Challenging Educational Assumptions: lessons from an Italian–American collaboration

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ABSTRACT   *In this paper, the authors argue that in order to create a curriculum of the future, we need to re-evaluate at least four key assumptions about teaching and learning that have guided educational decisions in the past. These assumptions are: learning is the result of individual, rather than group, activity; teachers are consumers, rather than generators, of theory; assessment is concerned with evaluating learning outcomes, rather than learning processes; teaching and learning are primarily cognitive, rather than aesthetic, ethical or affective, acts. Drawing on recent cross-cultural research, the authors use the example of the municipal pre-schools and infant-toddler centres of Reggio Emilia, Italy, to challenge these assumptions and suggest alternative ways for imagining classrooms of the future.*

INTRODUCTION

> Give me the child until he is seven, and I will give you the man. (The Jesuits)

> Everything has been thought of before; the difficulty is to think of it again. (Goethe)

Every society needs to nourish children's abilities and desires to learn and to support the many different ways that children come to understand the world around them. As we enter the 21st century, we need to consider what kind of education will serve our children best. While there is broad consensus that how we educate our children must change, there is less agreement as to the best ways to effect that change. What will the curriculum of the future be built on? As our society becomes more group-oriented in the workplace and in school, our knowledge of ourselves as individual learners and members of a community becomes more important. In order to live and work together effectively, we will need to be able to listen to one another, to work together to identify and solve problems and to acknowledge and respect diverse points of view.

Over the past decade, much attention in American education has been devoted to developing learning communities in schools (see for example Brown & Campione, 1990, 1994). But many of our cultural images of teachers,

parents, children and schools themselves stand in the way of realising such communities of democratic participation. It is sobering to realise that the majority of American schools today, barring a minority of interesting experiments, look as they did at the end of the last century (Darling-Hammond, 1997; Kohn, 1999). For over 100 years, schools have been operating on similar sets of assumptions and practices. In order to construct a curriculum of the future, we think it is imperative that we revisit assumptions about teaching and learning that have guided us in the past. (For the purposes of this paper, we interpret curriculum in its broadest sense, i.e. what as well as how students learn, what teachers do to facilitate and assess that learning and the context in which teaching and learning take place.)

Consider the following two scenarios based on real classroom examples.

Scenario 1: The Radon Experts (Berger, 1996)

In a sixth grade classroom in a small American town, 24 students and their teacher have spent the past several months researching the radon levels in their town. Radon is a colorless, odourless gas that can infiltrate houses and buildings and is the second leading cause of lung cancer in America. The class is collaborating on the study with a science professor and his students at a nearby college who serve as their guides and mentors. Up to this point in the project, the students and teacher have listened to lectures by the professor and the state radon expert and read books and articles about radon and radioactive decay. They have appealed to volunteers in the community interested in having their homes tested for radon, and developed a survey and questionnaire to collect background information such as the age of a house and type of foundations to determine factors that might correlate with the radon levels. They have also consulted with a lawyer to consider the social and political implications of their findings.

The college offers the students access to sophisticated equipment not available at their school and the college students help the sixth graders in using the equipment and analysing their data. The teacher and students try to locate other published research reports and recommendations from comparable studies, only to discover that theirs will be the first of its kind in the region. Realising the high stakes nature of their work gives the group a sense of urgency and responsibility.

Although a visitor to the classroom might at first confuse the energy in the room with a sense of chaos, it is clear that something serious and important is taking place. In different parts of the room, students are working in groups of two and three on different aspects of the research. Their goal is to complete a professional quality, polished report that integrates their data, interpretations and recommendations for the town governance committees and other interested parties. Two groups of students use a computer to organise the class database and design the charts and graphs for their publication. Other students are editing the methodology and recommendations sections of the narrative report.

Their drafts have already been critiqued twice by their peers, the college students and the teacher. Still other students are working together on the up-coming oral presentation at a public forum at the Town Hall. They rehearse, in front of a small group of peers, how to summarise their research in succinct and compelling ways and anticipate questions they will likely be asked. The air is filled with a sense of purpose and excitement. Each student as well as the teacher is involved in learning new information about radon, collecting and analysing data and writing up and communicating their findings; in short, making a scientific contribution to the field of environmental health and performing a vital service to their community.

