

Teaching Critical Thinking Skills to
Fourth Grade Students Identified as Gifted and Talented

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Abstract

In this action research study, gifted elementary students benefited from the involvement in critical thinking activities. The gifted education community has frequently discussed the development of our learners' thinking skills. As an educator of elementary gifted students, I have often been frustrated with the lack of depth I find in my students' thinking, as well as the lack of challenge they experience in their regular classrooms. My goal for this action research study was to move a group of fourth grade students identified as gifted and talented from being naïve and self absorbed about their thinking to taking ownership of their thoughts. The primary materials used for this study were from *The Miniature Guide to Critical Thinking for Children* (Elder, 2002). The study focused on a combination of affective and cognitive skills, and applied the intellectual standards of clarity, accuracy, relevance, logic, and fairmindedness to students' thinking. Activities that did not use the above materials are not mentioned in this modified text.

The characters of Selfish Sam, Naïve Nancy, and Fairminded Fran (Elder, 2002) allowed learners to become aware of and understand both positive and negative thinking behaviors in themselves and others. All students commented about personal application of the standards. In addition to understanding each standard, students saw the interrelatedness of the standards. Pre- and post-surveys showed an increased understanding and personal application of the standards.

More work must be done to help all teachers understand and teach critical thinking skills to their learners. Teachers of gifted students need to create classrooms

where critical thought is taught, practiced, and expected. The findings of this study would also suggest elementary classroom teachers, as a whole, are not comfortable with teaching and recognizing the intellectual standards of critical thought. Only when the language and practice of critical thinking are incorporated into daily use, will it become internalized by our young thinkers.

Since the completion of this action research study, I have continued to use the language of critical thinking in my classroom. I am more aware of the standards and work to incorporate them into my lesson planning. This unit of study will become the initial unit for my fourth grade gifted learners each year and will be incorporated into my fourth and fifth grade lessons.

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Introduction

Purpose of the Study

As a teacher of elementary gifted and talented students, I am often frustrated with the lack of depth in my students' responses and work. Certainly their work shows understanding of main concepts and often earns excellent grades and praise, yet I believe these learners have more to share. I have wondered if there is a way to improve the quality of their thinking.

An interview with Richard Paul in the Fall 2005 issue of *Compass Points*, a journal from the National Association for Gifted Children, intrigued me to learn more about critical thinking skills. My observations tell me primary grade students are excited to learn why and how things happen. As they reach 4th and 5th grades, this seems to erode. Now they are more interested in what they need to learn to get through the assignment or test. According to Paul,

Because of their brightness and the fact that they often are praised for what they say and do, they often become flashy rather than deep. They often become smooth and polished rather than disciplined and deep. They often develop quickness over depth, fluency over richness. To enhance critical thinking, students must move from a passive to an active state. As students get better at critical thinking, they become clearer, more precise, more relevant, deeper, broader, more logical, and more fair (2005, p.5).

The purpose of this study was to work intensively with a group of 4th grade gifted and talented students to evaluate if critical thinking skills could indeed be taught. I wanted to start with the most basic of critical thinking concepts and move

students from being naïve about their thinking, and from being self absorbed to taking ownership of their thoughts. According to Paul (1989) to learn to think critically is a combination of both affective and cognitive skills. He contends there are 35 dimensions of critical thought and groups them into affective strategies and cognitive dimensions.

In this study I focused on the affective skill of thinking independently while applying the intellectual standards of clarity, accuracy, relevance, logic, and fair-mindedness. Swartz and Parks (1994, p.9) see three approaches to teaching thinking. They are: “a) teaching of thinking, direct instruction in thinking in non curricular contexts; b) teaching for thinking, use of methods which promote thinking in curricular contexts; and c) infusion, restructuring content lessons for direct instruction in thinking.” To facilitate the study, I used a teaching of thinking approach using *The Miniature Guide to Critical Thinking for Children* developed by Linda Elder (2001). The guide claimed students would enthusiastically participate in the activities presented and would naturally be drawn toward the intellectual stimulation. Through this children were introduced to the most basic concepts in critical thinking: The language of critical thinking was simplified for them. Questioning techniques were a key piece of this learning as, “thinking is question driven” (Elder, 2002, p.4).

Definition of Terms

What is critical thinking? When reading through the literature, one can find as many definitions of critical thinking as there are authors. They all reflect thinking as a skill or art. Since critical thinking is a complex concept, each individual brings their own perspective to it. According to Paul and Elder (2005): “Critical thinking is a

process by which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them (p.1). William Huitt (1998, p.1) defines critical thinking as, “The disciplined mental activity of evaluating arguments or propositions and making judgments that can guide the development of beliefs and taking action.”

Who are the gifted and talented? As stated in House Report 107-334, which accompanies HR1, the No Child Left Behind Act (2001):

The term gifted and talented, when used with respect to students, children, or youth, means students, children, or youth who give evidence of high achievement capability in areas such as intellectual, creative, artistic, or leadership capacity, or in specific academic fields, and who need services or activities not ordinarily provided by the school in order to fully develop those capabilities. (p.544)

For the purposes of this study, the gifted and talented were those who have been identified into the Linn-Mar Community Schools Learning Enrichment Opportunities (LEO) program through the use of an out of level Cognitive Abilities Test or through the Iowa Tests of Basic Skills.

Context of the Study

I conducted this action research project with my 4th grade LEO students at Linn-Mar Bowman Woods Elementary School in Cedar Rapids, Iowa. These learners were between the ages of 9 and 10. All have been identified as gifted and talented by the district. There were 19 fourth grade students in two sections. From this pool of 19 students, 10 were randomly selected for the project. Learners came to the LEO room

for one hour and fifty minutes once a week. Both sections were taught in the afternoon.

The majority of students were middle to upper middle class economically. Ten percent of the school's population is designated as qualifying for free and reduced lunch. Eighty-four percent of Bowman Woods' population is Caucasian, while eighty percent of the students in the study were Caucasian. One student is identified as English Language Learner.

Review of Related Literature

Because I am trying to validate that critical thinking skills are essential for all learners in the gifted and talented classroom, my literature review focuses on three main areas. First, I will discuss why critical thinking skills are needed for all learners with an emphasis on the gifted and talented population. Second, since the topic of critical thinking is too large to completely cover within the confines of this study, I will describe the selected areas on which I will focus. Lastly, I will show how both "teaching of thinking" and "teaching for thinking" are necessary.

The need to teach thinking skills is not a new concept. No Child Left Behind, I feel, has put too much focus on basic facts and ignored the higher order skills our learners need to be successful in the world. Proponents of teaching thinking skills assume that, "too much classroom learning is concerned with traditional academic knowledge and routine skills" (Davis, Rimm, 1989). These skills can be underemphasized as the need to prepare for state assessments takes center stage. Looking as far back as 1967, Raths, Jonas, Rothstein, and Wassermann (1967) shared their frustration with the lack of emphasis on thinking in the schools. They said that,

“ . . . memorization, drill, homework, the three Rs and the quiet classroom” were rewarded, while “ . . . inquiry, reflection, and the consideration of alternatives were frowned upon” (Carr, 1990). Carr continues to share that to teach critical thinking skills outside of content leads to a fragmentation of those skills. They cannot be divorced from content; rather thinking is a way of learning content (Raths and others, 1976). Carr believes that to become effective tools for attacking real issues, these skills must be taught with content integration. (1990). Kiser (2001) reflects that some researchers (eg. Perkins, 1989; Sternberg, 1984; Feuerstein, 1980) believe that thinking skills can be improved. Other researchers have endorsed using stand-alone thinking skills programs (e.g., Feuerstein’s, 1980, Instrumental Enrichment Program or de Bono’s 1983, CoRT Thinking Program). Others (Perkins, Jay and Tishman, 1993) suggest teachers could create a “culture of thinking” by modeling and lifting up higher order thinking and expecting learners to practice higher order thought and the language of thinking.

