The world of tertiary education has changed significantly in the past fifteen years. Developing countries have seen tremendous enrolment growth, especially in the private sector. Many nations are facing an exponentially rising demand as more young people graduate from high school as a result of the successful implementation of the Education for All agenda. The launch of the Sustainable Development Goals by the United Nations in September 2015 has given renewed consideration to the importance of education for development and the urgency of putting in place viable financing strategies.

Against this background this book explores the crucial role played by tertiary education towards achieving the Sustainable Development Goals. It observes that tertiary education finds itself at a crossroad today, as national systems are pulled in several directions by a combination of factors—crisis factors, rupture factors, and stimulation factors—bringing about both opportunities and challenges. How these forces in the tertiary education ecosystem play out in each country will determine the new “perils” and “promises” that are likely to shape the contribution of tertiary education to economic and social development in the years to come.
The Tertiary Education Imperative
GLOBAL PERSPECTIVES ON HIGHER EDUCATION

VOLUME 38

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The Tertiary Education Imperative

Knowledge, Skills and Values for Development

Jamil Salmi

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FOREWORD

Postsecondary education is vital to both economies and societies worldwide. Evidence from research over the past few decades has shown repeatedly that nations without effective postsecondary institutions have been—and will continue to be—left behind in the global knowledge economies of the 21st century. Postsecondary education is understood by societies across the planet as a requisite for social mobility. These elements—economic drivers and social pressures—have combined to create mass postsecondary education systems worldwide and, at the same time, have emphasized the importance of the small but quite important research university sector. As Jamil Salmi points out in this comprehensive volume on the vital contribution of universities and other tertiary education institutions, postsecondary education has become a central element of both national education systems worldwide and the global knowledge economy. This has serious implications for developing countries keen on achieving the Sustainable Development Goals.

TERTIARY EDUCATION AS A GLOBAL POLICY CONCERN

This volume emerged from a research initiative of the United Nations in recognition of the central role of postsecondary education systems. It is one of a number of insightful reports commissioned by international agencies over the past several decades, including the World Bank, UNESCO, and the OECD. One of the first reports that argued that postsecondary education was key for economic and social development was Higher Education in Developing Countries: Peril and Promise, co-sponsored by UNESCO and the World Bank, and published by the World Bank in 2000. Salmi himself was instrumental in writing Constructing Knowledge Societies: New Challenges for Tertiary Education, published by the World Bank in 2002. This volume provided further evidence and useful guidance relating to the importance of postsecondary education. In the years since, postsecondary education has been recognized as a key element for development and increasingly integrated into educational planning by governments. During this same period, enrolments dramatically expanded, as young people and their families recognized the importance of postsecondary education for achieving expanded opportunities and social mobility.

Given these dynamic and sustained global demands for more and better postsecondary education, it is surprising that the World Bank’s pending 2018 World Development Report, the first such report dedicated to education, does not include postsecondary education as an integral part of the education spectrum. Similarly the Organization for Economic Cooperation and Development (OECD) recently closed its highly regarded higher education journal and abolished its Institutional
FOREWORD

Management in Higher Education program. UNESCO, as well, has diminished its higher education engagements over the past decade. In this context, it is imperative for global scholars of higher education to continue the discourse that can support improved and sustainable development and reform efforts for the sector. The sector is growing, as government and societies demand more and better tertiary education, whether international organizations choose to remain relevant to that growth or not. Salmi’s volume, therefore, could hardly come at a better moment.

MASSIFICATION AND PRIVATIZATION

Massification—expanded enrollment to over 35% of the traditional age cohort for higher education—has had dramatic implications for postsecondary education worldwide, although the specific circumstances vary significantly by country and region. The rise of private providers in the tertiary sector has been one widespread development. Indeed, private postsecondary education, both for-profit and non-profit, is the fastest growing segment of the sector worldwide. As Salmi points out in this book, Latin America and Asia are increasingly dominated by private, often for-profit provision—with Western Europe and North America less affected. Public postsecondary education has increasingly been privatized, with tuition and fees increasing in many countries as a way of financing institutions. Government funding has been replaced or supplemented by student tuition. Student debt has become an issue of public concern in many countries. There are outliers to these trends, however. Switzerland and the Nordic countries still regard postsecondary education as a public good and provide full government support, keeping tuition free or at a very low cost. Funding patterns, policy orientations to postsecondary education, governance structures, and other realities differ considerably worldwide. One of the strengths of this book is that it examines both general trends and specific patterns of development—thus providing valuable comparative perspectives that can be used by policymakers and institutional leaders in both industrial and developing nations.

