

# Creative Teaching & Learning

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Creativity  
**Intelligence**  
Arts-based  
Education  
**Cultures of  
Thinking**  
Assessment  
Understanding

## From **Zero** **to Fifty**

Celebrating  
Five Decades of  
Project Zero

**Special Issue**

# Valuing Thinking in the Arts

The arts are often placed within a context of supporting other subjects and imbued with myths about how children’s artistry is developed. **Ellen Winner** outlines some research-based approaches to thinking about arts education and assessment.

**P**roject Zero was given its name in 1967 by its founder, philosopher Nelson Goodman, who quipped that there was little, if any, systematic knowledge about thinking in the arts – hence the name Zero. In this essay, I tell the story of arts research at Project Zero from the early 1970s until today, focusing on four strands of research: developmental studies of children’s artistry; our move into arts education and assessment with Arts PROPEL; then a move into wider analyses of others’ research, which led to the debunking of popular claims about the outcomes of arts education; and most recently our ethnographic study of the habits of mind that are actually taught (and we hope learned) in visual arts education, culminating in our Studio Thinking framework of visual arts education. We now have a considerable body of knowledge about thinking in the arts and a secure foundation from which to move forward to new initiatives.

### Developmental Trajectories in the Arts

While most developmental psychologists (influenced by Piaget) have focused on the development of logical and scientific thinking, at Project Zero we have focused on the development of *artistic* thinking. We have studied the beginnings of metaphor, drawing, music, and pretend play (a precursor to metaphor and to acting). One of the most intriguing findings to come out of this research was that of the ‘U-shaped curve’ in artistic development.<sup>1</sup> Most capacities studied by developmental psychologists simply get bigger and better with age. But occasionally, one sees a decline or disappearance after the early years of childhood, followed by a reappearance (in some or all individuals) later on.

A ‘U’ had already been demonstrated by child language researchers who noted that, for example, children who utter an incorrect form of an irregular verb in the past tense (I *goed*) had actually been using the correct form (I *went*) a few months earlier.<sup>2</sup> Ultimately, of course, they revert to the correct irregular form. This sequence demonstrates rule learning: at first young children have memorised a small set of irregular verbs and thus utter them correctly. Later they master the ‘add an –ed’ rule and overgeneralise this to irregular verbs – and thus ‘I goed’ actually represents a cognitive advance, even though it seems on



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the surface like a regression. When transitioning from *goed* to *went*, children have retained the –ed rule but now know when to apply it and when not.

We documented a U-curve in the arts, also explainable by the acquisition of the rules of the domain. Children's drawings at age 3–5 are wonderfully inventive and aesthetic, often reminding us of 20<sup>th</sup>-century paintings by artists such as Paul Klee or Joan Miro. At an early age, children do not care if they paint the sun green and the sky purple, and that is what so charms us (or at least those of us familiar with 20<sup>th</sup>-century Western art).

