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Rethinking K-12 Education: Defining a New Model

The education industry is poised to undergo profound change. Here is how the landscape will evolve and what should be done to ensure it is sustainable.

Over the past 25 years, the world has changed faster and with more complexity than ever before. The most significant driving force is the advent of the Internet and the rapid advancement of technology as part of the digital age. Such a radical global transformation has demanded people learn new theories and knowledge that simply did not exist two decades ago, new skills that are of more prominence in our daily lives, and new technological competencies that will enable further advancement.

However, our education systems, particularly K-12, have not kept pace.[1] Stuck in the industrial age, our schools continue to teach content that is no longer relevant, using pedagogical methods that no longer benefit young people's evolved minds. In many ways, the skills of a secondary-school graduate today are similar to the skills of a graduate 20 to 40 years ago, making education one of the few industries in the world where significant evolution has yet to occur.

Most K-12 institutions have adapted their curriculum over the years, adding courses pertaining to 21st century skills, such as entrepreneurship and computer studies. Others have incorporated technology into the classroom, creating course websites or giving students laptops. However, this does not qualify as a significant evolution. Significant evolution is a radical transformation of educational institutions' operating model in direct response to environmental changes, whether it be a shift in consumer behaviors, a launch of new technologies, or the development of new regulatory policy making.

In the private sector, business leaders constantly rethink their operating model, fighting to stay relevant in the eyes of their customers. In education, this simply has not happened. K-12 institutions are stuck in an ecosystem that makes significant evolution extraordinarily difficult and the inertia has had an impact on an array of societal and macroeconomic issues across the globe:

Insufficient improvements in basic skills. Seventy-three million adults have only a low level of education, and nearly 20 percent of 15-year-olds lack sufficient reading skills, according to a report from the European Commission's Rethinking Education initiative.

More unemployed youth. Young people are three times more likely to be unemployed than adults, and almost 73 million of them worldwide are looking for work, according to the International Labor Organization. Furthermore, job vacancies are staying unfilled much longer today than they did pre-crisis—an average of 25 business days versus 14 days.[2] While these findings are primarily attributed to macroeconomic factors that deter hiring, they also indicate a potential mismatch between the new-age skills required by employers and the obsolete, industrial age knowledge acquired through formal education.

Dropout rates. While the overall dropout rate has declined (in the United States alone, it decreased from 12 percent in 1990 to 7 percent in 2012), the numbers vary dramatically by race and ethnicity, gender, and income level.[3] Hispanic students in the United States have consistently had the highest dropout rates, and today that number is unacceptably high at 14 percent. Students from low-income families had a five times greater risk of dropping out than their high-income peers. Twelve million children in the United States alone are expected to drop out of formal education in the next 10 years.

[1] K-12 is defined here as primary and secondary education from kindergarten for 4- to 6-year-olds through 12th grade for 17- to 19-year-olds.

[2] "The Establishment-Level Behavior of Vacancies and Hiring," Davis, Faberman, and Haltiwanger, *The Quarterly Journal of Economics*, 31 January 2013

[3] National Center for Education Statistics

Lack of progress in encouraging early-childhood education. A better early-childhood education can shape the success of the entire education system. Nobel Prize-winning economist and University of Chicago professor James Heckman, who has dedicated much time to researching early childhood, found that children of mothers who graduate from college score much higher on cognitive tests at age 3 than those whose mothers drop out of high school, proof of the advantage for young children of living in rich, stimulating environments. Interest in education at an early age encourages lifelong learning, which is another key policy objective in many countries. Early childhood programs are also valuable resources for encouraging parents to re-enter the workforce, thereby activating a key resource in the population needed to stimulate economic growth.

> "There is hard evidence that non-cognitive—or character—skills matter greatly."
>
> **—Professor James Heckman**

There are many other education issues, of course. But these four are compelling enough to support the call for a new vision. This paper examines some ideas for this new vision and the implications for the major players in the education ecosystem.

