

## A Message from the Head of School

# Thriving in the Second Machine Age:

## *The Challenge, the Path, and the Education that Makes It Happen*

By Robb Gaskins, Ph.D.



We are bearing witness to one of the most fascinating and critical periods in human history. MIT Professors Eric Brynjolfsson and Andrew McAfee (2014) refer to the current era as the Second Machine Age. Like the Industrial Revolution before it (the First Machine Age), the current Digital Revolution is a time of exhilarating opportunity and perilous challenge. Technological advances have made it possible for us to experience unprecedented levels of productivity, efficiency, analytic power, innovation, connectivity, wealth, abundance, and comfort. At the same time, digital technologies have been massively disruptive.

### ***The Challenge***

Millions of jobs have been eliminated by machines and millions more will be. Frey and Osborne (2013) project that 47% of jobs in the U.S. are at risk of being eliminated by automation within the next two decades. To be sure, substantial job loss in the face of technological change and the need to develop new skills and jobs was characteristic of the First Machine Age, too. But, there are a few important differences in the Second Machine Age that make the current challenge far more daunting. For example:

- In the First Machine Age, technological tools replaced muscle power. In the Second Machine Age, they are replacing brain power, which enables the completion of increasingly complex cognitive and physical tasks. As a result, machines today are not only eliminating positions that require basic skills but also positions that require an ever-increasing level of knowledge, skill, and complexity.
- The exponential rate of technological advancement in the Second Machine Age exacerbates the challenge of keeping pace with the rapidly expanding capabilities of machines and determining the optimal collaborative relationship between humans and machines.
- We are not developing new businesses that create jobs nearly as fast as we are losing jobs.
- All of these changes are occurring in a world in which national economies are increasingly interconnected.

The cumulative effect of these factors, as well as others, is that while the GDP and overall productivity in powerful nations across the world continue to rise, median income and job prospects for the average worker are diminishing, the middle class is contracting, and the gulf between the rich and the rest of society is expanding (Brynjolfsson & McAfee, 2014; Deloitte, 2014; Frey & Osborne, 2013; Michell, 2015).

### ***The Path***

If these trends continue unchecked, formidable economic, social, and political (as well as environmental) crises are looming (Brynjolfsson & McAfee, 2014; Michell, 2015). Fortunately, it doesn't have to be that way. As Eric Brynjolfsson recently stated in an interview printed in the Harvard Business Review (Bernstein & Raman, 2015), "Technological progress is an extraordinarily powerful force, but it's not destiny. It won't lift us into utopia or carry us into an unwanted future. The power to do that rests with us human beings." The question is: What is required for our nation, and nations around the world, to harness the ever-expanding power of digital technologies and thrive?

In order to thrive in the Second Machine Age, we need wise leaders, bold entrepreneurs, and skilled citizens. Our leaders must be creative, flexible, and thoughtful problem solvers who astutely evaluate the challenges before them and take actions that demonstrate clarity and vision. Consistent with research on why nations succeed or fail, our leaders must enact inclusive policies that facilitate economic growth and shared prosperity (Acemoglu & Robinson, 2012) while reflecting environmental foresight, global awareness, and attunement to the immediate social context (Diamond, 2005). Beyond strong leaders, our nation needs enterprising entrepreneurs with the confidence, expertise, and inspiration to launch businesses that create new jobs and promote further innovation (Brynjolfsson & McAfee, 2014). Finally, we need citizens who possess (1) the knowledge, strategies, and personal characteristics to continually adapt and succeed in the current era and (2) the potential to become entrepreneurs and leaders (e.g., Deloitte, 2014; Fadel, 2016).

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## The Education That Makes It Happen

Educators are entrusted with the critical task of developing the wise leaders, bold entrepreneurs, and skilled citizens that will enable our nation to thrive in the Second Machine Age. The key question is: What knowledge, skills, and personal characteristics need to be developed?