Adding to the complexity of this topic, other researchers (e.g., Lippman, 1991; Perkins, 1992) believe in a systems approach to thinking skills instruction. They suggest the need to infuse thinking skills instruction into all subjects at all grade levels. An example of this, Kassem (2001) tells of Beyer’s (1997) comprehensive, school-wide model with four component steps. These steps are: “a) provide thoughtful classrooms; b) make thinking visible and explicit; c) guide and support student thinking; and d) integrate instruction on thinking into subject-matter learning” (p.1).

The research is clear that higher order thinking skills are important for all learners. Elder (2002) says it would be a mistake to teach critical thinking skills to just

those students considered more advanced than the typical learner. It would be a mistake to underestimate the capability of students who need to struggle more than others to learn ideas and concepts. The research is also clear that that these skills are essential for gifted learners. Davis and Rimm (1989) point out that a different emphasis on teaching Bloom's taxonomic levels should be in place for teaching gifted students. The instructional focus for most students might be on knowledge and comprehension. Gifted students, on the other hand, grasp information and relationships with greater ease, and thus should be investing more time and effort into the higher-level activities of application, analysis, synthesis, and evaluation. Rogers (2001, p.283) points out that "gifted students tend to use higher order thinking more frequently and appropriately even without direct training, yet they tend to benefit significantly more from such skills training when it is offered." Another concern Rogers offers is the need to teach gifted student to "cite their proof and support their arguments" (p.283). James and Shelagh Gallaher (1994) say that using advanced language skills, gifted learners often camouflage what they don't understand correctly or well. They may not learn to give reasons to support their arguments (Rogers, 2001).

The time constraints of this project prevented me from embarking upon a comprehensive approach to teaching thinking skills. Paul (1989) sees thinking independently, or autonomous thinking, as the first of the affective strategies. This is thinking for oneself. My intention was to start here. According to Swartz and Parks (1994), knowledgeable thinkers are better able to take charge of their lives and achieve personal advancement and fulfillment. For them to do this, independent thinking is

foremost if they are to be able to judge information and situations critically for everyday problem solving and decision making. Everyday we all make many decisions using a variety of types of thinking. Students may compare and contrast friends, predict how much longer they will stand in the lunch line, or question why a certain assignment was given. They do not have to be taught this. When the decisions are bigger, such as buying an automobile, a quick and uninformed decision may lead to future disappointments and expense. Individuals must learn to think for themselves in both the small and large decisions of life.

In looking at the distinctions between uncritical thinking and critical thinking, we must also consider the differences between selfish and fair-minded critical thinking. Paul, Binker, Jensen and Kreklau (1990) feel critical thinking values must go hand in hand with the critical thinking skills. Learners, as a result of the way we nurture their learning, are forming intellectual and moral standards. Paul, et al, contend there are three kinds of thinkers: uncritical persons, who are generally naïve and don't care about their thinking; selfish critical persons, who are generally good at thinking, but not fair to others; and fair-minded critical persons who are good at thinking and fair to others. To be the fair-minded critical thinker, one must use intellectual standards to think well. My focus in this study was on the main intellectual standards of clarity, accuracy, relevance, logic, and fairness. To teach these standards, it was helpful to use stories and dramatized characters. Elder (2001) has developed a handy guide to doing this.

One of the best ways to approach teaching the parts of thinking is to foster questions (Elder, 2002). Nancy Johnson says there are many different kinds of

questions and that each is important. Balance needs to be achieved between the basic knowledge level, right/wrong answer questions and the divergent questions. She sees the most flexible and practical teaching technique as questioning. “Teachers who are good questioners motivate their students, stimulate high level thinking, encourage creativity, and enhance self concept in their students and themselves” (1990 p.4). By modeling this technique, students will better be able to make the transfer themselves. Elder’s guide (2001) also shares with learners the questions they should be asking themselves as they think fair-mindedly. Thus, they move from teaching of thinking to teaching for thinking

My review of the literature supports the idea that all children, and especially gifted children, need to learn the skills for critical thinking. These children tend to benefit greatly from teaching the skills in implicit and explicit manners. The definition of critical thinking is varied and wide, as are the recommendations for how to teach and practice these skills. I have explained the importance of independent thought and the use of intellectual standards as they relate to all of critical thinking. Lastly, I have shown how using questioning techniques will guide the teaching of these skills as well as direct the thinking in real life application.

Statement of the Focus of the Study

I believe using critical thinking skills is an important life skill for the gifted and talented learner. Too often these students do not stretch themselves, rather they use their advanced vocabularies to camouflage what they don’t understand. They need to be able to cite reasons to support their thinking. Understanding and developing

intellectual standards is a moral quality I want my students to exhibit. I do not want them to be selfish in their thought.

Following are the research questions I pursued:

1. Will my students transfer the skill of independent thinking taught explicitly to other situations?
2. Will the understanding of intellectual standards be applied to my students' thinking both in and out of the classroom?

There were some limitations to my study. First, I only saw my students once a week for approximately two hours, and this study lasted seven weeks. Reinforcing the language of critical thought was difficult and application of the skill was limited. Even more difficult was assessing this skill. It is an abstract concept and is judged differently by different people. Surveys to teachers were likely colored by their own definition or idea of what critical thought is. Another factor to consider was that since gifted students typically evidence some skill in critical thinking, it is difficult to show growth in some students.

I believe this research was valuable because in the light of No Child Left Behind legislation, these students may not have had as many opportunities to develop higher order thinking skills. As school districts focus on basic skills, I fear these gifted learners will be the ones left behind. These same students are often praised for what I consider mediocre thought. This can lead to underachievement. I wanted them to know they could become the independent thinker that is also fair-minded.

Summary of the Introduction

In summary, I believe it is my job as a teacher of gifted and talented to help students become critical thinkers. I wanted to help them discover how to be an independent thinker that is also fair-minded. The research indicates this is possible and necessary for all learners, as well as the gifted and talented learner. My study was to work with a group of 4th grade gifted and talented students to determine if critical thinking skills could be explicitly taught. Critical thinking is a broad and abstract concept. It is best taught to elementary students through the use of questioning, stories, and dramatization. The questions on which I hoped to gain insight were if the skill of independent thinking could be taught explicitly and transferred to other situations, and if understanding of intellectual standards was applied to my students' thinking both in and out of the classroom.

Methodology

The purpose of this study was to explicitly teach critical thinking skills to a group of fourth grade gifted and talented learners. It has been my experience that these students lack depth in their thinking and work. They often provide correct but shallow responses in their work, while their aptitude would suggest a greater capacity. As critical thinking is a very broad topic, I started with the most basic critical thinking concepts, and attempted to move students from being naïve about their thinking, and from being self absorbed to taking ownership of their thoughts. The focus of my study was on the main intellectual standards of clarity, accuracy, relevance, logic, and fairness.

Design

This observational research study attempted to show if critical thinking skills could be explicitly taught. In other words, could students transfer “thinking of thinking” into “thinking for thinking”? The study took place over a seven-week period at Bowman Woods Elementary School in the fall of 2006.

The primary program I used was, *The Miniature Guide to Critical Thinking for Children* by Elder (2001). My goal was to have students thinking about their thinking, as well as applying the intellectual standards of clarity, accuracy, relevance, logic, and fairness. The activities I used involved questioning techniques, drama, literature, and writing.

The baseline for this study was a student survey on understanding of terms that were used in the study, as well as a self-assessment of thinking skills. I also had classroom teachers complete an observation inventory about these learners, which

focused on the desired behaviors. Student writings and journals, as well a personal journal, completed my data collection.

Some of the “real world” constraints to this study were the limited time I had with these students. Because I only saw these students once a week for approximately 2 hours, reinforcing the language and application of these skills was difficult. Assessing the skill of critical thinking was difficult as well, as it is cannot be quantitatively measured. Each teacher brought his or her own definition of critical thought. As my classroom is a small space, it was sometimes difficult to effectively dramatize scenarios, as well as conduct small group discussions.

Subjects

The subjects for this study were selected from 21 fourth grade students identified as gifted and talented at Bowman Woods Elementary School in Cedar Rapids, Iowa. Not all of the 21 students participated in this unit of study. Students were presented all the unit options for the year and then chose from that menu. Those who participated in this unit had an interest in the topic. All learners do not take all of the units I teach.