FUTURE CHALLENGES

Without question, postsecondary education will continue to face dramatic challenges in the coming decades. Expansion will go on, especially in the developing and emerging economies—putting pressure on financing and quality assurance for tertiary education in nearly all countries around the world. Most countries will need a highly trained workforce to contribute to increasingly sophisticated economies, and it will be incumbent on governments and institutions to better align their education opportunities with the outcomes expected by graduates, society, and the labor market.
Challenges such as the role of distance provision of postsecondary education, the appropriate levels of internationalization, including the use of English as a language of global communication, efficient and effective funding models, adequate governance arrangements, the role of general education in the mix of postsecondary provision, and many other issues face postsecondary education. This volume provides valuable guidance for thinking through these key challenges.

*Philip G. Altbach*
*Founding Director*
*Center for International Higher Education*
*Boston College*
INTRODUCTION

...All regions and countries can benefit from progress toward a knowledge-based economy, which does not depend heavily on material resources, places less of a burden on ecosystems and is more sustainable than other economic models. By shifting to a knowledge-based economy, societies can move from the age of scarcity to the age of abundance. Knowledge does not deplete with use but rather increases as it is shared among people. Through technological innovation, we can help usher in a more sustainable future...

(Ban Ki-Moon, UN Secretary General, 24 April 2014)

The Brazilian aviation company, Embraer, is the world leader in the production of regional jets. The success of the country’s emblematic firm can be traced back to the creation of ITA, the National Aeronautic Engineering School, in the early 1950s. Established in close partnership with MIT, and widely considered today as Brazil’s top engineering school, ITA has trained the scientists, engineers and technicians who helped build Embraer into a leading global company.

Typhidot is a revolutionary method to diagnose typhoid fever. Invented by scientists at the Malaysian University of Science in Penang (USM), Typhidot is credited with saving thousands of lives. Compared with traditional methods for detecting the disease, Typhidot is faster, more reliable, cheaper, and it does not require cold storage. USM’s Center for Medical Innovations and Technology Development, from which Typhidot originates, is dedicated to finding innovative ways of diagnosing infectious diseases in an effective, quick and affordable manner.

Until the beginning of this decade, most practicing teachers in Palestinian primary schools were poorly prepared and did not have a university degree. After new regulations required all teachers to have both a university degree and a relevant professional teaching qualification, three West Bank universities worked together, with support from a renowned British teacher training institution, to radically overhaul their pre-service teacher training program, introducing a competency-based approach and a school experience element. A quasi-experimental study carried out after three years of implementation found very high value added for the new pre-service teaching program.

These are but three examples to illustrate the unique and vital contribution that tertiary education makes to economic and social development. But notwithstanding this crucial developmental role, for several decades traditional human capital theory challenged the need for public support of tertiary education on the grounds that graduates captured important private benefits—notably higher salaries and lower unemployment—that should not be subsidized by taxpayers. Influenced by this argument, many multilateral and bilateral donor agencies focused their support on
basic education rather than investing as well in the expansion and improvement of tertiary education systems in developing countries.\(^1\)

In the 1990s, however, a growing body of research demonstrated the importance of going beyond rate-of-return analysis to measure the full value of tertiary education as a fundamental pillar of sustainable development. By focusing primarily on the private returns of government spending, rate-of-return analysis failed to capture the broader social benefits accruing to society, which are important to recognize and measure. These include research externalities, entrepreneurship, job creation, good economic and political governance, and the positive effects that a highly educated cadre of workers has on a nation’s health and social fabric (Birdsall, 1996; World Bank, 2002).