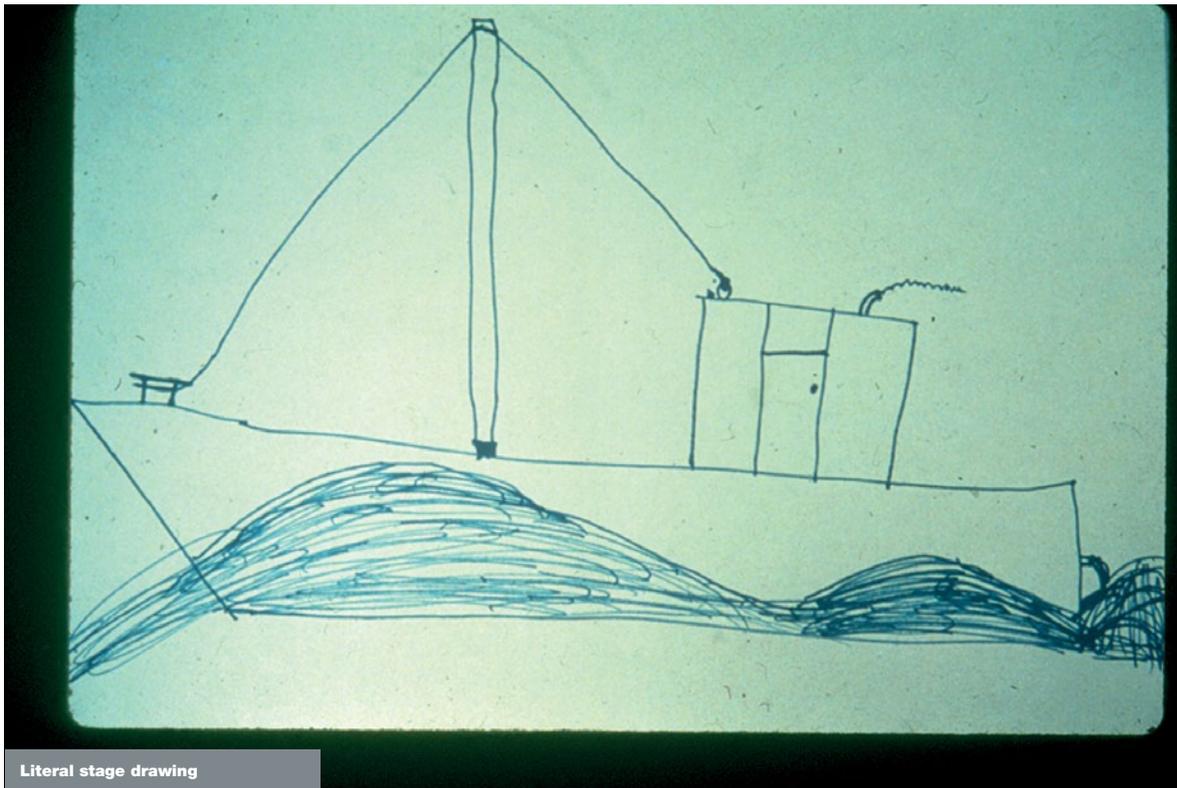
During the elementary school years, children enter what we dubbed the 'literal' stage. Children around 8, 9 or 10 become preoccupied with learning the rules of the drawing domain. They strive for realism and as a result, their drawings look conventional and far less interesting to us. Later, especially for those who go on to become artists, adolescents are willing to break these rules that they have established, drawing in a non-realistic, surrealistic or abstract style.

If we graph drawings by age in terms of aesthetic appeal (at least to Western, modernist eyes), we see a U-shaped curve, even though the decline is actually a sign of rule mastery. In short, young children's art is pre-conventional. In middle childhood children pass through a conventional stage, which only later are some able to override.

We documented the same kind of curve in the area of verbal metaphor. Whereas 3–5-year-olds make wonderful renamings (calling freckles *cornflakes* and skywriting a *scar*), a literal stage ensues in which children insist on using words the way they are supposed to be used.<sup>3</sup> This literal stage is not a bad thing, and it is likely that all children will pass through this, even those who will go on to become artists and poets. After all, one cannot break rules effectively and with intention until one has the rules to break.

Our conclusion: children pass from a pre-conventional to a conventional stage, and then, at least for those who go on to become amateur or professional artists, to a post-conventional stage. This results in a U-curve, though only some individuals actually reach the third stage of the U. The following pictures contrast a preschool painting and a literal stage drawing.





Literal stage drawing

### Assessment in the Arts

Due certainly to the influence of our founder, Nelson Goodman, we at Project Zero have always adopted a cognitive view of the arts. The arts involve thinking and serious learning and are not just an arena for feeling and self-expression (though they are that as well). And if the arts involve serious thinking and learning, then learning in the arts ought to be assessed.

In the 1980s, we were asked (and challenged) by the Rockefeller Foundation to develop forms of assessment in the arts that eschew standardised testing and capture the kinds of learnings that occur when children and adolescents study an art form. We accepted this challenge because we believed that assessing the arts signals the importance of learning in the arts.

To make matters more challenging, the Rockefeller Foundation asked us to work with the major multiple-choice test developers in the United States – the Educational Testing Service (ETS), and together to go beyond the use of standardised tests in this effort. We worked in three art forms: visual art, music and imaginative writing, which are documented in a series of handbooks.<sup>4</sup>

We coined our effort with the acronym PROPEL because of our belief in the centrality of making in arts education (production), the importance of looking closely at art (perceiving), and the role of thinking about one's process and evaluating one's learning (reflection). The name PROPEL is an acronym in which these three roles are embedded: PRO for production, which includes an R for reflection; PE for perception; and L for the learning that results.