These students were between the ages of nine and ten. They were split into two classes of eight to ten students meeting once a week in the afternoon for one hour and fifty minutes. A child’s homeroom placement determined which day they came to the LEO room. From each class, I randomly chose five students as the subjects of the study. One child was not in the random drawing, as she is mute and speaks through an interpreter. All participants were given different names to protect their identities within this paper.

The majority of these students are middle to upper middle class socio-economically. Eight-four percent of Bowman Woods' population is Caucasian, while 83% of the potential students in the study are Caucasian. The percentage of Bowman Woods students participating in the federal lunch program is 9.6%.

According to Iowa Tests of Basic Skills records for tests administered in October 2005, of the ten students in the study, nine had an Iowa Core Total (ICT) of 93% or better. Six students had an ICT of 99%. One student, who moved into our district late in the 2005-2006 school year, did not have an ICT score. That same student is an English Language Learner.

Instrumentation

There were four instruments used during the study to collect the data. The instruments included a teacher journal, student surveys, student journals, and a teacher observation inventory. Both the classroom teachers and I completed the teacher inventory. I constructed all of these instruments.

The first instrument I used was a pre-survey to determine student understanding and application of the intellectual standards I introduced (Appendix A). This survey provided a baseline regarding application and understanding of the critical thinking standards I presented. In the seventh week of the treatment, students again completed the survey. I compared responses to determine if there were any differences in behaviors and/or a greater understanding of the intellectual standards that were introduced.

The teacher journal served as a valid instrument, because it recorded my observations of the students' behaviors and attitudes toward the critical thinking

process. Recording my observations showed reactions and responses to the treatment. I wrote in it each day that students were in my classroom.

Student journaling was essential to my study as it revealed a student perspective on the treatment. A series of prompts was given to guide journal entries. Student journal entries also included responses to the prescribed activities in *The Teacher's Manuel to the Miniature Guide to Critical Thinking for Children* (Elder, 2002), as well as those directed by the teacher.

The classroom teacher observation inventory was the final instrument I used (Appendix B.) Its purpose was to see if skills were being transferred into the regular classroom setting. This inventory was given to the teachers at the onset of the study. As they observed the targeted skills, they were to write down the name of students demonstrating this behavior, and the date it was observed. I met with these teachers to explain its purpose and use prior to its implementation.

Procedures

Throughout the treatment, students were introduced and involved in activities that taught “of thinking” and then practiced these in situations to think “for thinking”. It was my intention to use explicit instruction to increase metacognition of critical thinking concepts.

The unit began with learners completing a preliminary survey to determine prior knowledge, understanding, and practice of the intellectual standards I would be introducing (Appendix A). Following this, students used the fictional characters of Naïve Nancy, Selfish Sam, and Fairminded Fran to help them understand critical thinking. Hand held masks of these characters were provided for the activities (Elder,

2002). Students read about and role-played these characters in order to begin thinking seriously about the concepts of fairness, selfishness, intellectual naivety, and laziness (Elder 2001). These character names were used throughout the unit by asking learners such things as, “Who are you acting most like right now, Selfish Sam or Fairminded Fran?” “Who would you most want to be like?” Or “Who is the character in the story acting like right now?”

As students read each of the character profiles, students worked in groups of two or three using the critical reading format from Elder’s book (2002, p.17). The basic idea of this format was to have learners read aloud in pairs or triads. They then shared back, in their own words, what was read. They went back and forth with reading and repeating until the passage was read and understood. Following this reading, students role-played the characters in their small groups and then for the whole group. After each whole class role-play, a discussion occurred as students considered if it accurately represented each character or not, and why. Accuracy was the primary intellectual standard I was looking for with this activity.

For practice in seeing how these characters might respond to life situations, students were involved in role-playing scenarios (Elder, 2002, p.18). In groups of three, they each took the persona of Naïve Nancy, Selfish Sam, or Fairminded Fran as they acted out how each character might respond in these situations.

To see if synthesis of information was occurring, learners completed two “Think for Yourself” pages (Appendix C). One sheet asked them to describe each of the characters in their own words, and the other had them look at themselves in ways

they may behave like Naïve Nancy, Selfish Sam, or Fairminded Fran. Students responded to that day's activities in their personal journals.

The second week of this unit introduced fair and unfair thinking. According to Elder (2002), being fair to others when having to give something up in the process is one of the great difficulties of life. When children work on this concept at a young age, they have a better chance to develop into a fair person.

To introduce the concept of fairness, children participated in a Socratic dialogue. This dialogue focused on questions about what fairness is, how it feels to be fair, to be treated unfairly, and some actual situations discussing fairness in application (Elder 2002, p. 22).

Related to fairness is the concept of empathy. "To have empathy is to be able to imagine what other people are thinking and feeling and to take into account the thoughts and feelings of relevant others before you act. People cannot be cruel or unjust to others when they empathize with them." (Elder 2002, p.23). After discussing empathy, students used the masks of Naïve Nancy, Selfish Sam, and Fairminded Fran as they acted out situations they have encountered on the playground or in the cafeteria.

An introspective activity followed, as students considered problems in their own behavior. Each child was asked to think of times they treated others fairly or unfairly, and then to draw pictures to show these situations. They then wrote the following on each drawing: what the picture showed, their purpose in the situation, and a consequence of their behavior (Appendix D). These became part of their journals.

Drawing from literature, I read the children's story, *The Little Red Hen*. As a class, we discussed this story using the prompts on page 26 of Elder's book (2002). Over the coming week, each child used the same format as they found a personal situation they needed to think about. They were to write about their thoughts and actions in response to it. Those who were comfortable sharing these with the class were invited to do so during the next class session. (Elder 2002, pp. 25, 26).

Week three of this unit was a formal introduction to the intellectual standard of clarity. When individuals are not clear about something, it is difficult to determine if it is relevant, significant, or fair. It cannot be judged for accuracy. According to Elder:

If children are not clear about what they are learning, they have not learned it. If they can't elaborate what they have learned in their own words, they haven't learned it. If they can't give an example of what they have learned, they haven't learned it. (2002, p.28)

To demonstrate the importance of clarity in communication, I read to the students, "The Debate in Sign Language" as retold by Syd Lieberman (Cohn, 1993). Following the reading of this short story, students worked in pairs or triads to create interpretative questions that they asked the other group. When responding to these questions, each group was to seek clarity using active listening, encouraging elaboration, and finally giving an example from the text.

To practice clarity in speaking and writing, students were involved in actively speaking and writing directions for various poses for their bodies. Replicating the desired pose gave immediate feedback on the clarity of the directions.

The last activity of the day was a journaling activity. Students wrote about that day's class, explained clarity, elaborated on how it was presented, gave an example of it, and finally either drew or gave an analogy to illustrate it (Appendix E). Comments on personal application of critical thinking were encouraged as well.

Relevance was the topic for the fourth week. Good thinkers make sure their thinking relates directly to the problem they are trying to solve, the question they are trying to answer, or the topic they are writing or speaking about. To simulate the importance of relevance, students were involved in discussions of thought-provoking questions. These were taken from *Kid Chat: Questions to Fuel Young Minds and Mouths* (Nicholaus & Lowrie, 2001). These questions provided many opportunities for students to get off the topic. When that happened, I redirected the discussion by asking them one of the following questions: "How does what you are saying relate to the problem? How does the information relate to the question we are asking? What will help us solve the problem? How does what you say relate to what we are talking about?" The goal for the students was to recognize when they had strayed from relevance and to ask their own questions concerning relevance.

Student journaling for the week was to find ten different examples of times when they, their teachers, classmates, or families wavered from relevance (Appendix F). Elaboration and clarity were expected.

The final intellectual standard I addressed was logic. I wanted learners to be able to discern when something made sense, and to question the logicalness of what people write or say. To do this, I felt students needed to first consider an idea using an open mind. Learners were involved in activities that had them considering the logical

fit of ideas as well as the flow of ideas from beginning to resolution. As a journal entry for this week, learners wrote about an actual decision or consideration they were involved with in the upcoming week.

