Lifelong Kindergarten:
Cultivating Creativity through Projects, Passion, Peers, and Play

Mitchel Resnick, MIT Media Lab
Published by MIT Press (2017)

A Hundred Languages

In the past few decades, there has been much talk about the transition from an Industrial Society to an Information Society. People now see information, not natural resources, as the driving force in the economy and society. Others prefer to describe our current era as a Knowledge Society, noting that information is useful only when it's transformed into knowledge.

In this book, I've been making the case for a different framework: the Creative Society. As the pace of change in the world continues to accelerate, people must learn how to adapt to constantly changing conditions. Success in the future—for individuals, for communities, for companies, for nations as a whole—will be based on the ability to think and act creatively.

The shift to a Creative Society presents both a need and an opportunity. There is a pressing need to help young people develop as creative thinkers so that they're prepared for life in a fast-changing world. At the same time, we can use this transition as an opportunity to promote a more humane set of values in society. One of the best ways to help young people prepare for life in a Creative Society is to make sure that they have the chance to follow their interests, to explore their ideas, to develop their voices. Those are values I would have wanted in any era, but they're more important now than ever before.

To take advantage of this opportunity, and to nurture these values, we need to pull together people from all parts of society: parents, teachers, designers, policymakers, and children. How can we do that? One place where I've looked for ideas and inspiration is the small Italian city of Reggio Emilia, which has developed a network of preschools and kindergartens that provide a glimpse into the possibilities of the Creative Society.

At the heart of the Reggio approach is a deep respect for the abilities of the child. The schools are designed to support and document children's explorations and investigations. On one visit to a Reggio classroom, I saw a table full of magnifying glasses, microscopes, and webcams that children were using to examine the microstructure of lettuce and other vegetables. On another table was an incredible assortment of crayons, markers, and craft materials that children were using to draw scenes from the city—and then to build models based on their drawings. In another classroom, children were studying worms that they found in the field next to the school, and they were making a long list of things they were learning about worms.

In Reggio classrooms, children and teachers are constantly documenting their work—and posting their documentation on the walls of the classroom for everyone to see. It's part of a process that they call *making learning visible*. The documentation serves several purposes: It encourages children to reflect upon their work, it enables teachers to get a better understanding

of their students' thinking, and it provides a way for parents (when they visit the classroom) to see what their children have been working on. Parents are viewed as partners and collaborators, invited to participate in all parts of the educational process.

Some of the documentation is published in book form so that teachers, parents, and researchers around the world can learn from the experiences in Reggio. One book documents children's exploration of shadows. The book is full of photographs of children creating and playing with shadows, exploring how different types of objects cast different types of shadows and how shadows change over the course of the day. It also includes children's drawings of shadows and their explanations of how shadows work. The book has a delightful title, based on a quote from one of the children: *Everything Has a Shadow Except Ants*.

Often, teams of children become engaged in long-term collaborative projects. On my first visit to Reggio, in 1999, one kindergarten class was involved in a year-long project to design new curtains for the city's opera house, located a few blocks from their school. The children spent several weeks at the opera house, studying it inside and out. They decided that their curtain design should include plants and bugs, in part because of their interest in the plants around the opera house, and in part because of their interest in the movie *A Bug's Life*, which had recently been released. Working with their teachers, they explored ideas around transformation and metamorphosis: how seeds turn into plants, how caterpillars turn into butterflies.

The children created hundreds of drawings of plants and bugs, scanned them into a computer, manipulated and combined the drawings, and produced large-scale copies. Toward the end of the year, they again spent several weeks at the opera house, painting their images onto the curtain. The project was an example of how Reggio children become actively involved in the life of the community. In another project, children designed and created bird fountains for the parks in Reggio. "Children are full citizens from the moment of birth," says Carla Rinaldi, who has led many educational initiatives at Reggio. In Reggio, it not only takes a village to raise a child, it also takes children to raise the village.