Scenario 2: The Portrait Artists (Project Zero/Reggio Emilia, 1998)

In a municipal pre-school in Italy, a small group of 4- and 5-year-old children are making discoveries about faces and their features. For the past 6 weeks, while the rest of the class has been involved in other activities and experiences, this small group of five has been enthusiastically engaged in their 'face work'. A couple of giggling girls ask one of their classmates if he would like to be a live model for them and their friends as they sculpt a bust of clay. The group laughs in excitement and delight at the challenge of the situation. The classmate readily agrees and proceeds to climb up onto the table. Over the next weeks, different children will be invited to serve as models for their friends. The children engage in lively conversation as they joyfully take on the roles of sculptors working from a live model. They have already had several years of working with clay and use the selected tools provided by the teachers with skill and care. One child is having difficulty making the eyes and turns for help to his friend who is recognised by the group for his competence with clay.

A tape recorder is running on the table and one of the two classroom teachers is standing nearby writing notes. On the wall, are enlarged colour xeroxed photos showing three series of facial features: eyes, noses and mouths. Parts of transcribed conversations of the children about noses and mouths are posted next to the series of photos, as are fanciful examples of portraits done in colored pencil, wire, and common everyday objects like scissors, leaves and spoons.

The two teachers meet together daily and occasionally with their fellow teachers and teachers from other schools. Throughout the project they have recorded their observations (usually through written notes or partial transcripts of children's conversations and photographs) as data for sharing interpretations of how the children learn. This process also guides the co-teachers in making new hypotheses about the kinds of questions and provocations that will keep the group's motivation high and sustain the children's emotional, imaginative and intellectual engagement. They also make predictions about what might happen next.

During the past month, the children have been involved in many situations in which they observed how faces differ, how the same face could change

depending on its expression or how the same features could change shape depending on the mood (e.g. eyes that are happy, sad or fearful). Other experiences in the project include: working with other two- and three-dimensional media like paint and wire; experimenting with bodily expressions; observing faces in mirrors; looking at photographs of different facial features like those on the wall; visiting a local museum to study portraits, statues and busts; making photographic portraits of themselves and other children. At the end of each morning, the children are invited to share their reflections on their work with the rest of the class. On one such occasion, the children and teachers decide that the final goal of the project will be a clay, graphic and verbal representation of all the children in the class, in which each child's work has to be in agreement with the work of others (i.e. the group collectively agrees which design elements their work will contain).

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These scenarios, based on actual classroom projects, provide brief snapshots of our vision for a curriculum of the future. They contain within them a series of choices that challenge many of our implicit and explicit assumptions about teaching, learning and assessment. In this article, we draw on recent collaborative research between Harvard Project Zero, a research group at the Harvard Graduate School of Education, the municipality of Reggio Emilia, Italy, and Reggio Children, in order to challenge some of these assumptions that often drive educational practice. While there are certainly innovative teachers, schools, and projects in the USA that could also be used to challenge these assumptions (witness the radon experts), we focus on the example of the Reggio Emilia pre-schools and infant-toddler centres because of their systemic (city-wide) nature and because of the value of cross-cultural comparisons in revealing hidden beliefs and values. Cultural assumptions cut across age groups. Although we ground much of our discussion in early childhood, we believe the images found in Reggio Emilia can inform education beyond the pre-school years.

Below, we identify four key assumptions about teaching and learning that we think need to be re-evaluated in looking toward a curriculum of the future. We also briefly introduce our proposed alternatives. We then take a closer look at each assumption, presenting some different possibilities for imagining the classrooms of the future. In doing so, we do not make the claim that the ideas we are proposing are new, but that they merit revisiting. Ideas are only as powerful as what you can do with them (Cole, 1979). We hope our discussion can offer some provocative ways to put powerful old ideas into powerful new practices.