Week six began a more direct application and synthesis of the skills presented to this point. I chose a “hot topic” on which learners did research in the upcoming week. I used the topic of TV, video games, and obesity. Each learner was given two different articles taken from either the newspaper or *Time for Kids*. No students had the same articles. Time was given in class for them to read these articles and write an opinion statement supported with facts and evidence. A handout was provided as a guide. This work was to be finished as homework. On week seven a lively open forum was held as articles and opinions were shared and discussed. During this videotaped discussion, I watched for independent thinking, as well as application of the intellectual standards of clarity, relevance, fairness, logic, and accuracy. I used the teacher behavior checklist while viewing the video to assess student success (Appendix B).

Following the discussion, students completed the same survey they did the first week. The unit concluded with a class discussion of the unit.

Internal Validity.

The students’ characteristics played a part in the internal validity of this study. Though each is identified as gifted and talented, they each brought a different level of prior success in thinking critically. Differences were seen in motivation, interest, and writing ability. Another difference was the presence of the sign language interpreter who was present in one of the classes. When she was present, some students were not

as candid about their comments. Also, classroom discussion flow is interrupted when the learner's response must be signed and then spoken by the interpreter.

Teacher bias was a concern. I know that classroom teachers are inundated with assessments during the first few weeks of the school year. They were not enthused about doing another assessment, and did not take it seriously as I had hoped. The other concern was the bias these teachers brought to the topic of critical thinking. As stated in the introduction, each person has his or her own definition of this skill. As this was an observational study, and because the assessments are subjective, bias did play a part in my observations as well.

One of the biggest validity concerns was my limited time with my students. As I only saw them for approximately two hours once a week, frequent reinforcement of the skills was not possible.

My room brought several possible concerns. First its small size impedes activities. It is also across the hall from the vocal music room. The sounds of music as well as classes coming and going every 25 minutes could be distractions. This is a new space for me this year, and my students were not accustomed to these distractions.

Methods of instrumentation were also limitations to my study. The instruments I used were teacher created, and therefore low in reliability.

I tried to minimize validity concerns by meeting with classroom teachers to explain both my purpose and the survey, and answer any questions they had. I contacted them twice during the study as a reminder to use the observation inventory and to provide opportunity for questions, I kept my door closed, played quiet music as needed, and put up curtains to minimize the distractions from outside the classroom.

Also, I did not have the student with the interpreter as part of the study. I worked to make my survey and observation inventory valid by modeling them after other surveys, and studying how to create surveys and questionnaires.

Timeline

Week 1: September 5-8	Pre-Survey Students
	Introduce topic and fictional characters
	Read pages 2-5 (Elder (2001))
	Role plays
	Journal entries (student and teacher)
Week 2: September 11-15	Fair and Unfair Thinking
	Socratic dialog
	<i>Little Red Hen</i> discussion
	Journal entries (student and teacher)
Week 3: September 18-22	Clarity
	“Debate in Sign Language”
	Clarity in thinking and writing activity
	Journal entries (student and teacher)
Week 4: September 25-29	Relevance
	<i>Kid Chat</i> discussion
	Journal entries (student and teacher)
Week 5: October 2-6	Logic
	Journal entries (student and teacher)
Week 6: October 9-13	Student sharing of personal decision

Application and Synthesis

Research on “hot topic” of TV, Video Games, and

Obesity

Week 7: October 16-20

Application and Synthesis

Presentations and Discussion

Post survey

Discussion of unit

Videotape

Collect observation inventories from classroom
teachers.

Complete own observation inventory

Findings

This study attempted to determine if critical thinking skills could be explicitly taught to a group of gifted and talented fourth grade students, and whether these students move from being naïve and self-absorbed in their thinking to taking ownership of their thoughts. The focus of this study was on the intellectual standards of clarity, accuracy, relevance, logic, and fairmindedness. Several data sources were employed to compile information. These included a student pre- and post-survey. These measured student understanding of the main intellectual standards that would be presented, as well as a self assessment of skills in the noted areas of critical thought (Appendix A). A classroom teacher observation inventory of critical thinking behaviors was given to students' homeroom teachers, and was also completed by me at both the beginning and end of the unit (Appendix B). Both of these tools were teacher-made. Other sources of data included both student and teacher journals.

Ten fourth grade students identified as gifted and talented at Bowman Woods Elementary School in Cedar Rapids, Iowa, were the subjects of this study. These learners were in two different groups that each attended the LEO (Learning Enrichment Opportunities) room once a week for a period of one hour and fifty minutes over a seven week period. Five students were randomly selected from each larger group of 8-10 learners. All subjects participating completed the requirements of the study.

Pre-assessing and post-assessing of students was necessary to measure growth in understanding and application of the intellectual standards presented. There were two parts to this assessment. The first part looked for understanding of the terms that

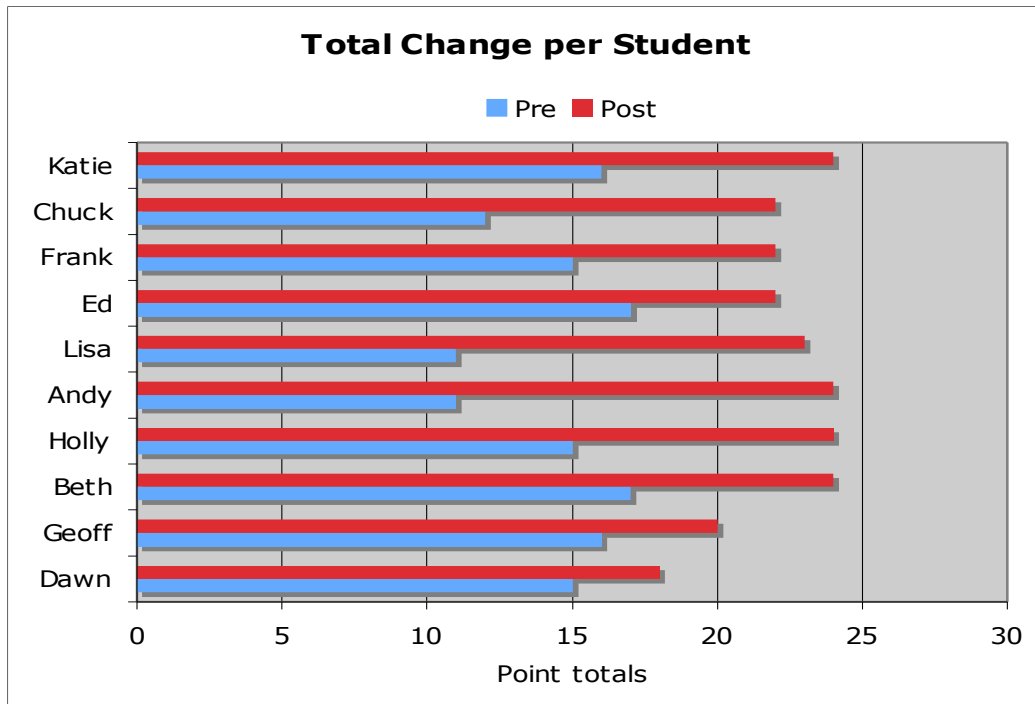
would be introduced in the study, and the second part looked for application of the intellectual standards in the learner's own understanding and behaviors.

In the first part, assessing the key terms, I used a rubric to score each response. A learner who fully understood the idea was given a score of three points, a learner who had a partial understanding was given a score of two, and a learner who lacked understanding, or did not attempt an answer, was given a score of one. Students were scored both on a definition of the term and an application of the term. Each student's score was totaled to determine a total number of points for his or her understanding of key terms and application. A perfect score would be a twenty-four. All students showed a measurable increase of understanding. As a total group there was a 35% increase in understanding. Naivety showed the largest growth with a 62% total increase, while selfishness showed the least gain with a 13% increase. Individual student understanding of key terms and concepts showed a growth range from 17% to 55%. Their pre- and post-assessment results can be found in Figures 1 and 2.