Defining a New Vision

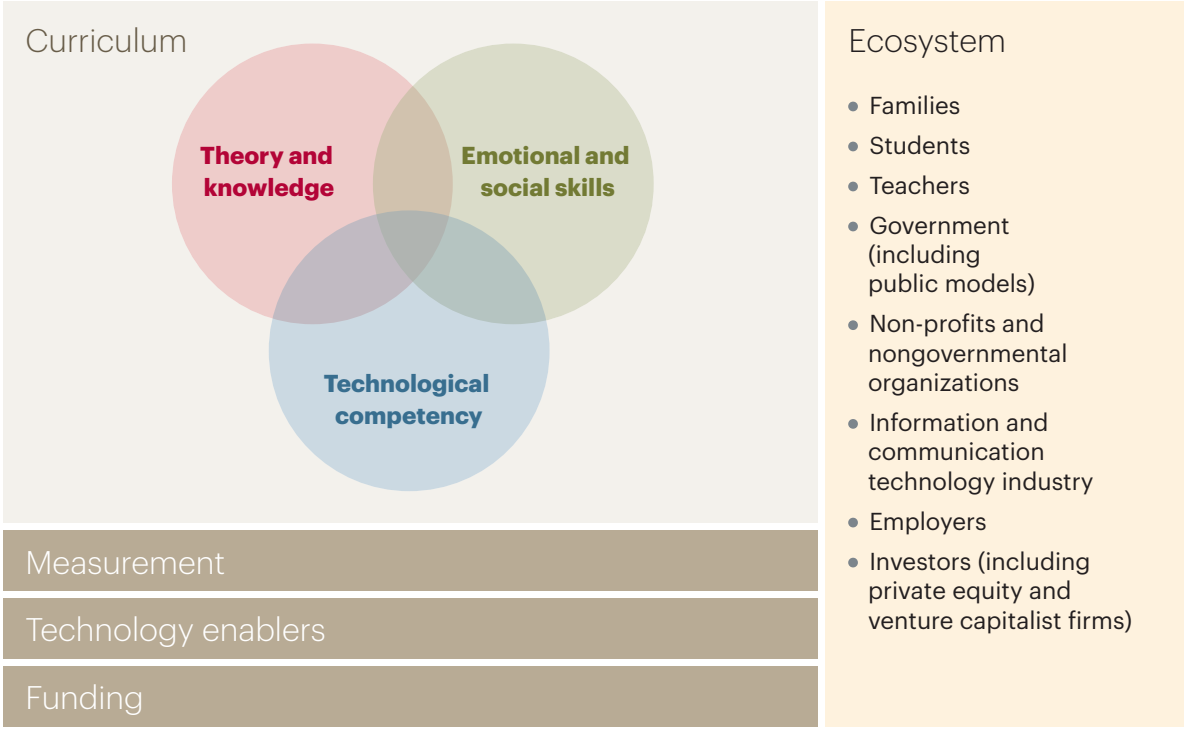
As popularized by Daniel Pink's best-selling book, *A Whole New Mind: Why Right-Brainers Will Rule the Future*, we know that the world is at a turning point—between the digital age where knowledge, logic, and analysis thrived and the conceptual age where creativity, innovation, and design skills are more strongly valued. "The future belongs to a different kind of person with a different kind of mind: artists, inventors, storytellers—creative and holistic 'right-brain' thinkers whose abilities mark the fault line between who gets ahead and who doesn't," Pink contends.

As a result, today's focus should be not only on closing the skills gap of the digital age, but also on ensuring that students acquire the skills to succeed in the conceptual age. In this paper, we discuss the following key, all-encompassing factors in achieving this goal (see figure 1 on page 3):

- **Curriculum:** What should we teach?
- **Measurement:** How do we effectively measure and compare the quality, efficiency, and results of education systems throughout the world?
- **Technology enablers:** How do we adapt to the technology-induced "rupture" in the way education is delivered? How can we take advantage of the possibilities offered by new technologies to build a better education model for the greater good?
- **Funding:** How do we ensure proper funding for education? What is the ideal economic equation?
- **Ecosystem:** Who are the actors that play a role in education at all levels, from defining the curriculum to deploying infrastructure and funding?

Figure 1
New vision for education takes an all-encompassing view

A.T. Kearney's education environment framework



Source: A.T. Kearney analysis

Curriculum: Evolving What—and How—We Teach

We define the curriculum as a set of organized courses and modules with intended learning outcomes. A curriculum has three pillars: theory and knowledge, emotional and social skills, and technological competency. Some components are isolated, but most overlap. For example, students understand geography via theory and knowledge, but there is an overlap when they practice cultural awareness—an emotional and social skill—as they draw from what they have learned in the geography course.

Pillar 1: Theory and knowledge

In the simplest of terms, theory and knowledge is what you know. Traditionally, learning institutions have taught theory and knowledge deductively, using information that already exists. Education has focused on this pillar with the belief that students who acquire and retain more knowledge are better able to succeed in the world. However, in the digital age, knowledge is a commodity: information is ubiquitous and accessible at the touch of a button. Students do need some retained knowledge to draw connections and conclusions, but concentrating on this pillar is no longer practical; a broader curriculum is needed. The fundamental challenge that schools and education systems will face is deciding which core bases of knowledge to prioritize and which to eliminate to accommodate other skills and competencies.

Pillar 2: Emotional and social skills

Emotional and social skills are represented by the direct application of theory and knowledge in the real world—the capacity to translate information into insights and ideas relevant to the environment. Pink offers a similar view, describing right-brain creativity as "the ability to synthesize knowledge and develop inventive solutions to complex challenges." Synthesis is paramount to innovating in the digital age: without it, we lack the ability to connect the dots from our repository of knowledge to the phenomena of the real world. Take computer programming as an example. Schools can teach the basic concept of writing code (theory and knowledge) and allow students to try their knowledge on a computer (technological competency). But it is only when a student creates something, such as a mobile phone application, that society benefits.

