Giftedness and Talent in the 21st Century
Adapting to the Turbulence of Globalization

Don Ambrose
Rider University, USA

and

Robert J. Sternberg (Eds.)
Cornell University, USA

When today's gifted and talented young people emerge into adulthood will they be able to overcome some enormous 21st-century problems that are pushing us toward large-scale socioeconomic devastation? Will they be able to capitalize on unprecedented opportunities that can lead to widespread prosperity and fulfillment? This book explores these questions while yielding insights from many of the world's leading scholars of giftedness and talent development. Until now there has been inadequate understanding of 21st-century trends and issues that influence the gifted and talented. The book provides some clarity by establishing a big-picture, interdisciplinary overview of the socioeconomic, cultural, and technological pressures emerging from 21st-century globalization and describing some ways in which those pressures simultaneously suppress, distort, and invigorate the discovery of aspirations and the development of talents. Throughout the volume, prominent scholars of gifted education and talent development use their impressive knowledge bases to clarify how we can adjust our thoughts and actions in order to give ourselves the best possible chances for success in this complex world.

"This impressive volume, edited by two of the world's leading thinkers on these topics, includes the perspectives of many of our best thinkers on issues of talent development and giftedness, and they offer an array of provocative perspectives on how we can better address our culture's and our economy's tremendous need for talent in the 21st century." – Jonathan Plucker, Julian C. Stanley Endowed Professor of Talent Development, Johns Hopkins University

"Turbulence in the subtitle is apt. The text, Giftedness and Talent in the 21st Century, is filled with strongly voiced perspectives from international authors who focus on how to conceptualize education as a creative and holistic enterprise within the context of globalization." – Ann Robinson, Past President, National Association for Gifted Children
Giftedness and Talent in the 21st Century
Advances in Creativity and Gifted Education (ADVA) is the first internationally established book series that focuses exclusively on the constructs of creativity and giftedness as pertaining to the psychology, philosophy, pedagogy and ecology of talent development across the milieus of family, school, institutions and society. ADVA strives to synthesize both domain specific and domain general efforts at developing creativity, giftedness and talent. The books in the series are international in scope and include the efforts of researchers, clinicians and practitioners across the globe.

Series Editor:
Bharath Sriraman, The University of Montana, USA

International Advisory Panel:
Don Ambrose, Rider University, USA
David Chan, The Chinese University of Hong Kong
Anna Craft*, University of Exeter, UK
Kristina Juter, Kristianstad University College, Sweden
James C. Kaufman, University of Connecticut, USA
Kyeonghwa Lee, Seoul National University, Korea
Roza Leikin, University of Haifa, Israel
Peter Liljedahl, Simon Fraser University, Canada
Paula Olszewski-Kubilius, Northwestern University, USA
Larisa Shavinina, University of Quebec, Canada

Editorial Assistant:
Claire Payne
TABLE OF CONTENTS

Foreword: Stream of Consciousness on Creativity, Globalization, Technology, and What Is Happening in a Rapidly Changing World  
Joseph S. Renzulli  

Section I: Recognizing Powerful Contextual Influences on Giftedness and Talent Development  
1. Previewing a Collaborative Exploration of Gifted Education and Talent Development in the 21st Century  
   Don Ambrose and Robert J. Sternberg  
2. Twenty-First Century Contextual Influences on the Life Trajectories of the Gifted and Talented  
   Don Ambrose  

Section II: Conceptions of Gifted Education in a Complex, Changing World  
3. Envisioning a New Century of Gifted Education: The Case for a Paradigm Shift  
   David Yun Dai  
4. Human Nature: The Unpredictable Variable in Engineering the Future  
   Roland S. Persson  
5. The Role of Domains in the Conceptualization of Talent  
   Paula Olszewski-Kubilius, Rena F. Subotnik and Frank C. Worrell  
6. Holistic Perspectives on Gifted Education for the 21st Century  
   Kirsi Tirri  
7. The Macroproblem of Conflicting Values in 21st-Century Education  
   Jennifer R. Cross and Tracy L. Cross  
8. The Hobbesian Trap in Contemporary India and South Korea: Implications for Education in the 21st Century  
   Bharath Sriraman and Kyeonghwa Lee  
9. High Achieving Deprived Young People Facing the Challenges of the 21st Century  
   Sheyla Blumen
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Clearing the Way for Pivotal 21st-Century Innovation: More Talent Literacy, Less Talent Management</td>
<td>163</td>
</tr>
<tr>
<td></td>
<td>Mary Jacobsen</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Filling That Empty Space in the Lives of People in a Globalized World Beset with Turbulence and Crises</td>
<td>181</td>
</tr>
<tr>
<td></td>
<td>Dorothy A. Sisk</td>
<td></td>
</tr>
<tr>
<td>Section III: New Practicalities for Gifted Education in the 21st Century</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>The Autonomous Learner Model: Supporting the Development of Problem Finders, Creative Problem Solvers, and Producers of Knowledge to Successfully Navigate the 21st Century</td>
<td>201</td>
</tr>
<tr>
<td></td>
<td>George Betts, Blanche Kapushion and Robin J. Carey</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Creativity and Innovation: The Twin Pillars of Accomplishment in the 21st Century</td>
<td>221</td>
</tr>
<tr>
<td></td>
<td>Joyce VanTassel-Baska</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Navigating Talent Development by Fulfilling Gaps between Gifted Potential and Performance</td>
<td>235</td>
</tr>
<tr>
<td></td>
<td>Seon-Young Lee</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Giftedness Plus Talent Plus Disabilities: Twice-Exceptional Persons, the 21st Century, and Lifespan Development as Viewed through an Affective Lens</td>
<td>255</td>
</tr>
<tr>
<td></td>
<td>Rick Olenchak, Laura T. Jacobs, Maryam Hussain, Kelly Lee and John Gaa</td>
<td></td>
</tr>
<tr>
<td>Section IV: Conclusion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Has the Term “Gifted” become Giftig (Poisonous) to the Nurturance of Gifted Potential?</td>
<td>283</td>
</tr>
<tr>
<td></td>
<td>Robert J. Sternberg</td>
<td></td>
</tr>
<tr>
<td>About the Contributors</td>
<td>293</td>
<td></td>
</tr>
<tr>
<td>Subject Index</td>
<td>303</td>
<td></td>
</tr>
</tbody>
</table>
Nothing endures but change.

(Heraclitus)

There I sat. Thirty thousand feet above the North Pole looking at the New York Times, watching the moving map on my personal TV screen, checking my email, and munching on a meal that was actually cooked on the plane. Fourteen hours to Hong Kong just crawled across the bottom of my TV. I wondered how long it took Marco Polo to get to China and what Wilbur and Orville would have thought about flying from JFK to Hong Kong in 14 hours, inflight TV and Internet, and the meals cooked and served on planes. Their first flight was 59 seconds, went up about 14 feet, and covered 40 yards. I’m glad Orville lived long enough to see big four engine planes fly across the Atlantic.

We’re flying the same route flown by Korean Airlines 007 when a Russian missile shot it down in 1983 – Missiles! Creativity? Technology? Thank goodness the Cold War is over but an article in today’s Times described some bad news – an alleged H-Bomb and missile test by the North Koreans. More creativity and technology gone astray! I hope my plane is well outside their air space. I wonder what the emperors who built the Great Wall would have thought about their defensive technology.

But another article in today’s Times reported some good news – the FDA just approved a new drug developed by a Chinese/American team of researchers for the treatment of melanoma. Good news for me since my annual PET scan is coming up. Nice example of the best use of creativity and international cooperation. Will technology improve what happens on this ever-shrinking globe or help us destroy it? Almost a third of the Earth’s population is in China. Imagine if the creative potential of this massive country could be unleashed. Maybe they would figure out the definitive cure for melanoma and all other cancers. One thing is for certain – creativity and innovation and technology and globalization touch everyone’s lives every day. Small world! Back to work. I need to finish the chapters that Don and Bob sent me so I can write a preface for their books.

Educational policy makers in China have finally come to the realization that their relentless pressure to produce the highest test scores in the world needs to be balanced with curricular and instructional strategies that promote creativity. One high ranking
official said to me, “We can make anything you Americans invent faster, cheaper, and in many cases better, but we want more inventors and innovators and Nobel Prize winners.” I wondered if those fancy UCONN pens I brought as gifts for my hosts were made in China! The persons who invited me said they wanted to “pick my brain” on better ways of promoting and infusing more teaching for creativity and innovation into the Chinese education system. I sometimes wonder if the more I learn about topics like creativity, globalization, and technology the less certain I am about what can be done to infuse good practices into what happens on a day-to-day basis in classrooms around the world. Glad I’m reviewing chapters that take on the interrelationships between and among these multifarious concepts – some ideas are starting to come together.

These random thoughts plowed through my brain as I turned off my in-flight TV and started to read another chapter from the books that Don and Bob asked me to review. This pioneering two-book series wraps its arms around all of the big ideas and issues that define the study of creativity, globalization, and a modern world that is changing at warp speed. As most of the chapter authors in the book point out, creativity, globalization, and technology have brought into perspective the numerous political, social, economic, and human relations issues that define the 21st Century. And undoubtedly, what was most important to me is that educators at all levels, from policy makers, researchers, and school administrators to curriculum developers, counselors, psychologists, and classroom teachers, will find ideas and issues in these books that pertain to the research, theory, and practice that guide educators in making schools more effective places for young people.

