



# PROJECT ZERO

JULY 2010

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# Director's Note

In 1967, the philosopher Nelson Goodman put together an interdisciplinary team of scholars and educators at the Harvard Graduate School of Education to explore how children and adults learn in and through the arts. Goodman believed there was a lack of demonstrable knowledge about the topic, and thus “Project Zero” was born. It was a generative (if controversial!) starting place. In the intervening decades, we have continued to investigate learning and the arts, and our work has expanded to include investigations into the nature of intelligence, understanding, thinking, creativity, and other essential aspects of human learning. Over the years, we have conducted dozens of major research initiatives; published over 90 books and hundreds of articles and reports; collaborated with countless schools, museums, and other partners; and worked with thousands of teachers.

Project Zero turns 43 this year. It's not an anniversary that traditionally calls for great fanfare, but we're feeling celebratory nonetheless. In these early years of the 21st century, Project Zero's core ideas about thinking and learning seem more relevant than ever, and they provide firm footing for our work. At the same time, we have urgent and exciting new frontiers to explore. As you'll see in this brochure, questions about thinking, understanding, conceptual development, ethics, and the arts continue to provide a geography for our work. And within this admittedly vast geography, the same fundamental questions that have been our compass for decades continue to guide us:

What's worth understanding today and tomorrow?

What does learning look like?

How and where does learning thrive?

Our inquiries into these questions have yielded theories and frameworks that are familiar to many. For example, many people know Project Zero through the Theory of Multiple Intelligences or the Teaching for Understanding framework. Others may have been introduced to us through Arts PROPEL or Arts Survive, Visible Thinking or Studio Thinking, Understandings of Consequence or Understanding for Organizations, GoodWork™ or GoodPlay. In

different ways, all of these projects represent a stand we take on the fundamental questions that guide our work.

While the questions that drive Project Zero's activities remain constant, our work these days is invigorated by new frontiers. For example, through seminars, projects, and now a new summer institute, we are exploring the future of learning by examining how forces such as globalization, the digital revolution, and mind/brain research are shaping the nature of learning and the practice of teaching.

Our work is further invigorated by our rapidly expanding global community of colleagues. From Mombasa to Michigan to Melbourne, educators around the world are bringing Project Zero practices to new settings and contributing to the development of new ideas. We're especially excited by the growing connections between our global colleagues that are sparked through Project Zero work: Glasgow educators connect with educators in Malawi through Visible Thinking; Studio Habits of Mind inspires a collaborative distance-learning project between Oakland and Bangalore; educators using Teaching for Understanding across four continents connect with each other through a WIDE World online course. These are just a few of the many connections we've heard about lately. As Project Zero looks ahead to the future, one of the things we're especially interested in is developing new ways to encourage and enrich these collegial interactions.

So, as birthdays go, 43 looks auspicious: We have lots to think about, and lots of work to do. The challenges of the 21st century encourage us to pursue the fundamental questions that have been guiding our work for over four decades with renewed vigor. We eagerly look forward to deepening connections with—and among—our colleagues and collaborators worldwide.

SHARI TISHMAN

Director, Project Zero

Harvard Graduate School of Education



# Artful Thinking

**“If a picture is worth a thousand words, a painting must be worth two thousand.”**

ARIANNA BONNES, 9TH GRADE

In New Bedford, Massachusetts, Chris Jones's history class is studying the Renaissance. Mr. Jones shows his students a painting from the period and, drawing on a technique from the Artful Thinking program, poses three simple questions: What do you see in this painting? What do you think about it? What does it make you wonder? Arianna's wonderful insight—that works of art are dense with meaning and rich with communicative power—follows an animated class discussion filled with provocative questions and interesting ideas.

Developed by Project Zero in collaboration with the Traverse City, Michigan, Area Public Schools (TCAPS), Artful Thinking uses the power of art to teach students to think. The program was designed to be used alongside the regular curriculum and in all grades and subjects, and its goals are twofold: to help teachers create rich connections between works of art and other things students study; and to use art as a force for developing students' thinking dispositions.

## THINKING DISPOSITIONS?

Most educators believe that it's important to teach students to think. Traditionally, efforts to teach thinking foreground the teaching of thinking skills—reasoning skills, problem solving skills, and the like. Thinking skills are certainly important. But if we want students to use their skills frequently, in diverse and novel contexts, then simply teaching skills isn't enough. Research at Project Zero and elsewhere has shown that motivation, values, cultural context, and alertness to opportunity are also important factors in developing the intellectual behaviors—the thinking dispositions—that are characteristic of good thinkers. Artful Thinking foregrounds six thinking dispositions that have special power for exploring works of art and other complex artifacts and topics. The six dispositions are captured in the image of the Artful Thinking Palette.

## CULTIVATING DISPOSITIONS THROUGH THINKING ROUTINES

Thinking dispositions are habits of mind, and, like any other kind of habit, they tend to develop when we engage in specific patterns of behavior regularly and frequently. Accordingly, at the heart of Artful Thinking are several “thinking routines”—short, easy-to-learn procedures that students use over and over again to deepen their thinking in various ways. For example, the three questions that guided the discussion in Chris Jones's class constitute a thinking routine called See-Think-Wonder that encourages careful observation and question-asking. Other thinking routines engage students in exploring multiple viewpoints, forming careful interpretations, uncovering complexity, and more. Thinking routines are designed for flexible and frequent use. They can be used solo or in groups, and with a wide range of topics and works of art. Above all, they are designed to encourage habitual patterns of thinking that deepen and extend students' thinking about the topic at hand, whether it's a Renaissance painting, an image from popular culture, an historical event, or a mathematical operation.

## WHY TEACH THINKING THROUGH ART?

Thinking routines work well with all kinds of topics, so why choose art as a starting place? Two reasons: One has to do with how art makes us think; the other has to do with what art makes us think about. In terms of the former, consider the kinds of things we have in mind when we talk about teaching thinking. We want students to learn to ask thoughtful questions, to construct careful explanations, to explore new viewpoints, to see the complexity and dimensionality of the topics they study, to find puzzles worth pursuing, and so on. These forms of thinking come naturally when looking at art, because art naturally invites them. When Arianna tells us that a painting is worth two thousand words, she's telling us that works of art are packed with meaning. And she's right: Works of art are metaphorical, often multi-layered and ambiguous, often full of detail. They express artists' intentions and their un-intentions, and they condense many meanings and purposes. Moreover, works of art are often made with the purpose of engaging our attention. In short, looking at art teaches us to think because works of art tend to be both complex and engaging: They naturally invite and reward deep and extended thought.

But of course artworks are more than simply levers for teaching thinking; they are also about important things. So another reason to teach thinking through looking at art has to do with the meanings of artworks themselves and the multiple ways they connect to the curriculum. Works of art provoke rich, multilayered meaning-making in ways unlike other

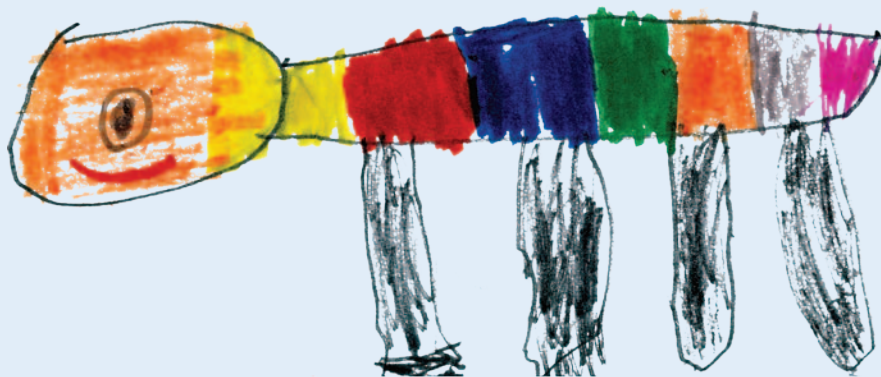
disciplines. They raise questions, evoke connection-making, and transform the shape of inquiry. There are many ways to connect art to the curriculum, from targeted connections between the content of artworks and specific topics or themes, to more open-ended approaches that leave loose the disciplinary directions in which a work of art will lead. Artful Thinking is in favor of any and all curricular connections, so long as students are invited to think directly and deeply about an artwork itself. The Artful Thinking routines help students uncover the multiple meanings of artworks by inviting them to ask creative questions, make diverse observations, explore multiple viewpoints, and seek personal connections.