The importance of emotional and social skills is enormous. We may connect more regularly than ever before, but as interactions become more virtual and lose the human touch, the most relevant of these skills today include leadership, networking, diplomacy, conversation and public speaking, empathy, conflict resolution, constructive criticism, creativity, listening, facilitating, flexibility, and team building.

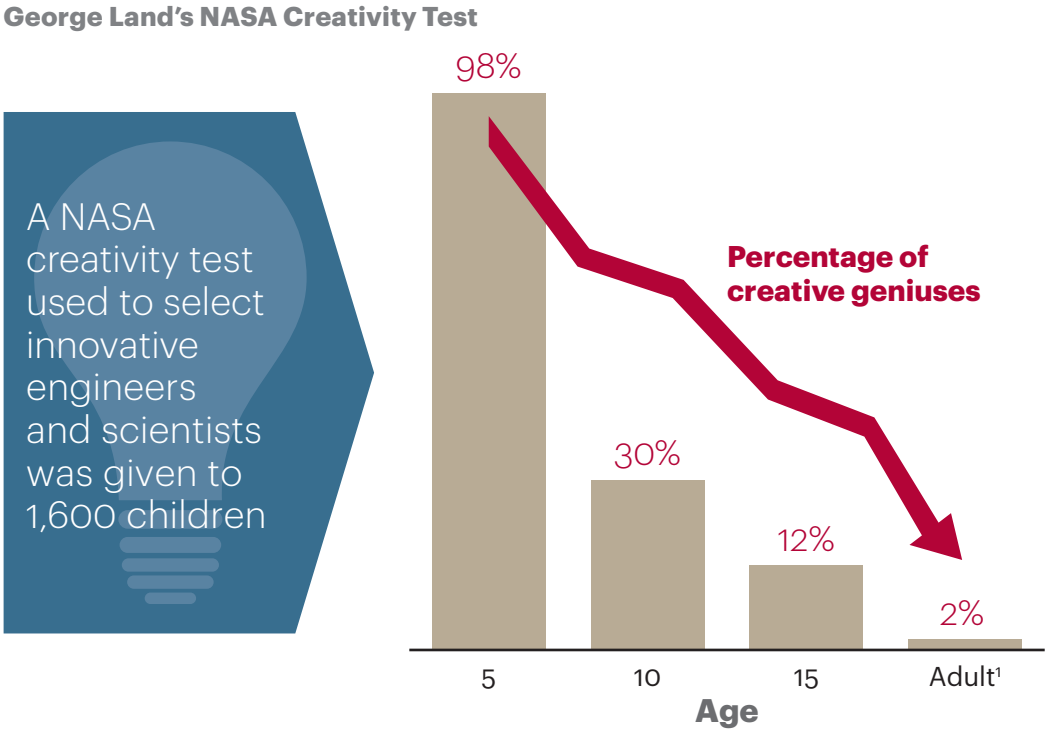
> "We aim to provide each child with a rugged, low-cost, low-power, connected laptop."
>
> **—One Laptop per Child (one.laptop.org)**

Heckman has empirical evidence that we are not looking at the big picture of human potential. We are focusing on cognitive skills where intelligence can be easily tested. However, the social and economic problems confronting the United States—obesity, dropouts, and rising crime—are directly attributed to low levels of social ability. He studied decades' worth of education data and concluded, in what he calls the Heckman Equation, that the most economically efficient time to develop these skills and abilities is from birth to age five, meaning investment in early-childhood development is more cost-effective than remediation.

In another study, George Land looked at education and creativity using a test that NASA developed to identify innovative engineers and scientists. In 1968, Land gave the test to 1,600 five-year-olds and then retested them when they were 10 and 15 years old. At age five, 98 percent tested as "creative geniuses" (see figure 2 on page 5). By age 10, the number had dropped to 30 percent, and by age 15, it had plummeted to 12 percent. When the same test was administered to 280,000 adults, only 2 percent registered as creative geniuses. Land concluded that non-creative thinking is learned. This was tangentially observed by Albert Einstein, who said, "It is a miracle that curiosity survives formal education."

A handful of institutions have adopted innovative models in isolation. For example, the Reggio Emilia Approach is a collaborative educational philosophy that places teachers, parents, and children as active contributors to the process of learning—the outcome often being significant improvements in social and emotional proficiencies. United World Colleges is another example of an institution offering an all-encompassing, value-based education

Figure 2
Study indicates noncreative behavior is learned



[1] The same test was given to 280,000 adults.
Sources: *Breakpoint and Beyond: Mastering the Future Today* by George Land; A.T. Kearney analysis

through its unique community participation and outdoor learning program. The Abu Dhabi Music and Arts Foundation has also innovated in this field by using various art forms to build understanding and learning ability in curriculum subjects. Overall, however, there has yet to be widespread reform.