Building on these findings, the path-breaking 2000 report entitled *Higher Education in Developing Countries: Peril and Promise* called for scaling up investment in tertiary education and research to equip developing countries with the knowledge and the qualified manpower needed to fight poverty and accelerate economic growth (World Bank and UNESCO, 2000). Written by a distinguished group of independent experts with financial support from UNESCO and the World Bank, the report had an important impact at three levels. First, it helped reorient donor policies to give greater attention to tertiary education in partner countries. Second, it unleashed several reform initiatives in the developing countries themselves. Third, it paved the way for increased South-South networking and collaborative activities (Salmi, 2016a).

Fifteen years later, the world of tertiary education has changed significantly. Developing countries have seen tremendous enrollment growth, especially in the private sector. Many of them are facing an exponentially rising demand as more young people graduate from high school as a result of successes in implementing the Education for All agenda. In Europe, the Bologna process has led to the creation of a regional “higher education space” facilitating the circulation of students and academics. In Asia, the most dynamic economies have been at the forefront of efforts to place tertiary education at the center of their development strategy.

Tertiary education finds itself at another crossroad today, as national systems are pulled in several directions by a combination of factors bringing about both opportunities and challenges. The forces exercising new pressures on tertiary education can be divided into three groups: crisis factors, rupture factors, and stimulation factors.

The crisis factors are the direct results of the economic and financial crisis that started in 2007–2008. Since then, the fiscal situation has seriously deteriorated in many countries and governments almost everywhere have significantly cut their tertiary education budget. At the same time, households have had fewer resources to allocate to finance their private education expenditures. Furthermore, in many countries, the slowing down of the economy has led to rising graduate unemployment.

Compounding these elements of financial crisis are disruption factors such as those pointed out in a 2013 report proposing the image of “an avalanche” to describe
the radical changes affecting how tertiary education institutions will be conducting their teaching and research activities in the future (Barber et al., 2013). Among these rupture factors are (i) technological innovations such as flipped classrooms and other strategies for more interactive learning, (ii) mass online open courses (MOOCS) reaching hundred of thousands of students all over the world, (iii) increased competition from for-profit and corporate universities that provide professional qualifications closely linked to labor market needs, and (iv) new accountability modalities like the global rankings, that allow for different kinds of comparisons of the performance of universities across all continents.

On a positive note, tertiary education institutions are also exposed to stimulus factors in the relatively few countries that, notwithstanding the financial crisis, have continued to give priority to the development of their knowledge economy and have protected their tertiary education budget for that purpose. Under the influence of the global rankings, several governments—for example China, France, Germany, Russia and South Korea—are supporting “excellence initiatives” that translate into a large influx of additional resources for their nation’s leading universities. In Sub-Saharan Africa, a new regional project funded by the World Bank, with parallel financing from several bilateral and multilateral donors, is supporting the development of centers of excellence to boost the research capacity of the leading universities in the Region.

Against this background, the launch of the Sustainable Development Goals by the United Nations in September 2015 has given renewed consideration to the importance of education for development and the urgency of putting in place viable financing strategies. This book, which focuses on the tertiary education level, is divided into five chapters.2 The first one examines the evolving context in which tertiary education systems operate. Chapter 2 reviews the contribution of tertiary education to economic and social development, contrasting the theoretical impact that it could have and the actual state of tertiary education systems in most developing countries. Chapter 3 proposes a sequence for designing and implementing tertiary education reforms, based on international experience. Chapter 4 concentrates on the financial sustainability aspects of tertiary education reform. Finally, Chapter 5 discusses the important role that the donors can play in support of tertiary education reform in developing countries.

The book carries the following main messages:

• The innovative application of knowledge has become a fundamental driver of social progress and economic development. Advanced knowledge and modern technologies are also influencing the pace of competition and transforming the nature of labor market needs through substantial shifts in the configuration and content of jobs.
• Tertiary education is indispensable for the effective and efficient creation, dissemination, and application of knowledge and for building institutional, professional and technological capacity.
The tertiary education ecosystem is evolving at an increasingly rapid pace, influenced by elements of uncertainty, complexity and disruption, such as changing demographics, global competition, political volatility, diminished public funding, greater private involvement, growing accountability demands, alternative delivery modes and game-changing technologies.

In this challenging context, developing countries can either become economically marginalized, incapable of using advanced technology and unable to compete on the global scene because their tertiary education systems are insufficiently developed and under-performing, or they can strengthen their capacity to create and apply knowledge through well-trained graduates and relevant research produced by a diversified and increasingly international tertiary education system.

