

# Preface

It seems to us that the time has come to weave together the compelling trends affecting education.

- Programs such as the International Baccalaureate, the CCSS Initiative, the STEM Education Coalition, and the NGSS call for more rigorous standards for students.
- The National Teaching Standards continue the call for a new and more rigorous kind of learner-centered, project-based classroom.
- Technology is linking people as never before and is providing unparalleled access to information and knowledge that spans the world.
- And neuroscience, cognitive science, and our collective wisdom are joining forces and helping us grasp the nature of any learner as a complex, self-directed, living system.

The book you are holding in your hands summarizes our passionate commitment to integrating all of the above trends as a way of shaping professional development and paves the way for a remarkably positive view of learning and education.

## **WHAT DOES IT MEAN TO USE MORE OF ONE'S BRAIN AND ONE'S MIND?**

Many people answer the question in terms of memorizing more facts. But if neuroscience and cognitive science are to be taken seriously, then the brain governs much more than memory alone. The “brain/mind” deals with emotions, movement, creativity, immune responses, language, reasoning, planning, organization, and dreaming. It allows us to experience compassion, interconnectedness, peace, and ambiguity. Add to that the fact that the environment and experiences affect human beings and their capacity to change their own brains by using a variety of processes to change their minds, and we are looking at a new definition of learning.

So the answer to the question calls for understanding that the body–brain–mind of every student constitutes an interconnected unity engaged in a dance between their physiology and the environment. It leads to the awareness that the brain is biologically designed to learn and that natural

learning is a matter of building rich neural networks. Every aspect of the process engages the twin dynamics of perception and action and has an impact on how a person interacts with the real world.

The Caines' originally synthesized much of the research from many different disciplines that elucidate these ideas. (See Caine & Caine, *Making Connections: Teaching and the Human Brain*, 1991, 1994.) The synthesis took the form of 12 principles—now known as the 12 Brain/Mind Principles of Natural Learning.

Given that the functioning of the brain encompasses so much, what are the implications for educators? The Caines have suggested that for education to be based on how people learn naturally, three essential elements need to be present:

- **Relaxed Alertness:** Learners need to be in a supportive yet challenging and empowering social environment that elicits their interests, purposes, and meanings. They call this environment *Relaxed Alertness*. The first section of the book therefore focuses on how to create Relaxed Alertness in any learning environment and why.
- **Orchestrated Immersion in Complex Experiences:** Content and the standards need to be integrated in events and experiences that engage emotions, thinking, and imagination and, more, that have meaning for the learner. They call learning and teaching that engages rich, experiential environments *Orchestrated Immersion in Complex Experience*. The second section of the book therefore focuses on how to create these environments and why they are critical to effective education.
- **Active Processing of Experience:** Experience by itself is never enough. While students are immersed in rich, complex, dynamic experiences in organic and natural ways, it is up to the teacher to consistently encourage students to summarize, analyze, reflect on, demonstrate, display, and present for feedback what they are learning. They call this third element *Active Processing*. The third section of the book therefore focuses on how to process student experiences and consolidate critical knowledge for assessment and outcomes measured by real-world performance.

## HOW DO WE GET THERE?

As we thought about writing this overview, the four authors took time out to watch the movie *Indiana Jones and the Last Crusade*. We needed a metaphor for courage. Near the end of the movie, Indiana has to pass through various tests in order to get to the Holy Grail. During some very intense moments, he has to decipher the instructions by going beyond the script provided with a map. The one test that intrigued us the most was where “Indy” has to trust that a bridge, which is totally invisible, was in fact there. However, it doesn’t appear until he steps out as if it existed. He had to think, then he had to believe in order to act.

What this book has to offer will never be understood adequately or even be visible until you, the educator, step out toward the practices we suggest to you.

### **We have to learn together.**

In this interconnected, very demanding, technologically complex world, it is time for educators to emerge from the isolation of their classrooms and their individual professional journeys. In fact, we strongly suggest throughout the book that mastering the new research and implications for instruction can happen only when those involved enter into dialogue and learning as a coherent community. This is why we encourage the reader to learn in tandem with at least one other person or, better still, in what we call Process Learning Circles. (These are introduced in Resource C and spelled out in depth in *Strengthening and Enriching Your Professional Learning Community: The Art of Learning Together* by the Caines [2010]. An overview also can be found at <http://www.nlri.org>.)

Today's world requires that we make use of the knowledge and information already in our communities even as we reach out to other experts and the world.