Pillar 3: Technological competency

Technological competency is the ability to directly apply knowledge by technological means. This includes basic uses of technology such as writing an essay in Microsoft Office, to more advanced uses such as manufacturing a product with a 3D printer. These skills are foundational to succeeding in our technology-driven society.

The main obstacle to widespread use of this curriculum is affordability. However, partnerships between educational institutions and the information and communications technology (ICT) industry can help clear this hurdle. In India, for example, Pratham's digital classroom is a low-cost solution to introducing children, mainly from weaker sections of society, to new technology. The school uses WebBox, a Wi-Fi-enabled Android smartphone repackaged as a keyboard that interfaces with a television in the classroom. WebBox has a learning application with digital content aligned to the state curriculum. It enables other innovative learning techniques such as slideshows and videos to make education more interesting and interactive. Vodafone India has partnered with Pratham for this Learn, Out of the Box initiative.

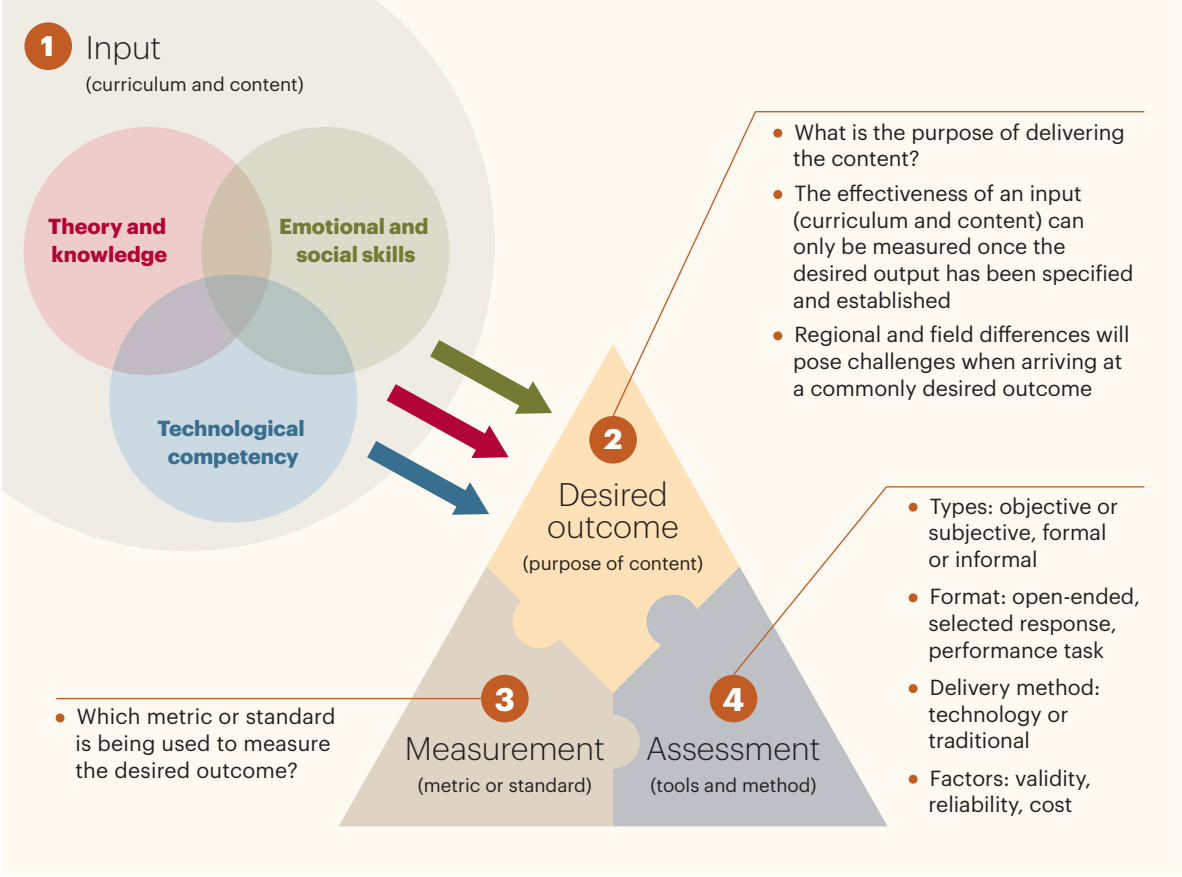
Measurement: Rethinking Standards and Metrics

Policy makers and practitioners often ask how we should measure education's effectiveness. The challenge with this question arises because stakeholders across different regions and fields will have a unique definition of education and its inherent purpose. While this poses no issues when measuring education on an isolated basis—for example, in a distinctive field or region where the purpose is more commonly agreed upon—it can cause discrepancies when used comparatively.