To reduce the performance gaps faced by their tertiary education systems, developing countries governments need to design and implement significant reforms. International experience suggests that an appropriate reform sequence includes the following steps: (i) ignition phase to sensitize all stakeholders to the urgency of the reform; (ii) elaboration of a vision for the future of the tertiary education system; (iii) formulation of a set of strategic reforms; (iv) launch of the reforms; and (v) structural measures to ensure the sustainability of the reforms, especially its long-term financial viability.

To achieve long-term financial viability, developing countries must not only improve resource mobilization through a combination of public and private funding but also adopt an expansion strategy that encourages institutional diversification—non-university institutions and private providers—and increased reliance on online learning opportunities.

Through knowledge sharing, capacity building and resource mobilization, the donor community can accompany partner countries in their efforts to expand coverage and improve the effectiveness and responsiveness of their tertiary education system.

NOTES

1 This book adopts the OECD definition of tertiary education as representing “a level or stage of studies beyond secondary education. Such studies are undertaken in tertiary education institutions, such as public and private universities, colleges, and polytechnics, and also in a wide range of other settings, such as secondary schools, work sites, and via free-standing information technology-based offerings and a host of public and private entities” (Wagner 1999: 135). Under the new ISCED 2011 education classification, tertiary education contains four levels: short-cycle tertiary (level 5), Bachelor’s (level 6), Master’s (level 7) and Ph.D. (level 8).

CHAPTER 1

THE CHANGING CONTEXT

New Challenges, New Opportunities

INTRODUCTION: KNOWLEDGE AND INNOVATION AS DRIVERS OF ECONOMIC AND SOCIAL DEVELOPMENT

If investments in factories were the most important investments in the industrial age, the most important investments in an Information Age are surely investments in the human brain. (Larry Summers)

Among the most influential changes that the past decades have brought is the increasing role that knowledge and innovation have come to play as major drivers of growth in the context of the global economy (OECD, 2015a). Technological progress has become the main driver of growth of GDP per capita, allowing output to increase faster than labor and capital (EOP, 2016). Innovation stimulates the development of new firms and job creation; it fuels rises in productivity and leads to economic growth. Innovative economies are more productive, better able to sustain higher living standards and reduce poverty, more resilient in times of crisis and have a stronger capacity to transform themselves.

The World Bank’s analytical framework for studying and explaining the dynamics of knowledge-driven development identifies the converging roles of four contributing factors: the macroeconomic incentive and institutional regime, the information and telecommunication infrastructure, the national innovation system, and the quality of human resources (World Bank, 1999).

Along similar lines, the new OECD Innovation Strategy (2015a) suggests that innovation can only flourish in an economic and regulatory environment that has the following characteristics:

• A skilled workforce that can foster new ideas and generate new technologies, bring them to the market, and implement them in the workplace, and that is able to adapt to technological and structural changes across society.
• A sound business environment that encourages investment in technology, that enables innovative firms to experiment with new ideas, technologies and business models, and that helps them to grow, increase their market share and reach scale.
• A strong and efficient system for knowledge creation and diffusion that invests in the systematic pursuit of fundamental knowledge.
• Policies that encourage innovation and entrepreneurial activity.
A strong focus on governance and implementation. The impact of policies for innovation depends heavily on their governance and implementation, including the trust in government action and the commitment to learn from experience.

Knowledge is indispensable not only for economic growth but also for social development purposes. Countries without a minimum institutional, scientific and technological capacity to apply research results are likely to lag in realizing key social and human benefits such as increased life expectancy, lower infant mortality, and improved health, nutrition, and sanitation. Such countries will be increasingly vulnerable to emerging environmental threats (World Bank, 2002).

Knowledge and knowhow play an equally essential role as the principal engine of social innovation, defined as the efforts of firms, universities, government agencies and NGOs towards designing and applying new business models and offering services that help improve the life of vulnerable communities and groups in society. Social innovation manifests itself through innovative initiatives, products and processes aiming at finding new solutions to society’s complex challenges that are durable and equitable from the viewpoint of the most vulnerable groups.