### ARTFUL THINKING RESEARCH

Artful Thinking is part of the Visible Thinking Initiative at Project Zero. It has its roots in Project Zero's long history of research on thinking dispositions, as well as in previous projects on teaching thinking, such as Art Works for Schools and Innovating with Intelligence. Research conducted while developing the program in Traverse City focused on conceptual change. We investigated the effects of the program on students' concepts of thinking, and its effects on both students' and teachers' concepts of art. We found evidence of growth in all areas. (Visit [www.pz.harvard.edu/tc/](http://www.pz.harvard.edu/tc/) to learn more about the Traverse City research.)

**PROJECT STAFF:** Shari Tishman, Patricia Palmer

**FUNDING:** Traverse City, Michigan, Area Public Schools through an Arts in Education Model Development and Dissemination grant from the U.S. Department of Education



# Cultures of Thinking

The Cultures of Thinking (CoT) project at Bialik College (a K–12 school located in Melbourne, Australia) extends the long line of research in the area of thinking dispositions conducted at PZ. This research shows that teaching thinking is more than the development of skills; it must also attend to nurturing students' inclination and motivation to think, as well as their awareness of opportunities for using their thinking abilities. This development is not a matter of direct instruction, but rather the “enculturation” of thinking through students' immersion in a rich learning culture where thinking is highly visible and apparent. At Bialik College, the CoT project team couples the Visible Thinking approach of using documentation and thinking routines to make students' thinking visible with an emphasis on developing the group culture of the school and classroom.

We define “Cultures of Thinking” as places where a group's collective as well as individual thinking is valued, visible, and actively promoted as part of the regular, day-to-day experience of all group members. Drawing on previous research by Ritchhart (2002), the CoT project focuses teachers' attention on the eight cultural forces present in every school and classroom. These forces act as shapers of the group's cultural dynamic and consist of language, time, environment, opportunities, routines, modeling, interactions, and expectations. As teachers strive to create a culture of thinking in their classrooms, they make time for thinking, develop and use a language of thinking, make the classroom environment rich with the documents of thinking processes, look for opportunities for student thoughtfulness, use thinking routines as supports and scaffolds, model and make their own thinking visible, interact with students in a way that shows an interest in and respect for students' thinking, and send clear expectations about the importance and value of thinking in learning.

This work doesn't happen by teachers merely implementing a defined set of practices, however. It must be supported by a rich professional culture. Indeed, a core premise of the CoT project is that for classrooms to be cultures of thinking for students, schools must be cultures of thinking for teachers. In our work at Bialik

College, we began by forming two focus groups of eight teachers with whom we worked intensively. We have since expanded to eight groups. These groups are all heterogeneous, including teachers from K–12 and of various subjects. This is a departure from traditional forms of professional development that target specific subject areas or levels. We have found that by working with a diverse range of teachers broaden their perspectives on teaching and a sense of shared mission develops. Team teaching efforts have emerged out of the group that might otherwise never have arisen. In addition, the group helps teachers gain a developmental perspective on students' thinking.

Over the last five years the CoT project's research agenda has sought to better understand changes in teachers' and students' attitudes and practices as thinking becomes more visible in the school and classroom environment. Toward this end, we developed measures of school and classroom thoughtfulness to capture these changes. We also conducted case studies of teachers and looked at how students' conceptual understanding of the domain of thinking developed. Our research to date has shown that students recognize CoT classrooms as being more focused on thinking, learning, and understanding, and more likely to be collaborative in nature than those of teachers not in the project. Teachers in the project notice that as they work with CoT ideas their classrooms shift in noticeable ways. Specifically, they find that they give thinking more time, discussion increases, and their questioning of students shifts toward asking students to elaborate on their thinking rather than testing them on the recall of facts and procedures. Our research on students' conceptual development found that over the course of a single school year the average CoT classroom students' growth and maturity, with respect to understanding thinking processes that they themselves use and control, increased by twice the normal rate one might expect by virtue of maturity alone (Ritchhart, Turner, Hadar, 2009).

As a development as well as a research project, we sought to serve the needs of the school while creating materials for broad educational use. These include frameworks and tools for professional learning communities, videos, frameworks for understanding classroom questioning, and an upcoming book on Making Thinking Visible due in 2011. Though the research phase of the project ended in 2009, the project continues through 2011 in a support phase to develop internal leadership and outreach around these ideas.

**PROJECT STAFF:** Ron Ritchhart, David Perkins, Becca Solomon

**FUNDING:** Bialik College (Melbourne, Australia) under the patronage of Abe and Vera Dorevitch

The GoodWork™ Project is a large-scale effort to identify individuals and institutions that exemplify good work—work that is excellent in quality, socially responsible, and meaningful to its practitioners and to increase the incidence of good work in society. The project began as a social scientific investigation of how workers confront—or fail to confront—the ethical challenges that arise at a time of rapid change, powerful market forces, and few counterforces. From 1996 to 2006, the research team conducted over 1,200 interviews with leading professionals in journalism, genetics, theater, philanthropy, law, business, medicine, pre-collegiate education, and higher education. We also interviewed budding young professionals in various fields. Our findings have been reported in numerous articles, papers, and books. For further information, please visit [www.goodworkproject.org](http://www.goodworkproject.org)

While we continue to write and speak about good work, at present our attention is focused on the following.

**1 THE APPLICATION OF OUR IDEAS.** The project has launched several practical initiatives aimed at encouraging good work, including a Traveling Curriculum in Journalism and the GoodWork™ Toolkit.

The Traveling Curriculum in Journalism (a collaboration with Bill Kovach and Tom Rosenstiel of the Committee of Concerned Journalists) engages journalists in guided conversations about the core mission of journalism, pressing challenges and obstacles that make that mission elusive, and strategies for achieving good work in the present climate.

The GoodWork™ Toolkit is a series of materials that introduce and raise consciousness about concepts of “good work”; in working with these materials, young students and veteran professionals alike explore, discuss, and articulate core responsibilities, beliefs and values, and goals for work. The Toolkit provides a framework for individuals to consider the kinds of workers they are now and the kinds of professionals they want to become. We recently launched a website ([www.goodworktoolkit.org](http://www.goodworktoolkit.org)) where educators from around the globe are able to access our materials and share their experiences with one another.

**2 A STUDY ON SUCCESSFUL AND UNSUCCESSFUL COLLABORATIONS IN THE FIELD OF NONPROFIT EDUCATION,** soon to be expanded to examine another domain. We are interested in the factors that increase the likelihood of success, warning signs that the collaboration is not progressing satisfactorily, and other crucial elements in collaborative efforts.

**3 WE ARE CONDUCTING A STUDY OF THE PLACE OF QUALITY IN A CONSUMERIST ERA AND THE NEW DIGITAL AGE.** Using both qualitative interviews and extensive quantitative analyses, we are exploring understandings of quality with respect to experiences, objects, and services.