We have defined four components of measuring the effectiveness of education universally (see figure 3). The first is the **input,** or the curriculum and content being delivered. The second is the **desired outcome**. The input's effectiveness can only be measured once the outcome has been identified. From a global perspective, the standards and metrics used to measure education's effectiveness must be derived from key stakeholder groups' agreement on a general purpose of education. The third component is **measurement**, or the criteria used to evaluate the desired outcome. The final component is the **assessment** used to evaluate the measurement metric. For measurement to be effective, these four elements must be in synchrony.

Figure 3
Four means of measuring the effectiveness of education

Measurement framework



Source: A.T. Kearney analysis

Current measurement tools and limitations

Various international education league studies exist today, the largest and most recognized being the Organisation for Economic Co-operation and Development Programme for International Student Assessment (PISA). Nearly 500,000 15-year-olds across 65 nations take this two-hour test, the purpose of which is to understand if they are "well-prepared to participate in society." (The age of 15 was chosen because most of these students are on the verge of completing compulsory education and can thus provide a representative measure of K-12 educational effectiveness.) The test focuses on three domains: math, science, and reading, and PISA results are used in significant policy decisions and educational reforms, including Common Core standards in the United States. However, questions arise on the importance and relevance of the results, given the asynchronous nature between the test's purpose and the domains being tested.

A.T. Kearney's education framework is built on three pillars in a school's curriculum: theory and knowledge, emotional and social skills, and technological competence. The PISA measurement framework tests the first pillar but does not address the other two—the components that prepare students to participate in society.

In the book *World Class Learners: Educating Creative and Entrepreneurial Students*, Oregon University Professor Dr. Yong Zhao identifies two education paradigms: employee oriented and entrepreneur oriented. The essential difference is that the employee-oriented paradigm uses a standard, prescribed curriculum to produce homogenous workers for large-scale employment (industrial age) while the entrepreneur-oriented paradigm focuses on supplementary elements, such as creativity, personality, and emotional development (conceptual age). The PISA test and other international studies, therefore, measure how effective a country has been at deploying their prescribed math, science, and reading curriculum (an employee-oriented education), rather than the degree to which it has cultivated creative and emotionally aware thinkers (an entrepreneur-oriented education).

Zhao then analyzed the Global Entrepreneurship Monitor (GEM), the world's largest entrepreneurship study. The 39 countries that participate in GEM also participate in PISA. Comparing the two studies, he found a largely inverse correlation between PISA test scores and entrepreneurial capacity. For our analysis, we selected countries that were involved in both studies in 2012 (see figure 4 on page 8). We chose the eight top-performing countries on the PISA test, and a randomly selected group of eight countries scoring in the middle and low end of the test. We then divided each country's "perceived entrepreneurial capabilities" score from GEM by its average PISA result (from math, science, and reading). The findings reveal a sizable gap between the two groups. The countries with the top PISA scores had an average GEM:PISA score of less than half that of the mid- and low-scoring countries, indicating a potential shortfall in PISA's measuring purpose to understand if students are "well-prepared to participate in society."

Zhao also mentions the contradictory practice of innovation-driven nations pursuing an educational strategy intended to improve test scores. The United States, for example, is a mature economy that needs innovation to grow and remain competitive. However, the nation's focus on standardized testing, a rigid curriculum, and teacher incentives in line with test scores will continue to erode creativity in young people.

New measurement variables

The Pearson Learning Curve is the latest innovation in education league tables. However, the analysis simply draws on data from the cognitive-focused assessments, such as PISA,

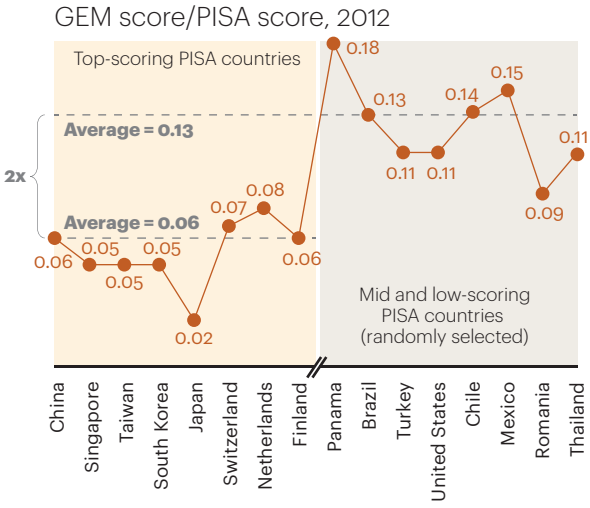
Figure 4
In the digital age, knowledge is a commodity

Most comparative education studies focus on theory and knowledge ...

