Network Practitioner Research Briefs 1999-2000 Report Series, 1-2.

Hall, V., & Wessel, J. (1989). *As today's work world changes, so do the skills employers seek*. The Atlanta Journal/The Atlanta Constitution, 53S.

Hedberg, K. (2002). *Using SQ3R Method with Fourth Grade ESOL Students*. Retrieved May 5, 2006, from http://gse.gmu.edu/research/tr/articles/SQ3R%20Method/SQ3R.htm

hooks, b. (2000). Justice: Childhood Love Lessons. In *All About Love: New Visions* (16-30). New Yok: William and Morrow Company, Inc..

Kingston, M.H. (1989). A Song for a Barbarian Reed Pipe. In *The Woman Warrior: Memoirs of a Girlhood Among Ghosts* (163-180). New York: Random House.

Moeller, V. (2005). *Socrates Does Shakespeare: Seminars and Film*. Lanham, MD: Scarecrow Press.

NCES (National Center for Educational Statistics). (2005). *Schools and Staffing Survey*. NCES No. NCES 2006005. Retrieved May 1, 2006, from http://nces.ed.gov/surveys/sass/

Painter, Diane D. (2000). *The ThinkQuest Challenge: A study of a constructivist learning environment through an after-school computer club*. Retrieved May 2, 2006, from http://www.fcps.k12.va.us/DeerParkES/TR/ThinkQuest.htm

Paul, R. (1993). *Why Students and Teachers Don't Reason Well*. Retrieved April 15, 2006, from http://www.criticalthinking.org/resources/articles/why-students-teachers-dont-reason.shtml

Paul, R. (1995). *Critical Thinking: How to Prepare Students for a Rapidly Changing World*. Santa Rosa: Foundation for Critical Thinking.

Paul, R. (2004). *Our Concept of Critical Thinking*. Retrieved April 4, 2006, from http://criticalthinking.org/aboutCT/ourConceptCT.shtml

Paul, R. & Elder, L. (April 1997). *The Elements and Standards of Reasoning: Helping Students Assess Their* Thinking. Foundation For Critical Thinking. Retrieved March 31, 2006, from http://www.criticalthinking.org/resources/articles/content-thinking.shtml

Paul, R., Elder, L., & Bartell, T. (1997). *A Brief History of the Idea of Critical Thinking. Excerpt from the California Teacher Preparation for Instruction in Critical Thinking: Research Findings and Policy Recommendations California Commission on Teacher Credentialing, Sacramento California*. Foundation for Critical Thinking. Retrieved April 23, 2006, from http://www.criticalthinking.org/about/centerforCT.shtml#top

Penner, M. (2005). *End of Life Ethics: A Primer*. Retrieved April 31, 2006, from http://www.str.org/site/News2?page=NewsArticle&id=5223

Pullen, A. (1992). Improving Critical Thinking Skills of English Students at Marlboro High School through Literature and Composition Instruction (Doctoral dissertation, Nova University 1992).

Sumner, W. G. (1940). Folkways: A Study of the Sociological Importance of Usages, Manners, Customs, Mores, and Morals. New York: Ginn and Co., 632, 633.

Tannen, D. (1990). Damned If You Do. In *You Just Don't Understand: Women and Men in Conversation* (202-205). New York: Ballatine Books.

U.S. Department of Education, National Center for Education Statistics. (2004). *International Outcomes of Learning in Mathematics Literacy and Problem Solving: PISA 2003 Results From the U.S. Perspective* (NCES 2005-003). Washington, DC: U.S. Government Printing Office.

Warburton, E, & Torff, B. (2005). The Effect of Perceived Learner Advantages on Teachers' Beliefs about Critical-Thinking Activities. *Journal of Teacher Education, 56(1)*, 24-33.

