



EDUCATING FOR GLOBAL COMPETITIVENESS

A white paper on education in the 21st century by Dr. Jim Goodnight, SAS



"In times of drastic change, it is the learners who inherit the future. The learned usually find themselves no longer equipped to live in a world that no longer exists."

– Eric Hoffer¹

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Educating for Global Competitiveness was written by Dr. Jim Goodnight, CEO and co-founder of SAS, the leading company in business intelligence software. Professor Mark Milliron, University of Texas at Austin, contributed to this report.

Abstract

To meet global competition, it is often argued, a nation must spend more on education. While that is true, what is even more important is how the money gets spent. Five guiding principles for evaluating 21st century educational policies are presented.

Introduction

From Boston to Bangalore to Beijing, education is the engine of economic growth. Whether we are discussing poverty alleviation, anti-terrorism or innovation, the discussion must begin with education.

There is legitimate concern in both Europe and the US that our education systems are not fully preparing students and communities to thrive in today's knowledge-based economy. Indeed, if communities and countries want to prosper on the road ahead, we must support bold, innovative, and transformative education policies and practices.

In the political debate over education policy, "boldness" often gets translated into "expensive." Certainly, governments must increase their investment in education at all levels: primary through lifelong learning. The data suggests some regions of the world – including many European Union (EU) nations – simply are not spending enough. The EU is currently considering increasing its own role in education through the formation of a European Institute of Technology (EIT).²

Although the aim of creating a world-class research university is admirable, the overall question of funding of higher education is more critical to address. The success of the US university system is due in part to the alumni endowments and competition between universities for the best teachers and students. Harvard University's endowment is US\$29 billion. The Massachusetts Institute of Technology (MIT), often cited as a model for the EIT, has an endowment of \$8.4 billion, which has grown on average 9 percent per year for the past 20 years. Oxford and Cambridge universities are the only European institutions with endowments of more than \$500,000.³ While endowments and competition are important factors in the success of the US higher education system, other success factors include the openness and diversity of institutions, each with very different missions, as well as the freedom and resources for university professors to pursue their academic interests. This culture of innovation and creativity is at the heart of the system's success.



Dr. Jim Goodnight
CEO, SAS

Wrong models for the information age

But the size of the educational budget is only one variable in the equation that translates knowledge into economic growth. Perhaps more important is how that money gets spent. The postwar tradition in Europe is to provide equal access to university education for all students. With a few shining exceptions, the practical result has been an increasingly mediocre university system. While the US system, with its declining taxpayer support and commensurately skyrocketing tuition, is not an acceptable alternative, what is indisputable is that competition in education creates world-class institutions, just as competition in business creates world-class companies.

A Lisbon Council study by education expert Andreas Schleicher of the Organization for Economic Co-operation and Development (OECD), notes that Europe is falling behind in the quality and quantity of its graduates, in the openness of its systems to students from all social backgrounds and in the availability of education and training to those who need it most. According to the study, social background plays a larger role in determining a student's performance in Germany, France and Italy than in the US. For example, German children with parents in white-collar, high-skilled occupations are four times more likely to take the path leading to university than those with parents from blue-collar or low-skilled occupations, even if the students display the same level of educational performance at an early age.⁴ You cannot create a pseudo-egalitarian university system in a culture still dominated by class differences and expect a different outcome. The goal ought not to be the creation of the "MIT of Europe" that will educate the elite few; the goal must be to create a strong and interconnected European university system that will compete with any other country's university system.

Most of our schools in Europe and the US are using an industrial factory model on an agrarian calendar trying to meet the needs of an information age. We are trapped in old models designed for a very different time. Our arguments are too often about finding funding rather than fundamentally redesigning the educational system. We expend too much energy testing the outcomes of outdated models and too little energy trying new technologies.

Governments and stakeholders must examine the policies, programs and practices in education systems and ask the hard questions about whether they are improving or expanding learning and, more importantly, how one even knows. In the 19th century, countries that wanted to compete in the industrial economy founded and funded secondary schools, tertiary schools, community colleges and adult-training courses. And as the creative economy emerges, we need to ask: What now should we initiate and fund?

