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# Process Learning

## Eight Big Ideas Behind the Constructionist Learning Laboratory

By Dr. Seymour Papert (1999)

*From the Ph.D. dissertation, "An Investigation of Constructionism in the Maine Youth Center," by Gary Stager, 2007.*

The first big idea is **learning by doing**. We all learn better when learning is part of doing something we find really interesting. We learn best of all when we use what we learn to make something we really want.

The second big idea is **technology as building material**. If you can use technology to make things you can make a lot more interesting things. And you can learn a lot more by making them. This is especially true of digital technology: computers of all sorts including the computer- controlled Lego in our Lab.

The third big idea is **hard fun**. We learn best and we work best if we enjoy what we are doing. But fun and enjoying doesn't mean "easy." The best fun is hard fun. Our sports heroes work very hard at getting better at their sports. The most successful carpenter enjoys doing carpentry. The successful businessman enjoys working hard at making deals.

The fourth big idea is **learning to learn**. Many students get the idea that "the only way to learn is by being taught." This is what makes them fail in school and in life. Nobody can teach you everything you need to know. You have to take charge of your own learning.

The fifth big idea is **taking time - the proper time for the job**. Many students at school get used to being told every five minutes or every hour: do this, then do that, now do the next thing. If someone isn't telling them what to do they get bored. Life is not like that. To do anything important you have to learn to manage time for yourself. This is the hardest lesson for many of our students.

The sixth big idea is the biggest of all: **you can't get it right without getting it wrong**. Nothing important works the first time. The only way to get it right is to look carefully at what happened when it went wrong. To succeed you need the freedom to goof on the way.

The seventh big idea is **do unto ourselves what we do unto our students**. We are learning all the time. We have a lot of experience of other similar projects but each one is different. We do not have a pre-conceived idea of exactly how this will work out. We enjoy what we are doing but we expect it to be hard. We expect to take the time we need to get this right. Every difficulty we run into is an opportunity to learn. The best lesson we can give our students is to let them see us struggle to learn.

The eighth big idea is we are entering a **digital world** where knowing about digital technology is as important as reading and writing. So learning about computers is essential for our students' futures BUT the most important purpose is using them NOW to learn about everything else.



This document is translated into more than 15 languages at

<https://inventtolearn.com/around-the-world-with-the-8-big-ideas-of-the-constructionist-learning-lab/>

**Figure 1.2.** Eight Studio Habits of Mind

We present the Habits of Mind in an oval because they are non-hierarchical, so none logically comes first or last. The habits do not operate and should not be taught in a set sequence that privileges one or another over the others. Instead, one can begin with any habit and follow its generative energy through dynamic, interacting habit clusters that animate studio experiences as they unfold.

**Develop Craft**

**Technique:** Learning to use tools (e.g., viewfinders, brushes), materials (e.g., charcoal, paint); learning artistic conventions (e.g., perspective, color mixing)

**Studio Practice:** Learning to care for tools, materials, and space

**Engage and Persist**

Learning to embrace problems of relevance within the art world and/or of personal importance, to develop focus and other mental states conducive to working and persevering at art tasks

**Understand Art Worlds**

**Domain:** Learning about art history and current practice  
**Communities:** Learning to interact as an artist with other artists (i.e., in classrooms, in local arts organizations, and across the art field) and within the broader society

**Stretch and Explore**

Learning to reach beyond one's capacities, to explore playfully without a preconceived plan, and to embrace the opportunity to learn from mistakes and accidents

**Envision**

Learning to picture mentally what cannot be directly observed and imagine possible next steps in making a piece

**Reflect**

**Question and Explain:** Learning to think and talk with others about an aspect of one's work or working process  
**Evaluate:** Learning to judge one's own work and working process, and the work of others in relation to standards of the field

**Express**

Learning to create works that convey an idea, a feeling, or a personal meaning

**Observe**

Learning to attend to visual contexts more closely than ordinary "looking" requires, and thereby to see things that otherwise might not be seen



## **Deborah Meier's Five Habits of Mind**

as originally explored in the book, *The Power of Their Ideas: Lessons for America from a Small School in Harlem*

1. **Evidence** – asking, “How do you know?”
2. **Connections** – asking, “How is this connected to something else I already know or care about?”
3. **Perspective** or **Viewpoint** – asking, “From whose perspective is this story being told?”
4. **Conjecture** – asking, “How can I imagine a different outcome?”
5. **Relevance** – asking, “Why is this important?”

# The Coalition of Essential Schools: Common Principles



## Learning to use one's mind well

The school should focus on helping young people learn to use their minds well. Schools should not be "comprehensive" if such a claim is made at the expense of the school's central intellectual purpose.

## Less is more: depth over coverage

The school's goals should be simple: that each student master a limited number of essential skills and areas of knowledge. While these skills and areas will, to varying degrees, reflect the traditional academic disciplines, the program's design should be shaped by the intellectual and imaginative powers and competencies that the students need, rather than by "subjects" as conventionally defined. The aphorism "less is more" should dominate: curricular decisions should be guided by the aim of thorough student mastery and achievement rather than by an effort to merely cover content.

## Goals apply to all students

The school's goals should apply to all students, while the means to these goals will vary as those students themselves vary. School practice should be tailor-made to meet the needs of every group or class of students.