### **There is a need for leadership that empowers others.**

Great leadership is vital. More specifically, getting there requires leadership that facilitates, empowers, and enables. If you are an individual who can encourage, inspire, and support others in excellence and personal and professional growth, then we encourage you to step up to the plate. Nationally, there is constant pressure for school leaders to standardize the instructional practices in their schools. This effort toward conformity is counter to what we understand about how our brains learn. Those who are not conforming to conformity are seeing remarkable results in their students and teachers. Whether you are a teacher leader, administrator, support staff, or superintendent, we call on you lead the way by demonstrating the qualities that are informed by the research and proven practices.

## **WHERE HAS THIS BEEN DONE?**

Since first being published in 1991, the Caines' Brain/Mind Principles of Natural Learning have been used on every continent and cited extensively, both with and without attribution. More experiences of note include the following:

- All the authors, individually and at times collectively, have been involved in long-term school and district-wide programs that have implemented the ideas and processes in this book. These include

- multiyear engagements with individual schools or districts in California, Michigan, Nevada, and elsewhere in the United States.
- For 10 years the Caines were international project colleagues with one of the world's leading-edge, state-supported programs of educational reform, originally called "Learning to Learn" in Adelaide, South Australia. One of the schools in the program, Bridgewater Elementary, was described in depth by the Caines in their book *Natural Learning for a Connected World: Education, Technology, and the Human Brain* (2011, Teachers College Press).
  - Coauthor Karl Klimek directs and oversees the implementation of grants and innovative projects by the Square One Education Network ([www.squareonenetwork.org](http://www.squareonenetwork.org)), a public foundation formed by industry and businesses that support educational change in a tristate area in the Midwest. The programs, projects, teaching, and leadership stimulated by those grants are truly outstanding and effectively reflect the value and learning impact of a project-based learning approach to teaching (see video at <http://www.nlri.org>).
  - The principles and processes have provided a foundation for superb school development programs created by others. An example is the work of Dr. Tim Jones, described in his book *Education for the Human Brain: A Road Map to Natural Learning in Schools* (2013, Rowman & Littlefield).
  - Many other high-level regional and school-based programs have been developed autonomously and without any reference to us but share and demonstrate the same underlying practices and philosophy. An excellent example, also described in some depth by the Caines (2011) in their book *Natural Learning*, is High Tech High in San Diego.

Exceptional schools, teachers, and leaders exist everywhere, but those who have put the ideas and processes in this book to the test are very special to us, and we thank them all.

## WHAT IS NEW IN THE THIRD EDITION?

The research sections in every chapter have been updated. For instance, we introduce findings on what are called *mirror neurons* to further support the principle that the brain/mind is social. There is more about plasticity—the capacity of the brain to change as a result of experience—and neurogenesis—the ability of the brain to regenerate itself. The research on executive function has been updated and incorporates Joaquin Fuster's (2003, 2013) work on how the brain shapes itself through experience, engaging both perception and action.

Now, more and more, we refer to the overall process as *natural learning*. With some colleagues we have also cofounded a new nonprofit called the Natural Learning Research Institute (see <http://www.nlri.org>). Its purpose is to provide supporting research on multiple aspects of natural

learning, to engage in long-term reform efforts with teachers and administrators, and to disseminate the findings to as wide an audience as possible.

Former readers will enjoy the new clarity and organization. Because there are a rather large number of new or unusual terms, there is a vocabulary section at the end of every chapter. We have changed our leadership section to “The Empowering Leader” because it better describes what we mean by leadership. The sections on leadership at the end of each chapter have been revised substantially. The resource on “How to Develop Process Learning Circles” has been expanded, and new stories and global experiences have been added.

You will find other changes in organization and headings that we hope will make the book much easier to read and share with others.

We hope that this new edition reflects our own learning and journeys with our colleagues and associates through the projects in which we have been involved. We are ready to conduct more and more trainings on the principles using the Process Learning Circles.

We owe thank-yous to many individuals, including those mentioned in the first edition. In particular we want to thank the neuroscientists and educators who continue to share their research and especially those who have become advisors to the Natural Learning Research Institute, including Joaquin Fuster of UCLA; Elkhonon Goldberg at the Institute of Neuropsychology and Cognitive Performance, New York; Lynn Nadel at the University of Arizona; Louis Cozolino of Pepperdine University in California; Robert Sylwester, Professor Emeritus, University of Oregon; and William Spady, prolific author on leadership.

We are also grateful for the CCSS wherever they call for developing capacities for higher-order thinking in students, teachers, and leaders. Ultimately this book can and should accompany any program dedicated to teacher education and development.

And finally we want to acknowledge and thank the many educators, parents, policy makers, businesspeople, and others with whom we have connected and shared ideas and, in many cases, action. The time has come to ground education in the amazing natural capacities with which every human being is endowed. And we are proud and delighted to be participants in this collective call for change.