This includes the development of frugal innovations that seek to create greater social value in developing countries while minimizing the use of scarce financial and natural resources. From the low-cost water purifier invented by the Tata Group in India to the mobile payment service pioneered by the Kenyan telecom operator Safaricom, frugal solutions can reach hundreds of millions of people at the bottom of the economy pyramid in ways that create more value while minimizing resource use and facilitating greater collaboration and engagement by local communities (Radjou, 2014).

Against this background of the dynamics of the knowledge economy, this chapter examines the changing labor market and the evolving tertiary education ecosystem, with a focus on the new accountability requirements, the effects of globalization on tertiary education, the impact of the new education technologies, and the political convulsions affecting tertiary education.

CHANGING LABOR MARKETS IN THE DIGITAL ERA

The Fourth Industrial Revolution was the main theme of the 2016 Davos meeting organized by the World Economic Forum. Observers underlined the importance of recent developments in fields that were previously separated but are now becoming increasingly intertwined, such as artificial intelligence and machine learning, robotics, nanotechnology, 3-D printing, and biotechnology and genetics (WEF, 2016). This rapid evolution in the business and production spheres is likely to cause widespread disruptions in labor markets.

In designing their future programs and courses, tertiary education institutions must therefore take notice of the considerable transformation that the labor market is undergoing in the digital era. These developments are going to translate
into tremendous changes in the skill sets needed to succeed in the new work landscape. The changes will be of three types: disappearance of existing jobs, emergence of new jobs, and transformation of existing positions and, therefore, needed skills.

In the first instance, the WEF report notes that many jobs will be threatened by redundancy as robots and intelligent machines become increasingly available to replace human beings in many tasks. A recent study published by two Oxford University professors looked at 700 professions at risk of disappearing over the next ten to twenty years as a direct result of the growing integration of robotics, artificial intelligence and information technology (Frey and Osborne, 2013). Their estimates indicate that up to 47% of total employment in the US labor market is likely to be affected by job computerization brought about by advances in machine learning and mobile robotics.

For context, every 3 months about 6 percent of jobs in the [US] economy are destroyed by shrinking or closing businesses, while a slightly larger percentage of jobs are added—resulting in rising employment and a roughly constant unemployment rate. The economy has repeatedly proven itself capable of handling this scale of change, although it would depend on how rapidly the changes happen and how concentrated the losses are in specific occupations that are hard to shift from. (EOP, 2016, p. 2)

Another key result of their analysis is that the loss of jobs through computerization is inversely related to educational attainment and that positions that require creativity, high-level socio-cognitive skills and the ability to deal with complex tasks are safe from automating. Research consistently shows that the jobs that are most under risk as a result of automation are highly concentrated among lower-paid, lower-skilled, and less-educated workers. The implication is that automation will continue to put downward pressure on wages for this vulnerable group, thereby accelerating economic inequality.

While these effects may not play out as strongly in the developing economies that still have a high proportion of employment in the informal sector, they will undoubtedly affect the modern sectors of the economy, where the majority of tertiary education graduates seek employment. They will bring about increased opportunities for the development of small and medium enterprises. Also, freelancing jobs will become more numerous in a world where production is more and more project-based.

Secondly, the growth of the digital economy implies the development of a whole range of new professions. The Spanish Observatory of Employment in the Digital Era predicts that four out of five young people between 20 and 30 will work in positions, directly linked to the digital world, that do not exist yet today (El Mundo, 2016). Among the professions likely to be most in demand are smart factory engineer, chief digital officer, digital innovation specialist, data scientist, expert in big data, smart city architect, director of digital content, expert in digital risks, director of digital
marketing, and growth hacker. Firms will particularly looking for big data specialists and growth hackers. Big data specialists, usually trained in computer science or mathematics, analyze the large databases collected by companies as inputs into decision-making on corrective actions and strategic orientations. Growth hackers, coming from informatics, publicity or digital marketing, are trained to identify new growth areas and modalities.

Increasingly linked to the digital economy are the cultural and creative industries, which also represent areas with high potential for the emergence of small companies and employment growth in developing nations, capitalizing on the specific culture and history of each country. In the European labor market, for example, these sectors account today for 3.3% of total employment and 4.2% of Europe’s GDP. The performing arts, the visual arts and music in the lead, followed by advertising, books, film, TV, architecture and newspapers.