The editors of this series have brought together a diverse group of the most prominent contributors to the literature in creativity, giftedness, curriculum development, the arts, talent development, and literacy. The books integrate the complex and diverse elements of these topics with the overriding themes of creativity and globalization. The sheer scope and detail of information about issues in each author’s respective area of specialization is almost overwhelming and it made me both think about my own work and things that need to be reexamined in view of the “macroproblems” that we face in a rapidly changing world and the need for interdisciplinary work in fields that have for too long have been studied in isolation. It certainly made the many disparate ideas in my brain, ideas that have appeared, disappeared, and reappeared in the literature over the decades, crash through my mind and I wondered what would be the best things to say in this preface.

No one sits down and reads books like this from cover to cover, but there is something in these two volumes for everyone. I suggest that readers begin with the introductory chapters of both books. These “big picture” focus chapters synthesize insights from over thirty academic disciplines. The overviews will help you understand the impact of globalization on the life prospects of today’s young people and will also help you make decisions about which chapters are most relevant to your own work. The interdisciplinary nature of macroproblems such as climate change, economic inequality, and political turmoil set the stage for addressing
macro-opportunities, which are unprecedented circumstances that can lead to significant advances in well-being for billions of people around the world. A focus chapter includes a 3-D model portraying globalization as an enormous wave with macro-opportunities on top and macroproblems on the underside of the wave. If we develop the knowledge, skills, and dispositions required for dealing with the complexities of 21st-century trends and issues, we may be able to leap to the crest of the wave and capitalize on the macro-opportunities. If not, we may be crushed underneath the wave by a combination of macroproblems. A part of the analysis highlights arguments about societal collapse generated by scholars in 15 different disciplines. Each of these prominent scholars argue that current conditions could lead to the collapse of societal institutions some time in the 21st century.

The stream of consciousness prompted by reviewing chapters in these two volumes made me realize that today’s world is a much different place than it was when most of the theories that guide today’s education system were developed. The only thing that has remained constant is change, and the focus of these two unique volumes will help you, as it has helped me, see that to move forward with new ideas we must consider change within the larger context of creativity, globalization, technology, and the interdisciplinary nature of knowledge. The stream of consciousness also reminded me that creativity, globalization, technology, and what takes place in the larger world affects every one of us every day and that is a good thing. We all live on the same planet and we all have a responsibility to contribute our gifts and talents to making this small planet a better place.

Joseph S. Renzulli
The University of Connecticut
SECTION I

RECOGNIZING POWERFUL CONTEXTUAL INFLUENCES ON GIFTEDNESS AND TALENT DEVELOPMENT
1. PREVIEWING A COLLABORATIVE EXPLORATION OF GIFTED EDUCATION AND TALENT DEVELOPMENT IN THE 21ST CENTURY

Are gifted and talented young people ready to handle complex 21st-century socioeconomic, political, cultural, and technological conditions when they move into adulthood? Will complex 21st-century societies benefit sufficiently from the actions of the gifted and talented to survive and thrive in the rapidly evolving context of 21st-century globalization? While most of the research, practice, and theory development in gifted education focuses on the effectiveness of current practices and pays little attention to large-scale global issues there are some exceptions. For example, Joe Renzulli (2012) analyzed the goals of gifted education and talent development in today’s world, highlighting the need for more insightful theory development in the field so we can more effectively enable bright young people to discover worthy aspirations while preparing for leadership roles in the complex 21st-century. He magnified the importance of helping the gifted and talented develop and employ executive functions that will enable them to become effective planners, decision makers, and ethical leaders in novel, complex situations. This advice is on the mark considering the growing complexity of 21st-century globalization.1

Another panoramic thinker in our field, Roland Persson (2012), showed us some ways in which gifted education is at least somewhat confined by dogmatic cultural insularity and excessive influence from the globalized socioeconomic system. The result is some insensitivity to cultural variation in conceptions of giftedness and talent development just when stronger awareness of diversity would help educators of the gifted prepare their high-potential students for interactions with diverse peers in an increasingly integrated international environment. Sternberg’s (2005, 2009, 2013) conceptions of leadership also broaden our vision by emphasizing the need for a synthesis of wisdom, intelligence, and creativity so gifted leaders can promote ethical outcomes in complex conditions. One more promising sign that our field is capable of elevating its collective gaze out toward the global socioeconomic and cultural contexts that so strongly influence our work is the activity within the global awareness network of the National Association for Gifted Children as well as occasional publications aligned with that awareness (e.g., Gibson, Rimmington, & Landwehr-Brown, 2008; Roeper, 2008; Sisk, 2013; von Károlyi, 2008).

Based on interdisciplinary explorations and collaborations that kept turning up huge socioeconomic and cultural problems and opportunities and their connections

---

with creativity, giftedness, and talent development (see Ambrose, 2009; Ambrose & Cross, 2009; Ambrose & Sternberg, 2012; Ambrose, Sternberg, & Sriraman, 2012; K. Sternberg & R. Sternberg, 2012; Sternberg, 2014; Sternberg & Jordan, 2005; R. Sternberg & K. Sternberg, 2008), we decided it would be wise to explore the ways in which giftedness, talent development, and creativity might be interacting with 21st-century globalization, which is the biggest contextual influence of our time. Consequently, we designed this project involving far-reaching, interdisciplinary analyses of globalization and the high-impact trends and issues it is generating. We invited leading thinkers from the fields of creative studies, gifted education, and general education to respond to an interdisciplinary focus chapter on globalization (the next chapter in this volume) from their areas of expertise. Those analyzing globalization through the lenses of gifted education and talent development joined us in the formation of this book. Those doing a similar analysis through the lenses of creativity research and theory clustered together as contributing authors for a sister book on creativity (Ambrose & Sternberg, 2016). Taken together, these two projects align with recommendations from leading scholars of creativity and giftedness who envision the need for the development of stronger creative capacities, wisdom, and ethics so bright young people will be better able to grapple with the complex challenges of the 21st century (see Gardner, 2012; Gardner, Csikszentmihalyi, & Damon, 2001; Reis & Renzulli, 2010; Renzulli, 2012; Sternberg, 2013, 2014).

The following questions preview more in-depth analyses that you will find in the chapters to come. If a question piques your interest, we recommend that you go directly to the relevant chapter for more in-depth exploration.

**Questions Based on Interdisciplinary Analyses of 21st-Century Globalization**

These questions emerge from the next chapter in this volume, which is the interdisciplinary focus chapter contributing authors used as a basis for their analyses from their areas of expertise:

- Are gifted education programs designed to enable bright young people to grasp the complexities of 21st-century problems that transcend international borders as well as the borders between academic disciplines?
- Can gifted education programs help bright young people think long term so they can appreciate the nature of problems that emerge and evolve over decades or even centuries?
- To what extent are gifted young people ready to understand and capitalize on unprecedented opportunities emerging from rapidly evolving developments in technology and scientific innovation?
- Can the gifted and talented develop the ethical awareness they will need to grapple with the severe socioeconomic inequality that 21st-century globalization is generating?
How many of today’s economic and political leaders went through gifted programs when they were children? How many of these gifted individuals grew up to become clever innovators with stunted ethics?

If a large “creative intelligence gap” separates our current level of cognitive ability from the much higher level we will need for solving today’s huge problems, can gifted education programs enable us to close that gap?

Will gifted young people be able to navigate through the exponential knowledge growth produced by 21st-century information technology and scientific networking?

Are the gifted and talented more or less likely to be immune to the dogmatism that makes ethnic, religious, and national groups engage in conflict with one another?

Does gifted education make it more likely that bright young people will be able to work together in the diverse teams that tend to outperform homogenous teams when it comes to grappling with highly complex problems?

If gifted education emphasizes the development of the gifted individual, does that emphasis work against the future emergence of the teamwork necessary for the scientific networking that promises to help us solve some of the biggest problems of the 21st century?

Can gifted education help the leaders and entrepreneurs of tomorrow escape their own selfish inclinations so they won’t aggravate the growing problem of severe inequality in an increasingly deregulated, globalized socioeconomic system?

If democracies in the 21st century are fragile and prone to degeneration into plutocracies (rule by and for the extremely rich), do gifted education programs provide sufficient sociopolitical awareness to serve as an antidote to the erosion and collapse of democracy?

Are gifted adults aware of environmental and socioeconomic trends that are strengthening the possibility that we will suffer from a major collapse of civilization some time in the 21st century? If they are aware of the possibility of such a collapse, to what extent do they care about it?

Are some gifted, powerful adults initiating and promoting narrowly conceived, dogmatic school reform initiatives that are driving American education back to the 19th century while some other nations are striving to move their education systems from 20th century models into the 21st century?

Are today’s citizens, policymakers, and academic researchers aware that some powerful school reform initiatives are pressuring American education to evolve into a system of educational apartheid that provides privileged young people with outstanding learning and networking opportunities while pushing the vast majority of those less fortunate into intellectually barren, quasi-militaristic, under-resourced schools?

