

The Relationship Between High Drawing Ability and General Critical Thinking

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This paper will deal with a proposed piece of research that I may be conducting for my dissertation. My interest in the subject is partially influenced by my background in visual art, writing, music, and theater. Although my educational background is in studio art, I have participated in community theater in St. Louis and I play three musical instruments. My interest in my subject also stems from teaching an Advanced Placement art class in a high school in Columbia, Missouri for the past seven years and my readings on gifted and critical thinking.

My experience in the arts caused me to come to the understanding that things are patterns or that the mind sees, thinks in, or seeks out patterns. Pythagoras said that things are numbers in referring to the world as a rationally ordered system. The Greeks understood the importance of training the mind into certain styles or patterns of thinking. Unlike our contemporary educational system that demands pragmatic application (how will this make the student a better worker or more employable?) for everything taught, the Greeks taught core subjects to train the mind in specific patterns of seeing and thinking. Ed deBono (1984) pointed out that "the brain organizes information in patterns" (p. 16). Along similar lines Elliot Eisner (1978) pointed out that one of the things that children learn when they paint is to be structure seeking rather than rule following individuals. The thinking that drawing fosters in terms of seeking patterns and structures is relational. This direction of thinking was already established in my mind when the issue of critical thinking began to become current in educational literature.

The new interest in critical thinking in education seems to mesh nicely with the new goals of art education. Gardner's (1989) Project Zero is a design for the encouragement of visual thinking. Students are asked to develop a body of work and periodically examine it critically for content, metaphor, style, and growth. He emphasizes production, perception, and reflection. Critical thinking is a part of the development of the skills, abilities, and process of making art.

Gardner (1983, 1989), Perkins (1988), deBono (1984), Chambers (1988) and others contend that critical thinking should be taught within a content area as opposed to being treated as a separate subject. Indeed, teaching thinking in a particular content area has been shown to enhance learning in that area (Chambers 1988). Furthermore, Gardner and Perkins contend that critical thinking is subject specific. That is, the critical skills used to solve an algebraic equation are of no help in the playing of a chess game,

or the critical thinking skills used to construct a drawing have no effect on someone trying to analyze a social situation. Wilson and Wilson (1988) found that studio experience alone did not produce good art critics. They found that advanced writing students were more able to attend to symbolic and metaphoric meaning in works of art than students with three years of studio experience alone. Art Costa, however, believes that thinking strategies are transferable (Brandt, 1988) and DiBlasio (1985) points out that the differences between scientific thinking and general thinking are not as foreign as had once been thought.

The formalized 'scientific method', a rigidly rule governed process of testing hypothesis and confirming knowledge, was presented as characterizing the whole of scientific inquiry, which we now appreciate to be as dependent on free association, intuitive leaps and rough analogies as in Inquiry in general (p. 197).

The process of thinking she describes is much a part of the type of thinking which is engaged in during studio activities.

Howard Gardner (1983) has put forth a very interesting and exciting theory of multiple intelligences. In this theory Gardner asserts that the brain is not equipotential, but rather various areas of the cortex have particular cognitive foci which are formed by sensory stimulation in early childhood. After the early development of synapse there is little plasticity in the representation of cognitive capacity. It has been found that visual artists have denser synapse formation in the visual area of the cortex and musicians have a denser formation in the aural area of the cortex.

In *Frames of Mind* (1983) Gardner outlined six separate intelligences which were linguistic, musical, logical-mathematical, spatial, bodily kinesthetic, and personal. He later expanded the personal into two categories of interpersonal and intrapersonal (Gardner, 1989). It is interesting to note that visual art was not listed as a separate intelligence. It could be argued that visual artists make use of many if not all of the other intelligences. Spatial intelligence would probably be one of the strongest and most obvious areas used by artists. Less obvious to some is logical-mathematical intelligence, reported by Clark and Zimmerman (1984) to be low for students identified as artistically talented. This may be due to a tendency of artistically talented students to spend more time with their art and compensate their schedules by taking fewer math courses.

When drawing an artist must see three-dimensional objects in space in relationship to each other and translate them as points, lines, and angles on a two-dimensional plane. Many of the operations in this sort of task are similar to algebraic problem solving (finding an unknown from a known) and geometric concepts (seeing relationships between angles, parallel relationships, etc.). Whipple (1919) found that the sort of motor ability present

in drawing is not revealed by any stock tests for motor ability, but that there was some evidence that flexibility of motor habit may be exhibited more decidedly in persons talented in drawing than in persons not talented in drawing. Thus, many areas of intelligence seem to be called into play when an artist engages in drawing.

