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Changing our Skin: Creating Collective Knowledge in American Classrooms

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In this essay, the author explores the notion that the focus of learning in classrooms and schools extends beyond the learning of individuals to create a collective body of knowledge that is larger than what any one person knows. This idea was examined in a collaboration between Project Zero researchers and educators from the municipal preschools in Reggio Emilia, Italy, around understanding, supporting, and documenting individual and group learning. The author draws on the experiences of classroom teachers in Massachusetts to suggest at least four key components in creating collective knowledge: (a) rethinking the nature of the learning task; (b) fostering a pedagogy of relationships*; (c) addressing four kinds of learning; and (d) documenting student and teacher learning.*

When you find the group, you also find the individual.

—Marina Boni, Making Learning Visible Seminar Teacher

Chris Bucco works with nine infants and toddlers in a program called Even Start *while their mothers attend English class next door. As new children enter*

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FIGURE 1. A classmate engages 16-month-old Harold in a puzzle (photo by Chris Bucco) (color figure available online).

the program during the year, Chris becomes fascinated by children's separation processes and how they become part of the group. She begins to jot down notes and to take pictures. As Chris documents this process for 16-month-old Harold, she notices the role other children play in helping Harold make the transition (Figure 1). *Chris develops some hypotheses about how toddlers can help other children integrate into the group, often without adult intervention. She shares her photographs and analysis with colleagues and parents so they can add their own perspectives.*

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Ben Mardell's kindergarten class spends seven weeks studying the Boston Marathon. The students identify topics for study groups that reflect their interests such as medical care, marathon training, and wheelchair racers. The children and teachers choose three products to communicate what they are learning to others—a sculpture, a book, and a video. These products are shared with parents and other members of the school community at a June breakfast (Figure 2). *In addition, Ben and his coteachers create a documentary about the project and how a group learning perspective influenced the learning of adults and children (Mardell, 2008). This documentary is shared at local, regional, and national education conferences.*

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For the past 10 years, first- and fourth-grade teachers Maggie Donovan and Cheryl Sutter have conducted a civil rights curriculum with their students. As part of this curriculum, the children travel between Maggie's and Cheryl's schools every few weeks to explore together some aspect of the American civil

FIGURE 2. A father and daughter at the Boston Marathon Project breakfast (photo by Melissa Rivard) (color figure available online).

FIGURE 3. A civil rights sit-in drawn by a first and fourth grader with labels by the teachers (photo by Melissa Rivard) (color figure available online).

rights movement (Figure 3). *Recently, travel costs have threatened to become prohibitive. Maggie and Cheryl turn to the students, their parents, and the principals of their respective schools to brainstorm how to resolve this problem. They also start to think about their partnership as more important than just the two of them and wonder about preparing younger colleagues who can work with them for a couple of years to carry on the partnership.*

FIGURE 4. Fifth graders design a new model for a solar system kit (photo by Deb Dempsey) (color figure available online).

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Deb Dempsey goes to the town library to get her fifth graders a kit about the solar system that includes books, tapes, and a model. When Deb returns with the kit, the students notice that the model is inaccurate and broken. Everyone is disappointed. One student suggests making a new model for the library. A small group of students choose to work on this project (Figure 4), *but even those not directly involved often walk by and ask questions and give feedback to the model builders. The art teacher and Deb's husband (a builder) critique the designs for the new model. Every spare minute, the builders work on the model. When the class meets to review the project, Deb hears for the first time students willingly say, "Well, maybe you could do it this way." Deb notices that three boys who often have the hardest time focusing give their complete attention to the group's report.*

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In a ninth-grade English classroom, Jennifer Hogue asks her students to write for 20 minutes about the meaning of dignity and its significance in their lives. As Jen reads over the students' responses later that night, she wishes the students could see what their classmates have written. She decides to write up quotes of particularly provocative ideas and views from each paper and group them under questions like "Does dignity come from within or without?" (See Figure 5.) *In the next class, Jen gives her analysis to students as a warm-up for a lesson in which students are asked to identify the question that most interests them and to respond to something they do not agree with.*

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FIGURE 5. Making ninth graders' thoughts about dignity public (photo by Jennifer Hogue) (color figure available online).

In each of these classrooms, teachers are striving to make learning public and to create a collective body of knowledge accessible to learners in and outside the classroom. Learning extends beyond the individual to inform other students, parents, teachers, and sometimes community members. As each person learns from and with others, the group becomes capable of learning more than they would as individuals.

The above examples come from classrooms of members of the 2003–2006 Making Learning Visible (MLV)[1] Seminar, a monthly gathering of over 20 teachers convened by researchers at Project Zero at the Harvard Graduate School of Education.[2] The goal of the seminar was to support children's and adults' individual and group learning by using documentation as a way to see how and what children learn. Many of the ideas and practices addressed in the seminar stem from the educational approach used by the

[1]Since 1997, the Making Learning Visible Project has investigated the dynamics of individual and group learning and the role of documentation in supporting the development of powerful learning groups in classrooms and schools. The project started as a collaboration between the Preschools and Infant-Toddler Centers in Reggio Emilia, Italy, and Project Zero, a research group at the Harvard Graduate School of Education (1997–2000). From 2001–2010, Project Zero researchers worked with preschool to high school teachers and teacher educators to translate these ideas into the U.S. context. For more information about the project, please visit the MLV Web site: http://www.pz..harvard.edu/mlv/.

[2]The author is an educational researcher at Project Zero and director of the Making Learning Visible Project.

Municipal Preschools and Infant-toddler Centers of Reggio Emilia, Italy—a set of schools renowned for the extraordinary quality of children's work. This essay draws on examples from the MLV Seminar, Reggio educators, and the field to illustrate how learning in groups extends beyond the learning of individuals to create a collective body of knowledge (Project Zero & Reggio Children, 2001).