How many of us are aware that China and the USA are involved in an ironic circular chase because they are trying to copy and catch up with each other in the design of their 21st century educational systems?
• Do gifted programs provide sufficient opportunity for the development of the interdisciplinary thinking necessary for understanding the important 21st-century issues that extend beyond the borders of single academic disciplines and professional fields?
• Will graduates of our gifted programs have the wisdom to support, oppose, or shape the development of new technologies in the 21st century based on critical thinking about the likely implications of those technological advances?
• Do our gifted programs help students develop the entrepreneurial savvy and resilience necessary for adaptation in conditions of growing insecurity and unpredictability?
• How can gifted young people discover and develop strong aspirations and talents in turbulent, unpredictable 21st-century work environments?
• How can the gifted and talented discover and develop leadership potential in an integrated, globalized world that brings together very diverse individuals and groups?

Questions Derived from the Work of Our Contributing Authors

These questions arise from the remaining chapters in the volume. The names of the authors whose work is relevant to each question are written in parentheses.

• How clear and useful is the distinction between the “gifted” and the “non-gifted” in view of the talents needed for success in the 21st century? Does the talent-development paradigm provide useful guidance for educators of the gifted in today’s world? (David Yun Dai, Chapter 3)
• How much control do gifted individuals actually have in their navigation through the turbulence and complexity of 21st-century events and circumstances? (Roland Persson, Chapter 4)
• What dispositions and psychosocial skills can help the gifted young person become eminent in a specific domain in today’s conditions? (Paula Olszewski-Kubilius, Rena Subotnik and Frank Worrell, Chapter 5)
• Can we extend beyond the cognitive domain to develop the whole person, which includes the social, affective, emotional, spiritual, and ethical dimensions of experience? How will this holistic emphasis on child and adolescent development align with the demands of the 21st century? (Kirsu Tirri, Chapter 6)
• Can gifted education recognize and address the huge problem of conflicting core values in 21st-century societies? (Jennifer Cross and Tracy Cross, Chapter 7)
• Can comparing and contrasting the differing constraints confronted by education in very different nations with differing ideologies help us gain insights about the optimal education of the gifted and talented in the 21st century? (Bharath Sriraman and Kyeonghwa Lee, Chapter 8)
• Is it possible for severely deprived, culturally diverse, gifted young people in Latin America to benefit from the same opportunities enjoyed by the gifted
and talented in Europe and North America when it comes to the discovery and development of aspirations and talents? (Sheyla Blumen, Chapter 9)

- Can the organizations of the 21st century dismantle stereotypes that suppress the development of creative intelligence and undermine efforts to engage in productive innovation? (Mary Jacobsen, Chapter 10)

- Can we help gifted young people discover stronger senses of empowerment, ethics, and connection with others that will help them overcome the excessive materialism and individualism of today’s Western culture? (Dorothy Sisk, Chapter 11)

- Will gifted education be able to developed autonomous learners, complex thinkers, and problem solvers who can integrate their cognitive, social, emotional, and physical capacities in complex 21st century conditions? (George Betts, Blanche Kapushion, and Robin Carey, Chapter 12)

- To what extent can gifted learners develop higher-level thinking skills and inclinations for integrating learning from differing subject areas in order to address today’s real-world problems? (Joyce VanTassel-Baska, Chapter 13)

- Are educators of the gifted able to identify the different types of learners and adjust their talent development to minimize the gap between their potential and actual performance so they have the best opportunities for success in the complexity of the 21st century? (Seon-Young Lee, Chapter 14)

- Are we able to help twice-exceptional individuals address their weaknesses while recognizing and emphasizing their strengths so they can meet the demands of 21st-century globalization? (Rick Olenchak, Laura Jacobs, Maryam Hussain, Kelly Lee, and John Gaa, Chapter 15)

Only a few of many possible questions are listed here, just enough to give you a sense of the intellectual terrain our contributors chose to explore in efforts to integrate giftedness and talent development with 21st-century globalization. We leave it to you to raise more questions as you make your way through the pages to come. Our hope is that this book will prompt readers to pay more attention to the effects of large-scale contextual influences on their own work.

AN OVERVIEW OF THE CONTENTS OF THE VOLUME

This book includes four sections that connect much of what we know about giftedness and talent development with the challenges of 21st-century globalization. The first section introduces the project and provides an interdisciplinary framework for analyses of globalization. The second section addresses conceptions of giftedness and talent development within the context of globalization. Authors in the third section come up with ways to make gifted education align better with 21st-century contextual influences. Finally, section four represents the synthesis of the contributions in the volume.

Our introductory section titled Recognizing Powerful Contextual Influences on Giftedness and Talent Development, is comprised of this introductory chapter
and a focus chapter titled, *Twenty-First Century Contextual Influences on the Life Trajectories of the Gifted and Talented*. In the focus chapter, Don Ambrose provides a conceptual model based on the integration of perspectives from multiple disciplines. The model illustrates the threat of enormous macroproblems and the potential benefits of unprecedented macro-opportunities that arise from socioeconomic, technological, cultural, and political-ideological conditions in the 21st century. The macroproblems threaten to crush individuals and societies that find themselves mired in a miserable trap underneath an enormous wave of globalization. Fortunately, the macro-opportunities promise to lift individuals and societies toward unprecedented success, if the education system can enable today’s young people to leap to the crest of the globalization wave. After the analysis of 21st-century demands, suggestions are made about the blend of knowledge, skills, and dispositions required for dealing with the macroproblems and capitalizing on the macro-opportunities. This focus chapter serves as a launching pad for the other contributing authors’ analyses. They use it to examine ways in which their expertise fits together with trends and issues in the 21st century.

David Yun Dai initiates section two with his chapter titled, *Envisioning a New Century of Gifted Education: The Case for a Paradigm Shift*. In his analysis, David continues his ongoing scrutiny of the gifted-child paradigm, this time in the context of 21st-century conditions. He considers the nature and shortcomings of current conceptions of giftedness as well as some other challenges to the effectiveness of work in the field. He sets the stage by taking an excursion through the research on creativity and giftedness, paying special attention to the work of pioneers such as Paul Torrance and Joseph Renzulli. He also analyzes the strengths and weaknesses of competing paradigms in gifted education, emphasizing the limitations of the essentialist conception and the possible fit of the talent development framework with the 21st-century socioeconomic and cultural context.

Roland Persson exercises his penchant for big-picture thinking in his chapter, *Human Nature: The Unpredictable Variable in Engineering the Future*. He temporarily backs away from the specifics of giftedness, talent development, and creativity to explore the bigger issue of human nature itself. Part of the analysis brings forth the somewhat troubling possibility that not even the gifted and talented have as much control over life’s events as they think they do, and that they might have even more difficulty than most because they are often marginalized due to their differences from the mainstream. He suggests that we must come to terms with these limitations in order to be more effective in exerting our shaping influences over the powerful trends and issues of the 21st century. Social cohesion and ethical awareness must come into play if we are to nudge globalization in positive directions.

Paula Olszewski-Kubilius, Rena Subotnik, and Frank Worrell draw some intriguing connections between their influential mega-model for talent development and 21st-century conditions in their chapter titled, *The Role of Domains in the Conceptualization of Talent*. The complexity of 21st-century globalization exerts strong influences on talent development, which was complex enough even in far
less turbulent 20th-century socio-contextual environments. The talent development
t mega-model portrays optimal growth of high ability as a sequence of successful
transitions from strong potential to competency within a domain to expertise within
that domain and finally to eminence for those most able to blend their outstanding
capacities with educational and career opportunities. While revealing the dynamics
of these successful developmental transitions, the authors discuss some ways in
which existing domains are changing and new domains might be emerging through
the influence of globalization. The take-home message is that support for the
development of knowledge, interests, and especially psychosocial strengths must be
informed by knowledge of the talent development demands embedded in the various
domains.

Kirsi Tirri provides an international, multidimensional analysis in her chapter
titled, Holistic Perspectives on Gifted Education for the 21st Century. She shows
how many European nations interpret the purpose of education as encompassing
much more than the cognitive domain, which dominates American education. This
broader view of education includes the development of the whole person, which in
turn embraces the social and affective aspects of experience as well as emotional
and spiritual concerns. While there is much less emphasis on identification and
programming for the gifted there is room for their appropriate development due
to the more expansive vision of education in Finland. Some particular aspects of
this expansive vision include attention to distinct, multiple intelligences, ethical
sensitivity, moral judgment, values and worldviews, altruism, respect for diversity,
and discovery of a sense of purpose. The end result is a more global vision of gifted
and general education for a globalized world.

Jennifer Cross and Tracy Cross situate gifted education within one of the most
pressing problems in today’s world. In their chapter titled, The Macropoblem
of Conflicting Values in 21st-Century Education, they show how an important
characteristic of 21st-century globalization is the way in which it ties together
diverse populations through intricate socioeconomic networks. This networking
has significant advantages but it also brings forth some enormous problems. When
populations have differing, conflicting values they are likely to have great difficulty
when it comes to finding common ground. Misunderstandings and conflicts will
ensue. Fortunately, Jennifer and Tracy tackle this issue head on. After providing
an in-depth overview of the scholarship on values, they identify the ways in which
divergent values can subvert attempts to generate an educational system that can
address the challenges of the 21st century. Their ambitious attempt to analyze the
barriers imposed by values conflicts shows up in a framework connecting various
value systems to the knowledge, skills, and dispositions that are required for success
in the context of 21st-century globalization.