**4 A SET OF STUDIES OF TRUST AND TRUSTWORTHINESS.** Inspired by GoodWork™ Project findings that suggested the demise of trust, we

launched studies of how, and to whom, young people extend or withhold trust. Links between civic engagement and trust are also under study.

**5 A SET OF STUDIES ON THE NEW DIGITAL MEDIA.** The GoodPlay Project is a study of the ways young people think about, and manage, ethical issues as they engage with new media, including online games, blogs, and social networks. We are also exploring how civic-minded youth use new media in service of civic and political goals. The Developing Minds and Digital Media Project is a broader investigation of the ways new media may be affecting young people’s minds, including their notions of intimacy, imagination, and identity.

**6 GOOD WORK IN A GLOBAL CONTEXT.** Having focused until now almost exclusively on the U.S. context, we are seeking knowledge, collaborations, and collection of data in other countries and regions of the world. Collaborations are already under way in India and Scandinavia.

**PROJECT STAFF:** Howard Gardner, Lynn Barendsen, Katie Davis, Kathleen Farrell, Wendy Fischman, Andrea Flores, Erhardt Graeff, Carrie James, Emily Kaplan, Margaret Rundle, Jen Ryan, Margaret Weigel, Mihaly Csikszentmihalyi (Claremont Graduate University), William Damon (Stanford University), Jeanne Nakamura (Claremont Graduate University).

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# Interdisciplinary Studies Project

## THE RISE OF INTERDISCIPLINARITY

Some questions simply cannot be addressed through a single discipline. Decisive shifts in knowledge production characterize the turn of the twenty-first century. Collaborations by medical doctors, engineers, computer scientists, and molecular biologists are revolutionizing medical care through new, minimally invasive surgical technologies. Pressing social issues like poverty challenge scientists, historians, psychologists, and artists to converge on solutions that transcend single-disciplinary perspectives. Interdisciplinary understanding (i.e., the ability to integrate knowledge from two or more disciplines to create products, solve problems, or produce explanations) is a hallmark of contemporary problem-solving and discovery—and a primary goal for education today.

The Interdisciplinary Studies Project examines the challenges and opportunities of interdisciplinary work carried out by researchers, college faculty, secondary school teachers, and students in a variety of research and educational contexts. We work on a novice-expert paradigm: Building on an empirical understanding of the cognitive, social, emotional, and institutional dimensions of interdisciplinary work among experts working in exemplary institutions, our project develops frameworks and practical tools to understand interdisciplinary student learning and guide quality interdisciplinary education.

## EXPERT INTERDISCIPLINARY STUDIES EXPERTS' STUDY

Our examination of how experts work in leading interdisciplinary research centers produced preliminary characterizations of the interdisciplinary mind at work, revealing the strategies used to negotiate disciplinary boundaries and assess the quality of interdisciplinary work, as well as the qualities of intellectual character exhibited by these professionals (e.g., a disposition to tackle risky and ill-defined problems).

## ASSESSING INTERDISCIPLINARY WORK AT THE FRONTIER

Building on the previous study and our proposed research evaluation framework, we collaborated with the American Association for the Advancement of Science to gather leading science policymakers, administrators, researchers, and funders of interdisciplinary research to examine innovations in assessing interdisciplinary work.

## SUCCESSFUL INTERDISCIPLINARY COLLABORATIONS STUDY

We studied nine well-established expert collaborations (e.g., MacArthur research networks) to understand the social, cognitive, and institutional dynamics underlying their success. Our interviews revealed that emotions and identity were central in expert interdisciplinary exchange, and we advanced a novel integrative framework to examine conditions for successful interdisciplinary collaborations: Shared Socio-Emotional-Cognitive Platforms [SSEC].

## INTERDISCIPLINARY EDUCATION STUDIES COLLEGIATE/PRE-COLLEGIATE STUDY

Our study of exemplary collegiate and pre-collegiate interdisciplinary educational programs established preliminary parameters for a pedagogy of interdisciplinarity, identified strategies teachers use to integrate disciplinary views in the classroom, and characterized successful assessment of student progress. Our in-depth, semi-structured interviews with teachers and students revealed purposes of interdisciplinary teaching and learning, tensions and continuities between disciplinary and interdisciplinary education, and some common misconceptions.

## THE TEACHER SEMINAR: EXEMPLARY EXPERIMENTS

Over two years we worked with twelve teachers to replicate Project Zero's Teaching for Understanding (TfU) project to build usable knowledge about teaching for interdisciplinary understanding, assessing student outcomes, and supporting professional development. We subsequently formalized the elements of education for interdisciplinary understanding at the pre-collegiate level.

## INTERDISCIPLINARY TEACHING IN THE INTERNATIONAL BACCALAUREATE MIDDLE YEARS PROGRAM

Building on the teaching for interdisciplinary understanding (TfID-U) framework, we developed a teacher's guide to inform quality planning and practice in the International Baccalaureate's Middle Years Program after documenting exemplary interdisciplinary teaching practices in countries around the world.

## INTERDISCIPLINARY STUDENT RESEARCH AND GLOBAL CONSCIOUSNESS IN THE INTERNATIONAL BACCALAUREATE

Building on the TfID-U framework and our emerging work on global consciousness, we are currently studying how engaging in interdisciplinary research projects on matters of global and local significance impacts students' sensitivity to global developments, their capacity for understanding them in interdisciplinary depth, and their revised sense of themselves as global and local actors. The International Baccalaureate Diploma Program has adopted this approach to essay writing as part of its graduation requirements.

## TEACHING AND LEARNING ABOUT THE WORLD AT THE INTERNATIONAL SCHOOL OF UGANDA

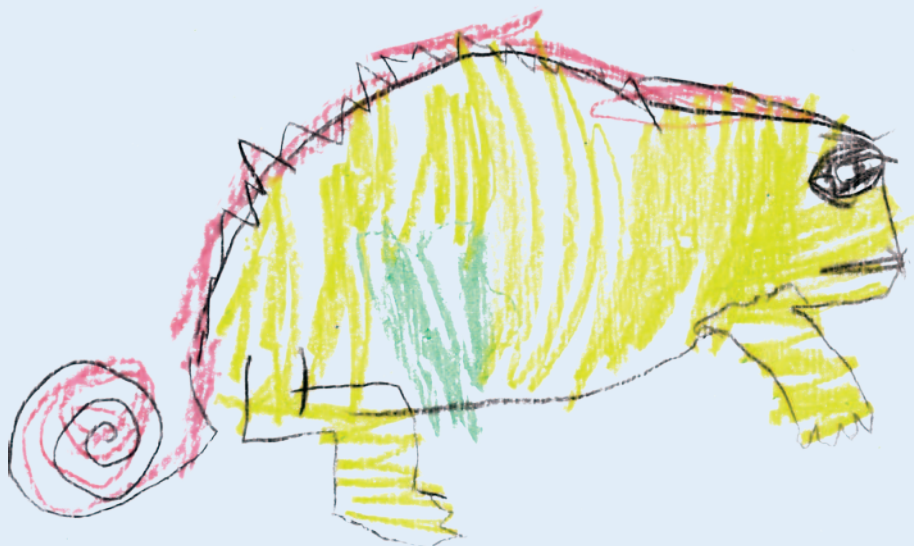
We examine the role of documentation and making learning visible in the development of interdisciplinary learning communities at the International School of Uganda. A partnership with four schools in extreme poverty allows us to further develop and test our frameworks.