The world is undergoing vast changes socially, environmentally, and technologically, many of which require new ways of thinking about teaching and learning. Creating collective knowledge can help transform schools from places where students work primarily on their own to places where they feel they are part of something larger than themselves. As my colleague David Perkins suggests, along with the need to address the achievement gap, we need to attend to another gap—the *relevance* gap. The relevance gap refers to what is worth learning and the lack of a powerful connection between much of the standard curriculum and the lives people live. Shifting the balance in classrooms to include a focus on *creating* as well as transmitting knowledge and culture is one way to bridge this gap.

BACKGROUND

In U.S. culture, the experience, rights, and freedoms of the individual reign supreme. In schools, we typically focus on individual achievement and the learning that students carry away in their own minds. We encourage children to create individual identities and to become independent learners. We fear that individual needs will get lost in a group. Though Americans profess to believe in the value of hard work to accomplish individual goals, our culture emphasizes innate abilities as a key component of success and we learn to hide the mistakes we make from others (Dweck, 2006). At the professional level, much of the teaching and learning in U.S. classrooms takes place without the opportunity for collegial support and is carried out and evaluated in private (Little, 1990).

Teachers are usually alone when they look at student work and consider student performance in the classroom (Little, Gearhart, Curry, & Kafka, 2003). Assessment typically takes place in private, involves grading or scoring and is a communication between two individuals—teacher and student or teacher and parent. The assumption underlying this focus on the private nature of learning is that knowledge is an individual attainment—something acquired or constructed through an individual's own activity.

Yet, in many professions, learning groups are concerned with building collective as well as individual knowledge (Perkins, 2003; Senge, 1990; Wenger, McDermott, & Snyder, 2002). A growing body of research suggests that students' academic achievement is higher when teachers share responsibility for student learning (Lee & Smith, 1996). What if students (and teachers) were working not just on discrete tasks and products that go

home at the end of the day or year but had a life in the larger community? What would education look like if we thought of knowledge as having more of a social existence?

The cognitive scientists Scardamalia, Bereiter, and Lamon (1994) argue that the individualistic focus in our schools distorts the knowledge-building process. Even when students engage in group discussion and investigation, the focus of analysis and assessment often remains the individual. Instead, Scardamalia and her colleagues suggest that along with individual understanding, a goal of schooling should be to create a public understanding of things and "get students involved in improving *the knowledge itself* rather than with improving their own minds" (1994, p. 207; emphasis in original). In this view, while students work on completing classroom exercises or developing individual understanding, they and their teachers also engage in a broader and ongoing dialogue to understand the nature of things and to contribute to a larger body of knowledge.

Creating collective knowledge in the everyday life of school entails people learning from and with each other—solving problems, generating theories, and creating products that no one person could "accomplish" on his or her own. The group creates knowledge that it holds collectively by drawing on individual expertise, understanding and accepting different opinions, negotiating and debating, and synthesizing multiple perspectives. Children and teachers are not just thinking and acting like scientists or artists; the class itself is functioning as a scientific or artistic community (Scardamalia et al., 1994). Karl Popper's distinction among three separate worlds is helpful here (1972). Popper distinguishes between World 1 (the physical world), World 2 (the world of knowledge we each have in our own minds), and World 3 (knowledge that exists as an abstraction beyond the individual mind). In World 3, the knowledge being generated is meaningful in and for the present as well as the future. Examples of World 3 include the bodies of knowledge built up over centuries in the professions and disciplines. As classrooms operating in World 3 deepen, clarify and consolidate their knowledge in order to make it public, they take on a new identity. This knowledge might be shared with other classes, teachers, schools, or the larger community or field.

Could this kind of collective knowledge-building happen in classrooms on a regular basis? Perhaps. An initial obstacle is students' own perceptions of when and how they learn with others. Many students do not see themselves as actually learning in groups. In one second-grade classroom in which the teacher, Carol Hawley, encouraged learning in groups, her students rarely perceived their cooperative groups as learning groups. As one child put it, "groups are fun but we don't really learn until you give us the answers" (Hawley in Turner & Krechevsky, 2003, p. 42). In Sarah Fiarman's fifth- to sixth-grade class, Nick, who was considered a motivated student, commented, "Sometimes groups aren't so good because we spend

a lot of time listening to each other's ideas and talking about whether you agree or not—you aren't really learning anything" (Project Zero et al., 2003, p. 42). This was surprising to Sarah because she thought Nick was describing learning, only he did not recognize it as such. In looking at a small-group transcript, Sarah also noticed that another student, Chris, was very engaged when Sarah was present, but as soon as she left, he disengaged from the work. Sarah thought that Chris was not feigning interest for her benefit; rather, he stopped attending because he did not think he could learn without the teacher. Sarah and other teachers *do* believe that students learn from one another in groups, but the benefits of this learning seem invisible to the students. In order to create a collective body of knowledge, the members of the group need to see themselves as engaged in *learning*. As will be described below, documentation is one way to make this learning visible.

METHODS

The MLV seminar was a 3-hour monthly gathering at the Harvard Graduate School of Education facilitated by Project Zero researchers. Members included 21 preschool through high school teachers of students from culturally and economically diverse backgrounds, three teacher educators, and one high school student. Participants joined the seminar with at least one partner. Teams came from Boston, Brookline, Cambridge, Dennis-Yarmouth, Lexington, Medford, and Plainville, Massachusetts. Seminars began with small-group discussions grounded in documentation collected by teachers, followed by a whole-group presentation or discussion. Small groups were formed based on members' interests and age groups taught. Each classroom team identified a question related to supporting individual and group learning. They collected a variety of documentation including photographs, written notes, transcribed conversations, and video- and audio-recordings. Many teachers enlisted students to help them gather this documentation.