In this paper, we have tried to identify the success factors for educating for global competitiveness.

Education matters for economic competitiveness

As the World Economic Forum recently underlined in its *Global Competitiveness Report*, “Education and training have emerged as key drivers of competitiveness, ensuring that the labor force has access to new knowledge and is trained in new processes and the latest technologies.... A country’s ability to absorb new technologies, to produce goods and services that can reach standards of quality and performance acceptable in international markets, to engage with the rest of the world in ways that are value-creating, is intimately linked to the quality of its schools, to the priority given to training in mathematics and science, and to the existence and accessibility of specialized research and training centers.”⁵

Günter Verheugen, European Commissioner for Enterprise and Industry and Vice President of the European Commission, recently made a similar point: “For nations like the EU and the United States to be competitive going forward, we must compete on our strengths.... Our strengths stem from our knowledge community/base, from our intellectual capital and how we as nations invest and nurture current and future intellectual assets.”⁶

Education is struggling to deliver what is needed

Governments, industry and educators on both sides of the Atlantic have raised alarms about the inadequacies of their educational institutions in addressing the needs of the 21st century work force. In the US, many are concerned with the deficiencies in science, technology, math and engineering education; and they are calling for expansive legislation to address K-16 education reform, research and immigration issues. Similar concerns exist in most EU countries: Many are struggling to devise and gain the acceptance of reform programs by their educational establishments.

- The US Department of Education recently noted that “approximately 90% of the fastest growing jobs will require some postsecondary education.”
- A recent report by the Conference Board and the Partnership for 21st Century Skills (a coalition of educationalists, business and government) indicated that a majority of US employers view new entrants in the work force as deficient in key skills critical for job performance.
- Europe’s universities, taken as a group, are failing to provide the intellectual and creative energy required to improve the Continent’s poor economic performance, according to a report published this year by the Centre for European Reform.⁷
- A new study by the Educational Testing Service in the US suggests that although university students appear fluent with technology, many are unable to use computers effectively to solve information problems. In the study, which surveyed more than 6,300 students, fewer than half correctly identified from several choices the Web site that was objective, authoritative and timely.

What are the necessary skills for the 21st century?

SAS is a global company with more than 10,000 employees worldwide in 425 offices and 51 countries around the globe. In its experience, students need at least three essential skills: **intelligence**, **creativity** and **courage**. There is something about the confluence of these that holds the promise of making a difference for students, communities and countries. Intelligence is not defined in the classic sense; it's defined as the tough-minded tools for living and learning, the ability to absorb information and assess its sources, and the skills to synthesize, analyze and use it to make decisions. More and more schools are looking to build these broader skill sets in their students' use of information from data mining to analytics to decision making. They need this intelligence – particularly analytical and critical-thinking skills – to be able to live in a world awash in information.

Intelligent analytics

The *Harvard Business Review* referred to this skill set as the ability to “compete on analytics.” The phrase comes from the work of Tom Davenport at Babson College, who analyzed a host of companies from Amazon.com to Marriott Hotels that are leveraging analytics to make a major difference in how they compete and win in the marketplace. Davenport makes the case for analytical intelligence by stating that “analytical talent may be to the early 2000s what programming talent was to the late 1990s.”⁸

Some would argue that analytical skills have always been essential for science, technology, engineering and math. To reach the highest levels of each, one needs to be able to analyze data, learn and adapt. Now, because of the daily processing of massive amounts of information, these skills may represent the difference between success and failure.

Needs to be allied to creativity...

Students and citizens also need the creativity skills to be able to process and produce with this information. As social theorist Richard Florida argues, every person has a creative or artistic side.⁹ It is unleashing this creativity in the context of analytical ability that holds powerful promise. Unfortunately, this need for creative stimulation often gets lost in the hue and cry to make more scientists and mathematicians.

...and endowed with courage

The final step, however, is courage to take action; to dive into the sea of transformation that is flooding our worlds. The hard work begins in boldly engaging difficult conversations, involving broad constituencies and moving toward thoughtful solutions. In the IT business, we know that will fail without a hard turn in R&D or a change in sales strategy or a new approach to cost containment.