Appendices

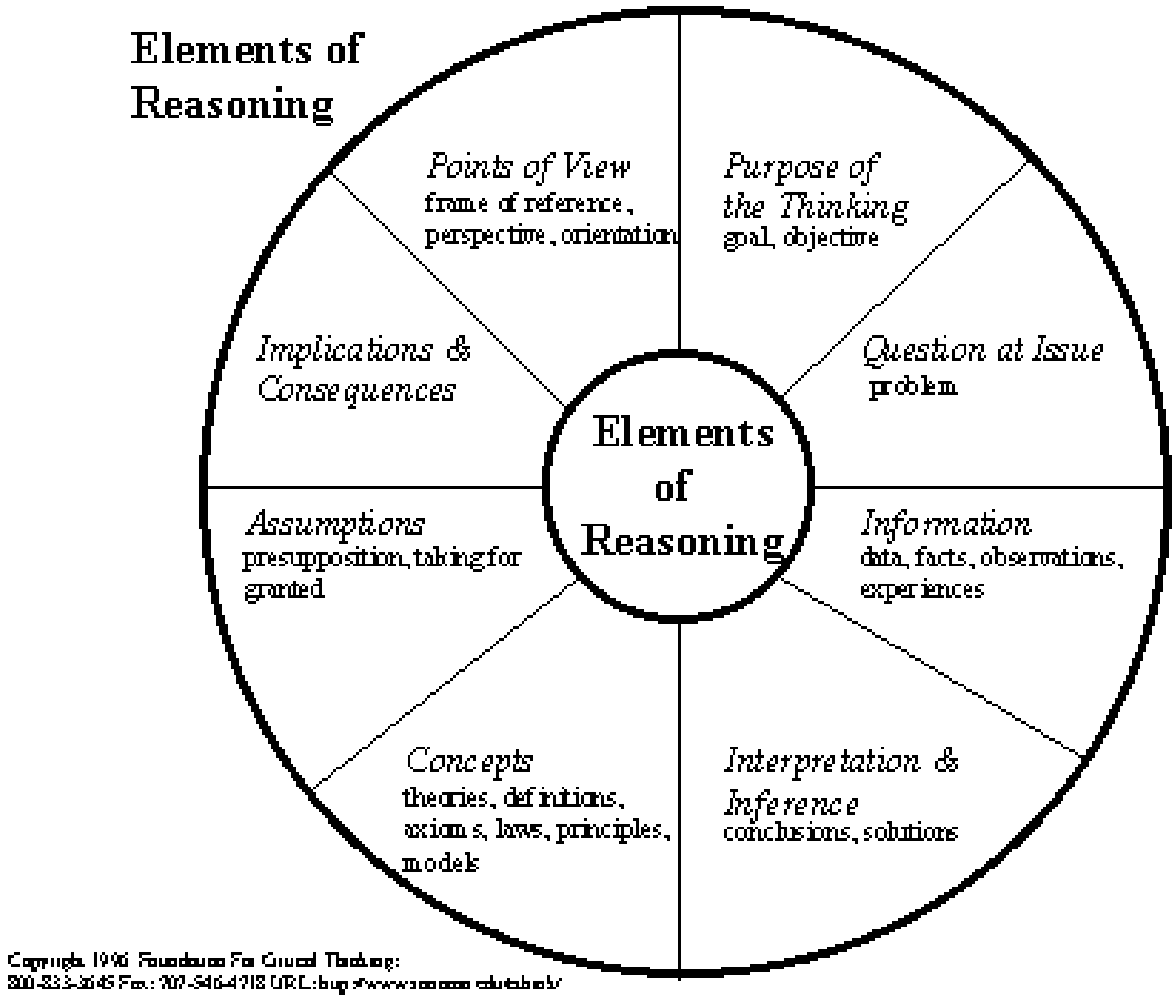
Appendix A: Critical Thinking Interview Profile

Critical Thinking Interview Profile

Thank you for agreeing to this interview. The purpose is to look into your development as a student and thinker. More particularly, the purpose is to determine the extent to which the tools and language of critical thinking have come to play an important part in the way you go about learning, in school and in everyday life.

- What is critical thinking?
- Are there any components of critical thinking?
- If so, what are they?
- If you were asked to analyze thinking, how would you do so?
- What standards do you use when you evaluate someone's thinking?
- What is your favorite subject and how does critical thinking apply to it?
- How does critical thinking apply to the study of science?
- How does critical thinking apply to the study of mathematics?
- How does critical thinking apply to the study of literature?
- Could you give me some examples of your use of critical thinking in your life?
- To what extent have your teachers encouraged you to think critically? Explain.