Every seminar was videotaped and small-group discussions were audiotaped and sometimes transcribed. Once a month, seminar members e-mailed reflections to a common e-group. Project Zero researchers read and analyzed the reflections for salient themes and provocative ideas, which they shared back with members the following month. PZ researchers also visited classrooms to observe, to collect or review documentation, and to interview students. The core text for the seminar was *Making Learning Visible: Children as Individual and Group Learners* (Project Zero & Reggio Children, 2001). In the first year, classroom teams wrote a short synopsis of their inquiry and presented it to other seminar members. In the second and third years, teams created and displayed documentation panels (with samples of student work, photos, dialogue, and teacher reflections and analysis) in two exhibitions. Colleagues from Reggio Emilia visited the seminar once or twice a year to offer feedback and critique.

In this essay, I draw on the above research and related work from Project Zero, the Reggio preschools, and the field to describe four elements central to creating collective knowledge: (a) rethinking the nature of the task; (b) fostering a *pedagogy of relationships*; (c) addressing four kinds of learning; and (d) documenting student and teacher learning.

RETHINKING THE NATURE OF THE TASK

Creating a promising task for group learning takes time and effort. Webb and Palincsar (1996), in an article in the *Handbook of Educational Psychology* on group processes in the classroom, identify several elements of a "group-worthy" task for further research: the level of conceptual understanding required by the task, the academic and social skills involved, the need for each person's participation in order to complete the task, and the extent to which the task can be divided up into equal parts (cf., Cohen, 1994). Lotan (2003) names five features of the group-worthy task: open-ended topics, multiple ways to show competence, intellectually significant content, constructive interdependence along with individual accountability, and clear and specific evaluation criteria. Many of these elements appear in the opening vignettes. For example, intellectually complex and compelling learning experiences such as Maggie Donovan and Cheryl Sutter's civil rights curriculum and Jen Hogue's question about the meaning of human dignity engage the intellect as well as emotion. Chris Bucco's hypotheses about young children's separation process invited multiple perspectives. In Deb Dempsey's model-building project, her students look to each other to figure out how to build a new model. Deb's voice as teacher is one among many.

Three related considerations emerged in the Making Learning Visible Seminar as important when devising group-worthy tasks.

Tasks In Which Everyone Can Be Invested

Often this entails creating smaller learning groups with members chosen precisely because they show particular interest in a topic. However, the rest of the class can also participate by giving feedback to the group. In Deb Dempsey's class, even students not directly involved in creating the model solar system became a kind of *competent audience*, asking questions and giving advice to the model builders. In Ben Mardell's kindergarten class, children grappling with a problem in need of feedback were the ones who presented at morning meetings. As Ben and his coteachers planned the marathon curriculum, they identified potential entry points and contributions for each child in the class (see Figure 6). For example, one girl showed great interest in the story of Rosa Parks fighting for civil rights. The teachers speculated she might want to learn about Kathrine Switzer's fight to participate

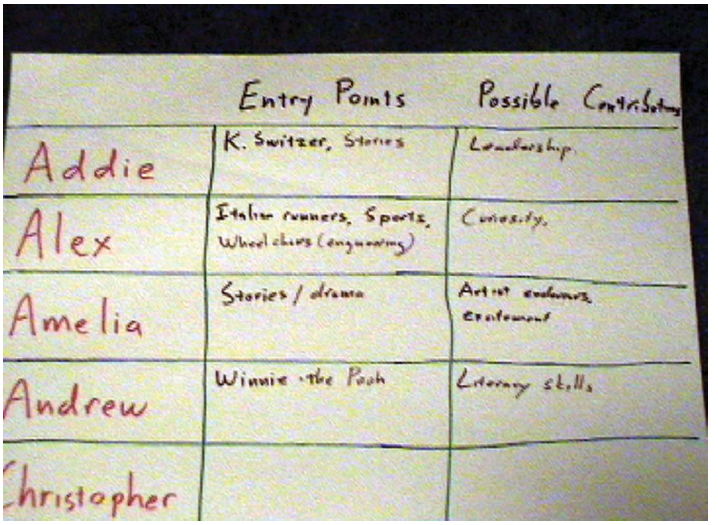

FIGURE 6. Ben's kindergarten entry points chart (a video still) (color figure available online).

in the marathon. Another boy was interested in Winnie the Pooh so the teachers invented a story with Pooh as a central character.

Tasks That Include a Central Focus on Learning

Many students and teachers perceive collaborative tasks as opportunities to share labor or specialize, rather than learn together. Although the completion of work can lead to learning, seminar teachers noticed that their students seemed to equate *getting work done* with *learning*. These teachers also realized that while they themselves considered learning a priority, sometimes "learning" took a back seat to the work that was supposed to generate it. As seminar member and inner-city high school teacher Heather Moore-Wood put it, "It's one thing to note that the kids often are not thinking about the learning, but *I'm* thinking about whether they cooperate and whether they did the work. That's often been my focus for whether they've done well, because it's such a big thing in our setting-cooperating, doing the work."

Consider this reflection from a ninth-grade student in response to Jennifer Hogue's question about whether working or getting work done is the same as learning:

> Most times for me it is not about learning, but completing the project. Many times I just want to complete an assignment and do not care or even think about how it may affect my learning . . . It wasn't until I hit 8th grade people started caring about *how* I learned.

> I am asking myself, "Do I learn better in groups or by myself? What is the point of me knowing if I am learning? Shouldn't me [*sic*] working on something mean I am learning? Who's to say if I am learning or not? How do others learn?" These questions are now in my head. . . . I feel these are good questions to better understand where people are coming from.

The researcher Hermine Marshall (1987, 1988; see also, Ritchhart, 2002) has distinguished three kinds of orientations in classrooms: learning, work, and work-avoidance. A *learning-oriented* classroom focuses on developing an understanding of the course topics. In *work-oriented* classrooms, students focus on completing the assignments and covering the material. In *work-avoidance* classrooms, students see how much work they can avoid doing. For the seminar teachers, the discovery of the distinction between doing schoolwork and learning in the group was critical. It helped them to clarify goals and to focus on creating genuine learning groups, not just groups in which students get the work done.