## Personalization

Teaching and learning should be personalized to the maximum feasible extent. Efforts should be directed toward a goal that no teacher have direct responsibility for more than 80 students in the high school and middle school and no more than 20 in the elementary school. To capitalize on this personalization, decisions about the details of the course of study, the use of students' and teachers' time and the choice of teaching materials and specific pedagogies must be unreservedly placed in the hands of the principal and staff.

## Student-as-worker, teacher-as-coach

The governing practical metaphor of the school should be "student-as-worker", rather than the more familiar metaphor of "teacher as deliverer of instructional services." Accordingly, a prominent pedagogy will be coaching students to learn how to learn and thus to teach themselves.

## Demonstration of mastery

Teaching & learning should be documented & assessed with tools based on student performance of real tasks. Students not yet at appropriate levels of competence should be provided intensive support & resources to assist them quickly to meet those standards. Multiple forms of evidence, ranging from ongoing observation of the learner to completion of specific projects, should be used to better understand the learner's strengths & needs, & to plan for further assistance. Students should have opportunities to exhibit their expertise before family & community. The diploma should be awarded upon a successful final demonstration of mastery for graduation - an "Exhibition." As the diploma is awarded when earned, the school's program proceeds with no strict age grading & with no system of "credits earned" by "time spent" in class.

## A tone of decency and trust

The tone of the school should explicitly and self-consciously stress values of unanxious expectation, of trust, and of decency (fairness, generosity, and tolerance). Incentives appropriate to the school's particular students and teachers should be emphasized. Families should be key collaborators and vital members of the school community.

## Commitment to the entire school

The principal and teachers should perceive themselves as generalists first (teachers and scholars in general education) and specialists second (experts in but one particular discipline). Staff should expect multiple obligations (teacher-counselor-manager) and demonstrate a sense of commitment to the entire school.

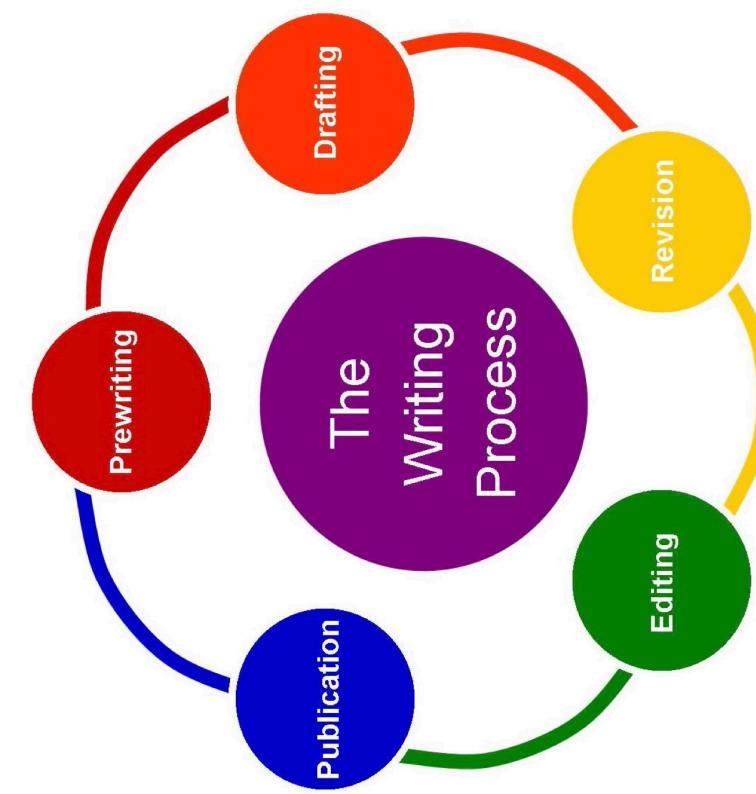
## Resources dedicated to teaching and learning

Ultimate administrative and budget targets should include student loads that promote personalization, substantial time for collective planning by teachers, competitive salaries for staff, and an ultimate per-pupil cost not to exceed that at traditional schools by more than 10 percent. To accomplish this, administrative plans may have to show the phased reduction or elimination of some services now provided to students in many schools.



## Democracy and equity

The school should demonstrate non-discriminatory and inclusive policies, practices, and pedagogies. It should model democratic practices that involve all who are directly affected by the school. The school should honor diversity and build on the strength of its communities, deliberately and explicitly challenging all forms of inequity.



# Languages for Learning

Language	URL
<b>Turtle Art</b>	<a href="http://playfulinvention.com/webturtleart">playfulinvention.com/webturtleart</a> & <a href="http://turtlearth.org">turtlearth.org</a>
<b>Scratch</b>	<a href="http://scratch.mit.edu">scratch.mit.edu</a>
<b>Snap!</b>	<a href="http://snap.berkeley.edu">snap.berkeley.edu</a>
<b>Lynx</b>	<a href="http://lynxcoding.club">lynxcoding.club</a>
<b>microBlocks</b>	<a href="http://microblocks.fun">microblocks.fun</a>
<b>Microsoft MakeCode</b>	<a href="http://makecode.com">makecode.com</a>
<b>TurtleStitch</b>	<a href="http://turtlestitch.org">turtlestitch.org</a>
<b>Beetleblocks</b>	<a href="http://beetleblocks.com">beetleblocks.com</a>
<b>Wolfram Language</b>	<a href="http://cmkfutures.com/wolfram">cmkfutures.com/wolfram</a>
	<a href="http://inventtoteach.com/stuff">inventtoteach.com/stuff</a>

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