A few developing countries, India and Nigeria for example, have already shown the way in this direction with the development of their movie industry. In Nigeria, the relatively recent success of “Nollywood” has resulted in thousands of new jobs. In 2015, the film industry employed one million people—second only to agriculture—produced 2,500 movies and generated 600 million dollars of revenue, up from 400 movies and 5 million dollars in 2002 (Onishi, 2016). Close linkages between the ICT and creative industries can also materialize, for instance in the form of digital media in art production, or ICT-enhanced tourism.

Thirdly, existing jobs are also going to experience significant changes in the skill sets required to perform effectively. As documented in several recent studies, the changes in job contents are likely to lead to growing labor market polarization. Goos and Manning’s “Lousy and Lovely Jobs” (2007) analyzed the concurrent rise in employment in low-income manual occupations that do not require high education qualifications and in high-income jobs that involve high-order cognitive skills. Similarly, a more recent study prepared by the UK University Alliance (2012) looks at the spread of middle wage routine jobs and, at the same time, the expansion of high wage abstract non-routine jobs in what the researchers describe as the “hourglass economy”.

The work of Harvard professors Levy and Murnane (2005) support these findings. They studied the skills requirements for the tasks performed in US firms, showing the types of skills for which there is less demand—or which have been taken over by computers and intelligent machines—and those for which there has been increased demand. In their path-breaking research, the authors divided the tasks performed in firms into five broad categories:

- Expert thinking: solving problems for which there are no rule-based solutions, such as diagnosing the illness of a patient whose symptoms are out of the ordinary;
- Complex communication: interacting with others to acquire information, to explain it, or to persuade others of its implications for action; for example, a manager motivating the people whose work he/she supervises;
• Routine cognitive tasks: mental tasks that are well described by logical rules, such as maintaining expense reports;
• Routine manual tasks: physical tasks that can be well described using rules, such as installing windshields on new vehicles in automobile assembly plants; and
• Non-routine manual tasks: physical tasks that cannot be well described as following a set of “if-then-do” rules and that are difficult to computerize because they require optical recognition and fine muscle control; for example, driving a truck.

Figure 1 below shows the trends of the last decades for each type of task. Tasks requiring expert thinking and complex communication grew steadily and consistently over the past four decades. The share of the labor force employed in occupations that emphasize routine cognitive or routine manual tasks remained stable in the 1970s and then declined over the next two decades. Finally, the share of the labor force working in occupations that emphasize non-routine manual tasks declined throughout the period.

Therefore, the evolution in the skills requirements for both new and existing jobs will not only affect the professional content of the curriculum but also have momentous implications in terms of generic competencies that graduates are expected to possess, as revealed by a meta-analysis of twenty-first century skills carried out by the World Economic Forum (WEF, 2015). Building on the fundamental literacies that any 21st century person needs to acquire during their primary and secondary education, such as literacy and numeracy, scientific literacy, ICT literacy, financial
literacy, cultural and civic literacy, university graduates must master complex competencies to be able to contribute effectively to addressing today’s challenges. The four key complex competencies are (i) critical thinking and problem solving skills, (ii) creativity, (iii) communication, and (iv) collaboration. Critical thinking is the ability to find and analyze relevant information to make a diagnosis of complex situations and formulate adequate responses and solutions. Creative people are capable of imagining and designing new, innovative ways of viewing and solving problems through the application, synthesis or repurposing of knowledge. This skill is of course crucial in the creative industries but it is also indispensable in any industrial or service activity where innovative processes and products can be applied to increase productivity or to find new solutions. Communication is the ability to listen, understand and explain complex phenomena and to convince others through oral, nonverbal, visual and written means. Finally, collaborative skills refer to the ability of individuals to work well in teams or within networks towards a common goal.