Tasks that Spark the Imagination

Consider the following lesson:

> Ninth-grade English teacher Lindy Johnson's fifth period class is a daily challenge. Every year at Halloween, Lindy asks students to create a monster, draw it, and write a descriptive paragraph using details. Four boys who almost never pick up a pencil begin drawing, showing their monster to others, and offering feedback. The class puts the monster drawings on the board. Lindy collects and reads the paragraphs to the class, asking them to match the paragraphs to the monsters.
>
> The next day, Lindy asks students to reflect on the monster activity, posing questions such as: How did seeing other people's monsters help you create your own monster? How do you think you work as a class? Did you enjoy sharing your monster with other students? Why? Students say they love the activity, sharing their work, and looking at other people's monsters. Lindy explains that in their next project—memoirs, this is the kind of feedback she wants to hear and excitement she hopes students will feel when reading each other's writing. The memoir project goes better than usual.

In this group lesson, visual descriptions are taken as seriously as written ones. The lesson involves an element of fantasy and a topic—monsters—with a rich role in our culture and history, intriguing to children as well as adults. Another seminar teacher, Kerrie-Lee Walker, asked her sixth-grade

students to create a comic strip with superheroes to show their understanding of concepts related to bacteria, viruses, vaccines, and the immune system. Students were excited and productive. In the next unit on systems of the human body, Kerrie-Lee asked each student to choose an organ and then as a group to create a huge diagram showing all the organs and how they relate to each other. This assignment flopped. What's the difference?

Kerrie-Lee's first assignment called for imagination and creativity. It included a storytelling and fantasy component. Although the assignment was individual, students asked Kerrie-Lee if they could talk to each other about their ideas. The conversations were productive and on task; students sought feedback and modified their work accordingly. Assignments that so vividly spark the imagination seem to lead to the desire to share one's work or to join with others in creating it. In contrast to writing essays or conducting science experiments, creating strange and fantastic creatures seems to cry out for entertaining others and getting their response.

The comic book assignment also asked students to represent their knowledge in a different medium with its own rules. The switch of medium required students to grapple with their understanding of bacteria in a different and perhaps deeper way than writing about it in a science report. The simultaneous simplicity and complexity of the monster and superhero assignments effectively connected to youth and pop culture. Tasks such as these integrate cognitive, affective, social, and expressive domains.

Many of these dimensions of a compelling group task overlap; not every dimension will be present every time a learning group contributes to collective knowledge. Rather, they serve as features to consider when planning experiences that will foster learning from and with others.

CREATING A PEDAGOGY OF RELATIONSHIPS

Another key element in creating collective knowledge entails a shift away from a view of teachers as deliverers and students as receivers of knowledge toward what Loris Malaguzzi, founder of the Reggio Emilia preschools, calls a *pedagogy of relationships*. Malaguzzi (1993) views relationships "not simply as a warm, protective backdrop or blanket but as a coming together of elements interacting dynamically toward a common purpose" (p. 10). At least four kinds of relationships are implied by the phrase *pedagogy of relationships*: learning in relation to other people, other *languages*,[3] other information or ideas, and the larger community.

[3] ***Languages* refer to how children create and combine symbolic representations of ideas to convey meaning (Edwards, Gandini, & Forman, 1998).**

Learning in Relation to Other People

In classrooms engaged in creating collective knowledge, students and teachers share a focus on learning content as well as how to learn in a group. Teachers regularly ask themselves, "Is this an assignment where individuals might learn differently and perhaps more deeply by interacting with each other or in a small group?" For example, many early childhood and primary-grade classrooms contain estimation charts or activities, such as "How many beans do you think are in the jar? Make an estimate." Each child's name is listed along with a space for his or her estimate. Each child guesses independently—one writes 7, one writes 21, and another 29. What if the same activity were set up so that at least two children were asked to come up with an estimate together? Pairing children and encouraging them to talk about "why 7" or "why 21" would likely deepen children's understanding as they confronted each other's thinking and ideas. They might also be asked to share their ideas and thinking with other friends.

Seminar and kindergarten teacher Melissa Tonachel says:

> I now re-examine every task and activity in the classroom to see how children may work together rather than independently. When children ask if they can work together, I almost never say no. . . . This goes against the grain, when our focus is traditionally on individual progress. However, now in the midst of writing parent conference reports, I find that I know individual children better, more expansively. I know more about their approach to learning and particular kinds of tasks, the areas where they feel most secure (they offer help to others), and the kinds of support most helpful to them. (M. Tonachel, written reflection, May 23, 2005)

In many elementary classrooms, children work independently alongside their peers, perhaps having social conversations, but not necessarily making meaning or solving problems together. After independent work is completed, children may show it to the teacher or put it in a designated spot or cubby. Asking children to share their work with a peer *before* putting it away might lead to deeper learning for both. At issue here is finding the right balance of and movement between learning on one's own and in a group. In a kindergarten art studio developed by seminar teachers Betsy Damian and Joanne Cleary, children had a chance to view a *museum* of other children's work before beginning their own art project. Students were also asked to reflect on their work *in the presence of others* both during and after their own pieces were completed.

A schematic diagram of group discussions taking place in many classrooms today would likely resemble a wheel with multiple spokes in which the comments of students are directed toward the teacher in the center and vice versa (Cazden, 1988/2001). MLV Seminar teachers encouraged students

to make eye contact with and direct their comments and questions to each other, not just the teacher. These classrooms also developed a common language to encourage students to relate their own ideas to those of others, such as "My comment agrees with/differs from what Josiah said." "I would like to ask a question so I can understand what Daria said." "I would like to add a new idea." "Building on Amir's idea . . . ."

Learning in Relation to Other Languages

Reggio educators use the metaphor of 100 languages to describe the many ways in which humans communicate and express themselves. Languages can include verbal descriptions, drawing, painting, wire, clay, puppets, numbers, physical movement, and more. One way to deepen our own and others' learning is through expressing our thinking in different symbol systems. Both Lindy's monster activity and Kerrie-Lee's superhero assignment involve representing knowledge in two languages—visual and descriptive narrative in the former, and scientific concepts and fictional narrative in the latter. In a project exploring the nature of crowds, preschool children at the Diana School in Reggio Emilia were invited to observe crowds, to photograph them, to describe them verbally, to reenact crowds in the classroom, to draw crowds from different points of view, to make a paper model, and to create a crowd out of clay (Municipality of Reggio Emilia Infant-Toddler Centers and Preschools, 1996).