The second section of the student assessment measured a student's application of the behaviors related to the concepts being presented in their own lives. Each learner was to circle the number below a behavior that best described his or her usual behavior. Rankings ranged from 1 to 5 with a 5 being the desired critical thinking behavior. Figure 3 shows the stated behaviors, the mean score for both the pre- and post-assessments, and the percentage of growth for each behavior.

Figure 1

Individual Student Pre- and Post-Assessment Results



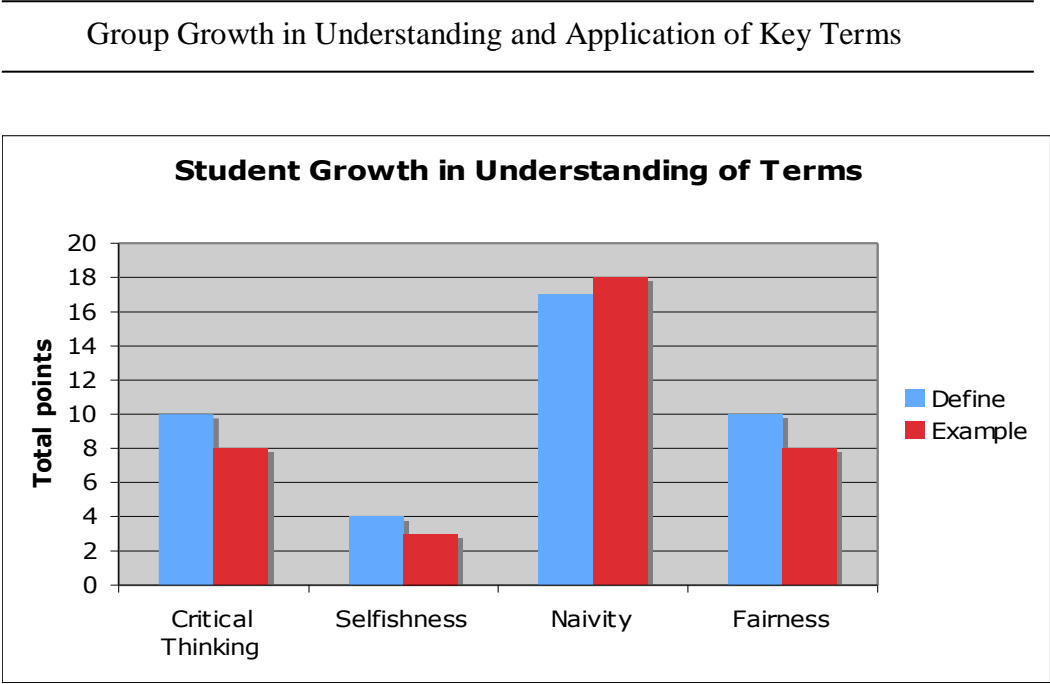
N-10

In comparing the mean scores for each response, I was able to see the perceived differences in the learner's behaviors from the start of the treatment to the end. Positive growth was seen in all areas with the exception of one. The most notable changes were in the areas of accuracy with a 20.5% growth, and in the area of confidence in being able to independently figure things out with a growth of 27.9%. The attitude having to do with personally being able to find better ways to do things, showed a decrease of one tenth of a percent.

The second source of data was the classroom teacher observation inventory. This was helpful in discovering if any of the preferred behaviors were being observed in the homeroom classroom. Teachers were to note at three different

times during the treatment period if any of their students were manifesting these critical thinking attributes and behaviors (Appendix B).

Figure 2



N=10

With the exception of the open enrolled home-schooled student, 90% of the learners showed application of some of these behaviors. The teacher commentary reflected common themes in completing it. Some of these are noted below:

Figure 3

Student Pre- and Post-Assessment Behaviors Survey

I think mainly on the knowledge level and generally accept others' ideas and opinions.	I am beginning to analyze and evaluate my own ideas and those of others at times.	I am an independent thinker who always analyzes and evaluates my own ideas and those of others.
Pre-assessment mean: 3.5	Post-assessment mean: 3.7	Percentage growth: 5.4%
I am always satisfied with the way I do things.	I sometimes think I need to look for better ways to do things.	I often think there must be a better way to do things and believe I can find it.
Pre-assessment mean: 3.2	Post-assessment mean: 3.1	Percentage growth: -1%
I usually have to ask others how to do things I don't already know how to do.	Sometimes I think I can figure things out on my own. Other times I don't even try to.	I believe I can figure out anything I need to figure out.
Pre-assessment mean: 3.1	Post-assessment mean: 4.3	Percentage growth: 27.9%
Lots of times I have to explain things to people several times. I'm not very good at finding several ways to explain things.	I can explain things so people understand them most of the time. If they don't, I have trouble finding another way to explain things.	People usually understand what I am trying to tell them. If they don't, I can usually find another way of explaining it.
Pre-assessment mean: 3.7	Post-assessment mean: 4.0	Percentage growth: 7.5%
I believe everything I hear or read from trusted sources. I don't have any trouble sharing it with others.	I am beginning to question things from trusted sources. I might check it out before telling it to someone else.	When I tell people things, I am pretty sure it is true. I like to be accurate in everything I say.
Pre-assessment mean: 3.5	Post-assessment mean: 4.4	Percentage growth: 20.5%
In talking with others about a problem, I find myself talking about different problems or ideas.	I try to stay on track with what others are saying. My ideas are sometimes relevant to the discussion.	In a discussion with other people, I stay on the topic. What I say relates to what others are saying.
Pre-assessment mean: 3.6	Post-assessment mean: 3.9	Percentage growth: 7.7%
I am glad to be done with a project. If it makes sense to me, that is good enough.	I sometimes make an effort to see if my work makes sense and fits together.	When I finish a project it all makes sense to others. The ideas fit together.
Pre-assessment mean: 3.9	Post-assessment mean: 4.0	Percentage growth: 2.5%
I make decisions and don't really worry about how they might affect others.	I am beginning to think about how my actions and decisions affect others.	When I make a decision, I think about if it is fair to others. I ask myself how it might feel to others. Sometimes I need to change my actions.
Pre-assessment mean: 4.0	Post-assessment mean: 4.2	Percentage growth: 4.8%

N=10

- This was very hard.
- I personally can't tell the growth from them. It is probably more due to my awareness of the nature of the activity.
- I am more attuned to Lisa. Ed is a bit quiet. Frank is very bright, but too talkative and off task.
- I just didn't have the time and didn't take the time to do this.
- The four students I was to observe already seem to have many of these attributes, so it was hard to note specific behavior changes.
- The timing during the year made it difficult to note changes, because I was still trying to get to know them at the beginning of the year.

In personally using the teacher observation inventory, it was noted that the data were not consistent from the pre-assessment to the post-assessment. This was due to the differences in the way it was implemented. As a pre-assessment, I noted students whom I felt fit the category. This was based on my knowledge of the learners. The post-assessment noted the behaviors and attributes as they manifested themselves during the videotaped lesson. The data suggest students had a decrease of 20% in thinking independently, clarity of thought, and logical thought. They showed a 10% growth in accuracy, a 20% growth in relevance, and a 50% increase in fairness. This perceived decrease in growth is likely due to the inconsistent nature of its use. I made several notations on the post-assessment that shed some light on its use. These include:

- Several behaviors listed are not possible to observe during a class discussion.
- Quiet students are not given as great an opportunity to demonstrate the desired behaviors.
- Being fully prepared for the discussion did not necessarily affect the critical thinking behaviors.
- These intellectual standards do not show themselves equally from situation to situation.