Assumption 1: Learning is the Result of Individual, Rather than Group, Activity

Despite the recent popularity of cooperative and project-based learning (Katz & Chard, 1989; Cohen, 1994a,b; Johnson & Johnson, 1995; Slavin, 1995, 1996;

Edwards *et al.*, 1998), the attainment of knowledge and understanding is still primarily viewed as an individual process. In and outside the classroom, thinking and learning are generally considered individual, rather than social and communicative, acts. However, we believe participation in groups is central to how individual learning is constructed, for adults as well as for children. As we saw in the radon example, in a school or classroom functioning as a learning group, adults and children feel like they are part of something larger than themselves that has meaning beyond what each individual has learned.

Assumption 2: Teachers are Consumers of, Rather than Generators of, Theory

Many of us carry around an image of teachers as facilitators of student learning who impart knowledge and skills either through direct instruction or by setting up learning experiences or projects and guiding students through them. But whether we think of teachers as 'sage on the stage' or 'guide on the side', we do not generally consider teachers as *learners* in the teaching and learning process. To our minds, schools should be places of inquiry for all participants, adults as well as children. Rather than enacting received theories about children's development, teachers should be engaged in an ongoing process of research into children's learning.

Assumption 3: Assessment in Schools is Concerned with Evaluating Learning Outcomes, Rather than Learning Processes

Most of us think of assessment as evaluating learning as a product, not a process ('what did the students learn?' not 'how are the students learning?'). But assessment is as much about how children learn and make meaning as it is about the products and outcomes of that learning. The two are inextricably linked. The way learning is assessed directly influences what gets taught. Rather than an exclusive product orientation, we propose an assessment approach that focuses on documenting children's learning processes and products as a way to inform curricular and pedagogical decisions.

Assumption 4: Learning and Teaching are Primarily Cognitive, Rather than Aesthetic, Ethical or Affective, Acts

We are all familiar with curricular or subject matter learning goals, like understanding number concepts or learning how to read and write and compose an essay. It is less common to see these goals as embedded in a larger aesthetic, ethical or affective context. In the schools of the future we believe we need to honor affective, aesthetic and moral forms of knowing as valid modes of inquiry that are on a par with, and closely tied to, scientific analysis. We need to explore more fully the role of these other forms of knowing in the classroom context.

FOUR EDUCATIONAL ASSUMPTIONS

Assumption 1: Learning is the Result of Individual, Rather than Group, Activity

Schools are by their nature social institutions. Children are virtually always in groups when they are in school; in this sense, nearly all school learning is group learning. Yet most of American educational practice remains focused on individual performance and achievement (Edwards *et al.*, 1994; Nimmo, 1998; Scardamalia *et al.*, 1994; Stevenson & Stigler, 1992). Almost all of our approaches to assessment and much of our curriculum are designed around the learning and work of the individual. Children generate 'individual' products that express their 'individual' identity while teachers devote 'individual' attention to 'individual' children. Personal goals often take precedence over communal goals.

This focus on the individual is not surprising given the emphasis in American culture on personal expression, individual skill development and the uniqueness of the individual. Many of us automatically think of terms like cognition, thinking and memory as applying only to the individual (Wertsch & Tulviste, 1992). In early childhood, a common goal of many programmes is to help children develop a sense of personal autonomy (Bredekamp & Rosegrant, 1993; Nimmo, 1998). While developing relationships with others may also be a goal, collaboration among young children typically refers to how children get along with one another in the social sense, e.g. how they take turns, share toys and negotiate conflicts. Rarely is collaboration mentioned as a critical way to build intellectual understanding.

We think the current educational balance is lopsided. In our opinion, the question confronting educators today is not whether group learning should happen; rather it is a matter of identifying the ways that educators can support and deepen the quality of learning that can occur whenever individuals are together in a group. Learning in a group fosters a kind of emotional and intellectual learning and understanding that is qualitatively different from that which results from individuals working alone. We define a learning group as any collection of people working toward shared goals in which individuals learn autonomously and through the ways of learning of others. (By *group* we refer both to the learning of individuals which is fostered by being in a group and to a more distributed kind of learning that does not reside inside the head of any one individual; see Salomon, 1993, for a discussion of recent research on distributed cognition.)