The Problem

The literature on critical thinking indicates that critical thinking abilities in one area are not transferable and do not indicate critical thinking ability in another area. However, these ideas are thus far theoretical in nature and at this point there is no evidence that any empirical research on the correlation of critical thinking in two or more areas has been conducted. If critical thinking is a pattern of thinking, then someone who is a good critical thinker should be able to learn in other areas and begin to think critically in those areas once the subject specific information (rules of the game) have been introduced. Furthermore, if there is an area that encourages transference of patterns of thinking it would be the arts, where seeing in terms of relationships is not only encouraged but critical to success in performance.

Literature on the importance of the arts in education is prevalent. Horn and Sieder (1992) and Hanna (1992) document academic success in the presence of a strong arts program. Whether the effect is motivational or due to the training of the mind to patterns of thinking, which aid in the learning of other subjects, is at the current time unknown.

The Research Questions

There are two major questions on which this proposed research will focus. These are:

1. Do students who produce high quality drawings (in terms of sophistication of image and concept, quality of line, design of page, use of value, and ability to draw from observation, as well as to abstract) exhibit high general critical thinking skills?
2. Do students who produce lower quality drawings have lower general critical thinking skills?

If the literature on the relation between general intelligence and artistic ability (Clark and Zimmerman, 1984) correlates also with critical thinking then the absence of high artistic quality will not necessarily correlate with low general critical thinking ability.

If a correlation exists between drawing ability and general critical thinking then it may indicate an instrumental function for art in education outside of the general importance of the transmission of cultural content, aesthetic training, and processes in visual thinking. Another and opposite

indication may be that students who have an interest in art can enhance their abilities by developing their general critical thinking skills by working hard in the other academic areas as well. This would be an excellent motivational message to students who have artistic ability and enthusiasm for art, but although they have the ability, are not as enthusiastic about their studies in the areas of math, science, literature, and social studies.

A negative or nonsignificant correlation would possibly point to the uniqueness of art as a field of study and reinforce the current theories of critical thinking and multiple intelligences.

Variable Analysis

To help in the understanding of this study, a further analysis of various factors which may influence the findings will be examined. The factors include:

1. teacher effect
2. parental involvement
3. cost or expenditure per student in the district
4. the extent to which general courses (English, social studies, math, science, etc.) teach critical thinking.

Population

The population for the study will be students in secondary advanced level classes. The sample population will come from at least three schools to create a balance in socioeconomic and ethnic groups and to compensate for teacher effects. The minimum N is hoped to be 50. At least three teachers are desired to lessen effect of the extraneous teacher variable.

Instruments

There will be two instruments in the study. The first is a drawing assessment scale to score particular criteria for quality of drawings. Three graders will be used for consistency and validity of scores. The second test will be a general critical thinking skills test such as the Cornell Critical Thinking test which has proven reliability and validity.

Methods

Drawings will be taken from advanced art classes in three different schools and marked for identification and comparison with the critical skills thinking test. Students will at that time be administered the critical skills thinking test. The test will be sent off for grading and the drawings will be

taken back to the three graders who will have been trained to evaluate the drawings on the set criteria. Scores will be tallied by adding the points under the weighted scale and then correlated with the scores from the critical skills thinking test.

Conclusions

Current literature suggests that no significant correlation will exist between critical thinking in one area and another. However, no empirical test has been conducted to support this theory in the area of visual art. Literature also indicates that there is a need to teach for transference of skills. If the conclusions support the current thinking then this study will serve to reinforce Gardner's theory of multiple intelligences and the view held by many in the area of critical thinking; that is, critical thinking is subject specific.

However, if there proves to be a significant correlation between scores on the drawings and the critical skills thinking test, it will reinforce the link between general intelligence and artistic ability outlined by Clark and Zimmerman (1984) and may allude to the possibility that artistic intelligence may be a gestalt of some, if not all, of the intelligences Gardner (1983) has outlined. It would be unwise to generalize to the transferability of critical thinking in other fields from this study. Specific research would be needed to test different areas.

Questions which might be raised and lead to further research if the study finds a positive correlation might be:

1. Is general critical thinking (as is above average intelligence) a precondition to artistic giftedness in drawing?
2. Does the development of general critical thinking improve artistic ability in artistically talented students?
3. Do critical thinking skills developed through the processes of art making enhance general critical thinking skills?
4. All else being equal (sex, IQ, SES) compare critical thinking scores of students who have had four years of art classes to those who have had none.
5. All else being equal (sex, IQ, SES) compare critical thinking scores of students who have had a DBAE art program to those who have had studio only.
6. All else being equal (sex, IQ, SES) compare critical thinking scores of students who have had an ARTS PROPEL model program to those who have had studio only.

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