To support learning for middle school students struggling with oral language, seminar teachers Rachel Hayashi and Todd Curtis asked pairs of students to use instant messaging to communicate their interpretations of a written text. Rachel and Todd printed out the transcripts and identified student insights, questions, and reading strategies. Then they returned the transcripts to students for review of their own and others' conversations. Todd also conducted a "Chalk Talk" with his students in which they wrote ideas in response to an open-ended question on a large piece of paper *without talking*. They then drew lines to indicate connections between different ideas. When learners represent their thinking in different ways, they deepen their own understanding, their ability to understand others, and others' abilities to understand them.

Learning in Relation to Other Information or Ideas

Considering or constructing relationships among ideas and topics as part of a larger network of knowledge is another way to deepen and extend learning. Reggio teachers have observed that the way children represent subjects like a tree or a house often changes significantly when they are asked to consider the subject in relation to something else, such as rain or shadows (Cadwell, 1997). Learning can be deepened by setting two or more

(but not too many more!) ideas or pieces of information in relation. For example, comparing different graphing strategies for the same information, relating historical incidents to modern-day events, or drawing one thing in relation to another (an ant and a crumb, a tree and the sun, my cat to your cat). In their civil rights curriculum, Maggie and Cheryl found that examining two forms of documentation side by side, such as a drawing and a tape-recorded conversation, enhanced their understanding of what and how the children learned. In such classrooms, teaching and learning often focus on making connections—with another idea, another person, another language, or the larger community.

Learning in Relation to the Larger Community

In its broadest sense, a pedagogy of relationships involves thinking about school as a place of learning within a larger social, political, and cultural context. Deb Dempsey's fifth graders prepared a model for the town library. Maggie and Cheryl, in choosing to study the civil rights movement, connected their curriculum to larger social issues and the history of their community (which had been part of the Underground Railroad). Kindergarten teachers Betsy Damian and Joanne Cleary posted text and images from the children's art studio on the school's Web site as a way to inform parents and others about young children's competencies. Ariela Rothstein, the only student member of the MLV seminar, began a club at her high school to launch conversations among teachers and students about "good teaching practices" (defined by students as those that demonstrate respect for students and support student understanding). Ariela and her peers also presented their work at national conferences, wrote an article published in *Education Week* (Rothstein, 2006) and created a Web site as a way to open the conversation up to the wider community.

In order to identify possible relationships between the curriculum and the city, educators in Reggio Emilia often set aside time at the beginning of the school year to consider the broader cultural and political landscape of the city and other institutions like museums, other schools and colleges in the area, cultural organizations, and public agencies. They also identify significant local, regional, national, or world events in order to discuss whether and how they might influence curricular choices. Before beginning a major project with children, teachers consider the relevant disciplines and contexts in which to situate the learning. They cast a broad net in seeking out historical, ethical, emotional, aesthetic, scientific, cultural, or political connections. When an exhibit on the work of artist Alberto Burri came to Reggio Emilia in 2001, the *atelieristas* (educators trained in the arts) and classroom teachers used it as an opportunity to study the relationships among children, art, and artists. Children exhibited their own work based on their study of Burri's art and his creative process and the teachers produced a catalogue that included

an account of the learning process of the children and adults (Preschools and Infant-toddler Centers Istituzione of the Municipality of Reggio Emilia, 2004). This project not only supported children's and adults' inquiry but also added to our collective understanding of how human beings learn.

ADDRESSING FOUR KINDS OF LEARNING

During her first year in the MLV Seminar, Deb Dempsey had a student, Caleb,[4] who claimed that he did not need the group in order to learn. Deb tried various ways to involve Caleb in the group with little success. Over the summer, Deb took a workshop on differentiating instruction for different learning styles and began to question whether she had not been honoring Caleb's learning style by trying to engage him in the group.

We raised Deb's puzzle with Tiziana Filippini, our colleague from Reggio Emilia. Tiziana responded:

> I would pose this question differently. I may understand that Caleb wants to learn by himself and he is able to learn by himself. We are talking about. . . a quality of knowledge, a structure of learning how to learn that is not that of a human being in a society where individualistic people live. We are looking through this other way of learning toward another society, toward other values. We are looking to men and women who can be different thanks to the fact that they have this competence. This is where democracy comes in. If you don't have this image of human beings leading you, everyone has their own path. If Caleb wants to learn by himself, that's O.K., but the problem is another one. If I am skilled, why should I waste time waiting for someone who is behind me? We say that when you are engaged with a child with special rights,[5] it's not just that you are teaching him something, but he is going to teach you something. What he teaches you is not math or literature; he's teaching you to interpret other minds and to find in yourself flexibility. . . in order to enter into other minds more easily.

Later, Tiziana described school as a place where "you don't just learn content, but you learn how to learn. . . . Each one of us can learn in an isolated way. If you learn in a group, it's because you get another quality of learning that is related to culture, values, and democracy. . . . To change [the old methodology of teaching] is to change your skin." The key themes of this essay are embedded in Tiziana's words. Learning in groups helps us learn about learning in a way that fits with the kind of people we want to become and the world we want to inhabit. It develops critical human capacities for

[4]"Caleb" is not the student's real name.

[5]Reggio educators refer to children with special needs as children with "special rights."

	Learning about Learning	Learning Content
Individual	Understanding oneself as a learner	Mastery of key concepts and content
Group	Understanding of how learning groups support and demonstrate understanding	Generation of public knowledge

FIGURE 7. Four kinds of learning.

participating in a democratic society—the ability to share our views and listen to those of others, to entertain multiple perspectives, to modify our ideas, and to negotiate conflict. Classrooms engaged in creating collective knowledge generate at least four kinds of learning—two related to the *content* of learning and two related to the *act* of learning (Figure 7; cf., Seidel, 1999).