Learning in groups enables individuals to construct new knowledge by creating new relationships using the learning strategies and outcomes of others. It encourages children and adults to confront and accept points of view different from their own. By working together, adults and children attain not just group understanding, but deep individual understanding. As Loris Malaguzzi (1990), the founder and past director of the Reggio schools and centres, put it, 'The development of intelligence grows together with the development of socialization. The theoretical dispute is among those who contend that intelligence

grows from a social situation and those who say that intelligence grows inside every child, seen in some way as separated or disconnected from other children'.

In learning groups in early childhood, each child is recognised by the others in the group as bringing a distinctive perspective and way of thinking. Children come to see the differences in themselves as adding to the richness of their working process and product. We saw an example of this in the second opening scenario when the little boy turned to the child recognised for his competence in clay. Moreover, in the act of communicating with one another, children make their thinking visible. When children can recognise—indeed, welcome—individual differences, they are on the road to learning how to think for themselves and appreciating the world's complexity.

Nonetheless, many American teachers are concerned that by focusing on the group, attention to the individuality of each child will be lost. In our view, group learning does not take away individuality from individuals, but rather enhances the individual even more. Small groups in particular help to bring out individual contributions more clearly. (Teachers in the Reggio pre-schools often consider small groups of two to six the most desirable context for intellectual work (Malaguzzi, 1993; Rankin, 1990). This belief informs many of the fundamental pedagogical decisions Reggio teachers make.) Group projects often build on or extend, rather than replace, the work of individuals. In the radon example, the collective work of the class was based on the contributions of each and every student (and teacher). Being part of a group allows us to have experiences we can't otherwise have. In a group, we learn how to share and exchange knowledge and how to defend, negotiate and modify our ideas in the presence of others. Each person forms a distinct identity in dealing with the differences of others.

Moreover, over time, schools and classrooms that nurture group learning can create a community culture or collective knowledge that is larger than what any one individual knows. Again, think of the radon experts. In our notion of group learning, the focus of learning extends beyond what the individual knows to having knowledge itself as a goal. Schools and classrooms operate in ways similar to the disciplines, i.e. they strive to create a public understanding of things (Scardamalia *et al.*, 1994). In Reggio, children and adults all feel part of a greater community of learners, as evidenced by the collective projects and products and the communication and interaction among the different groups of teachers, parents and children from the same schools, between schools and with the town of Reggio Emilia itself.

In the curriculum of the future, we need to revisit the role of group learning, including the role of adults. We next consider some key assumptions about teachers in the teaching and learning process.

Assumption 2: Teachers are Consumers of, Rather than Generators of, Theory

Over the past decade or so, notions of 'teacher as researcher', 'reflective practitioner' and 'action researcher' have become popular in the USA

(Cochran-Smith & Lytle, 1993; Hubbard & Power, 1999). These terms refer to teachers who are thoughtful and reflective about their practice and the reasons behind what they do. These teacher-researchers may pursue questions related to teaching and learning either individually or through study groups or they may collaborate with university-based researchers in investigating topics of mutual interest like assessing student learning through the use of portfolios (Seidel *et al.*, 1997) or applying a theoretical framework like teaching for understanding (Blythe & Associates, 1998).

Yet when we think about learning groups, whether in early childhood, elementary or secondary school, we do not usually consider the adults as part of the learning group. Indeed, in most cooperative learning approaches, the role of the adult is usually viewed as that of 'implementer' (Damon, 1984). But, as we saw in both opening examples, we think teachers need to be learning and engaged in inquiry-based research right alongside the children. Although there are important distinctions in what adults and children can and do learn, we think that it is inappropriate and unhelpful to ignore the learning of adults in favour of an exclusive focus on children. We might even propose that if there is deep learning on the part of the teachers (and parents!), there is likely to be deep learning on the part of the children.

In America, a traditional paradigm for professional development prevails: knowledge about teaching and learning is generated outside the classroom and then brought in through reading, courses, modelling, conferences and so on. Just as teachers are supposed to enact curriculum and assessment, they are seen as enacting accepted theories about child development and good pedagogy, rather than constructing them. In our conceptualisation, conducting collaborative research in schools is the essence of professional growth. The philosophy and practices of Reggio Emilia serve as a powerful example of this vision.