Circles indicate extent: None High

Study	Theory and knowledge	Emotional and social skills	Techno-logical competency
PISA			
GEM			
TIMSS			
PIRLS			
ICIL			

... which often have an inverse relationship with the two other areas



Note: PISA is Programme for International Student Assessment. GEM is Global Entrepreneurship Monitor. TIMSS is Trends in International Mathematics and Science Study. PIRLS is Progress in International Reading Literacy Study. ICIL is International Computer and Information Literacy. GEM score is measured by perceived entrepreneurial capability; PISA score is measured by average math, science, and reading score.

Sources: GEM 2012 Global Report, Organisation for Economic Co-operation and Development PISA 2012 Report; A.T. Kearney analysis

the Trends in International Mathematics and Science Study (TIMSS), and the Progress in International Reading Literacy Study (PIRLS). If the aim is to measure education's effectiveness and students' employability, all three pillars of the curriculum should be studied. As mentioned, most studies focus on theory and knowledge but miss other areas such as entrepreneurial aptitude, creativity, and empathy.

In terms of measuring technological competencies, the International Computer and Information Literacy Study (ICIL) is the first international comparative study that emphasizes students' acquisition of computer skills. Conducted in 2013, the study's results are expected to be published in November 2014. As noted in a recent ICIL publication, "The purpose of the ICIL is to investigate the computer and information literacy amongst young people to support their capacity to participate in the digital age. It also addresses the necessity for policymakers and education systems to have a better understanding of the contexts and outcomes of ICT-related education programs in their countries."

There are no large-scale international studies focusing on emotional and social skills. However, the Heckman Equation and other studies demonstrate that this realm of curriculum focus is one of the most important areas for young people. The challenge in assessing these skills is mainly in reliability and how to accurately replicate the evaluation. In addition, the most suitable tool to assess social and emotional skills is not the traditional, low-cost pen-and-paper method but in-person assessments.

Technology: A New Way to Teach

Methods such as blended learning, real-time video, and out-of-class technology can cause a rupture in the way education is provided. These methods, while very relevant to the three pillars of curriculum, also have good scalability. Tools such as bring your own device (BYOD), digital textbooks and other media, and Skype can help develop technological competency in the new education model while also being interesting and user friendly.

Eliminating premiums on content is another milestone brought about by technology. Content is now easily accessible on various digital platforms and no longer entails massive spending. For example, Apple and Google have nearly 120,000 educational apps, most of which are free or affordable. Arizona's Vail School District has embraced this new trend. "We used to invest hundreds of thousands of dollars every year in the textbook cycle, but we don't do that anymore," said Superintendent Calvin Baker. Instead, the 12,000-student district collects digital content from various platforms (often at no cost) and bundles it to create instructional materials for a course. Their courses are now in such demand that they charge 68 partner districts across the state a fee to use them. What previously was one of the district's biggest expenses is now an income-generating venture.

> "Technology is just a tool. In terms of getting the kids working together and motivating them, the teacher is the most important."
>
> **—Bill Gates**

The availability of technology can significantly improve the delivery of education, but affordability is essential. In several developing nations, affording technology for education is a major hurdle. One noteworthy player in providing low-cost technology is the One Laptop per Child Association, which aims to empower the world's poorest children through education. The project provides low-cost computers, called the XO laptop, to nearly two million children and teachers in Latin America and another 500,000 in Africa and the rest of the world. The cost was kept low by first rationalizing software and hardware resources and then mass-producing units to achieve economies of scale. Central to the project's strategy was its partnerships with Advanced Micro Devices, Chi Mei, eBay, Google, Marvell Technology Group, News Corporation, Nortel, Red Hat, and Quanta.

Figure 5 on page 10 examines the value of technology based on two criteria. Relevance considers how useful the technology is in delivering the three pillars of the curriculum. Scalability looks at the likelihood of student take-up (how interesting the tool is), teacher take-up (how usable it is), and school take-up (how affordable it is given budget constraints). Blended learning, real-time video, and out-of-class technology tools scored the highest.

Figure 5

Assessing the value of using technology in education

Circles indicate extent: None High

Area	Examples	Purpose	Relevance: Theory and knowledge	Relevance: Emotional and social skills	Relevance: Techno-logical competency	Relevance: Overall	Scalability: Student take-up (interesting)	Scalability: Teacher take-up (usability)	Scalability: School take-up (affordability)	Scalability: Overall
Blended learning	Tablets, laptops, digital textbooks and labs, class websites, forums, BYOD, cloud computing, learning analytics, wearable tech	Capitalize on a hybrid of in-person tools and technology								
Real-time video	Skype, video conferencing	Build social, emotional, and global understanding by communicating with students and schools globally								
Out of class	Mozilla's Open-Badges, Teach-Surfing, United World College	Give students opportunities and recognition for informal learning outcomes through technological devices and platforms								
Games and gamification	Minecraft, DuoLingo, SimCity	Recognize the value of extended practice, and develop personal qualities such as persistence, creativity, and resilience through extended play								
MOOC	Skills Academy, Codecademy, Global Academy	Provide flexible, low-cost access to well-developed self-learning materials online								
Physical space	Modular classrooms, comfortable seating, lighting, Wi-Fi, whiteboards	The learning experience is heightened 32 percent with more comfortable seating; engagement and communication increase 24 and 23 percent respectively with adaptable learning spaces								
Visual and verbal enhancements	Auto subtitling, wireless microphones, high-definition projectors	The learning experience is heightened 14 percent when instructor is clearly understood and 17 percent when materials are clearly visible								

Note: BYOD is bring your own device. MOOC is massive open online courses.