Bharath Sriraman and Kyeonghwa Lee consider the effects of globalization on
two Asian nations in their chapter titled, The Hobbesian Trap in Contemporary
India and South Korea: Implications for Education in the 21st Century. Their
analysis portrays some ways in which globalization exerts differing impacts on
these nations, which represent very different settings for the nurturance of gifts and talents. While the economies of both nations have grown considerably, young people still face some unusual constraints when it comes to the discovery of aspirations and the development of their talents. The authors invoke constructs such as ideological frameworks and social Darwinian processes to clarify the nature of these contextual influences. They conclude with some comments about what each nation must do to strengthen the chances for the success of their next generations as they confront the turbulence of 21st-century globalization.

Sheyla Blumen takes us into Latin American contexts in her chapter titled, *High Achieving Deprived Young People Facing the Challenges of the 21st Century*. She describes some daunting challenges faced by gifted education in Latin America and the Caribbean region while emphasizing some advocacy efforts on behalf of indigenous populations suffering from socioeconomic deprivation. She zeroes in on Peru, which provides examples of some promising attempts at providing impoverished, culturally diverse young people with opportunities to discover and develop their potential in spite of the odds against them. Her analysis includes interpretations of ways in which 21st-century conditions are influencing the life chances of bright young people in this part of the world.

Mary Jacobsen gives us a look at organizational development, leadership, and innovative processes in her chapter titled, *Clearing the Way for Pivotal 21st-Century Innovation: More Talent Literacy, Less Talent Management*. She turns our attention toward the need for innovation in our organizations in view of the complex, new demands on organizational systems posed by developments in the 21st century. Mary argues that those who work in organizations, especially those who take on leadership roles, must break themselves free from counterproductive stereotypes that suppress the work of talented innovators. These stereotypes often involve colleagues’ negative perceptions of talented employees. She uses the term “talent literacy” to help us understand the need for clarifying the nature of our misconceptions and dogmatism when it comes to appreciating and facilitating the work of those most capable of lifting organizations out of various forms of entrenchment and moving those organizations toward the acquisition of innovative new capacities that will enable them to succeed in complex, 21st-century conditions. While emphasizing the importance of innovators, she frequently returns to discussions of changing societal conditions and the ways in which these conditions are making the work of talented innovators more important than ever before. Particularly useful is an ICD (intensity, complexity, drive) model she develops to enable better understanding of the productive attributes and contributions highly talented individuals can bring to organizations, and to the world.

Dorothy Sisk closes this section by investigating some problems faced by many in today’s globalized world. In her chapter, *Filling that Empty Space in the Lives of People in a Globalized World Beset with Turbulence and Crises*, she discusses the sense of angst that can arise when our values are driven by excessive individualism and materialism, as they are in much of the world today. Arguing that the gifted
The third section of the book is titled *New Practicalities of Gifted Education in the 21st Century*. Here the authors explore a variety of practical modifications of gifted education that can better align programs, curriculum, and instruction with the demands of globalization.

George Betts, Blanche Karpushian, and Robin Carey recognized the topic of 21st-century globalization as a good fit with an influential conceptual framework in the field. They articulate and employ this framework in their chapter titled, *The Autonomous Learner Model: Supporting the Development of Problem Finders, Creative Problem Solvers, and Producers of Knowledge to Successfully Navigate the 21st Century*. The well-known autonomous learner model integrates a wide array of abilities and processes that, taken together, can strengthen the aspirations, talents, and life prospects of young people. The unprecedented nature of today’s large-scale problems and opportunities require considerable amounts of higher-order thinking as well as visionary aspiration development and the nurturing of initiative over the long term. Fortunately, the autonomous learner model, which has been undergoing revisions throughout the years, is designed to develop these capacities.

Joyce VanTassel-Baska contemplates some modifications to gifted education in her chapter *Creativity and Innovation: The Twin Pillars of Accomplishment in the 21st Century*. While outlining some big-picture patterns in the structure and dynamics of gifted education over the years, Joyce argues that current emphases on the development of creativity should be augmented with more attention to the development of propensities for innovative work. Through detailed analyses she distinguishes between these emphases and then shows how strengthening the innovative inclinations and abilities of gifted young people will align them and society more accurately with the demands of the 21st century. In essence, she recommends an injection of pragmatism into gifted education and into the subsequent adult lives of the gifted. The development of STEM innovative ability receives particular attention.

In her chapter titled, *Navigating Talent Development by Fulfilling Gaps between Gifted Potential and Performance*, Seon-Young Lee analyzes some important aspects of gifted underachievement while thinking about ways in which the problem of underachievement is magnified in 21st-century conditions. While underachievement always has been a problem it is even more pernicious for individuals and societies that must navigate through the big problems and opportunities presented by 21st-century globalization. While investigating underachievement, Seon-Young analyzes an array of categories into which gifted underachievers can fit. These categories have to do with cognitive style, academic motivation, sensitivity,
behavioral issues, and interpersonal relationships. She identifies 13 different types of gifted underachievers and recommends strategies that can address the strengths and weaknesses of each.

Richard Olenchak, Laura Jacobs, Maryam Hussain, Kelly Lee, and John Gaa take us beyond the cognitive realm to focus on affective development in today’s turbulent, socioeconomic context. In their chapter, *Giftedness Plus Talent Plus Disabilities: Twice-Exceptional Persons, the 21st Century, and Lifespan Development as Viewed through an Affective Lens*, the authors also consider the increasingly prominent phenomenon of dual exceptionality, which has some interesting potential connections with 21st-century conditions. This is especially the case when the authors look at the lifespan development of twice-exceptional individuals and their life prospects as adults. They set up their analysis by providing an overview of the intricate interplay between nature and nurture in the development of affect. They cover a considerable amount of intellectual territory in the analysis, including neuroscientific findings about affective and cognitive development.

Finally in section 5 Robert Sternberg integrates the complex, diverse elements of giftedness, talent development, and globalization in his chapter titled *Has the Term “Gifted” Become Giftig (Poisonous) to the Nurturance of Gifted Potential?* “Giftig” is the German word for “toxic.” And the use of the term has become, in some instances, toxic. As used, it can hold back education. At one time, educators thought they had a clear sense of what “giftedness” is: It was high IQ. That’s how Lewis Terman and his colleagues operationalized the term back in the early part of the 20th century. Now, a century later, many educators are still using the term in more or less the same way. But does high IQ, or even high school grades, represent the future of what we need to nurture gifted potential in the 21st century? By using this term, are we dogmatically locking ourselves into the distant past rather than opening up a new future? Sternberg argues in his final chapter that the term in its traditional usage no longer fits the needs of our world. In more modern senses, the term has come to mean so many things to so many different people that it no longer is serving the constructive function it once may have served. It may even be encouraging the identification of children other than those best equipped to deal with the problems of the future. It is time at least to reexamine the term, and if we continue to use it, think about what it should mean for the challenges of the 21st century, not for those of the 20th.

**CONCLUDING THOUGHTS**

The world is facing challenges in the 21st century that are very different from those in the 20th. Income inequality is increasing and shows no sign of abating. The enemies of civilization are no longer clearly defined hostile national entities, but rather rapidly shifting terrorist groups. Technology is providing some jobs but also eliminating many others. Competition is global rather than local. And nations possess weapons of mass destruction that are under the control of present and perhaps future
leaders whose trustworthiness with the destructive power they hold is, at the very least, questionable. This volume is unlike others in the field of giftedness: It seeks to understand the term “giftedness” in the context not just of past and contemporary challenges, but also of future challenges, some of which hold the power to destroy civilization as we know it. The volume represents the kind of thinking for where the field of giftedness needs to go, not just where it has been.

NOTES
1 The term globalization signifies the massive socioeconomic, technological, and cultural integration of populations around the world (see Beneria, 2003; Goldin & Mariathasan, 2014; Rodrik, 2007; Sen, 2010; Stiglitz, 2003; Tsing, 2004). More details about the nature of globalization and the problems and opportunities it creates appear in the next chapter of this book.
2 Prominent scholars from various disciplines argue that we have reached a point where our influences on the biosphere can spin out of control and precipitate the implosion and disintegration of life-sustaining systems some time in the 21st century. The next chapter in this book provides more detail.
3 The essentialist conception of giftedness revolves around gifted-nongifted distinctions based on the permanence of general intelligence. See David’s chapter for details.

REFERENCES


2. TWENTY-FIRST CENTURY CONTEXTUAL INFLUENCES ON THE LIFE TRAJECTORIES OF THE GIFTED AND TALENTED

This chapter represents an attempt to shed more light on the long-term development of the gifted, talented, and creative by placing that development in a large-scale context of 21st-century trends, which include *macroproblems* and *macro-opportunities*. Macroproblems are high-impact, global, long-term, transdisciplinary difficulties that threaten to harm or even devastate the lives of billions around the world (Ambrose, 2009a; Ambrose & Sternberg, 2012; also see Hunter, 1991). They are global because they span international boundaries and cannot be solved from within the borders of a single nation. They are long term because they derive from dogmatic thinking, neglect, and often corruption over years, decades, or even centuries and, consequently, will take long periods of time to solve. They are transdisciplinary because no single discipline encompasses sufficient expertise to address them fully so their solution will require collaboration across disciplines. Examples of macroproblems include climate change; looming resource shortages; the erosion of democracy; and severe inequality in a globalized socioeconomic system increasingly driven by dogmatic, market-fundamentalist ideology. In contrast, macro-opportunities are unprecedented circumstances that can lead to significant advances in well-being for billions of individuals and to ethically guided progress for societies. Examples include powerful new forms of scientific networking, innovative technologies, and the strengths of diverse minds when grouped together for complex problem solving.