## INFORMING EDUCATIONAL POLICY ON GLOBAL COMPETENCE

Through this initiative in collaboration with the Asia Society and the Council of Chief State School Officers, we are working with curriculum officers and experts nationwide to define global competence and create a framework for its inclusion in state curricula. The definition builds on and expands our conceptions of global consciousness and highlights the key role of disciplinary and interdisciplinary student work. Twenty-six states are adopting the framework in 2011.

**PROJECT STAFF:** Veronica Boix Mansilla, Flossie Chua, Liz Dawes, Sabine Hoidn, Analia Ivanier, Arzu Mistry, Melissa Rivard, Kyoko Sato, Joan Soble, Lina Yamashita

**FUNDING:** The Atlantic Philanthropies, International Baccalaureate, International School of Uganda, Canadian Institute for Advanced Research, Asia Society



# Learning in and from Museum Study Centers

The Harvard Art Museum (HAM) is home to two well-known study centers. The Agnes Mongan Center for the Study of Prints, Drawings, and Photographs specializes in works on paper from the collection of the Fogg Museum. The Study Room of the Busch-Reisinger Museum offers works on paper as well as small-scale sculpture. Open to the public, both centers offer visitors quiet, well-lit spaces for the intimate study of works of art and artifacts.

Anticipating a major renovation and expansion that would include the study centers, HAM took the opportunity to reflect on its educational mission and identify its strengths. The museum has always known that its study centers are powerful places of learning, and it invited Project Zero to help explain why.

Over the course of a year, Project Zero researchers conducted several strands of research, including interviews with museum staff, observations and interviews in the study centers with a diverse range of visitors, interviews with faculty from several disciplines, and an extensive review of related literature. As the research unfolded, it quickly became apparent that although study centers were in many ways rarified environments, they held powerful lessons for educational environments more broadly—for museum galleries, school classrooms, university lecture halls and laboratories, and any other setting where people learn from objects.

What makes learning in study centers special? In one sense, the answer is as varied as the works and themes visitors come to explore. A physician looks at images of wounded soldiers by German artist Otto Dix and deepens his understanding of post-traumatic stress disorder. History students examine the intricate pattern of a Cherokee woven basket and gain a window into the character of Native American life. A contemporary artist observes the erasure marks in a Cezanne drawing and makes a connection with her own artistic process. Students studying the history of science examine a collection of antique light bulbs and are surprised to be moved by their beauty. These sorts of understandings are singular, yet our research uncovered a broader theme: When talking about their experience, visitors tend to mention learning several

kinds of things in one visit. For example, they talk about learning about specific artistic materials and methods, and about artistic and creative processes more generally. They talk of learning about the meanings of particular works and about the different disciplinary lenses the pursuit of meaning invites (how would a scientist, historian, or artist look at this?). They talk about learning about the process of critical looking itself, and about gaining visual understandings that can't be put into words. To generalize, when visitors talk about learning in study centers, they tend to describe complex knowledge across multiple dimensions.

Here is the connection between study center learning and learning more broadly. One of the great purposes of education is to help people develop the capacity to appreciate and understand the complexity of the world around them. The opportunity to develop complex knowledge is more than just a nicety for elite students in academic art museums, it is a necessity for all students. As educators, we need to know all we can about how to develop it.

So how do study centers help people develop complex knowledge? One answer points to the objects study centers contain—rare and often beautiful objects that curators and collectors have deemed worthy of contemplation and study. But while such objects can yield much complex knowledge, so, too, can everyday objects. Consider, for example, the complex themes of human history suggested by a dinner fork. Consider, too, the fact that museum visitors often look at rare and beautiful objects and don't think deeply about them. Complex knowledge doesn't inhere to objects, it is a quality of mind, and one way study centers encourage it is by evoking in visitors a set of cognitive expectations—expectations that profoundly shape the way they look and think about the objects in front of them.

When visitors come to a study center, they typically expect to spend some time. Whether they stay half an hour or half a day, they come mentally prepared to devote significant time to the experience. Relatedly, visitors expect to look closely at objects—to examine them carefully and attend to their nuances and details. Perhaps most importantly, visitors expect that their own impressions and ideas will be a source of insight. Regardless of whether they are experts or novices, no matter what kind of background knowledge they have or where they got it, people come to study centers expecting that their own firsthand experience will be informative and valuable. Otherwise they wouldn't come.

Call it the study center mindset. With their quiet environments, generously sized tables, and unobtrusive yet helpful presence of staff, the Harvard study centers do much to evoke it. From the standpoint of complex knowledge, what's important about this mindset is the patterns of thinking it encourages. One such pattern is extended observation. When people

expect to spend time with an object, they tend to look closely at its details and to examine it from different vantage points, allowing their eyes to revisit certain features again and again. Another pattern of thinking the study center mindset encourages is question-asking. Visitors often come to study centers with specific questions in mind, but they anticipate raising new questions during their visit that will shape their thinking in unexpected ways. Relatedly, because visitors expect to learn from their own direct experience with objects, they tend to make lots of personal connections—to other objects, and to their own prior knowledge and experiences. Finally, the study center mindset seems to encourage people to appreciate the complexity of an object; when visitors talk about the object they've looked at, they almost always remark on its many dimensions and possible meanings.

From a cognitive perspective, study centers work in large part because they evoke a mindset that primes certain patterns of thinking. These patterns of thinking—extended looking, question-asking, connection-making, complexity-seeking—are powerful in terms of uncovering the complexity of works of art. But they are powerful for learning about art and artifacts in other settings—in classrooms and laboratories, in museums, and online. Art museums are a traditional home to study centers, but they can be found—or created—anywhere that minds and objects and thoughtful educators meet. As powerful learning environments, they have a lot to teach us all.

You can read the full research report at [www.pz.harvard.edu/Research/HAMPZStudyCenterLearning.pdf](http://www.pz.harvard.edu/Research/HAMPZStudyCenterLearning.pdf).

**PROJECT STAFF:** Shari Tishman, Alythea McKinney, Celka Straughn

**FUNDING:** Harvard Art Museum



# Learning Innovations Laboratory

Project Zero's Learning Innovations Laboratory (LILA) at the Harvard Graduate School of Education is a consortium of 25–30 researchers and practitioners who are leaders in their fields. The practitioners are Chief Learning Officers or Chief Innovation Officers of global organizations. Over the course of a year they collaboratively share problems, contribute ideas, and craft best practices. They push their thinking and practice by conducting inquiry into the deep challenges of human change and creativity they face. Since 1999, LILA has dedicated itself to understanding learning organizations, and is itself a model of a learning organization.

## WHAT WE DO

LILA's staff organize periodic meetings of the community, design and maintain the collective learning methodology, produce research briefings and articles, and lead research projects. The meetings are typically two-day "laboratories" during which researchers and leading practitioners present provocative work on pre-selected topics. Members then explore how such emerging findings may inform the challenges of learning and innovation they are facing. Consortium members are challenged to think outside their comfort level in a safe and confidential environment. As a learning community of practice, the consortium itself is a model of a progressive learning environment, with a set of norms, customs, and tools that are used to advance members' own learning.