The centrality of making was in contrast to another approach developed at the same time by Elliot Eisner and Stephen Dobbs at Stanford (funded by the Getty Trust) called Disciplinary Based Arts Education (DBAE), where making was only one of four equally important areas to be stressed, along with art history, art criticism, and art philosophy (aesthetics).<sup>5</sup>

Arts PROPEL introduced two concepts: *domain projects* and *processfolios*. Domain projects are projects that students work on over a long period of time, and that undergo many drafts and much reflection (both oral in conversation with the teacher and written in a journal). While DBAE argued for the teaching of art

history as a stand-alone part of art classes, even at the elementary school level, PROPEL sneaked in art history by helping students see connections between their work on a domain project and something professional artists had worked on.

For example, a student in visual arts who is struggling to create a portrait with dramatic lighting might study paintings by Rembrandt to see how he solved this problem; or a student trying to make a portrait in which the hands, rather than the face, are expressive might be motivated to study paintings by Rembrandt, Van Gogh or Picasso showing expressive hands.

In short, while PROPEL did not pretend to provide students with a systematic study of art history, it was founded on the belief that students are motivated to learn about art history in order to help them with their own work – which is why artists study the works of other artists. And as they worked, they should develop their skills of perception and reflection.

They would be asked to look closely at their work and at the work of artists, and they would be asked to reflect about their working process and to evaluate their drafts. These reflections could be oral or written, and all written reflections, including all drafts, would be saved, not in a *portfolio* (a collection of a student's best works), but in a *processfolio* (a collection that would reveal the students' process of thinking as she or he created works of art).

The PROPEL approach to assessment is formative and qualitative. Student work is to be continually assessed in terms of growth as the teacher, together with the student, reviews the learning that has taken place. And the evidentiary base of this assessment is not to be just the student's final works, but also the drafts along the way, and the written and oral reflection from the student about his or her process, goals and learning. Hence, the neologism *processfolio*.

### Debunking False Claims About the Outcomes of Arts Education

Just as Arts PROPEL was an attempt to avoid objective tests in assessing arts learning, REAP (Reviewing Education in the Arts Project) was an attempt to rectify specious arguments about why we should have the arts in our schools.

We have always argued that the arts should be a core aspect of every child's education. But all too often schools focus so heavily on traditional academic subjects that arts education is offered minimally, if at all. In an attempt to prod school systems to give the arts a more prominent role, some arts advocates have argued that the arts are important because they result in improved standardised

test scores and grades in core academic subjects, and lower high school drop-out rates.

As a result of such claims, many people believe that when schools infuse the arts into the curriculum, overall academic performance rises. Many people believe that music education raises children's IQ and improves their performance in maths and science. These views are popular in the media and held to particularly by individuals who lack first-hand experience in the arts.

Just what is the evidence for such claims? In 2000, we conducted a series of meta-analyses of studies (by other



researchers) to test these kinds of claims. We reviewed several hundred articles examining the relationship between arts education and academic achievement.<sup>6</sup>

First, we looked at the correlational evidence and it was positive. In an often cited paper, James Catterall showed that students who choose to take multiple arts classes in school score higher on standardised tests and have better grades in academic subjects, and this finding held across social class.<sup>7</sup> Many other correlational studies reported the same link: arts-involved students are academically strong.<sup>8</sup>

However, because the studies reporting this are correlational in design (simply assessing students in terms of arts involvement and academic performance), no causal conclusions can be reached. Does art study cause higher scores? Or do those with higher scores take more art? We can come up with numerous plausible non-causal explanations for such a link: e.g., academically strong students may be likely to come from families and/or schools that value the arts; academically strong students may be strongly motivated to learn in many areas; and academically weak students do not have time for the arts because they are guided into remedial classes or tutoring.

Unfortunately, however, studies reporting positive associations between arts involvement and academic performance have often been used to support the claim that studying the arts *causes* test scores to rise.

It is instructive to note that in the UK, where secondary school students choose to focus on only a few subjects, the opposite finding was reported: students who focused more on arts courses in secondary school tested lower than those who selected more on academic courses.<sup>9</sup>

No one would want to argue that choosing the arts courses causes test performance to decline! Rather, the explanation for this seems clear: academically strong students in the UK do not, by and large, choose to focus on the arts. In the US, students do not specialise in arts vs. more core academic courses; hence the findings in the UK do not mirror those in the US.