In the US, the Partnership for 21st Century Skills has developed a vision for learning in which students focus on core subjects including math, science and foreign language. In addition, other content must be included and cover topics such as global awareness, finance, economics, business and entrepreneurial literacy. There needs to be a strong emphasis on learning and thinking skills – critical thinking and problem solving: communication, creativity and innovation, collaboration, contextual learning, information and media literacy, e-skills and life skills.

As part of teaching critical thinking and problem solving, as well as fostering entrepreneurial literacy, educators must teach young people to take risks. And policy-makers have to create a landscape that rewards those who take risks and makes failure an acceptable cultural and financial option.

Policies for meeting the challenge

We need to take a step back and focus on policy and practice that will build a lifelong learning system for the 21st century. Our policy must be focused on the goals of student access and success, workforce readiness, research and development infrastructure, global literacy, and essential disciplines.

Moreover, we have to throw out our attachments to the way we have always done things in education. Our focus on practice needs to be driven by two tough-minded questions: (1) Does this practice improve or advance learning? (2) How do we know? Five priorities will help deliver the desired answers:

1. Ensure access to education and training

- Make education and training widely available anytime and anywhere (on-site, online and just-in-time). We need to be open to supporting new models, different providers, and broad-based primary, secondary, postsecondary and business partnerships that increase educational access.
- Communities and policy-makers must foster lifelong learning by providing flexible and varied educational opportunities, and access to the necessary knowledge and skills at any point in an individual's lifetime.
- Invest in pre-primary education programs, which have historically provided the best return on investment. The earlier a child learns to read, the better. All other learning hinges on the development of that one skill.
- Ensure access to higher education for all by providing the economically disadvantaged with government-supported financial aid.
- Ease transferability of students in higher education – both from country to country and from discipline to discipline.

2. Continually assess education performance in relation to goals, that is, learning and earning

- Create strong accountability and transparency in our education systems.
- Put accountability systems in place that will provide educators with insights on what happens to students after they complete their educations, transfer to other universities or take jobs. Discern whether these students have the necessary skills to gain and maintain employment.
- Support policy that rewards evidence-based educational transformation.
- Enable governments and educators with the tools that will allow them to gather data, analyze that data and create policies based on firm knowledge of which policies will create desired outcomes.

3. Implement consistent policies that will ensure workforce availability

- Enact a “human capital” tax credit for employers who provide training and education for workers. This will have the dual effect of lowering the public cost for training and education while providing an incentive to employers to commit to lifelong learning.
- Develop a curriculum that supports essential disciplines like science, technology and engineering while addressing the emerging need for global literacy.
- Provide scholarship assistance, teacher institutes and mentoring programs to encourage more participation from those with experience in business or civil society to become teachers.
- Create a labor policy that has enough flexibility to allow for necessary worker redeployment.
- Provide a tax structure that rewards companies for engaging in R&D activities.

4. Advance innovative research and development

- Concentrate government funding on basic research. As cited in a League of European Research Universities study, “funds for basic research are spread too thinly.”¹⁰
- Ensure research results are open and available to the public through online databases that would allow access by companies and academics alike.
- Allow university researchers to license and retain the intellectual property they create in order to found a commercial venture.

5. Promote social, state and global business/education partnerships

- Work together to enhance the use of technology in learning and to develop the information technology skills necessary for the workplace. Ensure that e-skills become a part of the education and lifelong learning curricula.
- Provide incentives for business to participate in school mentor programs, “adopt a school” programs or community-based initiatives.
- Embrace best practices from other regions of the world that have hard data to substantiate results.
- Foster a culture of innovation and reward risk-taking at all levels.

Conclusion

We must help in creating innovative, educational institutions of the 21st century where technology infuses every part of the curriculum, where creativity and innovation are fostered in every discipline, and where students and educators are constantly striving to solve problems and think “outside the box.” It is the creation of new ideas and solutions that, ultimately, will lead to new industries and jobs for the 21st century. The productivity and competitiveness of every nation depend on it.