## CURRENT FUNDING MEMBERS

3M  
ConAgra  
Covidien  
EMC  
Federal Reserve Bank  
FedEx Ground  
Gannett  
GE  
Humana  
IDEO  
Lockheed Martin  
McKinsey  
Novartis

Qualcomm  
Sun Microsystems  
Unicredit  
U.S. Army  
Whirlpool

## RECENT TOPICS OF INQUIRY

- Leading Insight and Impact
- The Future of Learning in Organizations
- Collaborative Learning across Boundaries
- Learning Amidst Uncertainty and Complexity
- Learning through Action and Reflection
- Scaling Change: Shaping Decisions at Large Scale
- Decision Dynamics
- Executive Decisions: Glimpsing the Mind's Decision Making Mechanisms
- The Good Life: Personal, Organizational, and Societal Implications of Optimal Experience at Work
- All Engaged: Enabling Optimal Experience at the Organizational Level
- Beyond the War on Talent: Engagement in the Contemporary Workforce
- Developing Leadership for an Uncertain World
- Leading Lifelong Learning in Organizations
- Leading Change in Organizations
- Developing Leaders and Leadership in Organizations
- Transforming Organizations: Rethinking Design and Leadership Development
- Communities of Practice: What the Future Holds

## RECENT GUEST FACULTY

Teresa Amabile, Harvard Business School  
Chris Argyris, Professor Emeritus, Harvard Business School  
Warren Bennis, University of Southern California  
John Seely Brown, Deloitte Center for the Edge  
Rob Cross, University of Virginia  
Yrjö Engeström, University of Helsinki  
Howard Gardner, Harvard Graduate School of Education  
David Garvin, Harvard Business School  
Richard Hackman, Harvard Department of Psychology  
Marc Hauser, Harvard Department of Psychology

Linda Hill, Harvard Business School  
Bob Kegan, Harvard Graduate School of Education  
Ellen Langer, Harvard Department of Psychology  
Jennifer Lerner, Harvard Kennedy School  
of Government  
Sandy Pentland, MIT Media Lab  
Peter Senge, MIT Sloan School of Business  
Otto Scharmer, MIT Sloan School of Business  
Ed Schein, Professor Emeritus, MIT  
Theda Skocpol, Harvard Department of Sociology  
Etienne Wenger, Learning for a Small Planet  
Benjamin Zander, Boston Philharmonic

**PROJECT STAFF:** Marga Biller, Amanda Nourse, David Perkins, Deborah Soule, Daniel Wilson.



# Making Learning Visible

Most of us are in groups all the time. But are these groups learning groups? When does a group become a learning group? Can documenting children's and adults' learning lead to new ways of learning? How can documenting students' learning serve as professional development?

These are some of the questions addressed in the research project Making Learning Visible (MLV). MLV draws attention to the power of the group as a learning environment and documentation as a way to see how and what children are learning. MLV is based on collaborative research conducted by Project Zero researchers with teachers from the Municipal Preschools of Reggio Emilia, Italy, and preschool through high school teachers and teacher educators in Massachusetts and Ohio.

The overall goal of Making Learning Visible is to create and sustain powerful cultures of learning in and across classrooms and schools that nurture individual and group learning. Often when people first encounter the MLV work, they think of it as a project about documentation, perhaps because that is the most tangible aspect of the work—something people can see. Then, after spending more time with the ideas, they consider it a project about group learning. In the end, people see MLV as a project about culture, values, and democracy. Learning in groups not only helps us learn about content, it helps us learn about learning in a way that fits with the kind of people we want to become and world we want to create. Learning in groups develops critical human capacities for participating in a democratic society—the ability to share our views and listen to those of others, to entertain multiple perspectives, to seek connections, to change our ideas, and to negotiate conflict. Documentation is a critical tool for understanding and supporting group learning and sharing it with others.

MLV addresses three aspects of learning and teaching:

- How teachers and students can support individual and group learning in the classroom

- How observation and documentation shape, extend, and make visible children's and adults' learning
- How teachers, students, and others not only transmit, but also create, knowledge and culture

## CURRENT WORK

Over the past five years, Project Zero has collaborated with five public schools in the Boston area and with the Wickliffe Progressive Community School in Upper Arlington, Ohio, to facilitate communities of learners in classrooms and staffrooms. Documentation from these collaborations can be found on the MLV Web site ([www.pz.harvard.edu/mlv](http://www.pz.harvard.edu/mlv)). Highlights from this work include the following.

## CREATING LEARNING CONNECTIONS

Making learning visible in schools takes a variety of forms, including public exhibitions of teaching and learning, holding schoolwide faculty discussions grounded in documentation of teacher practice, using an entrance-way flat-screen TV to share student work and reflection, hosting brown-bag lunches to review student work and teacher practice, and displaying what and how students learn on hallway bulletin boards and panels. This visibility creates learning connections between and among students and teachers outside individual classrooms. Hallway documentation in particular has generated student conversations about learning—both structured and informal—across grades.

## THE MANY PURPOSES OF DOCUMENTATION

Documentation serves different purposes during different stages of learning. These purposes include collecting documentation as an aid to student and teacher reflection and informing future learning, and as a way to provide the wider community with evidence of valued student learning not often assessed by standardized tests. Yet it is easy to become so focused on learning to document that one forgets about the underlying goal of documenting to learn. Documentation makes learning visible when it focuses on learning, not just something we did, and when it promotes conversation and deepens understanding about children's thinking and effective teaching.

## BRIDGING BIG IDEAS TO MOMENTS OF PRACTICE

Documentation helps teachers approach teaching and learning with fresh eyes every day. It connects pedagogical beliefs and values about education to instances of practice by providing qualitative data with which to evaluate one's classroom practice. Discussing video documentation in particular provides a common reference point for debating different

perspectives and challenging one's assumptions and beliefs about how students learn.

### BRINGING A STUDENT PERSPECTIVE INTO ADULT CONVERSATIONS ABOUT TEACHING AND LEARNING

In every MLV school, teachers share with students the very questions that perplex them as adults. As a result, teachers have developed a greater trust in students' abilities to contribute to their own learning. When teachers regularly invite students to share their perceptions of what is and isn't working in class, students become more engaged in their learning and see themselves and their peers as holders of knowledge. (One side benefit of documenting is that in order to document, teachers often need to let students take more of a lead.)

**PROJECT STAFF:** Mara Krechevsky, Ben Mardell, Melissa Rivard, Daniel Wilson

**FUNDING:** Atlantic Philanthropies, an anonymous funder, the Massachusetts Department of Education, and the Wickliffe Progressive Community School through a grant from the Ohio Department of Education



# Qualities of Quality in Art Education

Completed in 2009, *The Qualities of Quality: Understanding Excellence in Arts Education* was a multi-faceted study of how arts educators define and strive to create high-quality arts-learning experiences for children and youth, both in and out of school. While access to arts learning experiences remains a critical challenge in U.S. education, with many children having little to no opportunity for formal arts instruction, the quality of the opportunities that are available is also a serious concern. This study attempted to take a snapshot of the challenge of quality in arts education today, specifically how arts educators think about what constitutes quality and how they strive to achieve and sustain it. The study produced a series of tools for arts educators and their colleagues to use in examining, defining, and working to achieve consistent and reliable levels of quality in all arts learning opportunities, in and out of school.

In particular, the study focused far less on legislative and preparatory efforts to achieve quality—standards, curricular frameworks, and professional development, for example—than on the nature of the arts learning experience as it actually occurs. The study used qualitative approaches to gain insight into the complex and ephemeral subject of people's thoughts about quality, what informs those thoughts, and how their ideas guide the decisions they make that impact the quality of arts learning. The study employed a review of relevant literature, interviews with nominated leaders in the field, and site visits to programs nominated for their sustained efforts to grapple with the issue of quality in their setting.

The major findings of the study suggest that there is considerable work on the issue of quality currently going on in arts education. Taking an “experience perspective” on quality—considering what constitutes quality in an arts learning experience—several key findings emerged. Copies of the complete report on this study are available from Project Zero and The Wallace Foundation.

## THE PURSUIT OF QUALITY

Quality is understood not only as an excellent product, but also as a relentless pursuit of a goal that is, itself, constantly evolving as understandings deepen and

capabilities increase. It is achieved through ongoing, daily work and decisions at all levels of a program or partnerships. Continuous reflection and discussion about what constitutes quality and how to achieve it are both catalysts for and a sign of quality.