Source: A.T. Kearney analysis

Funding: More Actors are Playing a Role

New K-12 funding models are emerging beyond the traditional use of taxpayer funds. More actors are playing vital roles in these emerging models, particularly where government investment in education is relatively low.

The first emerging model is a partnership between independent institutions, such as private schools and charter schools, and industry partners for funding support and curriculum development. In Chicago, the Sarah E. Goode STEM Academy focuses on developing skill sets that will guarantee graduating students a $40,000 job with IBM, the school's corporate sponsor. However, many industry players are taking matters into their own hands and developing significant internal educational capabilities. For example, General Electric (GE) has a legacy of involvement in education. The GE Crotonville "university" is GE's global leadership institute dedicated to sharing ideas and creating transformative learning experiences to customers and employees across the globe. Over the years, this has become a strategic advantage in acquiring, developing, and retaining GE's leaders globally.

Private-equity investment funds are also getting more involved in education. For example, India-based Kaizen Private Equity is the first fund in the nation focused entirely on education ventures. However, impact investors—funds focused primarily on social enterprise investments—have an extensive history in managing a portfolio of education businesses. Acumen Fund is a non-profit impact investment fund with five education businesses in its portfolio. Lok Capital is another example of an impact investor, focused on education and other social causes in India. Acumen and Lok have invested in India's Podar International Schools, which offer standardized educational services with lean facilities. Podar's low-cost solution is self-sustainable and return-generating for its investors. Pearson's Affordable Learning Fund is also investing in low-cost, for-profit schools. Its first investment, Omega Schools in Ghana, has already grown from 10 schools serving 6,000 students to more than 35 schools serving 20,000 students.

The third model is a collaboration between government bodies and organizations, both for-profit and not-for-profit. Governments often find economic and capability challenges in educating social niches, particularly in rural and underserved markets, or in addressing nontraditional forms of learning, such as gaming. In Singapore, Playeum, the Children's Centre for Creativity and Culture, has joined forces with the government to bring play-based education to underprivileged members of society. In New York, the Institute of Play launched its first project to design and implement an innovative New York City public school called Quest to Learn.

The Education Ecosystem

Education is changing. The curriculum is shifting toward right-brained and technological learning outcomes. New measurement standards are gaining traction globally. Technology is being used in both privileged urban schools in developed markets and underprivileged rural schools in emerging markets. More actors are financing education around the world. What used to be a slow-moving, predictable sector is quickly becoming fast-paced, innovative, and complex.

However, this added complexity makes it difficult for players—particularly those relatively established in education—to know where they stand, how they are affected, how to navigate the sector, and how to stay relevant. Forward-thinking stakeholders have their eye on how

the sector will unfold and which strategies will create long-term competitive advantage. From technology players and content providers to private equity investors, teachers and administrators, and government bodies, now is the time to understand how your role in education—at all levels of the model—will be impacted.

Technology players, such as Google and Apple, are fully aware of the technology tipping point happening in education. Hardware, for example, has become affordable enough for schools to use on a large scale. Google is selling devices in schools, suggesting their Chromebooks can achieve savings of more than $5,200 per device across three years. Apple, which has been distributing its products to educational institutions for decades, has tens of thousands of MacBooks and iPads in schools around the world. However, school competencies rarely extend to IT, and most government budgets cannot justify additional spending on IT departments. Technology players must offer a full suite of products and services—including managed infrastructure services, data security, and access permissions—so schools can focus on what they do best: teaching.

> "Education is the most powerful weapon you can use to change the world."
>
> **—Nelson Mandela**

Similarly, software such as educational gamification and digital textbooks has become functionally rich enough for teachers and students to prefer it over traditional textbooks. In fact, 44 percent of students in grades six through eight want to read on a digital device. Google Play for Education is a good example. This new app store gives teachers access to approved apps that help them meet both curriculum requirements and the individual needs of students. Technology leaders, however, are experts in serving adults and will need to customize their products and services to meet the unique needs of education consumers—K-12 schools educate students across a diverse age group, from age four to the late teens. Digital control mechanisms are also needed to filter out low-quality applications, support sharing and collaboration, and ensure students are downloading only school-sanctioned materials. Players that take advantage of data tracking and analytics (in collaboration with schools and districts) will be able to identify consumer trends and behaviors early on—and adapt accordingly.