Loris Malaguzzi laid the foundation for the Reggio approach, working in the Reggio schools from the 1960s to the 1990s. One of Malaguzzi's core ideas was that children have many different ways of exploring the world and expressing themselves. In his poem "The Hundred Languages," Malaguzzi wrote:

> *The child has*
> *a hundred languages*
> *a hundred hands*
> *a hundred thoughts*
> *a hundred ways of thinking*
> *of playing, of speaking.*

Malaguzzi was critical of the way that most schools constrain children's imagination and creativity:

> *The child has*
> *a hundred languages*

(and a hundred hundred hundred more)
but they steal ninety-nine.
The school and the culture
separate the head from the body.
They tell the child:
to think without hands
to do without head
to listen and not to speak
to understand without joy
to love and to marvel
only at Easter and at Christmas.

Malaguzzi developed his ideas primarily for children in preschool and kindergarten, but the Reggio approach is valid for learners of all ages. We need to support a hundred languages (or more) for everyone, everywhere.

It's not easy to put these ideas into practice. John Dewey, the pioneer of the progressive education movement, wrote that his approach was "simple but not easy." That is, Dewey's ideas were relatively easy to describe, but difficult to implement. The same is true for the Reggio approach—and for the four P's of creative learning.

Ten Tips for Parents and Teachers

There's a common misconception that the best way to encourage children's creativity is simply to get out of the way and let them be creative. Although it's certainly true that children are naturally curious and inquisitive, they need support to develop their creative capacities and reach their full creative potential.

Supporting children's development is always a balancing act: how much structure, how much freedom; when to step in, when to step back; when to show, when to tell, when to ask, when to listen.

In putting together this section, I decided to combine tips for parents and teachers, because I think the core issues for cultivating creativity are the same, whether you're in the home or in the classroom. The key challenge is not how to "teach creativity" to children, but rather how to create a fertile environment in which their creativity will take root, grow, and flourish.

I'm organizing this section around the five components of the Creative Learning Spiral (as shown in chapter 1): imagine, create, play, share, and reflect. I propose strategies for helping children *imagine* what they want to do, *create* projects through *playing* with tools and materials, *share* ideas and creations with others, and *reflect* on their experiences.

For each of the five components, I'll suggest two tips. That's a total of 10 tips. Of course, these 10 tips are just a very small subset of all of the things you might ask and do to cultivate children's creativity. View them as a representative sample, and come up with more of your own.

1. IMAGINE: Show examples to spark ideas

A blank page, a blank canvas, and a blank screen can be intimidating. A collection of examples can help spark the imagination. When we run Scratch workshops, we always start by showing sample projects—to give a sense of what's possible (inspirational projects) and to provide ideas on how to get started (starter projects). We show a diverse range of projects, in hopes of connecting with the interests and passions of workshop participants. Of course, there's a risk that children will simply mimic or copy the examples that they see. That's OK as a start, but only as a start. Encourage them to change or modify the examples. Suggest that they insert their own voice or add their own personal touch. What might they do differently? How can they add their own style, connect to their own interests? How can they make it their own?

2. IMAGINE: Encourage messing around

Most people assume that imagination takes place in the head, but the hands are just as important. To help children generate ideas for projects, we often encourage them to start messing around with materials. As children play with LEGO bricks or tinker with craft materials, new ideas emerge. What started as an aimless activity becomes the beginning of an extended project. We'll sometimes organize mini hands-on activities to get children started. For example, we'll ask children to put a few LEGO bricks together, then pass the structure to a friend to add a few more, then continue back and forth. After a few iterations, children often have new ideas for things they want to build.

3. CREATE: Provide a wide variety of materials

Children are deeply influenced by the toys, tools, and materials in the world around them. To engage children in creative activities, make sure they have access to a broad diversity of materials for drawing, building, and crafting. New technologies, like robotics kits and 3-D printers, can expand the range of what children create, but don't overlook traditional materials. A Computer Clubhouse coordinator was embarrassed to admit to me that her members were making their own dolls with "nylons, newspapers, and bird seed," without any advanced technology, but I thought their projects were great. Different materials are good for different things. LEGO bricks and popsicle sticks are good for making skeletons, felt and fabric are good for making skins, and Scratch is good for making things that move and interact. Pens and markers are good for drawing, and glue guns and duct tape are good for holding things together. The greater the diversity of materials, the greater the opportunity for creative projects.