Given that the defining feature of the current era is technological advancement, it is not surprising that there is widespread agreement that students need a strong foundation of technological knowledge and skill. However, when you review the writing of leaders in education, business, and economics about the factors they consider most essential for success in the future, they rarely place their primary focus on **technological expertise** (e.g., Bellanca & Brandt, 2010; Brynjolfsson & McAfee, 2014; Fadel, 2016; Friedman, 2014; Wagner & Dintersmith, 2015). Instead, the focus is on a combination of knowledge, skills, and personal characteristics that enable students to adapt, grow, and innovate across contexts in an ever-changing environment.

The most consistently cited factors that are required for students to thrive in the current era are **the four C's: critical thinking, communication, collaboration, and creative problem solving** (e.g., Bellanca & Brandt, 2010; Fadel, 2016; Wagner & Dintersmith, 2015). In order for students to become adept in these four areas, there are corresponding factors that must be nurtured. At the root of each of these areas that promote innovation is **intrinsic motivation**. Intrinsic motivation fuels the generation and investigation of questions, the acquisition of knowledge, the development of new skills, and the willingness to take risks throughout our lives (Wagner & Dintersmith, 2015). Also, when coupled with strategic knowledge and scaffolding, intrinsic motivation is essential to the establishment of critical dispositions such as persistence and resilience. Students also need **clarity and focus**. When we learn to find a balance between mindfully attending to ourselves, others, and the immediate context, we are in a better position to perceive situations clearly and determine optimal courses of action (Goleman & Senge, 2014).

The development of an **expanded growth mindset** is also essential to applying the four C's and thriving in the current era. Not only do we need to see our own abilities as unfixed (Dweck, 2006), but we also need to see ideas as unfixed and open for modification and reconceptualization. Having **an extensive, well-structured, and generative foundation of content knowledge** is extremely important to innovation, too. While information is readily available on the internet, quickly accessing information in digital files cannot begin to compare to working from a dynamic and well-organized understanding of relevant ideas and how those ideas are interconnected (Bransford, Brown, & Cocking, 2000). Our conceptual frameworks are the means by which we understand the world and recognize the potential for innovation (Alexander & Murphy, 1998). Consequently, their centrality to creativity, critical thinking, and all cognitive functioning cannot be understated. Given the challenges facing the world today, global awareness and environmental understanding must be integral parts of our students' conceptual knowledge.

**Social and emotional intelligence** is yet another imperative component of skilled application of the four C's that leads to success in this age of innovation (Brynjolfsson & McAfee, 2014; Frey & Osborne, 2013). Today in businesses around the world, it is common for critical thinking and creative problem solving to occur in teams. In addition, inspired leadership requires advanced interpersonal skills as well as compassion for others and the natural environment. Thus, qualities such as emotional awareness, knowledge of social conventions, and empathy are all critical to our individual and collective futures.

To become effective critical thinkers and creative problem solvers, we also need **strategies** that help us complete these operations (Alexander, et al., 2010). These strategies along with our conceptual knowledge are the tools in our cognitive toolboxes we use to solve problems and determine our actions. **Self-regulatory skills** are also essential (Fadel, 2016). If conceptual and strategic knowledge are the assortment of tools in our toolboxes, self-regulatory skills are what enable us to determine which tools to use and how to integrate and apply them to best address the situation at hand. In short, they control all of the components of our thoughts and emotions and determine how we function in the world.

If every school effectively developed the four C's and complementary factors highlighted above, we would be producing the leaders, entrepreneurs, and citizens we need to thrive in the future. At Benchmark School, our instructional framework—The Seven Pillars of Benchmark Instruction—and our new strategic vision are focused on these very goals. This alignment with what is required to help students thrive in the future is why Benchmark has consistently generated strong leaders, entrepreneurs, and citizens in the past and it is why we will continue to do so long into the future.

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*Benchmark is pleased to announce that Head of School Robb Gaskins was recently elected to the Board of Trustees of the Pennsylvania Branch of the International Dyslexia Association (PBIDA) for a three-year term. PBIDA is an organization that supports individuals with dyslexia and related learning differences, as well as their families, educators, and other professionals in Pennsylvania and Delaware. To learn more about the resources for parents provided by PBIDA, visit [PBIDA.org](http://PBIDA.org).*