According to the European Commission, on average, EU Member States spent 5 percent of their GDP on public expenditure for education as a whole. This figure is comparable to that of the US and higher than that of Japan (3.5 percent). If money bought parity, then the education outcomes in the EU and US would be equal. Research suggests that spending on pre-primary education brings the greatest return on investment, followed closely by spending on primary schools. Given that Europe spends more money than the US on pre-primary and primary education, then Europe ought to be able to spend less at higher levels to obtain similar outcomes as the US. If money were the answer, then we would have already been able to calculate how much it would cost to optimally educate a student.

Our area of focus needs to be on fostering and growing creative capital. When we talk about creative capital, we’re talking about people. Creative employees pioneer new technologies, give birth to new industries and power economic growth. Today, as we talk about maximizing performance, be it educational or corporate, we must keep in mind that people – and the creative capital they represent – are a critical part of the equation. The creative economy is here to stay, and societies that best educate for creativity will have a crucial advantage in the ever-increasing competition for global talent.

Educating for creativity – Two initiatives from SAS

SAS has created some innovative partnerships at home and abroad. For example, the company started Cary Academy, a private day school for grades 6 through 12 (middle and secondary school) located next to the SAS world headquarters in Cary, North Carolina. It is designed to do things very differently. The school has more computers than children, teachers who are challenged to be innovative, and students who push the boundaries of creativity and innovation in the classroom – and in online venues as well. Students operate in technology studios; they design Web sites and engage in powerful project-based learning. Recently, SAS announced a new initiative with North Carolina State University to create an Institute for Advanced Analytics. The initiative aims to promote the use of analytical concepts, tools and practices in modern organizations.

Information Evolution Model

SAS has developed an idea called the Information Evolution Model to help organizations think about how they use information. The model has five levels, each more developmentally mature than the last. Level one is referred to as Operate: Here, individuals who have specialized skills are the keepers and processors of information. Level two is Consolidate: Departments or teams begin consolidating and sharing information to mine the past and report on the present. Level three is Integrate: This represents a bold step forward where an organization begins pulling information together across the entire organization. Level four is Optimize: The organization finally begins using predictive analytics and higher-level skills to discover the best ways to operate. The final level is Innovate, and it is toward this stage of the model that we strive. The innovation level combines the science of analytics with the art of creativity – where the fuel of information meets the creative spark, which provokes transformation. When we have business leaders, policy-makers or education experts who understand, synthesize and analyze their environments, coupled with the creativity to find new and novel solutions and strategies, we are almost there.

About SAS

SAS is the leader in business intelligence software and services. Customers at 40,000 sites use SAS software to improve performance through insight into vast amounts of data, resulting in faster, more accurate business decisions; more profitable relationships with customers and suppliers; compliance with governmental regulations; research breakthroughs; and better products. Only SAS offers leading data integration, intelligence storage, advanced analytics and business intelligence applications within a comprehensive enterprise intelligence platform. Since 1976, SAS has been giving customers around the world THE POWER TO KNOW®.

¹ Hoffer, Eric. *Reflections on the Human Condition*. New York: Harper & Row, 1973.

² European Commission. "The Commission paves the way for a 2008 launch of the European Institute of Technology." Document IP/06/1416. 18 October 2006.

³ National Association of College and University Business Officers. *2005 NACUBO Endowment Study*. <http://www.nacubo.org>. 2006.

⁴ Lisbon Council. "The Economics of Knowledge: Why Education is Key to Europe's Success." March 2006.

⁵ World Economic Forum. *2006-7 Global Competitiveness Report*, 26 September 2006.

⁶ Verheugen, Günter. "The New European Industrial Policy: From Commitment to Results." Document SPEECH/06/505, 15 September 2006.

⁷ Lambert, Sir Richard and Nick Butler. *The Future of European Universities: Renaissance or decay?* London: Centre for European Reform, 2006.

⁸ Davenport, Thomas H. "Competing on Analytics." *Harvard Business Review*, January 2006.

⁹ Florida, Richard. *The Rise of the Creative Class*. New York: Basic Books, 2002.

¹⁰ League of European Research Universities. *Universities and Innovation: The Challenge for Europe*, November 2006.



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