This analysis emerges from an extensive, interdisciplinary search for theory and research pertaining to the discovery and development of aspirations and talents within influential socioeconomic, political, ideological, and cultural contexts. I draw from significant work in economics, political science, sociology, social epidemiology, ethical philosophy, history, complexity theory, the environmental sciences, psychology, creative studies, gifted education, and other disciplines to develop a metaphorical model representing the impact of 21st-century globalization on the development of societies, the evolution of education systems, and the life chances of individuals. After illustrating the structure and dynamics of two different versions of the model, I describe some of the most impactful 21st-century macroproblems and macro-opportunities and the demands they are making on our knowledge, skills, and dispositions.

© 2016 Sense Publishers. All rights reserved.
CATCH A WAVE: A METAPHORICAL LANDSCAPE FOR THE DEVELOPMENTAL TRAJECTORIES OF CIVILIZATIONS, EDUCATION SYSTEMS, AND CREATIVELY INTELLIGENT INDIVIDUALS

The “catch a wave” model, which takes different forms in Figures 1 and 2, provides a metaphorical landscape illustrating the importance of rethinking education – especially gifted education – in rapidly evolving and challenging 21st-century socioeconomic, political, and cultural contexts. The two versions of the wave model represent two different levels of analysis – the societal level shown in Figure 1 and the level of the education system shown in Figure 2. The models provide frameworks for understanding large-scale contextual threats and opportunities, which are revealed by scholarship in a variety of disciplines. The structure and dynamics of each model portray the profound changes that have been taking place since the mid-20th century. Implications for gifted education, general education, and creative studies can be derived from the models because the knowledge, skills, and dispositions required decades ago no longer are sufficient for success in the 21st century.

**Societal Context: Will Our Civilization Thrive or Collapse?**

Figure 1 shows the societal level of analysis, portraying the success or failure of the globalized, Westernized, market-driven socioeconomic and cultural system that dominates most of the world in the 21st century. The depth dimension on the left side of the model signifies the passage of time from the early to mid-20th century on into the 21st century. The top surface of the model, moving from left to right, signifies a metaphorical landscape along which a society or civilization can advance through more or less effective economic, sociopolitical, and cultural policies and initiatives. The vertical dimension represents the achievement of societal success, conceived of here as the ability of a society to remain viable over the long term while lifting the vast majority of its citizens toward ethically guided self-fulfillment.

On the surface at the back of the model a straight arrow moving from left to right represents the trajectory of Western society in the early-mid 20th century. Despite a few intermittent stall outs (e.g., the Great Depression, WW II), our civilization at that time moved forward predictably on a linear path toward success; however, that success was somewhat limited, signified by moderate elevation as the culture progressed toward the right-rear sector of the model. In a century dominated by modernist ideology throughout most of the developed world (see Inglehart, 1997) success as a society primarily meant enabling entrepreneurial capitalists to build a level of prosperity (broadly shared in some nations, not in others) based on the extraction and refinement of natural resources. While resource shortages and environmental problems were emerging in that era they did not dominate and societal collapse was on the seemingly distant horizon. The noticeable but somewhat limited level of success in the back, right-hand sector of the model represents the way in which the dominant conceptions of societal and individual fulfillment were
confined to notions of materialistic gain. But success in 20th-century societies could have been more pronounced (higher on the model). According to the prominent ethical philosopher Alan Gewirth (1998), high-level human fulfillment requires the discovery of altruism-flavored aspirations and the concomitant discovery and refinement of capacities (i.e., talents) for development that goes far beyond materialistic-individualistic vainglory.

The wave on the right, front of the model represents the effects of globalization, which entails massive economic, technological, and cultural integration of populations around the world (see Beneria, 2003; Goldin & Mariathasan, 2014; Rodrik, 2007; Sen, 2010; Stiglitz, 2003; Tsing, 2004). Globalization brings with it large-scale problems and opportunities, which are deemed macroproblems and macro-opportunities because of their enormous impact (Ambrose, 2009a; Ambrose & Sternberg, 2012).

Macroproblems show up on the underside of the globalization wave signifying their colossal impact when they come crashing down on populations that are mired in a devastating, miserable place shown here as the *Hobbes trap* (a dimly lit future). Those unfortunate enough to find themselves stuck in that trap will endure lives that are poor, nasty, brutish, and short, to borrow words from the pessimistic, 17th-century philosopher Thomas Hobbes (1985/1651). This trap denotes a wretched, disaster-plagued collective existence featuring severe resource shortages, environmental destruction, economic collapse, widespread eruptions of warfare and genocide, and other disasters caused by the inability or unwillingness of a society’s leaders to deal with pressing macroproblems and to capitalize on macro-opportunities. Societies
can move blindly forward into the trap if they are too dogmatic and ill prepared to recognize and grapple with the demands of the 21st century.

Here is more detail about the dimly lit future in the Hobbes trap. Decades ago, a volume written by environmental scientists – *The Limits to Growth* (Meadows, Randers, Meadows, & Behrens, 1972) warned about the need for more attention to resource shortages and environmental stewardship. The authors outlined some possible future scenarios, some involving societal collapse. Later they published a follow-up report showing how considerable sustainability problems still persisted on the large scale (Meadows, Randers, & Meadows, 2004). More recently, investigators from various fields, most of them employing interdisciplinary analyses, have pointed toward the strong possibility of a major collapse of modern civilization in the 21st century, similar to the collapses that took place in prior civilizations such as those of the Romans, the Mayans of Central America, the Mauryan and Gupta Empires of ancient India, and the Khmer of Southeast Asia.

There is, however, a difference between today’s situation and the conditions that provoked most of the earlier collapses. The worldwide socioeconomic integration brought about by globalization could make a societal collapse spread around the globe instead of staying localized as they did in the cases of most ancient civilizations. An early example of rapid, widespread collapse occurred when the well-integrated, thriving civilizations of the late Bronze Age rapidly broke down precisely because that integration provided a network for the spread of systemic problems (see Cline, 2014). But a 21st-century collapse could be much more widespread and occur much more rapidly due to the far more substantial economic and technological integration of today’s globalization.

A word of caution is in order here. Societal critiques often come with warnings that the sky is falling. A prominent example was the Y2K frenzy that preceded the coming of the 21st century. Such warnings tend to come and go leaving us skeptical about future expressions of concern pertaining to macro-sociopolitical and economic phenomena. We should be wary of chicken-little warnings that emerge from within the borders of single disciplines, or from nebulous, intuitive impressions about macrophenomena. Nevertheless, this skepticism should not make us immune to warnings that emerge from triangulation of findings from credible researchers in multiple disciplines. The warnings about macroproblems and the possibility of widespread, societal collapse in the Hobbes trap discussed in this chapter emerge from some of this transdisciplinary triangulation.

For example, prominent thinkers making arguments about the possibility of massive, widespread, societal collapse include political scientists Thomas Homer-Dixon (2000, 2001, 2006) and Leslie Paul Thiele (2013); historians of science Naomi Oreskes and Erik Conway (2013); geographer Jared Diamond (1992, 2004); sociologist William Robinson (2014); physicist Michael Nielsen (2011); geo-ecologist Wolfgang Lucht (2010); anthropologist Joseph Tainter (1988); environmental scientist Vaclav Smil (2008); environmental studies scholar David Orr (2012); archaeologist Harvey Weiss and geoscientist Raymond
Bradley (Weiss & Bradley, 2014); philosopher Bruce Edmonds (2015); business-management scholar Jorgen Randers (2012); systems scientist Safa Motesharrei, political scientist Jorge Rivas, and environmental scientist Eugenia Kalnay (Motesharrei, Rivas, & Kalnay, 2014); and biologists Paul and Ann Ehrlich (2013). While holding out some hope that we might avoid large-scale collapse through unprecedented, collaborative creative problem-solving they point out the likelihood that we will not be able to overcome the gap between our current cognitive abilities, in a collective sense, and the enormous problems we face. Homer-Dixon (2000) termed this the ingenuity gap, arguing that a civilization like ours facing huge resource shortages and environmental devastation will need unprecedented levels and forms of ingenuity to avoid synchronous failure – the simultaneous disintegration and implosion of life-sustaining systems on a very large scale. Synchronous failure in collapsing societies usually leads to widespread, violence-saturated anarchy. Nielsen and Diamond made similar arguments about the mismatch between collapsing societies’ cognitive abilities and the enormous problems they confront.