Learning about Learning

One way to learn about the learning process is to make it *visible* or perceptible to others. Kindergarten teacher Melissa Tonachel begins the school year by developing a common language so that learning in groups can become audible as well as visible (cf., Barnes, 1976; Mercer, 1995). Melissa tries to avoid language such as *copying*, *cheating*, or *stealing* my idea:

> Among the first goals I set for the school year. . . was to establish a community where "she's copying me" and "he took my idea" did not exist. In other words, I started with language. I started saying, "You have the same idea as she does!" "That must be an important idea—I notice lots of people are thinking about it." "That idea begins like his, but then you changed it." We developed a signal for "I have the same idea" during group discussions (put your finger on your nose). We have explicit conversations about where ideas come from, how they change, and how we get good ideas from each other. . . . In this way, children still feel connected to ideas they sprout, but they release ownership of them, allowing their ideas to grow, to be transformed, reconsidered, and ultimately to become part of the group understanding. Being this careful about the language of ideas also widens the space for and acceptance of different ideas. (M. Tonachel, written reflection, May 23, 2005)

In the block area, Melissa posts photographs and drawings of children's structures as a way to make learning in groups visible. When one child, Max, was struggling to build a structure that wouldn't fall down, Melissa suggested he look at the photographs for ideas of how to make a stronger foundation. The photos gave Max new ideas for building as well as whom to ask for help. Moreover, when Max found himself in the photos, he remembered his own experience of building and gained confidence to try again.

As a way to foster a learning group in her classroom and extend student learning, Lindy Johnson asked her ninth-grade English students to reflect on their learning by sharing students' words back with them. Lindy documented "book club" conversations between students and community mentors that took place over e-mail, pulling examples of "deep" and "surface" interpretations in order to deepen the discussions. She videotaped students rehearsing *Romeo and Juliet* and showed students the videos to encourage self- and peer-assessment. Lindy also documented students creating a whole-class sonnet by writing who spoke and how often on a chalkboard as a way to increase the number of voices in the discussion. Over time, Lindy's students felt more listened to and developed a clearer sense of themselves as learners.[6]

Not only are individuals learning about themselves as learners but the group itself is learning how to learn—with particular ways of talking, norms of participation, and artifacts of individual and group learning. In her book, *Talking their Way into Science*, Karen Gallas (1995) describes the phases of a "science talk" in which a theory is proposed, supported by analogy or facts, clarified by questions and then revised or expanded: "Within each of these phases of development, there are certain phrases, or kinds of thinking, that stand out. The attempts to pose a theory are usually marked by the phrase 'Maybe' or are posited in a tentative tone. The children learn that in proposing an idea, they should be careful not to adopt an authoritative voice. . . . A 2nd grader advising a new 1st grade science talker: 'You should say "maybe" before you try to answer the question.' In other words, it's bad talk to speak with finality if you are trying to have a dialogue. This is not something I have taught the children. It is a talk behavior they have shown me and teach each other" (p. 38).

Teachers and students together shape the teaching and learning of the group. As Ariela Rothstein's high school club discovered, teachers who seek input from students about the effectiveness of their teaching and change their instruction accordingly are seen by students as true partners in learning. As one teacher commented after a student-led workshop, "Hearing other teachers' best practices in their own classrooms is so helpful, but gaining student insights into best practices is even more so."

Learning Content

In the last of the opening vignettes, Jennifer Hogue contributes to the group's knowledge by sharing students' thinking with each other and adding her own interpretation of what they wrote. In another activity, Jen asked the students to post one thing they wanted to remember and one thing that

[6]**See the appendix for a conversation protocol that engages students in thinking about learning in groups.**

bothered them about a character from *Lord of the Flies* on a bulletin board. Later, small groups of students looked at the postings and discussed what was most important and what was missing in relation to their character. Jen, too, identified common themes. In these activities, Jen personalized and deepened her students' learning by sharing and interpreting individual ideas with the group. Jen was listening better—the post-its on the bulletin board gave her something to "listen to"—and she commented, "I feel like a better teacher." The papers students wrote were more connected to what they cared about. Jen's focus on creating collective knowledge added breadth and depth to the content learning of the individual and the group.

In a graduate preservice seminar for teachers of students with special needs, MLV teacher educator Stephanie Cox Suarez asked her students to e-mail their reflections to the group after each session as a way to bring in different perspectives and deepen learning. She also e-mailed her own reflections. Stephanie had never before asked her students to reflect in public. Pairs of students documented and summarized what they learned in each class in brief oral presentations, and Stephanie created panels with text and images representing the key ideas and children's work from each seminar. At the end of the semester, Stephanie collected the theories that individual students and the class developed in a booklet that she gave to each student. Her student, Carol, commented, "I think the one thing that sums up this semester's seminar for me is that I've learned what other people have learned" (Cox Suarez, 2006, p. 33).

Often, when we communicate our learning to others, our own learning deepens. When children share discoveries from their own activities with the whole class, individual learning becomes part of the thinking of the group. Individual children in Ben Mardell's class learned more about the Boston Marathon thanks to the expertise and understanding developed in the group. At the end of the year, Melissa Tonachel's kindergarteners requested that she leave documentation of their discoveries on the walls as a resource for next year's class. And Chris Bucco's documentation in the *Even Start* infant-toddler program provoked parents' assumptions about their own children's capabilities and the nature of learning more generally. In each of these examples, making learning visible extended the learning of individuals as well as the larger community.