Appendix B: Elements and Standards of Reasoning



Universal Intellectual Standards

…which are applied to the **Elements of Reasoning** (above)

Is the statement **CLEAR**?

Is the statement **ACCURATE**?

Is the statement **PRECISE**?

Is the statement **RELEVANT**?

Does the statement have **DEPTH**, or is it superficial?

Does the statement have **BREADTH**, or is it too narrow?

Is the statement **LOGICAL**, or are there contradictions in it?

Appendix C: Choices for Assignment 3

English 12

Rank the following topics from what *most* interests you (1) to what *least* interests you (4).

Value of Life _____

What does it mean to 'be alive'? Is human life valuable? Is it more valuable than animal life? Than plant life? Or not? What you think about the value of human life will have a lot to do with how you view and treat people.

What's your view? Why?

Racial Profiling _____

Have the police ever stopped *you* because of the way you looked?

Until recently, law enforcement officers were openly allowed to use race as one consideration in determining whether or not they should stop and question someone about a crime or potential crime. With the recent attention on global terrorism, 'racial profiling' is a hot issue!

Should police use race as a factor in criminal profiling? Why or why not?

Juvenile Justice _____

At what age does someone become an adult? Moreover, at what age should someone be tried as an adult by the criminal justice system? Should a 15 year old murderer be given the same punishment as a 45 year old? Should a 16 year old thief be treated the same as someone who's 36? Why or why not?

Bullying At School _____

What is 'bullying'? Is bullying only physical, or can it be verbal and psychological? What impact does bullying have on people, and who (if anybody) is responsible for controlling it?

What do you think? Why?

Appendix D: Sample Outline 1

Value of Life English 12
Hamlet vs. Armstrong Hall/Scanlan

Recommended Outline:

I. Introduction: Explain Hamlet's view vs. Armstrong's view

A. Hamlet's view is:

B. Armstrong's view is:

II. Hamlet's view of the value of life is:

A.

B.

C.

D.

III. Armstrong's view of the value of life is:

A.

B.

C.

D.

IV. Assess both views

A. Hamlet's view:

1. Accurate? Why/Why not?
2. Logical? Why/Why not?
3. Have sufficient Depth? Why/Why not?

B. Armstrong's view:

1. Accurate? Why/Why not?
2. Logical? Why/Why not?
3. Have sufficient Depth? Why/Why not?

V. Conclusion—summarize your argument

Appendix E: Sample In-Class Essay Prompt 1

Value of Life English 12
Hamlet vs. Armstrong Hall/Scanlan

Writing prompt:

> In a well-organized and detailed essay, **compare** and **contrast** Hamlet's view of life with Lance Armstrong's view of life. Use specific references from the texts.
>
> Finally, using the Universal Standards of Reasoning, **assess** both views—are they *accurate*, *logical* and have sufficient *depth*?

Appendix F: Sample In-Class Essay Prompt 2

Value of Life English 12
Should Terri Schiavo Live or Die? Hall/Scanlan
Melinda Penner *vs*. Faye Girsh

Recommended Outline:

I. Introduction: Explain Girsh's view vs. Penner's view

A. Girsh's view

B. Penner's view

II. Girsh's view on the question of Terri Schiavo is:

A.

B.

C.

D.

III. Penner's view on the question of Terri Schiavo is:

A.

B.

C.

D.

IV. Assess both views

A. Girsh's view:

1. Accurate? Why/Why not?
2. Logical? Why/Why not?
3. Have sufficient Depth? Why/Why not?

B. Penner's view:

1. Accurate? Why/Why not?
2. Logical? Why/Why not?
3. Have sufficient Depth? Why/Why not?

V. Conclusion—summarize your argument

Appendix G: Sample In-Class Essay Prompt 2

Value of Life English 12
Hamlet vs. Armstrong Hall/Scanlan

Writing prompt:

In a well-organized and detailed essay, **compare** and **contrast** Faye Girshs's view of the Terri Schiavo situation with Melinda Penner's. Use specific references from the texts.

Based on the previous readings, how do you think Hamlet and Lance Armstrong would view Terri's situation? What would they advise?

Finally, using the Universal Standards of Reasoning, **assess** both views—are they *accurate*, *logical* and have sufficient *depth*?