In order to connect this analysis with research in creative studies and gifted education I use the term creative intelligence gap to stand for Homer-Dixon’s notion of the ingenuity gap. The creative intelligence gap shows up on the model as the daunting space between the lower surface, where a society is poised to wander ahead blindly and dogmatically into the dimly lit future of the Hobbes trap, and the much higher, optimism-generating surface on top of the globalization wave. In stark contrast, and fortunately for us, the macro-opportunities show up on the top of the wave because they promise to lift populations that are well prepared for the 21st century to a very high level of success. A society that is well aware of 21st-century problems and opportunities and generates the ethically guided creative and critical thought capacities necessary for addressing those problems and opportunities will be able to make the quantum leap to the crest of the wave and follow an exciting, unpredictable developmental path. The unpredictability is signified on the model by the multiple, interweaving arrows on the top of the wave.

The quantum leap on the model plays a gatekeeping role for a society aspiring to success in the 21st century. It represents a society’s discontinuous jump from the lower level to the top of the wave. This jump is based on an analogous phenomenon in theoretical physics in which a subatomic particle instantaneously moves from one energy level to another with no apparent “in between” transition status (see d’Espagnat, 2006; Omnès, 1999). Similarly but on a much larger scale, a society aspiring to reach the top of the globalization wave must make a discontinuous leap in terms of its collective creative and critical thought processes and problem-solving actions. The analogy of discontinuity applies here because continuing past practices, for example, following established thought paradigms and socioeconomic and cultural procedures, which often are habit bound and saturated with dogmatism (see Ambrose, 2012a, 2012b), will be insufficient at best and devastatingly counterproductive at worst.
In order to understand the need for the quantum leap to the crest of the globalization wave we must analyze some examples of the macroproblems and macro-opportunities that make up the underside and topside of the wave. The examples listed in the subsections below are potentially high-impact, or already so; however, different or additional examples could have been included. I encourage readers to suggest others.

Examples of Macro-Opportunities

Exponential knowledge growth. Advancements in information technology and scientific networking are spurring knowledge growth in many academic disciplines and professional fields, some of which feature enormous additions to their knowledge bases (see Arbesman, 2012; Motta, 2013; Zander & Mosterman, 2014). It will tax our collective minds to master and use all of this knowledge; however, rapidly expanding knowledge bases in many fields present us with a macro-opportunity – arming us with unprecedented volumes of scientific and technical knowledge as well as better understanding of the human condition. This expanded knowledge provides raw material that gives us the potential for strengthening our creative intelligence. In turn, if we are sufficiently wise we can apply the enhanced cognitive skills to the solution of our most pressing macroproblems.

Cognitive diversity. Subra Suresh (2013, October), former director of the National Science Foundation and chair of the Global Research Council, argues that international, transdisciplinary collaboration among scientists is becoming the new norm in scientific work, largely because innovation accelerates when research teams include diverse ideas and perspectives. Along similar lines, in a large-scale analysis of group problem-solving outcomes in a wide variety of organizational contexts, economist and complexity theorist Scott Page (2007, 2010) revealed that cognitive diversity provides significant advantages when it comes to grappling with complex problems (also see West & Dellana, 2009). A cognitively diverse problem-solving team encompasses diverse theories, and/or problem-solving heuristics, and/or belief systems.

For example, such a team might include individuals trained in counseling psychology, economics, biology, engineering, philosophy, and the visual arts. One individual on this team might have expertise in quantitative-empirical research methods while another might be a natural ethnographer. Yet another individual might be a strong group facilitator. Some members of the team might adhere to liberal-progressive ideology while others might be more conservative. In contrast, another team might consist of intelligent, highly skilled individuals but all of them are economists who adhere to the rational-actor theory of the individual, possess the same highly refined quantitative model building skills, and strongly believe in laissez-faire, neoliberal ideology.
Now assume that both teams are trying to solve the same problem. Even if the cognitively diverse group possesses less intelligence, collectively speaking, than the homogenous group of economists its cognitive diversity makes it likely to outperform those economists as long as the problem is complex and not solely about economics. Of course, a cognitively diverse, highly intelligent team will perform even better. Interestingly, cognitive diversity turns into a disadvantage when it comes to simple, algorithmic problems.

Given the increasing complexity of problems in the 21st century, cognitive diversity is important now and will become even more essential in the years to come. In addition, it is becoming more feasible because 21st-century networking technology enables clusters of diverse minds to come together much more easily than they could in the past. As Page (2007, 2010) noted, we can think of cognitive diversity as a key attribute for group effectiveness. In addition, we can think of it as an important attribute of individual minds. An individual who is able to build a personal problem-solving toolbox, which includes diverse theories, disciplinary perspectives, methodological tools, and belief systems, will benefit from cognitive eclecticism in a world that demands the intellectual flexibility of cognitive diversity.

Unprecedented scientific and artistic networking. Nielsen (2011) described the inception of highly effective, unpredictably emergent online collaborative projects that have led to solutions for previously unsolvable mathematical and scientific problems. For example, in the polymath project an eminent mathematician was making little headway in an attempt to solve a very difficult mathematical problem that always had stymied great mathematical minds. After posting what he had done online and inviting suggestions for next steps, ideas began to flow in from very diverse mathematical thinkers from around the globe. Some who contributed useful pieces to this complex puzzle were other leading mathematicians but many of the contributors were much less distinguished. In a short period of time the problem was solved.

While the solution to the problem was inaccessible to a single mathematical genius or even to a collaborative team of genius mathematicians, the unpredictable, organic-emergent intermixing of many pieces of microexpertise turned out to be the key. The term microexpertise signifies bits of knowledge and skill that are distributed throughout a population. While an eminent expert in a domain has mastered an impressive array of knowledge and skill, that expert simply cannot possess all of the relevant puzzle pieces when it comes to today’s increasingly complex problems, even when those problems are domain specific. Consequently, she/he cannot match the collective mass of microexpertise bits possessed by hundreds or thousands of individuals around the globe even though none of those individuals could match the eminent expert in a one-on-one intellectual contest in that domain. The notion that “none of us is as smart as all of us” actually is true when it comes to this kind of networked problem solving.
Some other examples of the phenomenon come from the galaxy zoo project; a competition between the world’s greatest chess player and the unpredictably emergent teamwork of many lesser players around the world; the spontaneous global networking of contributors to an open architecture project for the design of innovative buildings in the third world; and an open-source, game-based process that enables skillful visual thinkers to invent new proteins for attacking diseases. In the galaxy zoo project, for instance, astronomers realized that they couldn’t possibly analyze all of the data coming in from powerful new telescopes so they decided to build a website and invite outsiders to look for patterns in space. The results have included highly productive discoveries of new types of galaxies and other space-based phenomena. Nielsen went so far as to suggest that these emergent, online collaborations very well could represent the beginning of the next scientific revolution.

Similar, unpredictably emergent, online collaborations are coming forth in other dimensions of human experience. For example, in the arts, composer-conductor Eric Whitacre has been pulling together emergent, highly proficient and creative virtual choirs from around the world (see Webb, 2010).

Example of a Macroproblem/Macro-Opportunity Hybrid

Runaway technology. While electronic networking is advancing, so are other forms of technology. Rapid advances in digital technologies are promoting unprecedented levels of economic productivity and creating seemingly boundless opportunities for innovations in a variety of industries (Brynjolfsson & McAfee, 2014). Developments in materials science, including nanotechnology, the science of engineering matter at very small molecular and atomic levels (Interrante & Chandross, 2014; Khan, 2012), and biotechnology, the science of re-engineering life itself (Carlson, 2010; Harris, 2007; Rose, 2006), are accelerating rapidly. Technological systems for generating and exploiting green energy are improving and have the potential to replace dirty energy sources such as coal and oil (Prentiss, 2015). They also could provide strong opportunities for job creation while reining in environmental destruction and climate change (Gallagher, 2014). Among other purposes, advances in materials science such as nanotechnology innovations could revolutionize our development and use of materials for construction and engineering, giving us opportunities to make stronger, lighter vehicles, machines, and buildings with smaller carbon emission costs. Biotechnology could solve some of our most difficult medical and food-shortage problems. The emerging science of synthetic biology is especially promising because it provides the potential for transforming our material world (see Bonnet & Subsoontorn, 2012; Bonnet, Yin, Ortiz, Subsoontorn, & Endy, 2013; Kahl & Endy, 2013). Just one example of many possible applications is the production of new, exceptionally strong and biodegradable building materials.

Nevertheless, unpredictable events occur in complex systems (Jervis, 1997; Miller & Page, 2007; Page, 2010; Thompson, 2007) and unexpected, harmful effects
from runaway technology always loom on the horizon (Ravetz, 2010; Tonn & Stiefel, 2012). For example, the unprecedented prosperity generated by the digital revolution, termed the second machine age by Brynjolfsson and McAffee (2014), is flowing into the hands of a few while the wages of the many are stagnating and unemployment is growing. These harmful effects can derive from accidental misuse of new technology, unanticipated implications of the application of new technology, or unethical, exploitative applications by bright but unscrupulous individuals and groups.

Farther out on the time horizon a more devastating problem might arise from unpredictable developments in artificial intelligence. According to Bostrom (2014), humanity lacks sufficient long-range vision to guide the development of potentially powerful artificial intelligence innovations toward the betterment of future lives. Instead, short-range profit seeking drives artificial intelligence developments and future advances in this area could spin out of control as increasingly clever artificial minds, unguided by ethics, outpace the development of our own cognition. Consequently, rapid advances in new technologies potentially represent both macro-opportunities and macroproblems.