Reggio educators see themselves as theory builders as well as theory consumers. They have been described as philosophers of childhood, collectively creating a framework for theory and practice based on deep respect for and sensitivity to the capacities and interests of young children (Kennedy, 1996). Teachers in Reggio Emilia see themselves as building knowledge through rigorous documentation of children's learning experiences. They are collectively engaged in an ongoing process of posing hypotheses and gathering data through careful observation, documentation and interpretation. In this way, they use practice to create theory.

The Reggio schools are sites of 'pedagogical research'. This type of research synthesises theory and practice by embedding them in the daily life of the school. It differs from university-based research models of generating theories and frameworks which are then applied and tested in the classroom. Rather, theories of learning emerge from the daily practice of education. Meanings are made, not merely dispatched and consumed. New questions and hypotheses emerge all the time which take the teacher-researchers back to old data. Theories are created, modified and validated (or not) by educators, who are also learning themselves.

In the USA teachers of young children typically develop curricula by planning thematic units, centre-based activities or short- or long-term projects. It is less common to see teachers investigating materials, tools or phenomena that they expand into curricula, or systematically documenting and following children's interests, questions and hypotheses as a way to generate curricula. While most educators have ideas about what they would like young children to learn that guide their curricular decisions (like learning how to share or understanding cause and effect), rarely do teachers come together to set comparable learning goals for themselves.

In the Reggio schools, learning goals are as much for the adult as they are for the child. Teachers want to understand children's points of view and thinking processes so they can enter the children's world on its own terms and facilitate learning more meaningfully. They are constantly engaged in documenting children's learning in order to frame next steps for the group and create motivating experiences that will deepen or extend individual and group knowledge. Reggio teachers often start with questions or learning goals that are oriented toward domains and materials and include hypotheses about children's thinking. They study, experiment and play with the materials and tools themselves, exploring their educational, aesthetic, emotional, ethical, political and cultural 'identities' (or characteristics). Tools are seen as a kind of border between magical thinking and scientific discoveries that facilitate learning by enabling children to represent their ideas through different media and modes of expression. Materials are considered in the light of their potential to generate surprises and for children to become more competent and feel more emotions.

For example, teachers in one school set up an overhead projector with a variety of opaque and transparent materials. They then followed and documented children's interest in and questions about the phenomena of light and shadow that were provoked by their exploration. A study of the nature of light and shadow (the domain) and the overhead projector (the material) ensued. Questions the teachers posed to themselves included, 'While children are playing with the constructions, how much do they perceive the transformation possibilities offered by the light instruments at their disposal? 'Do [children] ask themselves questions concerning light and shadows? Which ones? How much do they test them? How much do they get charmed by them? Do they transform them into a 'narrative' subject while they are playing? If so, of what kind?' (Diana Preprimary School, 1995)

At Christmas time, the teachers sent the following letter home to parents (Diana Preprimary School, 1998) along with some photographic images of some of the children's constructions on the overhead projector and light table:

> We can talk about light in many different ways but at the end we remain convinced that each word is opaque and that the perception of light, so brilliant and clear, steams up and is dulled in the translation.

> Nonetheless, although aware of this, we want to accompany these images of light that are a Christmas present from your children with

some simple remarks to help you better understand the reasons for our choice.

Light is an impalpable element but it lends itself to strong modifications, both perceptive and environmental and emotional. It is not by chance that lately light has been rediscovered and used often by artists, designers, architects and art directors. It lends itself to archety-pal metaphors and images, and, at the same time, represents and reinterprets concepts of great modernity, due to its capacity for vari-ation ... .

While children explore the overhead projector and the light table, their thoughts and words move easily from perceptions and worlds of imagination to optical-scientific explorations. This is a fairly common process of knowledge; but in this case it becomes an emerging process: children construct understandings and imaginations that are simul-taneously translated within different fields of knowledge, where the aesthetic dimension is a coordinating element of great influence.

Isn't it important to receive a present that combines intelligence, beauty, interest, and fun? ... .

We have a lot to learn from this view of schooling. All individuals in the school create a culture of teaching and learning. Through systematic documen-tation of children's work, teachers generate new ideas about teaching and learning. Parents can participate in this culture too by helping to support and document children's work. Over time, parents shift from being interested only or primarily in their own child, to being concerned with other children, to an interest in childhood and learning in general. Our vision for the millennium is that teachers will be emotionally and intellectually engaged as learners as well as teachers in the educational process. As we will see in the next assumption, the role of documentation and assessment in conducting and sharing this new form of research is key.