## QUALITY ADHERES TO ACHIEVING MULTIPLE PURPOSES OF AN ARTS EDUCATION

Just as works of art are complex, so are the yields of arts education, and high-quality arts learning experiences usually serve many purposes simultaneously. A mark of high-quality arts learning in any program is that the experience is rich and complex for each individual learner and for the community in which it takes place, engaging learners on many levels and helping them learn and grow in a variety of ways that are especially valued in the specific context of the program.

## MULTIPLE VERSIONS OF EXCELLENCE

A wide range of programs count as high quality—there is no single recipe, but there are necessary ingredients. Pursuing excellence in art education does not depend on drawing distinctions between art and other disciplines or on determining whether art is best taught in or out of schools; by teaching artists, art teachers, non-arts teachers, or volunteers; as production or perception; or when integrated or taught in its own right. High-quality arts education focuses on quality in relation to the purposes of the program, the experiences of each participant, and the impact on the community in which it takes place.

## DECISIONS IMPACT QUALITY

There are many decision-makers whose decisions have critical impact on the quality of arts learning experiences. These include people quite far away from “the room” in which the experience takes place (administrators, funders, policymakers, etc.), those who surround the room (notably program staff and parents) and those who are in the room (students, teachers, and artists). While decisions made at all levels have critical impact, the decisions made by students and teachers “in the room” have tremendous power to support or undermine the quality of the learning experience.

## ALIGNMENT AMONG DECISION-MAKERS

A misalignment of ideas about what constitutes quality in arts learning experiences among these decision-makers is often a factor complicating the achievement of high quality in arts programs. Alignment of basic values, principles, and purposes that inform ideas about quality can be quite difficult to achieve and often requires far more basic investigation, dialogue, and negotiation than it is given. Attention to these “basics” is an essential foundation for achieving and sustaining high-quality arts education.

**PROJECT STAFF:** Steve Seidel, Shari Tishman, Ellen Winner, Patricia Palmer, and Lois Hetland

**FUNDING:** The Wallace Foundation and The Arts Education Partnership

All professions must address the problem of how their practitioners stay abreast of current developments in that field and continue practicing clinical skills. Most professions have various ways in which they do this, including journals, meetings of professional associations, conferences on specific issues, and so on. Medicine is distinguished by various forms of professional learning practices known as “rounds.” Perhaps the most popular image of medical rounds is a small group of doctors traveling from patient to patient in a hospital ward to discuss each patient’s “case.” But medical rounds also include larger group gatherings, including monthly meetings featuring short lectures on current research studies and protocols like the “mystery case.” In all of these settings, “young” and “old” physicians and other health professionals come together to share knowledge and practice clinical diagnostic skills.

Education has far fewer opportunities of this kind for lifelong professional learning. At Project Zero we have been engaged since 1995 in an effort to create a powerful learning community based on this medical model. The intent was to create an opportunity for educators who shared an interest in the collaborative assessment of student work to gather voluntarily on a regular basis to discuss emerging issues in educational practice, to present their personal puzzles about teaching and learning, and to practice looking at student work together. Steve Seidel designed this structure and facilitates these sessions, which we call ROUNDS.

## WHO COMES TO ROUNDS?

The ROUNDS mailing list has about 150 addresses. This group is made up mostly of teachers, administrators, and researchers who either have collaborated on Project Zero research studies or have been students at Harvard Graduate School of Education. Participants work in a wide variety of settings, ranging from preschool through graduate schools, public and private schools, in-school and out-of-school settings, museums, adult education programs, and policy/research organizations. At most sessions, the group also includes both educators at the start of their careers and veterans. This range of experiences is a significant factor in the vitality of the conversations. Everyone is considered to have special perspectives and expertise to offer the group.

Participation is entirely voluntary and rewarded only with coffee and serious, though spirited, dialogue about educational matters. Some participants come to most sessions; many come once or twice a year, while others come only rarely. All are welcome to come whenever they can, and there is a sincere effort to sustain a structure that makes it truly possible to enter the ongoing conversation at any time. New participants are always joining the group.

## WHAT HAPPENS AT ROUNDS?

The structure of ROUNDS has changed little since it began. With the group sitting in a circle, sessions start with introductions and then a volunteer (planned in advance) offers a question or issue from her work as an educator. The purpose of this segment is not to help the presenter solve her problem or figure out what to do about this issue, but rather to open a dialogue, drawing perspectives from the diverse experiences of the group. Questions that have been presented in recent sessions have had to do with how educational leaders can make their own learning public, the role of documentation in tracking the work of teacher inquiry groups, and the place of “progressive” educational practices in schools not showing “adequate yearly progress” on the Massachusetts Comprehensive Assessment System (MCAS) tests.

After a break, the group reconvenes to spend an hour engaged in the close examination of a piece (or pieces) of student work brought by another volunteer (again, planned in advance). The protocol used to structure this conversation is the Collaborative Assessment Protocol, developed by Seidel and others at Project Zero for the Arts PROPEL project in the late 1980s. This part of the meeting serves as a time for participants to practice their clinical skills of observation, interpretation, and analysis. In this way, ROUNDS has also been a laboratory for the further development of the Collaborative Assessment Protocol.

Since October 2001, following the events of September 11, the structure of ROUNDS has been altered to create time at the end of every session for participants to openly reflect on what it means for them to be educators in a time of war. Usually only ten to fifteen minutes at the end of the session, this time has come to be an extremely important part of the experience of participating in ROUNDS. We intend to continue ROUNDS in the foreseeable future, hoping that it will continue to foster a rich dialogue month by month and also serve as a viable model of a voluntary, long-term professional learning practice for educators.

**PROJECT STAFF:** Steve Seidel

**FUNDING:** Private source

# Teaching and Learning in the Visual Arts

The Studio Thinking Framework describes three “structures” in which instruction occurs in studio arts classrooms (Demonstration-Lecture, Students-at-Work, and Critique) and eight “Studio Habits of Mind” that describe what art teachers intend to teach. The end state of artistic learning can be described through reference to these eight flexible mental habits, and the framework can guide art teachers’ planning and assessment. The framework supports rigorous pre-service and in-service professional development and leads to the design of future research that tests arts learning and transfer.

## THREE PHASES OF RESEARCH WITH ARTS AND NON-ARTS TEACHERS AND STUDENTS

The field of arts education research is in an early phase of development (Deasy & Fulbright, 2001) and has not yet conclusively demonstrated the kind of learning that occurs in the arts and the kinds of learning that transfer to other domains of learning. Generalizable causal arguments are still largely out of reach because art education research methods are skewed towards qualitative and correlational methods (Winner & Hetland, 2000; McCarthy, Ondaatje, Zakaras, & Brooks, 2004), and the field is skeptical of the validity and/or feasibility of the double-blind experimental studies that might demonstrate causal benefits of arts education. In addition, a chronic lack of funding (compared to such research fields as mathematics and reading education) has certainly slowed the development of arts education research questions from their initial, descriptive phases to later stages in which a greater proportion of replicable studies employ experimental designs.

Research in arts education needs strengthening in two areas: analysis of the habits of mind learned in the study of an art form, and testing of mechanisms by which particular habits of mind may transfer to non-arts cognition (Winner & Hetland, 2000; Hetland & Winner, 2004; McCarthy, Ondaatje, Zakaras, & Brooks, 2004).

From data collected through sustained observations of visual artist-teachers in rigorous and supportive

school contexts (Phase I), we developed the Studio Thinking Framework. That framework is presented for a teaching audience in the 2007 volume by Hetland, Winner, Veenema, and Sheridan, *Studio Thinking: The Real Benefits of Visual Arts Education* (Teachers College Press).