Table 1

Notations of LEO Teacher on Observation Inventory

	Thinking Independently		Clarity		Accuracy		Relevance		Logical		Fairness	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Beth	X		X	X	X	X	X	X			X	X
Lisa	X	X	X	X	X	X	X	X	X		X	X
Geoff			X	X	X	X	X	X	X			X
Frank	X	X	X			X				X		X
Andy				X		X		X				X
Chuck									X			X
Katie			X	X	X		X	X			X	X
Dawn			X					X				X
Holly	X	X	X		X		X	X	X		X	X
Ed	X		X	X		X	X	X		X	X	X
% Showing Attribute	50	30	80	60	50	60	60	80	40	20	50	100

N=10

Table 1 shows the fictional names of students in each intellectual standard category on both the pre- and post- assessment. For the final class project, learners were to research the topic of video games, television viewing, and childhood obesity. It was through the videotaped discussion that I made the post-assessment notations reflected in Table 1.

My teacher journal contained reflections on the class activities each day I met with students. Its purpose was to look for student understanding of the intellectual standards as they were presented, as well as if the planned activities were having the desired outcomes. Most of the time, I noted positive reactions from the learners. One of the more exciting entries occurred the first day I met with Holly. She saw the intellectual standards listed on the board and exclaimed, “That’s Carl F.” From that point forward, all students used her mnemonic to remember the standards of clarity, accuracy, relevance, logic, and fairness. I noted students who seemed to grasp the concepts as well as those who seemed to struggle. A common theme was stated this way one day, “Students are enjoying it. They give the ‘right’ answers. I’m not sure if they are looking inward much.” Another common concern was that Chuck was not participating or even responding when called upon. The day of the clarity activity, I had several students comment on the difficulty of the written task. One learner was near tears when her directions were not accurate. She reported another day that her mother had been holding her accountable for accuracy and not exaggerating since finding out about our study of this standard.

Listed below are some quotes from my journal related specifically to the activities.

- Week 1 – Introduction and Accuracy: The critical reading format was effective and kids took it seriously. When discussing Selfish Sam, it is important to not confuse Sam with a bully; he is a thinker first.
- Week 2 – Fairness: Empathy is not the same as sympathy is important for students to understand. Students connected empathetic behavior with the golden rule. Discussion of *The Little Red Hen* was deep. Kids were surprised that a “little kids” story could have so much to discuss.

- Week 3 – Clarity: Each pair of students picked an interpretative question to share. Chuck never opened his mouth today. I'm not sure how to get him engaged in this. After class I spoke with him about his lack of participation. He said nothing. I shared with him that he was acting like Naïve Nancy when he let the other learners carry the entire activity.
- Week 4 – Relevance: The worksheets were too easy. I don't think the kids saw the connections. They enjoyed the activity, but this one needs to go. During the discussion, the kids were into their own responses and not reacting/responding to others.
- Week 5 – Logic: The situation activities went well. Using a personal example on the board was helpful for students.
- Week 6 – Application and Synthesis: Review of the standards went well. I was surprised to see the learners remember so much. Students are discovering how the intellectual standards overlap each other. When it comes to personal application and understanding, I think they may not be developmentally ready to be in touch with their own thinking. If I had them daily, I could keep these words and skills in front of them; and I would probably see greater understanding.
- Week 7 – Application and Synthesis video: Students came in prepared and excited. Discussion was quite lively with learners making connections to one another. I had to cut the discussion off at one hour for both groups. Interruptions were a problem for the second group. They seemed to interrupt the flow. Chuck was given several opportunities to share and never had anything to say. He would not even open up his preparatory work to get going. Dawn was quiet too. Her body language indicated she was quite interested in the discussion, however.

The final data source I used was student journals and reflection activities.

Their purpose was to acquire an inside look to the thoughts of the learners and see if they were internalizing any of the lessons. Journal topics varied from week to week.

In reading the journals, I discovered that 100% of the learners made at least two significant comments about personally applying what they learned. All ten students had insights about fairness in their own lives. In comments during the last week of the unit, all students mentioned at least one intellectual standard they are more aware of as a result of this unit. There were two themes that became evident in the journals. One was a true enjoyment of the unit. The other was a greater understanding of the intellectual standards for their lives. Listed below are some samples of student comments:

- It's hard for my brain to think so much. I thought my brain would explode into words of unknown knowledge.
- I like critical thinking because we get to talk about how to understand people.
- I often wonder, "Is this logical?"
- I learned what selfishness and fair actually meant.
- I absolutely loved the clarity writing. It was challenging, but fun.
- Today in class I mostly acted like a Naïve Nancy because I mostly did what other people wanted me to do.
- I'm pretty much a Selfish Sam.
- I learned about how to solve problems better with using logic.
- I learned clarity and relevance. I think they will be very useful when I am writing reports.
- I realized everybody is a little like Sam, a little like Nancy, and a little like Fran.
- Sam, Fran, and Nancy often pop into my head when I think about LEO.
- Clarity is to understanding as undistinguishable is to confused.

There were a few uncontrolled factors that might have affected this study.

While videotaping the second group, there were numerous interruptions as people knocked on the door, one student left for an appointment, and the sound of recorder music wafted in from the music room across the hall. One student, who was not chosen for the treatment analysis, is mute and uses a sign language interpreter for

speaking. These events interrupted the flow of the discussion and could have had a negative impact on it.

Responses to student assessments could also be considered an uncontrolled factor to the study. For the pre-assessment, students may not have understood the behavior description enough to give an honest answer. The descriptions took on more understanding after the teaching of the skills. Even though I told them to be honest on both surveys, they may have responded with what they thought I wanted to hear. All of these students were in my class at least part of last year, and we had a good relationship. Generally, they liked to please me.

One obvious weakness to the study was the teacher observation inventory. The classroom teachers were uncomfortable with it and did not use it as intended. My use of it was not consistent from the pre to the post. Because I noted my generalized observations of the learners at the beginning of the study, and then noted only the behaviors observed during the videotaped lesson at the end, I was not comparing “apples to apples”. It also was not designed for a single videotape lesson observation because it contained behaviors that could not be observed in this situation. It needed to be used over a period of time using a variety of observation situations.

Conclusions

The purpose of this study was to determine if by explicitly teaching critical thinking skills, gifted and talented fourth grade students would move from being naïve

about their thinking, and from being self-absorbed, to taking ownership of their thoughts. In this study I focused on the affective skill of thinking independently, while applying the intellectual standards of clarity, accuracy, relevance, logic, and fairmindedness. I used a “thinking of thinking” approach. The data suggested that teaching critical thinking skills does have a positive impact on student awareness of their thinking.

According to Paul (1989), to learn to think critically is a combination of both affective and cognitive skills. He contends there are 35 dimensions of critical thought, and groups them into affective strategies and cognitive domains. The constraints of this study did not allow time to teach all 35 dimensions. To facilitate this study, I primarily used a teaching of thinking approach using *The Miniature Guide to Critical Thinking for Children* developed by Linda Elder (2001), which focuses on the basic concepts in critical thinking.

Throughout the treatment students were highly engaged in the activities. The pre- and post-student assessments indicated that a basic understanding and application of the intellectual standards rose by 35%. The largest increase was in the area of naivety with a growth of 62%. The smallest gain was in the area of selfishness, showing only a 13% increase. Students went from not using the language of critical thinking to using it frequently as a result of greater understanding. Students applied the terms to themselves while looking inward. Student journals supported this.

“I liked how we learned the intellectual standards which told me how to be more like Fairminded Fran.”

“I mostly acted like Naïve Nancy.”

“I think about relevance more.”

“Now I am better at staying on the topic, and I have learned much about discussions like when you can be irrelevant, to give examples, and mostly how to get people to understand what I’m saying.”

Likewise they found the activities to be a positive experience.

“I liked the acting skits a lot.”

“Really awesome unit and discussions.”

“I really liked doing role play. It was fun.”

From all the journals, the only negative comment was, “I do not know why we have homework every week.”

Their positive experience could have a lot to do with the learning environment. As gifted and talented students, these learners have come to me for over a year. We have established a positive relationship with each other. By virtue of being in the LEO classroom, these students are grouped with other bright children who foster excitement for learning. Spending time with other learners who are bright in a welcoming environment to their unique personalities is a definite benefit to these gifted young people (DeLisle, 1999).