Assumption 3: Assessment in Schools is Concerned with Evaluating Learning Outcomes, Rather than Learning Processes

In America, we often seem obsessed with testing and measuring children's performance in schools. Too often, we spend too much time judging and too little time trying to understand children through their work. Our attention is likely to be as much on the products or outcomes of learning—'did the children learn it?'—as on the processes or contexts of learning—'how do the children learn?'. The enormous American investment in standardised tests reveals our profound lack of faith in teachers as assessors of student thinking and activity and our disregard for the role of documentation in teaching and learning. Of

course, tests measure much more than knowledge. As one critic put it, 'Failing to finish a timed, multi-item achievement test in biology is a lesson in the American romance with speed, efficiency, and technology, as much as in the structure of a scientific domain' (Wolf, 1990).

In early childhood education, assessment has generally not played a significant role (Hills, 1993). In most American pre-school classrooms, assessment of children's development and learning is relatively informal. Teachers may make observations, record anecdotes or collect children's work, but seldom in a systematic way. Even a programme like Headstart, which serves millions of children, has no agreed upon way of assessing children and charting progress. One recent approach to assessment in the early years has been to push reading, writing and numeracy skills into the pre-school and use standardised tests early on. Many of these measures view children in isolated ways as notation users, rather than as full human beings or contributing members of a community. Another approach has been to adopt a more performance-oriented view based on children's developmental progress, like the Work Sampling System designed by Sam Meisels and his colleagues (Meisels *et al.*, 1994). This work represents a significant step forward in creating a more comprehensive and differentiated assessment of children, making use of portfolios, developmental checklists and written narratives to assess children's skills, behaviour and academic accomplishments. (For other methods of observing and recording children's learning see Carini, 1975, 1982; Barr *et al.*, 1988; Chen *et al.*, 1998; Krechevsky, 1998; Falk, 1999; Featherstone, 1999.)

While we might all agree that one purpose of *documenting* children's work is to understand how children learn and make meaning (learning as a verb), many of us are understandably also concerned with the results of such processes and how they can be substantiated and reported (learning as a noun). Both views are concerned with making learning public. The focus of documentation as developed in the Reggio Emilia pre-schools and infant-toddler centres is on the acts as much as the products of learning; product and process are closely intertwined. This emphasis on documenting and understanding children's learning processes as a way to inform curricular and pedagogical decisions plays a major role in contributing to the superior quality of Reggio children's projects and products. Ironically, too great an emphasis on outcomes and products (often arising from pre-determined 'learning goals') may lead teachers to overlook important information about children's ways of making meaning that in a curriculum grounded in documentation might lead to different learning goals and perhaps deeper understanding on the part of the children (Carini, 1987; Duckworth, 1996).

In our view, assessment and documentation are critical to determining the quality of the learning processes and contexts that lead to children's products and performances. Assessment does not just evaluate what a child knows or knows how to do, but what the child can do with various kinds of environmental support (i.e. within Vygotsky's (1978) zone of proximal development). This means that teachers need to document and evaluate 'the possible', to assess not

just what and how the child learns, but the contexts, opportunities and materials offered to the child (Rinaldi, 1998a). In the portrait artists example, teachers used their documentation of daily activity to carefully choreograph different combinations of media and settings that would stimulate and deepen the children's intellectual and emotional engagement.

Documentation is a research orientation, rather than a method for displaying children's work or creating a final report or archive. It sustains educational action—the learning and teaching of adults in dialogue with the learning processes of children (Rinaldi, 1998b). Its forms and methods are constantly refashioned, depending on the learning context. Documentation allows teachers to foster children's learning from the inside based on children's own thoughts, ideas and context, rather than imposing it from the outside. Through documentation, teachers and parents stay close to the learning processes of children and themselves. As we saw in the Diana Preprimary School parents' letter, it provides children, parents, teachers and the wider culture with a basis for discussion, reflection and learning about children's ways of being, learning and living (Rinaldi, 1998a).