4. CREATE: Embrace all types of making

Different children are interested in different types of making. Some enjoy making houses and castles with LEGO bricks. Some enjoy making games and animations with Scratch. Others enjoy making jewelry or soapbox race cars or desserts—or miniature golf courses. Writing a poem or a short story is a type of making, too. Children can learn about the creative design process through all of these activities. Help children find the type of making that resonates for them. Even better: Encourage children to engage in multiple types of making. That way, they'll get an even deeper understanding of the creative design process.

5. PLAY: Emphasize process, not product

Throughout this book, I've emphasized the importance of making things. Indeed, many of the best learning experiences happen when people are actively engaged in making things. But that doesn't mean we should put all our attention on the things that are made. Even more important is the process through which things are made. As children work on projects, highlight the process, not just the final product. Ask children about their strategies and their sources of inspiration. Encourage experimentation by honoring failed experiments as much as successful ones. Allocate times for children to share the intermediate stages of their projects and discuss what they plan to do next and why.

6. PLAY: Extend time for projects

It takes time for children to work on creative projects, especially if they're constantly tinkering, experimenting, and exploring new ideas (as we hope they will). Trying to squeeze projects into the constraints of a standard 50-minute school period—or even a few 50-minute periods over the course of a week—undermines the whole idea of working on projects. It discourages risk taking and experimentation, and it puts a priority on efficiently getting to the "right" answer within the allotted time. For an incremental change, schedule double periods for projects. For a more dramatic change, set aside particular days or weeks (or even months) when students work on nothing but projects in school. In the meantime, support after-school programs and community centers where children have larger blocks of time to work on projects.

7. SHARE: Play the role of matchmaker

Many children want to share ideas and collaborate on projects, but they're not sure how. You can play the role of matchmaker, helping children find others to work with, whether in the physical world or the online world. At Computer Clubhouses, the staff and mentors spend a lot of their time connecting Clubhouse members with one another. Sometimes, they bring together members with similar interests—for example, a shared interest in Japanese manga or a shared interest in 3-D modeling. Other times, they bring together members with complementary interests—for example, connecting members with interests in art and robotics so that they can work together on interactive sculptures. In the Scratch online community, we have organized month-long Collab Camps to help Scratchers find others to work with—and also to learn strategies for collaborating effectively.

8. SHARE: Get involved as a collaborator

Parents and mentors sometimes get too involved in children's creative projects, telling children what to do or grabbing the keyboard to show them how to fix a problem. Other parents and mentors don't get involved at all. There is a sweet spot in between, where adults and children form true collaborations on projects. When both sides are committed to working together, everyone has a lot to gain. A great example is Ricarose Roque's Family Creative Learning initiative, in which parents and children work together on projects at local community centers over five sessions. By the end of the experience, parents and children have new respect for one another's abilities, and relationships are strengthened.

9. REFLECT: Ask (authentic) questions

It's great for children to immerse themselves in projects, but it's also important for them to step back to reflect on what's happening. You can encourage children to reflect by asking them questions about their projects. I often start by asking: "How did you come up with the idea for this project?" It's an authentic question: I really want to know! The question prompts them to reflect on what motivated and inspired them. Another of my favorite questions: "What's been most surprising to you?" This question pushes them away from just describing the project and toward reflecting on their experience. If something goes wrong with a project, I'll often ask: "What did you want it to do?" In describing what they were trying to do, they often recognize where they went wrong, without any further input from me.

10. REFLECT: Share your own reflections

Most parents and teachers are reluctant to talk with children about their own thinking processes. Perhaps they don't want to expose that they're sometimes confused or unsure in their thinking. But talking with children about your own thinking process is the best gift you could give them. It's important for children to know that thinking is hard work for everyone—for adults as well as children. And it's useful for children to hear your strategies for working on projects and thinking through problems. By hearing your reflections, children will be more open to reflecting on their own thinking, and they'll have a better model of how to do it. Imagine the children in your life as creative thinking apprentices; you're helping them learn to become creative thinkers by demonstrating and discussing how you do it.