Teaching these skills is a direct need for gifted and talented learners. Rogers (2001. p. 283) states, “gifted students tend to use higher order thinking more frequently and appropriately even without direct training, yet they tend to benefit significantly more from such skills training when it is offered.” Her statement is supported by the positive results observed in this study. The student post-assessment indicated positive growth from 2.5% to 27.9% in 7 of the 8 areas. One area, “I often

think there must be a better way to do things and believe I can find it,” showed a decrease of 1%. In my journal on the day of the pre-assessment, I noted, “The ranking sheet needed more clarification. I had students complete it as I explained more completely the intent of each question. The form needs language that better describes the critical thinking terms.” On the day of the post-assessment, students understood the intent of the statements more fully, and I did not need to explain again. This change in understanding likely had an impact on the outcome of this assessment. Once students understood the statements, they could answer with more integrity. Thus, the post-assessment is a better indicator of the critical thinking skills than the pre-assessment. The uneven growth on the intellectual standards is more likely due to the design of the instrument than the activities. Regardless, such subjective statements are only a snapshot of a student’s thoughts that one day in time.

Student journals would indicate an increased awareness of the desired skills. Students wanted to take ownership of their thoughts and not be naïve in their own thinking. All ten student’s journals indicated a greater understanding and application in their own lives.

“I would think about how I want to be treated.”

“ I think I will get better at understanding my parents a lot better.”

“You never know what is true or false until you find out.”

“I think about relevance more.”

“Now I am better at staying on the topic, and I have learned much about discussions.”

The thinking of thinking approach used in *The Miniature Guide to Critical Thinking for Children* (Elder 2001), engaged students and brought the terms and understanding to life. The guide claimed students would enthusiastically participate in the activities presented, and would be naturally drawn toward the intellectual stimulation. In going through my journal reflections, I found this to be true with 90% of the learners. Only one student chose to not participate in the class activities, yet his personal journal showed depth of thought.

The use of the classroom teacher inventory was not helpful to the purposes of this study. My review of the literature suggested one could find as many definitions of critical thinking as there are authors. The complexity of this concept, the wording in the inventory, along with timing in the school year, left the classroom teachers confused and apathetic to complete the instrument. My personal use of it was not consistent from pre- to post-assessment. All of this skewed the results.

Another factor affecting the learning of critical thinking skills was the population with which I was working. According to Rogers (2001), “Gifted students tend to use higher order thinking more frequently and appropriately even without direct training, yet they tend to benefit significantly more from such skills training when it is offered” (p. 283). She also notes their ability to grasp concepts quite readily. Her theory is supported by my data in that in only seven lessons focusing on the intellectual standards, students saw a 35% growth in understanding. It is also supported by the commentary in both student and teacher journals.

In reflecting on this action research project to see if critical thinking skills can be explicitly taught, I would make some changes. First, I would use the teacher

observation inventory differently. I would not have the classroom teachers fill it out due to the difficulty they seemed to have in understanding the intent and content of the instrument. Personally, I would utilize this form differently by using consistent data on the pre- and post-inventory. I would make observations based on a series of assignments and class activities, both before the beginning of the treatment and again at the conclusion. To do so, I would need to start this research later in the school year. I would include a videotaped discussion in both. It was helpful to have the videotape in order to more objectively note student behaviors.

The other noticeable change I would make would be with the student self-assessments. The second section, having to do with application of the behaviors related to the concepts being presented, needs to be more user friendly. The language on this needs to be more age appropriate for fourth grade learners. I would also refine the questions to reflect only on the intellectual standards. In doing these things, I feel I would achieve a clearer picture of the growth of my students.

When I contacted Dr. Elder (2006) regarding research studies that shared the effectiveness of her program, or other studies dealing with teaching critical thinking skills to elementary learners, she replied, “We do not know of any research of the type you are looking for.” This suggests that measuring critical thinking skills is not easily done. As it is a subjective area to evaluate, it is difficult to quantify the results of this study. Throughout this study, students were presented five intellectual standards of critical thought, practiced those skills in a variety of situations, and have been asked to apply them to a real situation. I do believe it is possible to teach these skills and see improved awareness and application of critical thought in my students. I believe the

pre- and post-assessments, along with student and teacher journals, support this learning.

Action Plan

Gifted learners need to improve the quality of their thinking. This is a concern I have had over the years I have worked with these children. The research studies suggest that because of their abilities, these students often receive praise for what they do; yet their work often lacks depth (Paul, 2005). Critical thought is complex and probably never mastered; yet with an understanding and application of these skills, fourth grade learners can improve. I plan to connect the terms and concepts into the rest of my curriculum this year. I will display the posters of the intellectual standards throughout the year and use the masks of Naïve Nancy, Selfish Sam, and Fairminded Fran in other activities. Critical thinking is not something you learn and remember without practice. My goal is to keep my students thinking about their thinking and applying the intellectual standards of clarity, accuracy, relevance, logic, and fairness.

Since the conclusion of the unit, I have had the students involved share their learning with classmates who were not working in the unit. I have continued to use the terms and lift up the standards for my learners. I would like to teach this unit each year to my fourth grade students and reinforce the language throughout both their fourth and fifth grade years in my classroom. I will expect deeper thought from my students and refer back to this unit so that the students connect my expectations with critical thinking.

I have been asked to share the results of this study with my superintendent. It is my hope she will gain a greater appreciation of the different learning needs of the

gifted learner and the type of teaching done in Linn-Mar's talented and gifted department.

Finally, I will send a copy of this paper to Linda Elder, President of the Foundation for Critical Thinking. She has expressed a desire to see it and the results of using her program with my gifted learners.

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Appendix A

Student Pre- and Post Student Survey

Name: _____

Critical Thinking Survey

Here are some words for you to think about. Take time to consider what each one means and then write your answers on this page. Remember there are no right or wrong responses, only your opinions at this time.

Define each of the following words:

➤ Critical Thinking–

➤ Selfishness–

➤ Naivety–

➤ Fairness–

Give an example or tell of a situation that describes each of the following words:

➤ Critical Thinking–

➤ Selfishness–

➤ Naivety–

➤ Fairness–

Connerly, 2006

SELF ASSESSMENT

Directions: Read each row and the behaviors it describes. Then circle the number below the behavior that best describes your usual behavior. Circle 2 or 4 if your behavior is halfway between two boxes.

I think mainly on the knowledge level and generally accept others' ideas and opinions.	I am beginning to analyze and evaluate my own ideas and those of others at times.	I am an independent thinker who always analyzes and evaluates my own ideas and those of others.
----------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------

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

I am always satisfied with the way I do things.	I sometimes think I need to look for better ways to do things.	I often think there must be a better way to do things and believe I can find it.
-------------------------------------------------	----------------------------------------------------------------	----------------------------------------------------------------------------------

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

I usually have to ask others how to do things I don't already know how to do.	Sometimes I think I can figure things out on my own. Other times I don't even try to.	I believe I can figure out anything I need to figure out.
-------------------------------------------------------------------------------	---------------------------------------------------------------------------------------	-----------------------------------------------------------

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

Lots of times I have to explain things to people several times. I'm not very good at finding several ways to explain things.	I can explain things so people understand them most of the time. If they don't, I have trouble finding another way to explain things.	People usually understand what I am trying to tell them. If they don't, I can usually find another way of explaining it.
------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------

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

I believe everything I hear or read from trusted sources. I don't have any trouble sharing it with others.	I am beginning to question things from trusted sources. I might check it out before telling it to someone else.	When I tell people things, I am pretty sure it is true. I like to be accurate in everything I say.
------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------

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

In talking with others about a problem, I find myself talking about different problems or ideas.	I try to stay on track with what others are saying. My ideas are sometimes relevant to the discussion.	In a discussion with other people, I stay on the topic. What I say relates to what others are saying.
--------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------

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

I am glad to be done with a project. If it makes sense to me, that is good enough.	I sometimes make an effort to see if my work makes sense and fits together.	When I finish a project it all makes sense to others. The ideas fit together.
------------------------------------------------------------------------------------	-----------------------------------------------------------------------------	-------------------------------------------------------------------------------