Of course the act of documenting in and of itself is not meaningful. Documentation must be for a purpose. It requires the act of interpretation and evaluation. Documentation provides the interpretable traces of observation that form the basis for pedagogical and curricular decisions. (It is interesting to note that the term 'evaluate' derives from the Latin 'to bring out value' and 'assess' comes from the Latin 'to sit beside'. We might do well to ponder the degree to which our current assessments reflect what we value or resemble the act of 'sitting beside' (instead of standing over) our children.)

American educators who have studied the Reggio approach find a significant difference in their understanding of children's learning and interests when they systematically record and reflect on children's words and actions, rather than depending on memory alone (see for example Kantor & Whaley, 1998). For example, one set of American educators discovered that 'less is more' and that they did not need to provide the wide variety of experiences they had previously offered (Kantor & Whaley, 1998). Variation was embedded in extended explorations of a single material (e.g. glue or paint) in different ways. Curricular experiences lasted longer and took on new meanings when children were given the opportunity to revisit and build on what they had done.

In the new millennium, we would like to re-invigorate assessment practices that depend on teachers' observation and documentation skills and analytical, cultural and ethical perspectives. As Vea Vecchi (1996, p. 156), the atelierista (arts educator) of the Diana Preprimary School, expresses it:

> We feel it is necessary, once again, to deny the assertion that learning, and how we learn, is a process that cannot be seen, that cannot be activated and observed, leaving the school with the sole task of eliciting learning and then verifying it after the fact. What we are interested in is precisely an attempt to see this process and to understand how the

construction of doing, thinking and knowing takes place, as well as what sort of influences or modifications can occur in these processes.

But learning and knowing are not only cognitive acts. We now turn to some ways of knowing too often neglected in our current schools.

Assumption 4: Learning and Teaching are Primarily Cognitive, Rather than Aesthetic, Ethical or Affective, Acts

Few people would disagree with the claim that one of the central purposes of school is to promote the development of children's cognitive processes. All of us want our children to develop the ability to think critically and creatively, to learn disciplinary ways of thinking and understanding and to acquire the basic literacies. We do not, however, spend much time pondering how cognitive forms of learning might be related to other forms of learning. For example, could feeling the beauty of something or experiencing the pleasure of understanding with others also be considered a form of learning?

In creating a curriculum for the future, we think it is important to resist the all-too-human tendency to simplify either individual or group learning processes or the phenomena or content being learned. Hence, we support a broader view of learning as engaging students cognitively, emotionally, aesthetically and ethically in solving problems and creating products considered meaningful in a culture (Gardner, 1983). The radon study provides an extraordinary example of such products and processes. Cognitive moments were not separate from the way the students and teacher lived the situation. If any set of learners—child or adult—does not understand what they are learning in relation to their own life context, then an important dimension of meaning is lost.

In the USA we often separate out cognitive goals from other aspects of a learning experience. For example, developing a sense of community is an important goal for many teachers at the beginning of the school year. Most teachers plan activities and experiences that they think will build an effective sense of community. But this type of planning is usually conducted without any connection to providing compelling intellectual provocations, perhaps because of a belief that groups need to develop an identity or become a 'community' before they can engage in 'real work'. Yet we believe that the ways groups form and function and what they learn go hand in hand. Powerful intellectual problems motivate the building of community and vice versa.

We earlier noted that a defining feature of a learning group is shared activity around a common goal. Another critical component of learning groups in our view is the presence of passion. As long as individuals share a passion for understanding a particular subject, a learning group exists. Yet many of us, at least in Anglo-American contexts, are afraid of excessive emotion in schools (Nimmo, 1998). We view the expression of emotion as of possible therapeutic benefit, but not as a communicative act critical to learning. But shared emotions

can bring groups together and motivate learning. Creating or finding experiences that will stimulate excitement, curiosity and joy in children *and adults* is a fundamental part of teaching in the Reggio view. Reggio teachers strive to find materials or experiences (e.g. posing riddles, immersing materials in light or dressing up in imaginative costumes) that will generate feelings of surprise, amusement, wonder and even betrayal. Teachers also nurture their own capacities to feel amazement, passion, a sense of adventure and a commitment to the highest standards of excellence for themselves, the children and the teaching profession.