Examples of Macroproblems

Resource depletion. The BP oil disaster in the Gulf of Mexico foreshadowed another pressing macroproblem – a looming shortage of resources such as hydrocarbons, minerals, fresh water, and arable land (see Daly & Farley, 2010; Friedrichs, 2013; Klare, 2012; Prior, Giurco, Mudd, Mason, & Behrisch, 2012; Rockström et al., 2014). Klare (2012) illustrated ways in which these shortages are encouraging extraction industries to take ever-bigger risks such as deep-water drilling and mining in dangerous regions because easily accessible resources are disappearing quickly. In the case of oil and gas extraction, the shortages are encouraging a frenzied chase for “unconventional hydrocarbons” such as those found in the tar sands of Western Canada and the difficult-to-release natural gas deposits that are being accessed through hydraulic fracturing. These extractive processes are far more damaging to the environment than conventional oil and natural gas extraction, and those processes were dirty enough. Consequently, the energy industry is causing far more devastating environmental damage than ever before, and this damage includes the rapid acceleration of climate change (see the next macroproblem).

The potential for dangerous international conflicts over territory and resources also is rising due to the shortages. For example, nations are saber rattling and building up their military capacities in anticipation of conflicts over oil and gas resources in Southeast Asian waters and in the Arctic Ocean, which is being made more accessible to drilling due to climate change. In addition, wealthy nations such as Saudi Arabia and the United Arab Emirates are buying up enormous tracts of arable land in third-world countries in order to ensure their own food supplies at the expense of the impoverished populations in those nations. International tensions are
rising over this practice. In the long run, we must either use our ingenuity to come up with replacements for some of these resources or pay gargantuan ethical and economic prices for them in the future. Klare (2012) terms this macroproblem the race for what’s left.

Environmental devastation and climate change. Insufficiently regulated, globalized capitalism coupled with population growth has been aggravating one of our longest running macroproblems—environmental pollution. Climate change likely is the worst manifestation of this problem and, in and of itself, possibly represents our second-most-dangerous macroproblem because it threatens the viability of life on earth as we know it (see Archer, 2009; Dumênil & Lévy, 2013; Flannery, 2006; Friedrichs, 2013; Nordhaus, 2013; Pellow, 2002; Sherwood & Huber, 2010; Verchick, 2010). Even now, climate change is magnifying the power and frequency of high-impact storms worldwide, causing severe heat waves and desertification of large tracts of land, precipitating mass extinctions in the biosphere, establishing conditions favorable to widespread epidemics, and setting the stage for huge, disastrous mass movements of environmental refugees around the world.

Distortions of globally networked capitalism, and severe inequality. The trend toward economic globalization over the last several decades has freed up entrepreneurial enterprises while tying the hands of regulators who are charged with protecting the interests of national and regional populations from exploitative economic practices. The exploitation includes rapacious raiding of natural resources and race-to-the-bottom outsourcing of previously secure first-world jobs to deplorable third-world sweatshops. The result has been a morphing of somewhat beneficial capitalism into a distorted system of exploitative global economic domination (see Ambrose, 2011, 2012; Applebaum, 2005; Arvidsson & Peitersen, 2013; Block & Somers, 2014; Brown & Jacobs, 2008; Blyth, 2013; Chang, 2007; Christensen, 2011; Daly & Farley, 2010; Garrett, 2014; Gilman, 2015; Harvey, 2006, 2007, 2010; Kotz, 2015; Kasser, Cohn, Kanner, & Ryan, 2007; Kuttner, 2013; Pasquale, 2015; Piketty, 2014; Posner, 2009; Robinson, 2014; Sachs, 2011; Santoro & Strauss, 2012; Sassen, 2014; Stiglitz, 2010, 2012, 2015; Zucman, 2015). This domination has led to a pervasive form of slow violence—a form of long-term attrition destroying the life support systems of billions throughout the world (see Nixon, 2013).

The exacerbation of already serious economic inequality within and between nations (Piketty, 2014; Stiglitz, 2012, 2015; Wilkinson & Picket, 2009) is an enormous, spinoff macroproblem deriving from these distortions of capitalism, which ironically emerged as a system for freeing the masses from exploitation under the thumb of European aristocracies in centuries past and was not intended to serve unfettered greed, individualistic vainglory, and the feathering of privileged nests (see Fleischacker, 2004; Muller, 1995; Sen, 2010). If the trend toward even more severe inequality continues, humanity faces a highly unethical divide between a small number of immensely powerful, selfish plutocrats and the vast majority of
miserable, exploited, and denigrated citizens whose insecure, impoverished lives are poor, nasty, brutish, and short, to borrow descriptors again from the 17th-century philosopher Thomas Hobbes (1985/1651). The division of populations into exploitative elites and exploited commoners has been a primary reason for societal collapses throughout history (Motesharrei, Rivas, & Kalnay, 2014) so the severe inequality macroproblem is particularly worrisome.

Democratic growth and erosion. Democracy is not an either-or political condition. Instead, it is a complex political system characterized by shades of gray ranging anywhere from vibrant, participatory governance systems to near totalitarianism (see Ackerman, 2010; Ambrose, 2005; Gutmann, 2003; Hacker & Pierson, 2005, 2010; Harvey, 2006; Roberts, 2010; Ringen, 2007; Wolin, 2008; Yamin & Ambrose, 2012). Some nations are more democratic than others and no perfect democracy has existed yet on earth, at least not on a national scale. Interestingly, democracy has been expanding around the world (United Nations, 2002), spreading into third-world nations at the same time that it has been eroding in many developed nations (see Gilman, 2015; Kurlantzick, 2013).

A democratic government tends to erode when the population of a nation polarizes ideologically and then one side comes to dominate the system (Bermeo, 2003; Gutmann & Thompson, 1996). Most often, this manifests in the form of extreme left-wing ideology (e.g., the Pol Pot regime of Cambodia, the Stalinist Soviet Union) or extreme right-wing ideology (e.g., the Pinochet regime in Chile, Nazi Germany). In a particularly worrisome example of democratic erosion, leading political scientists have shown that the United States has been going through this polarization process and has been shifting toward right-wing extremism over the last several decades (see Hacker & Pierson, 2005, 2010; Wolin, 2004, 2008). Disturbing consequences include mass deception of the citizenry and the erosion of civil liberties. When a democracy erodes, the political and economic levers of the nation are commandeered by unscrupulous, dogmatic elites, and the media is manipulated to spread propaganda in order to keep the populace ignorant and compliant. Evidence of democratic erosion in the United States comes from the dominant influence of plutocratic money in the political system through the power of lobbying and the ways in which the shortsighted, ideologically tainted Supreme Court Citizens United and McCutcheon v. Federal Election Commission decisions enormously magnified the influence of money in politics (see Gilman, 2015; Hacker & Pierson, 2010; Teachout, 2014).

Additional evidence comes from the replacement of objective, investigative journalism, which is designed to seek out and shed light on corruption, with industrial journalism, which tends to ignore or hide corruption. When the media is dominated by industrial journalism, arguments between entertaining but vacuous talking heads provide superficial, distorted, biased messages about what’s going on in the world and the public lacks the knowledge necessary for participation in the democratic process (Belsey, 1998; also see Starkman, 2014). In view of its recent
acceleration, democratic erosion in developed nations, especially in the United States, is becoming another serious macroproblem because the short-term wants of a few plutocrats (e.g., oil barons, inheritors of immense fortunes, financial industry insiders) trump the needs and rights of the vast majority. Note that the effects of this macroproblem correspond with the effects of the severe inequality macroproblem because the political and economic systems in the developed world are so closely intertwined. Consequently, these two macroproblems mutually reinforce.

Dangerous dogmatism. Shortsighted, narrow-minded, superficial, dogmatic thinking might be our most serious macroproblem because it is pervasive and causes most of our other macroproblems. Dogmatism is a major contributor to everything from creativity killing school-reform initiatives; to misconceptions about creativity and giftedness; to reckless, enormously damaging economic policy; to foolhardy military aggression; to ethnic conflict; even to the extremes of genocide (see Ambrose, 2009a; Ambrose & Cross, 2009; Ambrose & Sternberg, 2012; Ambrose, Sternberg, & Sriraman, 2012; Granik, 2013). Interestingly, gifted and creative individuals are not immune to dogmatism (Elder & Paul, 2012). Understanding and successfully grappling with the human penchant for dogmatic thought and action is a necessary step toward solving most of our other unrelenting macroproblems.

Taken together, the enormity and pressing nature of these macro-opportunities and macroproblems will demand more creative intelligence than humanity has ever been able to muster. An education that can help young people overcome the creative intelligence gap and make the quantum leap to the crest of the wave in the 21st-century model in Figure 1 will aim at the development of a very different, more complex set of abilities than those provided by the 3R’s education of the not so distant past.

EDUCATION SYSTEMS: A BIG-PICTURE ANALYSIS THROUGH THE LENS OF THE CATCH A WAVE MODEL

As mentioned earlier, the catch a wave model applies at multiple levels of analysis. Now that I have used Figure 1 to consider 21st-century trends and issues at the panoramic, societal level I narrow the scope somewhat to analyze ways in which education systems are evolving within the context of 21st-century globalization.