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

I make decisions and don't really worry about how they might affect others.	I am beginning to think about how my actions and decisions affect others.	When I make a decision, I think about if it is fair to others. I ask myself how it might feel to others. Sometimes I need to change my actions.
-----------------------------------------------------------------------------	---------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------

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

Connerly 2006

Appendix B

Teacher Observation Inventory

Assessment of Critical Thinking Skills

Attributes and Behaviors

Color	Date
○	_____
○	_____
○	_____

TEACHER: _____

Assumptions:

1. At least one indicator of the behavior must be observed to indicate the presence of that attribute.
2. The assessment will be based on performance observation.
3. Students will be assessed in a whole group setting.
4. Students will have had an opportunity to prepare for the discussion.
5. Students will be aware this is being videotaped for my own reflection only

Attribute: Thinking Independently

Does not passively accept beliefs or ideas of others
Recognizes solid sources of information
Is able to see new ways of looking at things
Looks for alternative ways of doing things
Evaluates information
Comes to own conclusions

Attribute: Clarity (Doesn't confuse people)

Shares ideas so others understand
Understands what others are saying
Understands and follows directions
Asks, "Could you tell me what you mean?"
Asks, "Could you say that in other words?"
Says things like, "Let me tell you what I think you said. Tell me if I am right."
Written work is clear in meaning

Attribute: Accuracy (Makes sure it's true)

If not sure about something, will check it out
Looks for ways to gain greater understanding
Wants truth
Speaks truth appropriately

Attribute: Relevance (Wants to be on track)

Thinking connects with class discussions
Written work connects with topic-does not bring in irrelevant information
Relates thinking to the problem
Asks, "What will help us solve this problem?"
Asks, "How does what you say relate to what we are talking about?"

Attribute: Logical (Wants things to fit together)

Knows when things don't make sense
Will rework or rewrite to make sure things flow or fit together
Wants to know reasons for why things are as they are

Attribute: Fairness (Considers others feelings)

Tries hard to not be selfish

Considers others' ideas

Considers others' feelings

Thinks about how something would make them feel

Connerly, 2006

Appendix C

Think for Yourself Activities

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

Appendix D

Fairness

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

Name: _____

Date: _____

FAIRNESS

Think of a time when you have either been fair or not fair in a tough situation. Draw a picture to show this.

Explain the situation you drew: _____

What was your purpose in this situation? _____

What was a consequence of this behavior? _____

Appendix E

Clarity

Name: _____
Date: _____

CLARITY

Based on today's activities, write a clear definition of clarity: _____

Give an example of a time where using clarity is necessary. (Do not use the examples from class.) _____

Use the space below to either draw an example of clarity or write an analogy to illustrate clarity.

Appendix F

Relevance

Name: _____

Date: _____

RELEVANCE

In the coming week you are to be on the lookout for situations where you, your teachers, classmates, or families have wavered from relevance. Do not mention it to them, just make a mental note and then journal about it here. Our point is not to change other people; it is to help us become more aware of how often this really does happen.

As you write these on your own loose leaf paper, remember clarity and elaboration will be expected.

Have fun being a quiet detective.

Appendix G

TV, Video Games, and Childhood Obesity
Assignment Sheet

Convince Your Parents and Teachers
OR
What you need to know about TV, Video Games, and
Childhood Obesity

During the next week your mission is to learn about the topic above and be able to hold your own in a critical thinking discussion in class next week. You will need to use the five intellectual standards of **clarity, accuracy, relevance, logic, and fairness** as you and your classmates defend your viewpoints and share about your research.

The topic of TV and video games is near and dear to your hearts. You should be able to defend your position and relate it to obesity issues.

Think about it this way. Pretend one of your parents has read the article and agrees with what it says so much that they are ready to radically change the rules at your home. Another adult in the house reads this and thinks the extreme opposite way. What would they say to defend their viewpoint? How would you convince them of your ideas on the topic? Using the intellectual standards, how would they or you present their viewpoint to the other person? You will want to do both a CAF and a PMI on each article.

To accomplish this mission:

1. Read the articles provided to you by Mrs. Connerly
2. Read additional articles you find on the topic. (Optional)
3. Take notes on these readings in your journal
4. Use your journal to do both a CAF and a PMI on each article.
5. Know what you believe and how you would present it in a fair-minded way
6. Be ready to discuss these in class next week

I will be videotaping this discussion, so you will want to be ready with your best “arguments” presented in a fair-minded manner.

Who will you be?

- Naïve Nancy
- Selfish Sam
- Fair-minded Fran

Appendix H

Informed Consent Letter and Form

August 28, 2006

Dear LEO Parents:

I am currently conducting an action research project with my fourth grade LEO learners to see if critical thinking skills can indeed be taught. I want to see if your student starts to think about his/her thinking rather than just going forth without thought. I'm doing this as part of a partial fulfillment of my Masters of Collaborative Teaching and Learning degree from Graceland University. The study will coincide with the critical thinking unit and will last for seven weeks beginning the week of September 5.

During this unit students will be introduced to Naïve Nancy, Selfish Sam, and Fairminded Fran. These characters help us to see the most common ways people think about their actions and beliefs. We will also be learning about the intellectual standards of clarity, accuracy, relevance, logic, and fairmindedness. In the process of learning these, I hope to see the students move from being naïve or self absorbed to taking ownership of their thoughts.

During the course of the unit we will use role-play, discussions, group and individual activities, as well as a weekly journal assignment. Please help your learner remember to do their journal assignment each week.

It is my hope this unit will be the start of thinking about our thinking throughout all LEO activities this year as well as the start of a lifetime of thinking critically.

I do need you to read the attached "Informed Consent Document" and sign it if you give permission for your learner to be a part of the study. Your child's participation is entirely confidential. If you do not want him/her to be a part of this research, they may still participate in the Critical Thinking unit.

Thank you for your help in my continuing learning.

Sincerely,

Debra Connerly

Graceland University Informed Consent

Project Title: Teaching Critical Thinking Skills to Fourth Grade Students Identified as Gifted and Talented

Researcher: Debra Connerly

This document is an invitation to participate in the following research project. Please read and sign to give permission for your involvement in this study. If a child under 18 years of age is invited, signed consent is required from the parent or guardian.

Purpose: This is a research study. I am inviting your student to participate in this research study because your student is in my LEO class. The purpose of this research study is to study if critical thinking skills can be taught.

Length of Study: If you give permission for your child to take part in this study, their involvement will last for the first seven weeks of LEO class (September 5-October 20).

Description of Activities: Students will be involved in activities to get them thinking about thinking. Standards of clarity, logic, relevance, accuracy, and fairness will be addressed. Activities will include reading, role-play, group and individual activities, and written work. Students will participate in class discussions. One of these will be videotaped so that I can use it to review their comments. I will be the only person who views this videotape.

Possible Risks: At this time there are no foreseeable risks to participating in this study.

Benefits: All students may not benefit personally from being in this study. However, I hope your student will learn to think more carefully and become a more fair-minded thinker.

Confidentiality: I will keep your student's participation in this research study confidential to the extent permitted by law. If I write a report or article about this study, I will describe the study results in a manner so that your student cannot be identified.

Is Being in this Study Voluntary? Taking part in this research study is completely voluntary. You may choose for your student to not take part at all. If you decide your student will participate in this study, you reserve the right for your student to stop participation at any time. If you decide your student will not be in this study, or if your student stops participating at any time, your student will not be penalized or lose any benefits for which your student otherwise qualifies.

If You Have Questions, Please Contact:

Jim O'Connor at james-o-conor@uiowa.edu.

I encourage you to ask questions. Your signatures indicate that this research study has been explained to you, that your questions have been answered, and that you agree for your student to take part in this study.

Subject's Name: _____

Parent/Guardian Name (printed) _____

Relationship to Subject: _____

Signature of Parent/Guardian: _____

I also grant permission for _____ to be videotaped for Mrs.
(student/subject name)

Connerly's observation only.

Signature of Parent/Guardian: _____