As the Diana teachers said in their letter to parents, when children explore and develop their own thinking together, their words and thoughts cross easily among different domains of knowledge. The aesthetic dimension emerges as an element of great influence: it serves as a criterion for determining the quality of one's learning and motivates further learning. Rinaldi (1997) points out that when we learn and build knowledge, we are constructing, putting into relationship and evaluating what we are doing according to models that are attractive to us. Indeed, Reggio educators maintain that very early on individuals and groups of children seem to develop a sensitivity to an aesthetic of knowledge—a sense of excellence—which allows them to evaluate and modify their ideas, theories and products. They exhibit the capacity to choose 'what is best' between theories and to identify different conceptual or formal solutions that advance the work of the group as well as their own work. In the opening pre-school scenario, the group decision that the work of the children needs to be in agreement with one another grows out of a sense of aesthetic integrity, not out of a sense of conformity. It is interesting to consider that, to our knowledge, in the standards movement in the USA there has been no attempt to understand how standards operate in a child's mind (Seidel, personal communication, 1999). Yet children in Reggio Emilia show us that they have developed a sense of standards even before they enter primary school!

In our view, the values of a learning group should not be seen as separate from the learning goals and experiences of the group. For example, before beginning a project on trees, Reggio educators do not just ask themselves what kinds of cognitive learning goals they have for children (e.g. to learn the parts of a tree, how trees grow, etc.) but they embed the project in a larger social, cultural, ethical and political context:

> The children pass by the trees every day on their way to and from school, and often play around them. But do they really *see* the trees? Do they sense them as an important presence? What do they know about trees? What relationships do they have with them? ...

> Our desire is for children to *encounter* the trees, and as a result of this encounter to feel admiration, curiosity and respect, to enter into a living relationship with the tree, recognizing it as a living organism with all this concept entails; that is, that we, along with all other living

organisms, are inhabitants of the same planet, Earth. (Vecchi, in Cadwell, 1997)

This type of encounter between children and trees is arguably an ethical act. It is also about making the ordinary extraordinary. In the hands of Reggio educators, a bird, a puddle, a shadow or a leaf can take on numerous identities that touch children's and adults' hearts, minds and bodies (Municipality of Reggio Emilia, 1996). Learning is an act of love that results from a fundamental desire to make sense of the world. If children, or any of us, learn about photosynthesis in terms of light and chemical reactions without learning about plants and trees as part of our ecosystem, we miss developing a critical component of our relationship to knowledge. The view of education that we are proposing can be summed up by paraphrasing the words of Carla Rinaldi, the pedagogical director of the Reggio schools and centres: schools are places where we invite children and adults to live.

CONCLUDING NOTE

To begin the process of creating a curriculum for the future, we have argued that we need to re-examine key assumptions that underlie educational decisions in our communities and schools. All of these assumptions can also be framed as dichotomies that we would challenge as well, i.e. learning is the result of both individual and group activity; teachers are builders as well as integraters of theory; assessment addresses learning processes as well as products; teaching and learning are not only cognitive, but emotional, aesthetic and ethical acts. We have used the example of a cross-cultural collaboration in exploring these assumptions and false dichotomies because of the power of such comparisons for making visible the unacknowledged consequences of so many of our beliefs, values and practices (Stevenson & Stigler, 1992).

The kind of education we envision comes about only through a slow process requiring collaborative and systemic involvement from many people over many years. The Reggio experience is the result of over 30 years of a sustained commitment to the rights of children, teachers and parents as participating members of a learning community. Reggio children and adults have had to learn how to trust each other, take risks, think critically and probe deeply as they have built and carried out their ongoing project of pedagogical research.

Most parents and educators would agree that the early years in a child's development are a critical time for creating a solid foundation for lifelong learning and achievement. Early childhood is the time to launch children on their individual and collective learning paths so that they can capably negotiate their way through school and the world beyond. The world is becoming increasingly connected and interdependent at the same time that many of us are feeling more isolated in our own communities. If children grow up in a culture that values group learning and begin their formal schooling with support for

thinking, feeling and acting in groups, they will likely be better able to participate in and practice democracy as informed and caring citizens.

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