DOCUMENTING STUDENT AND TEACHER LEARNING

As has probably become clear by now, documenting student—and often teacher—learning plays a key role in creating collective knowledge. Malaguzzi (1993) describes the goal of the Reggio approach as creating schools that are "active, inventive, livable, *documentable* [emphasis added], and communicative" (p. 9). Creating collective knowledge can take place

without documentation, but documentation increases the likelihood of such knowledge developing. In the MLV research, we define documentation as *the practice of observing, recording, interpreting, and sharing through a variety of media the processes and products of learning in order to deepen learning*. Documentation helps us to understand and nurture our own and others' learning and deepens our understanding about teaching and learning more broadly. Documenting learning builds collective knowledge by offering a research orientation, by creating cultural artifacts, and by serving as a collective memory (Project Zero & Reggio Children, 2001). It grounds teachers' conversations and collaborations in the products and processes of learning and contributes to the group's identity as a learning group. Of course, not all documentation centers on learning; learning has to be a lens the documenter brings. Even then, it can be difficult to make the learning visible to oneself and others.

The clearer the purpose for the documentation, the stronger the documentation, and the more likely it is to spark a rich and recursive process of documenting, getting another idea, documenting some more, and so on. Documentation shifts conversations away from telling "stories" of classroom experiences to collectively looking at and analyzing student work in service of understanding and supporting learning. Jen Hogue's initial purpose in documenting was for each student's ideas to be heard, understood, and perhaps integrated into the schemas of others. But she soon realized that not only did the group need to hear the individual's ideas but also the individual needed to revisit the learning of the group. Jen's question became: "How can I use documentation to reflect the learning of the group back to the individual and the learning of the individual back to the group?" She wrote:

> Again and again in journal entries and reflections, I have written descriptions of a "good feeling" I've gotten after focusing the attention of the class on itself as a learning group—partly because the questions were authentic, partly because students were being seen, heard, listened to. I also have records of noticing myself teaching differently—attempting more inquiry-type lessons, playing the part of a coach—when I was focusing on documentation and/or group learning. Finally, I have records of my reflections that I am listening better to students as a result of documentation efforts. (J. Hogue, written reflection, May 4, 2004)

Along with teachers, students can become involved in documenting their own and others' learning. Indeed, one way seminar teachers engaged disaffected students was by asking them to document instances of their own or others' learning. Sixth-grade science teacher Johanna Grochawalski asked her students to document their small-group discussions during a project on planets. Each time the group met, students took turns recording the

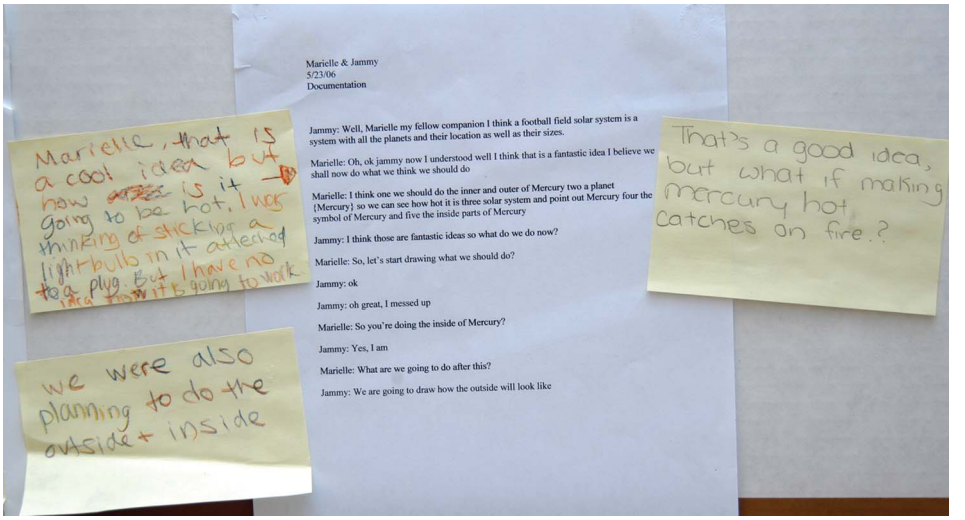

FIGURE 8. Sixth-grade students comment on a small group's ideas about representing the planet Mercury (photo by Melissa Rivard) (color figure available online).

conversation on index cards, with one student typing up the cards for homework. Partial transcripts were then posted around the room. Students from other small groups and classes who were also studying planets added comments and questions on post-its (Figure 8). Johanna noted that students were more polite and seemed to choose their words more carefully knowing they were being recorded. Listening improved as well.

Daycare teachers Marina Boni and Chris Bucco[7] enlisted four-year-olds to help them document children teaching or learning from each other by asking children to alert them when they noticed such moments. Ben Mardell asked his kindergartners to let him know when they made a discovery they wanted documented. Deb Dempsey gave her fifth graders cameras and asked them to take *pictures of learning*. And Jen Hogue asked her students to reflect on photographs of the week's activities and identify what went well and what could be changed so she could modify her teaching. Exercises like these provoked conversations about what it means to *learn* and how you know when it's happening. Such documentation takes learning out of the realm of the abstract and makes concepts like metacognition more concrete.

Documentation of this nature also supports democratic practice. Expressing and explaining one's own ideas—and listening and responding to those of others—are critical to establishing a democratic culture in and outside the classroom. Knowing that someone is listening, students may

[7]**Chris was Marina's co-teacher at a daycare center before working for Even Start.**

take more care to formulate their thoughts and to listen in return. Indeed, creating a space in which people offer, receive and modify ideas becomes one of the things teachers and students are working on. When Ben Mardell's teaching assistant, Rachel Bragin, audiotaped a group of children explaining to another class how to use a recycling bin, she realized she had been talking too much. Rachel decided to repeat the experience with another class. In preparation, she asked the children to listen to the recording. One child noticed that another child hardly talked at all, leading to a discussion about why this might be and how to remedy it (B. Mardell, personal communication, March 17, 2004).