Content providers have massive opportunities ahead to disrupt the traditional education market, similar to the impact digital had on the traditional media industry. Paper-based publishers are downsizing because of falling profits but at the same time are being forced to innovate—with fewer resources—to compete with digital and technology players. As the media sector has demonstrated, people want information in a variety of formats: some want only digital, some want only paper, and some want varying degrees of both. Forward-thinking content providers will learn from their customers: the students themselves and the teaching environment. For students, content providers can use the growing prominence of big data in education to segment learning styles, identify the learning and results, and understand how these will shift over time. For the teaching environment, they will need to balance the urge to beta test new forms of content delivery with soliciting educator feedback about what actually works in the classroom. An understanding of these diverse perspectives will be crucial to adapting content strategies. However, unlike the media industry, education

often doesn't let students choose their consumption platform, nor does it allow educators to choose a delivery model. Content providers will have to educate decision makers about student preferences so that the decisions made benefit all K-12 stakeholders.

Investors will see new market opportunities open up. The education sector made up a mere 1 percent of all venture capital deals between 1995 and 2011. In comparison, technology accounted for 38 percent and healthcare 19 percent. Whether it is an edutech startup or for-profit schools, this 1 percent will become a much larger piece of the pie over the next five to 10 years. Investment funds such as India-based Kaizen and U.S.-based Novak Biddle have already become experts in this nascent industry with key equity holdings and strategic relationships across the country. Investors with education holdings will need to optimize their existing education portfolio, build expertise in a subsector, and collaborate with other holdings both within education and externally, such as ICT, to create synergies across the group.

For new education investors, it will be crucial to identify niche, yet scalable, investment opportunities that aren't overvalued by a herd mentality. Coursera, for example, received $22 million in funding in 2012, and another $40 million in 2013. Their higher education courses reach millions of students across the globe, yet with an estimated burn rate of $10 million annually and an unclear monetization strategy, potential investors should consider other options with less risk, a better portfolio fit, and stronger return-generating potential in the short term.

Teachers and administrators are the first to understand how challenging it is to achieve change in their schools, let alone implement it consistently and across an entire district, state, and country. But transformative change—the type that schools will need for the conceptual age—rarely happens top down in education: it happens from the bottom up, through teachers. The challenge that teachers will face is grasping new technologies, learning new methods, and testing approaches they aren't accustomed to. But if we start training young teachers who understand and appreciate technology while we collaborate at the same time with universities to ensure these materials are embedded into teacher education programs, this change will occur naturally and across the board.

For school administrators, the challenge is much more difficult. Because schools are being run more like businesses, school "business models" will start to incorporate commercial best practices to help increase operational efficiency and improve the student experience. Should we insource or outsource back-office functions, student administration, and career services? Should our IT infrastructure, student data, and customer relationship management solutions be on or off site? Should our sales channels be digital, traditional, or a mix of both? These are all new questions for school leaders—and ones that will have unique responses depending on the location, student demographic, budget, and organizational mission.

Government bodies face three issues. The first is testing. As mentioned, PISA is a one-dimensional view of a country's global competitiveness through education. New assessments, such as ICIL, must be quickly adopted to measure the other dimensions. The accreditation process also needs to change. In its current form, the process is unclear, political, and insufficiently flexible for new, innovative educational models. If it fails to improve, alternative forms of accreditation, such as Mozilla's Open Badges, will take over. Finally, governments should embrace new delivery models, particularly public-private partnerships (PPPs). However, many governments are not prepared to collaborate with the private sector, leaving many PPPs poorly designed and even more poorly implemented. Understanding the various types of PPP models and how to set regulations and design policies around them will be vital.

Lastly, we see the need for a new role: an **aggregator** to help countries consolidate the delivery of education policy by coordinating change from the top down. This intermediary role may be occupied by one of the actors already identified in the ecosystem—a government's ministry of education for example—or a new type of actor, such as a newly created PPP. Regardless of the organizational model, the role would ensure that policy-level changes can be easily implemented, rather than having thousands of subcritical units (regional governments, districts, and schools) trying to reinvent the change themselves. In most countries, education is a fragmented landscape with multiple states and tens of thousands of school districts that are each experimenting and doing things differently. Without an aggregator, change will be implemented from the bottom up, taking far too long and resulting in many different outcomes. However, with an aggregator, the system can not only embrace change, but also self-iterate—meaning we can incorporate changes into the system in real time as the requirements for education change in the world around us.

The Way Forward

Education is a one thousand-year-old industry on the cusp of profound change. We need to design an ecosystem this time around that will be suitable for at least the next one hundred years.

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The authors wish to thank Sumitra Pasupathy for her valuable contributions to this paper. Sumitra is a social entrepreneur and the co-founder and director of Playeum, an innovative education content and service provider centered on creativity for children and families based in Singapore.

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