In Figure 2, the dark, left-to-right trajectory arrows on the surface represent the attempts educators and educational leaders make over the long term to create educational philosophy, curriculum, and instruction that will enable students to aspire, achieve, and ultimately succeed in their adult lives. The vertical dimension represents the extent to which this work actually does lead to authentic, long-term student success as opposed to superficial, short-term success signified by shaking out inauthentic grades.

On the surface at the back of the model the straight arrow moving from left to right now represents the trajectory of an education system in the early to mid-20th
In that era, educational success was considered to be the result of pedagogy that could provide basic, domain-specific knowledge and skills; consequently, success represented by the elevation in the back corner of the model was moderate, if it was achieved. It was moderate because it was missing some important elements, which will become clear later in this analysis.

The dark, left-to-right trajectory arrow on the near-side surface of the model represents the trajectory of an education system in the 21st century. If the philosophy, curriculum, and instruction of the education system does not match 21st-century demands it will push millions of students into the Hobbes trap where they ultimately will be crushed by the macroproblems on the underside of the globalization wave. If instead the education system matches 21st-century demands it could provide millions of students with the discontinuous, quantum leap to the crest of the globalization wave where they will be able to capitalize on the unprecedented macro-opportunities.

Using the American education system as an example, the Hobbes trap generates *creaticide* and *apartheid* that derive from current pressures to push American education back toward alignment with the worst forms of 19th-century pedagogy. For example, David Berliner (2012) coined the term *creaticide* to stand for the systematic killing of creativity in the American education system. The murder of creativity comes from dogmatic adherence to accountability initiatives driven by widespread, high-stakes measurement of superficial, narrow abilities through standardized testing. The term “apartheid” appears on the model because it signifies the pressure that influential but dogmatic, ignorant, and unscrupulous profit-seeking educational reformers are putting on school systems to impose more high-stakes...
testing, quasi-militaristic discipline, and barren, robotic instructional methods throughout the schools while cleansing them of higher-order thinking (see Berliner, 2009, 2011, 2012; Berliner & Glass, 2014; Fabricant & Fine, 2013; Horn & Wilburn, 2013; Kozol, 2005; Lubienski & Lubienski, 2014; Nussbaum, 2010; Ravitch, 2010, 2013). This situation magnifies educational apartheid because school systems run along these lines suppress the life chances of the deprived while the privileged enjoy elite school experiences unencumbered by accountability mania (for more on the magnification of privilege through exclusive educational opportunities for elites see Khan, 2010). Young people forced into this trap will have little to no chance of overcoming the enormous creative intelligence gap (represented by the vertical double arrow) and making the quantum leap to the crest of the globalization wave.

Notice that the quantum leap on this version of the model has some symbolism indicating an ironic race between the world’s two most powerful nations. A circle on the model shows the USA near the top but moving downward and China near the bottom but moving upward. Recently, several leading thinkers in general education, gifted education, and creative studies have discussed, independently, the problem of the USA dropping in terms of emphasis on creativity and some of them have portrayed China, which is notoriously noncreative in its education system, as desperately trying to become more creative. For example, Yong Zhao (2009, 2013, 2014) argued that China is trying to revamp its excessively mechanistic, noncreative, accountability driven model and align it more with the creative, constructivist, student-centered approach found in many American classrooms. Similarly, Kyung Hee Kim (2011) suggested that American emphases on standardized testing are de-emphasizing creative thinking while Asian school systems are attempting to replicate the American system due to its past success with creative learning. David Dai (personal communication, November 15, 2012) has taken on a project to translate scholarly books on creativity into Chinese because leaders in the Chinese system want it to become more creative. Further illustrating the irony of the circle on the model in Figure 2, Jonathan Plucker was cited in “The creativity crisis” (2010), a Newsweek article in which he relayed the bemusement of Chinese colleagues who said “you’re racing toward our model. But we are racing toward your model, as fast as we can” after he told them about American reform initiatives and accountability systems.

In essence, the societal catch a wave model in Figure 1 and the model in Figure 2 showing the challenges of the 21st century for education systems reveal some extremely high-stakes concerns for citizens, policymakers, educators, and the children they serve and mentor. The perilous Hobbes trap, featuring a dimly lit future in the societal model and creaticide/apartheid in the educational model, becomes something even more pernicious when it is applied to the future lives of today’s children. If our societal leaders are unwise, dogmatic, and unscrupulous they will deny educational leaders and teachers opportunities to create an education system capable of lifting millions of children up toward to the macro-opportunities on the top of the globalization wave. Instead, it will force educators to operate fearfully in barren, hyper-mechanistic, quasi-militaristic, 19th-century ways and millions of
children will be pushed forward into the dingy, dangerous, oppressive region under the macroproblems on the underside of the globalization wave. Here, their lives will be poor, nasty, brutish, and short while they are being crushed inexorably by those macroproblems.

In the Hobbes trap they will suffer from unrelenting insecurity and severe economic deprivation deriving from reliance on increasingly rare and far more expensive natural resources as well as the destitution that comes from exploitation of the vast majority by a few extremely powerful, selfish, unethical plutocrats who monopolize the levers of an increasingly distorted form of hegemonic, globalized capitalism. They will suffer from human-rights abuses that ensue from the erosion of democracy, the aforementioned economic exploitation, and the escalations of mass conflict that occur when populations face severe, unprecedented environmental stressors. In addition, they likely will face as yet unimagined difficulties that will come from the unpredictable negative effects of runaway technology.

Should they escape the Hobbes trap and make the quantum leap, today’s children, tomorrow’s adults, will have opportunities to sample a profusion of enormously appealing prospects heretofore undreamt. This especially will be the case for the gifted and creative. They will be able to contribute to, and benefit from, numerous, rapid leaps forward in scientific innovation and knowledge, which will emerge from the meshing of micro-expertise through networked, interdisciplinary science. They will find creative, ethical new ways to make the powerful, innovative capacities of globalized capitalism work for the good of the vast majority instead of for the benefit of a selfish, vainglorious, hyper-materialistic, well-positioned few. They will come up with ways to solve our current resource shortages while creating a new era of environmentally friendly abundance. Most importantly, they will diminish violence and greed by capitalizing on cognitive diversity, developing their creative intelligence, and dismantling the dogmatism that plagues so many in so many ways.

TWENTY-FIRST CENTURY KNOWLEDGE, SKILLS, AND DISPOSITIONS

The high-impact globalization wave shown in the catch a wave model in Figure 2 requires more than rote learning of easily measured knowledge and skills. Such an education may have sufficed in the early to mid-20th century, as shown by the linear life trajectory arrow in that region of the model. But the quantum leap to the crest of the wave will require an extensive range of other abilities, which are outlined in the list to follow. We could argue that only the gifted few with leadership potential need to master the daunting list of proficiencies in this list. Moreover, we could claim that these gifted individuals need not address the entire range of proficiencies. Instead, they could specialize and count on widespread collaboration among specialists to solve macroproblems and capitalize on macro-opportunities. Such an argument makes some sense because it would be extremely difficult for anyone to master all of the proficiencies. However, the majority of citizens, designated gifted or not, will need to develop some understanding of
21st-century challenges and opportunities while developing some level of expertise with these proficiencies because today’s enormous challenges require at least some participation of citizens en masse and the generation of the political will necessary for tackling unprecedented macroproblems and capitalizing on unprecedented macro-opportunities. We need widespread citizen awareness and support for the work of experts in the various domains relevant to each macroproblem and macro-opportunity.

The following is an extensive, and likely incomplete, list of knowledge, skills, and dispositions that might give us a chance to make the quantum leap to the crest of the globalization wave while avoiding the Hobbes trap. Elements in the list were inspired by a helpful analysis of 21st-century skills provided by Dede (2010) while some other elements came directly from prior interdisciplinary explorations of contextual pressures in today’s world (e.g., Ambrose, 2009). In the descriptions below, the selected aspects of knowledge, skills, and dispositions were connected with and adapted to the macroproblems and macro-opportunities described earlier in this chapter:

**Broad and Deep Proficiency in the Subject Areas**

Due to the complex, transdisciplinary nature of today’s macroproblems and macro-opportunities education must be comprehensive, addressing diverse concepts in multiple disciplines. Contrary to the direction imposed by major school-reform initiatives; which narrow and fragment the curriculum, forcing it to address easily measured, superficial knowledge and skill in literacy and mathematics (see Berliner, 2006, 2009, 2011, 2012; Berliner & Glass, 2014; Nichols & Berliner, 2007; Ravitch, 2010, 2013; Zhao, 2009, 2012); today’s students need deep-level cognitive and affective immersion in a variety of subject areas including literacy, the arts, mathematics, the sciences, world languages, history and governance, and geography. “Deep level” means grappling with interesting problems in the subjects and mastering key concepts instead of just learning superficial facts and basic mechanics for standardized testing.

**Creative Thinking Skills and Inquiry-Based Dispositions**

Given the unpredictable, evolving conditions of the 21st-century globalized context, today’s students must learn to generate insightful ideas, adapt, innovate, and problem solve when confronted with uncertain, nebulous, threatening technical, socioeconomic, and cultural circumstances (see Sternberg, 2009a, 2012). “Inquiry-based” dispositions entail the development of keen interest in digging into the core of puzzling situations and interesting phenomena. These skills and dispositions may be particularly important when it comes to the development of gifted young people (see Renzulli, 2012).