As our Reggio colleagues remind us, documentation is a form of communication that is created with others in mind. Much of the documentation discussed in this essay can be made public to others outside the classroom. The group gains a new identity when its goals include contributing to the larger field. When Reggio educators decided to hold an exhibit and to write a book describing the learning process, their research with the children took on new meaning. Creating a new solar system model for the library engaged students who did not usually participate in Deb Dempsey's class. The Boston Marathon sculpture, book, and video united adults and children in Ben's class in a common project, extending and deepening their learning.

In the United States, the term *documentation* typically suggests more of a record-keeping than a learning mentality. But documentation does not have to be a postmortem; it can be a *research* tool for schools to deepen everyone's understanding of how we learn. Looking at how children think and learn—how ideas are born and evolve—is not the only focus of documentation, but it is a central one.

CONCLUDING NOTE: TOWARD "CHANGING OUR SKIN"

Embracing the notion that the focus of teaching and learning over time is not just improving individual understanding but contributing to collective knowledge requires rethinking many of our fundamental assumptions, values, and beliefs about teaching and learning. Can we see learning as more than a private and individual activity? Can we see students as teachers and teachers as learners? Can teaching and learning be considered ethical and political as well as cognitive acts? How do we *change our skin*?

Some years ago, on a trip to Reggio Emilia, developmental psychologist Rebecca New asked a teacher how she decided which of her many photographs to display in the classroom. The teacher responded she never puts up pictures of individual children because she wants parents to know that each child learns because of other children. In a trip to China in the 1970s, the sociologist, Ruth Sidel (1982) noticed that children were wearing smocks with buttons down the back. She commented that in the United States the

smocks would be turned around so children could learn how to manipulate the buttons themselves. The Chinese educators replied that teachers ask children to wear their smocks this way on purpose—to encourage interdependence and reliance on one another.

The fact that virtually all formal learning environments, from early childhood to graduate school, situate learners in a social context suggests that teachers need to attend to the design and nurturance of small- and large-group learning. Yet, common practice in teacher education programs rarely focuses on how to nurture groups as a powerful context for learning. Typical assignments entail writing case studies of individual students rather than developing group projects or approaches to collective reflection. Nor do most preservice and in-service programs provide opportunities for teachers to explore the role of documentation in teaching. It should not be taken for granted that all, or even many, aspects of teacher education actually focus on learning—how it happens, what it looks like, and whether teachers or younger learners can identify it. Documenting and analyzing student and teacher learning with others is one way to provide this focus. But without considerable experience in supporting group learning through documentation, it is unlikely teachers will be able to make significant progress. Creating a culture and practices that examine and develop the understandings and meanings that bring a group together can lay the foundation for a group to become a learning group.

In this essay, I argue that when students and teachers learn from and with each other, they become capable of understanding and accomplishing more than they would as individuals. In the best cases, classrooms and schools function like the disciplines—contributing to our public understanding as well as increasing individual knowledge. Reconsidering the nature of the task, fostering a pedagogy of relationships, nurturing different kinds of learning, and making learning visible through documentation are key to realizing this vision.

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APPENDIX

making learning visible — Understanding, Documenting, and Supporting Individual and Group Learning

Looking at Learning in Groups: Visual Essay and Discussion

Purpose

- To offer an engaging way to launch a conversation about how learning groups form, function, and demonstrate understanding in your setting.
- To involve students in research questions about learning in groups.

Preparation

- Choose a visual essay in the MLV book that you think will be especially engaging for your students. Prepare the visual essay for presentation (e.g., xerox from the book, use overheads or powerpoint, or, if your group is small enough to see the images, just read directly from the book). The City of Reggio (Boys and Girls) and Ring-Around-the-Rosy have worked well in the past.
- Practice reading through the essay before presenting it to your students and edit the adult narrative as appropriate for your age group. If possible, meet with a colleague to discuss why you chose the essay and the things about group learning you would like to discuss or make visible for your students.
- Think through the kind of conversation you hope to have with your students and any questions you want to ask. We provide suggestions for questions below. Jot down your hypotheses about how you think students will respond to the essay. What would you like to learn about your students' feelings and ideas about learning in groups?
- Think about how you would like to organize the presentation and discussion. Would you prefer a whole-group conversation about the essay or small-group discussions. Think about what forms of documentation will capture the things you most want to learn and choose at least two ways to document the conversation such as a tape recorder and a few photographs or notes.

Presentation and Discussion (time frame: 45-60 minutes)

- Begin with some discussion about learning in groups, perhaps by first asking students about their own experiences. You might ask:
  - What are some things that you learn best by yourself?
  - What are some things that you think you learn best in a group?
- Prepare students for the visual essay by asking them to pay close attention to the things they notice about the individuals in the essay and how they work together (what they say, when they work alone or together, etc.)
- Present the visual essay.
- Facilitate a conversation. Ask students to share what they noticed, what struck or surprised them, or any questions the essay raised. Ask the following questions as relevant, or come up with your own:
  - How did this group learn together?
  - Can you think of a group you have been a part of that worked well or helped you learn?
  - What do you think are some of the signs that a group is working well together?
  - When you learn in a group, do you all learn the same thing?
  - How do you decide on things in a group?
  - Which do you like better—working/learning alone or in a group? Why?
  - What can be hard about learning in a group? Learning alone?
  - Pretend you're the teacher of this class and you want to put kids into groups to learn about _____. How would you do it? (What size groups? With friends or not? Gender? Mix of skills or interests? With or without adults?)
  - What things would you look for that would let you know people in a group were learning?
  - What advice would you give me if I wanted to document how you learn and think? Individually? In a group?
  - Do you have any questions for me?
- If it is hard to get the conversation going, try pointing to specific moments in the story and ask the children what they notice about it—like the moments of invitation in the City of Reggio.

Reflection

- As soon as you have a free moment after the discussion, quickly review the documentation you gathered and add any notes that will help you remember key moments or highlights that shed light on your questions about learning in groups.
- Get your documentation into a format that you can share with one or more colleagues.
- Share your documentation and ask your colleague(s) to share his or her own interpretations. Choose one or more moments, observations, or interpretations to share back with your students.