In addition, the ability of individuals to become successful professionals and active citizens in their rapidly changing environment is determined by their character qualities, also called socio-emotional skills, and commonly misnamed as “soft skills”. These include (i) curiosity, (ii) initiative, (iii) persistence, (iv) adaptability, (v) leadership, and (vi) social and cultural awareness. Curiosity, an important determinant of the motivation of learners, reflects the desire to ask questions and show open-mindedness. Initiative is the ability to seek new tasks or new goals in a proactive way. Persistence (or grit) is the capacity to sustain interest and efforts in accomplishing a task or a goal. Adaptability is the capacity to modify views, methods, plans or goals in light of new information. Leadership is the ability to inspire, guide and direct others to achieve a common goal. Finally, social and cultural awareness is the capacity to interact with other people and with the environment in a socially, culturally and ethically appropriate manner (Figure 2).

In his latest book (2009), Howard Gardner, the Harvard professor who developed the concept of multiple intelligences in the early 1980s, proposes “five minds for the future” that embody many of the complex competencies and character qualities presented above:

- The disciplined mind: the need to train and acquire the skills to become an expert in a specific professional area
- The synthesizing mind: the ability to understand, evaluate, use and communicate information from various sources in a coherent way
- The creating mind: the ability to think outside the box, break new ground, bring out new ideas, ask unfamiliar questions, and conjures up new ways of thinking
- The respectful mind: the capacity to accept and defer to the ideas of diverse groups
- The ethical mind: the capacity to do the right thing under all circumstances.
THE EVOLVING TERTIARY EDUCATION ECOSYSTEM

**New Forms of Accountability**

No good book was ever written on command, nor can good teaching occur under duress. And yet, conceding this, the fact remains that left entirely to their own devices academic communities are no less prone than other professional organizations to slip unconsciously into complacent habits, inward-looking standards of quality, self-serving canons of behavior. To counter these tendencies, there will always be a need to engage the outside world in a lively, continuing debate over the university’s social responsibilities. (Derek Bok, 1990)

Until the 1980s, tertiary education institutions in the United States, the United Kingdom and Commonwealth countries were the only ones in the world with a strong tradition of external quality assurance. By contrast, most tertiary education systems
elsewhere evolved without any formal quality assurance mechanism at the national level. Tertiary education institutions operated under a widely accepted notion of academic autonomy that applied not only to the relationship between universities and the State, but went all the way down to the lecture hall and the classroom.

This all started to change in the 1980s and the 1990s, as most OECD countries moved to establish some form of government-sanctioned quality assurance. Europe witnessed a considerable drive as a direct result of the Bologna process officially launched in 1999. By 2008, most countries had a functioning evaluation or accreditation agency. The successful convergence of quality assurance regulations has been one of Bologna’s most noticeable outcomes.

The former socialist countries of Eastern Europe and the Soviet Union have also been keen to participate in this process. Today, most of them have a quality assurance system in place, even though the capacity is still unequal, as reflected by the fact that many of the agencies from these countries have not been accepted as full members of the European Association for Quality Assurance in Higher Education (ENQA).

In Latin America, the first quality assurance body was established in Mexico in 1991, followed two years later by a national accreditation agency in Colombia. In the following two decades, most countries in the region set up a national quality assurance body, with the exception of the Central American nations, which started with a regional accreditation agency. Today Bolivia and Uruguay are the only countries in the region without any formal accreditation body, although in the case of Uruguay the Ministry of Education is responsible for licensing new private universities.

Asia and the Middle East have experienced a similar evolution. In South-East Asia, Indonesia took the lead in establishing a national quality assurance agency in 1994, followed over the next two decades by almost all the countries in the region. Today, Myanmar is the only tertiary education system without a formal external quality assurance department or agency. In the Arab world, the first decade of the new century saw the creation of quality assurance systems in most countries, twelve out of the seventeen main countries in the region by 2010.

Africa is perhaps the region where the quality assurance movement has been slowest. By 2006, only 6 countries had a fully established quality assurance agency, Ghana, Nigeria and South Africa being the pioneers in that domain. In the past decade, however, progress has been impressive and today 23 countries count with a national quality assurance agency. The concluding declaration of a recent pan-African conference on quality assurance urges all countries that do not have with a proper QA system to put one in place as a matter of priority, especially in view of the growing importance of private tertiary education and e-learning (Jongsma, 2014).