Our model defines categories of learning that artist-teachers aim to nurture in students through studio arts instruction. It also describes three “studio structures” by which visual arts teachers organize time and interactions in their classes. The model emphasizes learning dispositions: the habits of mind that artist-teachers want their students to internalize. Our focus on thinking and understanding in visual arts (engendered by processes of making, perceiving, and reflecting, from Arts PROPEL, Winner, 1991) means that the model cuts across differences in media (e.g., ceramics vs. video) and perspectives (e.g., modernist vs. post-modernist). We argue that the model sets the stage for the kind of quantitative studies that could be synthesized into generalizable conclusions that would be trusted, compelling, and useful to practitioners and policymakers alike.

Since the initial research, we have conducted ongoing professional development and research in Alameda County, California, from 2003 to the present. Through the Alameda County Office of Education, the 18 districts of Alameda County have begun using the framework in combination with the Teaching for Understanding Framework, ideas from Reggio Emilia, and concepts developed in the Making Learning Visible and Making Thinking Visible projects at Project Zero. Non-arts and arts specialists at the elementary, middle, and high school levels, and arts learning coaches, who are arts partners from higher education and cultural organizations across the art forms (dance, drama, music, visual arts), work with teachers to design and deliver curriculum that focuses on developing student understanding and integrating arts rigorously with instruction in other disciplines. In 2009, funded by a three-year U.S. Department of Education grant, the Teacher Action Research Institute began as a districtwide initiative in the city of San Leandro in Alameda County. All eight elementary schools are participating, with fourth grade and visual arts teachers partnering in year one, and with at least another grade of teachers (usually fifth, with some second and third) in year two, and with another cohort planned to be added for year three. The project builds on the districtwide practices of Culturally Responsive Teaching Strategies to develop arts and non-arts learning for students at the lower end of a racially predictable achievement gap. Deliberate connections are made to mandated curriculum and texts, and to contemporary artists and art practices.

**PROJECT STAFF:** Lois Hetland, Ellen Winner, Shirley Veenema, Kimberly Sheridan

**FUNDING:** The J. Paul Getty Trust, the Ahmanson Foundation, and the U.S. Department of Education

# Understandings of Consequence

Dealing with many of the world's most pressing problems requires an ability to understand and reason about causal complexity. For example, understanding global warming involves reasoning about non-obvious causes, spatial gaps, temporal delays, cyclic causality, and distributed causality where the agency and intentionality of one's actions are on a different level than those of the emergent outcomes. In the past decade, there has been a growing interest in how children reason about the nature of causality, which suggests that children are capable of understanding complex causality, to a greater extent than earlier research suggested. Yet paradoxically, students' difficulties in learning science have been linked to how they reason about complex causal forms. Understanding the nature of causality is critical to learning a range of science concepts from "everyday science" to the science of complexity.

Since 1998 our project has been studying how students think about causality when answering questions such as "How can my actions here impact people on the other side of the planet? Why do I sometimes get sick when I am around a sick person, but sometimes I don't? Why do some people not believe that climate change is happening?" These ask us to reason about forms of causality that are probabilistic and involve reasoning across varied time scales and spatial distances. The Understandings of Consequence Project has studied these and other forms of causal complexity and how we reason about them.

Our earlier findings showed that students hold default assumptions about the nature of causality, for instance, effects follow causes in a simple linear chain, that causes are close to their effects in space and time, causes tend to be obvious, and so forth. These assumptions can hinder science learning. We found that curriculum designed to RECAST (REveal CAusal STructure) their assumptions while learning the science led to deeper understanding and that learning about causal forms in one topic can transfer to other topics—those that have similar and even those with dissimilar causal forms, if students get the right kinds of support.

The UC team and the Science Media Group (SMG) of the Harvard-Smithsonian Center for Astrophysics collaborated to develop an interactive, multimedia professional development website. It is designed to guide middle school physics and biology teachers in assessing the structure of their students' scientific explanations and in using existing curricula and developing their own curriculum to restructure or RECAST students' understandings to fit with scientifically accepted explanations. It includes documentary footage from classrooms; interviews with teachers describing challenges and obstacles they faced introducing the curricula, how these were overcome, and the benefits they obtained from using the materials; comments by students, which demonstrate the wide range of students' prior thinking about specific causal forms as embedded in

the science concepts; examples of student written work and journals; and design guides and questions to help teachers understand the features of and how to design RECAST activities, assessments, and rubrics related to causal understanding in science. The site went live in June 2010 ([www.cfa.harvard.edu/smg/Website/UCP/](http://www.cfa.harvard.edu/smg/Website/UCP/)). We are now testing the site with teachers across the United States.

The UC Project has also collaborated with Professor Chris Dede and the MUVE (Multi-User Virtual Environment) Project at the Harvard Graduate School of Education to develop an EcoMUVE, an immersive computer environment designed to teach middle school students to reason about causal complexity in environmental science. This is important because it is challenging to teach many ecosystems concepts in the classroom, given the spatially and temporally distributed nature of many ecosystems problems. Further information can be found at [www.EcoMUVE.org](http://www.EcoMUVE.org).

Our current research is titled Causal Learning in the Classroom. It studies student learning of three complex causal concepts—distributed causality, probabilistic causality, and action at a distance—that are important to many science concepts. It takes a close look (through micro-genetic studies) of learning in grades K, 2, 4, and 6, extends the learning context over the course of a school year, and tests learning scaffolds that hold promise based on the existing research. It studies problems in the social domain, games, biology, and machines, considering how learning in one domain might be leveraged in service of learning in another. In the later phase of the work, we will develop and test curriculum. The findings will be integrated into materials designed to teach students about climate change and ecosystems.

**PROJECT STAFF:** Tina Grotzer, Megan Powell, Leslie Duhaylongsod, Shane Tutwiler, Therese Arsenaault, Erin Carr, Adi Flesher, Molly Levitt, Matt Shapiro, Erika Spangler

**FUNDING:** The National Science Foundation, The Institute of Education Sciences, U.S. Department of Education



In 2006, Project Zero's GoodWork™ Project team (led by Howard Gardner) extended the purview of our investigations of the “good”—we began to explore the ethical dimensions of play. More specifically, we began a study of how young people think about the moral and ethical aspects of their playful activities with new media, including social networks, blogs, online games, and content-sharing websites. We call this initiative The GoodPlay Project.

Our research is focused on five specific issues that we believe to be ethically significant in the new digital media—identity, privacy, credibility, ownership and authorship, and participation in a community. Foremost in our research are questions about the extent to which youth think about these issues in a critical, ethical manner when they spend time online. In 2008, we conducted in-depth interviews with digitally engaged youth ages 15–25. At present, we are studying “tweens,” or youth ages 10–14.

One goal of our interviews is to discern where, when, and how digital youth feel—and, importantly, enact—a strong sense of ethical responsibility online, and where they do not. We are thus particularly attentive to the presence or absence of ethical thinking in youth's narratives about their online participation. Interviews conducted to date with older youth yielded some troubling results. Overall, we found that while youth reported a sense of responsibility to individuals such as family, friends, and teachers offline, when online, they felt the greatest responsibility to or for themselves. When our interview participants did cite responsibilities to others online, they were typically limited to offline contacts and circumscribed online communities (e.g., gaming guilds, online forum members). Very few youth were able to reflect on their responsibilities to larger, more abstract communities online (e.g., the Wikipedia community, a larger gaming community, the Internet community as a whole). We also found a small but concerning number of cases where youth displayed a deep sense of irresponsibility, or a lack of moral or ethical thinking. Examples included spamming online forums; posting incorrect information in a Wikipedia article before a class project with the intention of tricking classmates; creating a fake profile on a social network in order to invade the privacy of a coach; and high-stakes cheating in a massive multiplayer online game. To be sure, we also found some examples of young people using new media in impressive, socially responsible ways. However, to date, many of the findings from the GoodPlay Project suggest a scarcity of ethical thinking among youth when they are online.