To allow a causal conclusion, an experimental or quasi-experimental design is called for. In such a design, a group of children getting a high dose of the arts

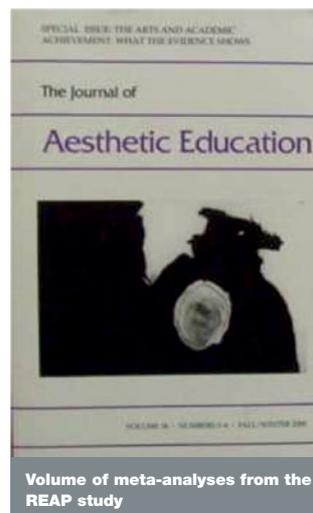


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must be compared to another similar group getting a low dose, and both groups must be assessed academically prior to and after receiving their dose of the arts.

When we looked at such studies, we found zero evidence that the arts group improved more than the non-arts group on any academic measure. It is important to stress here that this conclusion was based on a statistical synthesis of many studies. Thus, while some experimental studies might report a positive finding, overall, when the studies were combined in a meta-analysis in order to examine the strength of the overall effect, the results did not support a causal conclusion.

Despite our research to the contrary, the claim that the arts boost academic performance in the form of test scores and grades persists. This is unfortunate. These claims arise from good motivation – the attempt to secure a strong foothold for the arts in our schools. But those who live by such instrumental claims may die by them.

Once it becomes clear to the public that the arts do not boost academic performance, or even that they produce a modest effect but that direct instruction is far more effective, schools may in good conscience decide to drop the arts. Why teach the arts if all they are good for is boosting reading, writing, and maths, and they do not do this as well as teaching these subjects directly?

To avoid this trap, educators should not justify the arts in terms of what they can do for other subjects, but should rather stress the intrinsic importance of the arts (just as we believe in the intrinsic importance of maths and science). After all, no one ever demands that maths be justified for its effects on learning music or history. Demanding evidence of transfer of learning from the arts places an unfair burden on the arts, as psychologists have long shown that transfer is notoriously difficult to prove.<sup>10</sup>

### The Studio Thinking Framework

After the negative conclusions from REAP, which were greeted with anger from many arts advocates (as potentially hurtful to the arts in our schools), we undertook a more positively motivated research effort – documenting what the arts actually teach (beginning with the visual arts). Of course, the arts teach the techniques of each art form. But we asked what broad habits of mind might be taught alongside the teaching of technique.

This kind of work, we believed, could also lead to the possibility of discovering transfer, because the search for transfer must begin with a full understanding of what is learned in the ‘parent’ domain of a particular art form. Only then does it make sense to ask whether what is learned might transfer to performance in another domain outside of the arts.

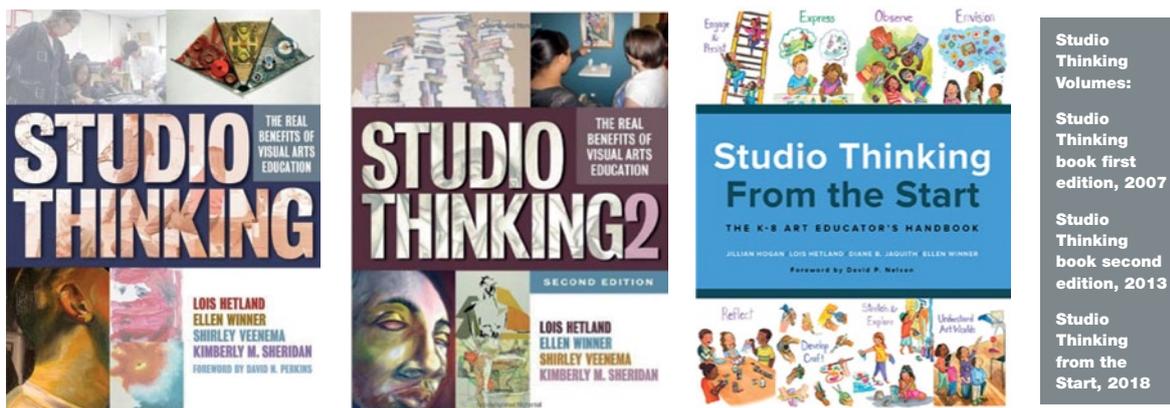
We undertook a qualitative, ethnographic study of visual arts classrooms. We elected to begin our study where we were most likely to find strong teaching in the arts, and hence we selected secondary schools (the Walnut Hill School for the Arts and the Boston Arts Academy) where students focus on an art form, spending at least three hours a day in art classes with teachers who are also practising artists. We studied visual arts teaching, but the same kind of study can and should be done in any art form in which one seeks to discover what is learned and what might transfer.