Continuing the Spiral

Of course, the Creative Learning Spiral doesn't end with a single cycle of imagining, creating, playing, sharing, and reflecting. As children move through the process, they get new ideas and continue to the next iteration of the spiral, with another cycle of imagining, creating, playing, sharing, and reflecting. With each iteration of the spiral, there are new opportunities for you to support children in their creative learning.

The Path toward Lifelong Kindergarten

A few years ago, a Media Lab colleague wrote to me about her daughter Lily, who was in kindergarten. "One of Lily's classmates is repeating kindergarten for developmental reasons," she wrote. "Lily came home one day and said: 'Daisy did kindergarten last year and is doing it again this year—for two whole years! I want to do kindergarten again too!'"

Lily's reluctance to leave kindergarten is understandable. As she moves through the school system, she might never again have the same opportunities for creative exploration and creative expression. But it doesn't have to be that way. In this book, I've presented reasons and strategies for extending the kindergarten approach, so that children like Lily can continue to engage in creative learning experiences throughout their lives.

Of course, extending the kindergarten approach isn't easy. Educational systems have proven stubbornly resistant to change. Over the past century, the fields of agriculture, medicine, and manufacturing have been fundamentally transformed by new technologies and scientific

advances. Not so with education. Even as new technologies have flowed into schools, the core structures and strategies of most schools have remained largely unchanged, still stuck in an assembly-line mindset, aligned with the needs and processes of the Industrial Society.

To meet the needs of a Creative Society, we need to break down many structural barriers in the educational system. We need to break down barriers across *disciplines*, providing students with opportunities to work on projects that integrate science, art, engineering, and design. We need to break down barriers across *age*, allowing people of all ages to learn with and from one another. We need to break down barriers across *space*, connecting activities in schools, community centers, and homes. And we need to break down barriers across *time*, enabling children to work on interest-based projects for weeks or months or years, rather than squeezing projects into the constraints of a class period or curriculum unit.

Breaking down these structural barriers will be difficult. It will require a shift in the ways people think about education and learning. People need to view education not as a way to deliver information and instruction in bite-sized pieces, but rather as a way to help children develop as creative thinkers.

When I think about the transition to a Creative Society, I see myself as a short-term pessimist and a long-term optimist. I'm a short-term pessimist because I know how difficult it is to break down structural barriers and to shift people's mindsets. These types of changes typically don't happen overnight. At the same time, I'm a long-term optimist. There are long-term trends that will strengthen the case for Lifelong Kindergarten. As the pace of change continues to accelerate, the need for creative thinking will become more apparent. Over time, more and more people will come to understand the critical importance of helping children develop their creative capacities, and a new consensus on the goals of education will emerge.

Around the world, there are hopeful signs. There are more schools, museums, libraries, and community centers providing children with opportunities for making, creating, experimenting, and exploring. And there are more parents, teachers, and policymakers recognizing the limitations of traditional approaches to learning and education—and searching for better strategies to equip children for life in a rapidly changing world.

Another reason for my long-term optimism centers on children themselves. As more children experience the possibilities and joys of creativity through their participation in communities like Scratch and Computer Clubhouses, they become catalysts for change. They're becoming frustrated with the passivity of school classrooms, and they don't want to accept the old ways of doing things. These children, as they grow up, will continue to push for change.

This is just the beginning of a long journey. The path toward Lifelong Kindergarten will be a long and winding one. It will require many years of work by many people in many places. We need to develop better technologies, activities, and strategies for engaging children in creative learning activities. We need to create more places where children can work on creative projects and develop their creative capacities. And we need to come up with better ways to document and demonstrate the power of projects, passion, peers, and play.

It's worth the time and effort. I've dedicated my life to it, and I hope others will, too. It's the only way that we can ensure that all children, from all backgrounds, will have the opportunity to become full and active participants in tomorrow's Creative Society.