In keeping with the GoodWork™ Project legacy of creating interventions, we have developed educational materials to encourage youth to consider the ethical consequences of their play online. In collaboration with Project New Media Literacies at MIT/USC, we co-produced a casebook titled *Our Space: Being a Responsible Citizen of the Digital World*. At present,

we are contributing to a Digital Citizenship curriculum produced by Common Sense Media.

The GoodPlay Project is funded by the John D. and Catherine T. MacArthur Foundation's Digital Media and Learning Initiative. For more information, please visit: [www.goodworkproject.org/research/digital.htm](http://www.goodworkproject.org/research/digital.htm) and [digitallearning.macfound.org/](http://digitallearning.macfound.org/).

**CARRIE JAMES**, Research Director and Co-Principal Investigator, The GoodPlay Project

# The Contours of “Good Play” among Digital Youth

# The Future of Learning at Project Zero

## WHERE VISIONARY EDUCATORS MAKE SENSE OF THE WORLD, LEARNING, AND OUR PROFESSION IN CHANGING TIMES

The question is rather fundamental and is being raised by teachers, parents, leaders, and policy-makers the world over: Are we preparing our youth adequately to thrive in a rapidly changing world? Consider it in your own context, in relation to your students, your children, or youngsters in your town. What will matter most for students to learn? How will our youth learn best in the future? You may find the task puzzling on two grounds. First, it requires that you understand how the world is changing. Second, it demands that you appreciate how learning itself is being transformed by new palpable developments.

Yes, we are experiencing a digital revolution comparable to the Industrial Revolution of the nineteenth century. How do you see it affecting learners today? Yes, globalization is rendering world economies interdependent and accelerating world migration, leaving no country untouched. How do you see globalization redefining what it means to become economically competitive and civically sophisticated today? Yes, we know more about the role of human biology in learning than ever before, even though our knowledge is tentative and partial to date. What does the future hold and how might we gauge more ethical uses of human biology? Large transformations in the technological, economic, social, and scientific spheres create the new context in which our children and youth are growing, indeed the new contexts for which we seek to prepare them. How can we best fulfill our educational mission in these changing times?

At Project Zero we are engaging these puzzles up front. Last August we held our inaugural “Future of Learning” summer institute. During the institute, participants and faculty committed to taking the pulse of contemporary society and reflecting about enduring and changing qualities of learning. Together we examined what is known about the impact of three developments—globalization, the digital revolution, and mind/brain research—on learning. We examined implications for practice in our varied

home institutions. The lessons gained were multiple, personal, and quite idiosyncratic, yet three shared and important insights stood out.

Pressing transformations are defining our times. We can engage them critically, maximizing promises and sidestepping risks.

At the dawn of the 21st century, important changes in our societies are transforming the lives of children and youth around the globe and redefining their futures. Globalization is redrawing the cultural landscape of classrooms and calling upon educators to prepare a new generation of global citizens. In turn, the digital revolution is giving rise to new learning styles. Increasingly, young people no longer view themselves as mere consumers of information, but as producers of knowledge, ready to express their views and document their lives freely online. Furthermore, our growing understanding of the biological workings of attention, emotion, literacy, and numeracy are beginning to shed light on why some classroom practices work and others do not.

Being a responsible educator today requires that we become aware of the changes around us, and that we serve as intelligent brokers between our students and our changing world. We are witnessing global, digital, and scientific developments that require that we mine the opportunities for the deeper, better, and more relevant learning they offer, while sidestepping the risks they present.

Future learners may differ from past ones in telling ways. We can renew the image of the learner that guides our practice.

Clearly, learners present perennial qualities: Their prior knowledge and experience matter, and so does their conceptual change. They understand by thinking with knowledge and benefit from timely and informative feedback. Yet peering through the lens of globalization, future learners present a changing face. Our world's 214 million migrants, and the peers who receive them in their lands, increasingly count on multiple cultural frames of reference as part of their prior knowledge and experience. They are asked to participate as local, regional, and global citizens and hold jobs in transnational economies. They are exposed to traditions that contrast sharply with their own, often resulting in a less productive form of conceptual change—sharp, local retreat. Peering through a digital lens, the emerging future learner controls highly personalized learning environments; she continues to produce knowledge on the Web and to challenge traditional standards of “expertise.” She manages multiple virtual identities and interacts with others whom she may never meet, handling more or less successfully the dilemmas of life online. Taking a biological stance reveals a future learner whose brain images can be used to diagnose learning disabilities early in life and devise timely programs to correct disorders or administer performance-enhancing drugs and neuro-prostheses.

The emerging image of the future learner embodies promise and concern. To navigate between these poles we must focus our attention on our learners—as it is primarily through detailed observation of their idiosyncratic learning and well-being that we may be able to gauge how larger transformations in learning play out in their lives. In doing so, we may find ourselves harnessing the excitement of learning in new digital environments to design instruction that engages deep and enjoyable thought. We may capitalize on the cultural diversity of our classroom as a most authentic context to prepare students for a world of increasing complexity and difference. We may find ourselves attending more to the emotional dimensions of learning, helping kids manage emotion and cognition at once. Embracing new learning styles should not be done uncritically. We will certainly find ourselves guiding students through the ethical dilemmas of public participation on the Web. We will need to unwind social stereotypes. We may consider the degree to which a medicated brain is in fact necessary for active children to learn.

The challenge (and excitement) of working at the frontier: Building professional judgment in uncertain terrains.

So, what is the future of learning? When teachers embrace learning for the future, they nurture competencies such as expert thinking, collaboration, and entrepreneurship. They foster intercultural understanding, environmental stewardship, and global citizenship. They engage with new digital learning styles, inviting students to enter into complex problems and to produce, create, and express themselves through digital means. Recognizing that emotion and cognition are deeply connected in the human mind/brain, teachers prepare students to live ethical and reflective lives in rapidly changing environments.

Yet a collection of desirable aspirations (like the ones above) does not amount to an agreed-upon canon. In fact there is no canon, no textbook, nor any stable definition of the future of learning—at least not yet, and perhaps not ever. Educating with the future of learning in mind involves viewing learning as a changing phenomenon. It involves managing uncertainty, as we do not know which future global or digital developments may transform how people learn. It requires managing emerging knowledge about what matters most for youngsters to learn and how, where, and with whom they might learn it best. In fact, educating for the future invites us to construct our own professional take on how learning is being transformed and how we can best support it. In other words, educating for the future relies in a rather fundamental way on our informed professional judgment.

As we slowly embark on the task of weaving together our own position on the future of learning, we would do well to ground ourselves in the wisdom of practice. Large global transformations become more

meaningful and manageable when examined with detainment in their local instantiations. So how about beginning by asking ourselves the question of what we view as the purpose of education in the twenty-first century in our particular contexts and for the particular children, youth, or adults in our charge? Whether our work takes place in an urban school in Chicago, a publisher in Madrid, a boarding academy in New York, a museum in Buenos Aires, or the slums of Bangalore, never before has the demand for such reflective and ongoing professional renewal been so pressing. Never before has education played such a pivotal role in the cultural and environmental survival of our planet. Never before has the future been so present.

VERONICA BOIX MANSILLA, Principal Investigator, The Interdisciplinary Studies Project and Education Chair, The Future of Learning summer institute





**PROJECT ZERO**

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