We videotaped classes over one year and interviewed teachers monthly. We then spent another year coding what we saw being taught. This led to the development of the Studio Thinking framework, where we documented the implicit and explicit teaching of eight broad, important and potentially generalisable habits of mind (or thinking dispositions) being taught.<sup>11</sup> One of these habits is the most obvious things students are taught – Develop Craft. We never saw this habit being taught in isolation. Rather, Develop Craft was always taught in tandem with one or more other habits. Each one of these habits of mind is potentially transferrable outside of the art studio – but transfer can never be assumed. It must be demonstrated. We called these *Studio Habits of Mind* and they are listed alphabetically in the following table.

## Studio Habits of Mind

Habit of Mind	Brief Definition	Sample Transfer Hypothesis
Develop Craft	Learn technique and care of materials.	Students understand that all areas of curriculum involve basic rules, and recognise importance of learning these.
Engage & Persist	Find problems that engage you, and stick with them.	Students are more likely to find engaging problems in any other area of the curriculum.
Envision	Imagine in images what you cannot observe directly.	Students are better able to envision molecular structures in chemistry.
Express	Convey meaning and personal vision.	Students develop a stronger personal voice in their non-fiction writing.
Observe	Open up your eyes and look more closely than you usually do.	Students' observational skills are strengthened in biology.
Reflect	Explain one's process (meta-cognition) and evaluate own and others' works.	When writing a history paper, students reflect on possible hypotheses and begin to evaluate strength of the evidence pro and con.
Stretch & Explore	Take risks and learn from mistakes.	Students are more likely to try out a new way of solving a maths problem.
Understand Art World	Recognise that artists learn from one another; recognise connections between own art and that in the professional art world.	Students begin to recognise links between work in a school subject area and work by professionals in the domain.

The Studio Thinking framework made explicit what many art teachers were already teaching. But we provided a framework which teachers have found very useful in their thinking and planning, as well as in their advocating for the importance of what they teach. And while the framework was developed with high school teachers, many teachers of grades K-8 have adapted this approach to their classrooms, as we documented in our most recent Studio Thinking book.<sup>12</sup>





We stress that transfer cannot be assumed. These skills must first be clearly taught and learned in the visual arts. These skills may or may not be used by students outside of the context in which they were learned. If skills do transfer, they may only do so when teachers explicitly teach for transfer.<sup>13</sup> The study of transfer of learning from one domain to another has a long and vexed history, and one should never assume that a skill that ‘sounds’ general is in fact generalised. Only careful research can tease apart those skills which generalise from those which do not, and the circumstances under which transfer occurs.

### Concluding Thoughts

I have highlighted some of the more unusual adventures we have had in our work in arts education at Project Zero: our study of the development in artistry in childhood that lead us to the surprising finding of a U-shaped curve; our work with the Pittsburgh public schools and the Educational Testing Service (known for its quantitative standardised summative assessment measures in academic areas) in the development of qualitative, non-standardised formative assessment measures in the arts; our debunking of the arts-academic transfer myth; and our attempt to conceptualise the real benefits of visual arts education – the Studio Habits of Mind.

I conclude by reflecting on what lies ahead. We need to document the kinds of habits of mind taught in other art forms, as there is no reason to expect that all of the arts teach the same kinds of thinking skills. And in fact, this is already beginning: my student Jillian Hogan has already conducted such a study in

high school music teaching, and my former student Thalia Goldstein is currently conducting such a study in theatre.<sup>14</sup> I also envision the development of measures of learning of each of the habits. I acknowledge that this is a daunting task, but without such measures we can make no transfer claims about the habits.

Finally, a few words about the relationship between arts education and moral, political and civic awareness. Any art form can be practised for the sake of art alone. The arts can also be (and have often been) practised to express values such as patriotism, nationalism or outrage at injustice. It is important for students to understand the uses (and abuses) to which the arts have and can be put, and to help students develop a meta-cognitive awareness of how they are using the arts – as a means to explore pattern, colour, beauty, emotion, language, etc., and/or as a means to express their own values, whatever these may be. Towards this end, arts educators would do well to introduce students to how the arts have been used – including contemporary art today, which is often used by marginalised groups to convey outrage at injustice.

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## Notes

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