As a result of this “quiet quality assurance revolution”, countries fall today into one of the following four categories (Salmi, 2015a):

- Advanced systems whose tertiary education institutions have well-developed internal quality assurance processes with a strong focus on quality enhancement, in line with national standards defined by the external quality assurance and/or
accreditation agencies, often linked to the national qualifications framework. Leading OECD economies would be in this category.

- Well-established systems relying still predominantly on external quality assurance, where a significant proportion of tertiary education institutions do not fully meet the national quality assurance standards. Many industrial and developing countries would be in this category.
- Countries that are in the process of setting up and consolidating their quality assurance system. Many developing countries and countries in transition in Eastern Europe and Central Asia would be in that category.
- Countries that have not established a formal quality assurance system. These would encompass a few countries in Asia, the Middle East, Latin America and the Caribbean and the Middle East, and about two dozen countries in Africa.

Complementing the widespread development of national and professional quality assurance agencies, new instruments of accountability have appeared or been suggested in recent years as ways of complementing the pool of information available to measure the performance and operation of tertiary education institutions (Salmi, 2015). Of particular relevance in this context are the following modalities: (i) student engagement surveys, (ii) assessment of student learning outcomes, (iii) labor market results information, and (iv) rankings.

**Student engagement surveys.** Following the example of the United States, where the first large-scale survey of student engagement (NSSE) took place in 2000, a number of countries have developed and implemented their own version of a survey aimed at ascertaining how students assess the quality of teaching and learning in their institutions. Today, student engagement surveys are carried out regularly in Australia, Canada, Germany, Ireland, the Netherlands and the United Kingdom. Pilot surveys have also been undertaken in recent years in countries as diverse as China, South Africa and South Korea.

Continuing a movement that started in the 1960s with student evaluations of their teachers, student engagement surveys include not only subjective indicators, such as the level of satisfaction of students, but also attempt to measure more objective aspects related to the degree of active engagement of students in interactive and collaborative learning activities. In countries where surveys of student engagement are conducted regularly, high school graduates tend to be better equipped to choose which college or university they would like to attend (Ramsden and Callender, 2014).

Student engagement surveys face two challenges (Klemencic and Chirikov, 2014). First, some observers have questioned their validity and reliability with respect to the ability of students to make informed judgments when asked to report learning gains, and the selection of the key factors that are supposed to determine student learning (Porter et al., 2011). Second, not all stakeholders are ready to live with the kind of transparency that these surveys imply. For instance, many US universities, including
top-tier universities, have not been willing to release their NSSE results publicly. This limits the usefulness of these surveys for the universities’ main stakeholders, such as employers, parents and prospective students.

Assessment of student learning outcomes. Unlike what happens at lower levels of education, the world of tertiary education does not have a long tradition of measuring learning outcomes. However, promising initiatives have emerged in recent years. In the United States, a growing number of institutions have been using one of three assessment instruments to try and measure added value at the undergraduate level: the ACT Collegiate Assessment of Academic Proficiency (CAAP), the ETS Proficiency Profile (EPP) and the Collegiate Learning Assessment (CLA). Similar instruments have been in use in other OECD countries, such as Australia’s Graduate Skills Assessment.

A few Latin American countries—Brazil, Colombia and Mexico for example—have also been pioneers in measuring the acquisition of knowledge and competencies of undergraduate students. In Brazil, the late Paulo Renato, then Federal Minister of Education, introduced the Provão in 1996 as a voluntary test designed to compare the performance of similar programs across all universities, it was the first such national assessment system in the world. The Provão consisted of a final course examination for undergraduate students that did not count towards the graduation of the students themselves but served to evaluate the results of their program and institution. The Provão was replaced in 2004 by a new test (ENADE), applied every three year to a sample of students, which examines the test scores of both first-year and last-year undergraduate students as an attempt to measure the added value of undergraduate programs (Salmi and Saroyan, 2007). Similarly, the Colombian Assessment Institute (Instituto Colombiano para la Evaluación de la Educación), has implemented two tests (SABER-11 and SABER-PRO) since 2009 that measure students’ abilities at the start and end of their undergraduate education.

In some cases, policy-makers have considered the opportunity of using students learning outcomes for quality assurance purposes. But these proposals have been met with caution by the tertiary education community, as illustrated by the controversy sparked by the 2006 report of the Spellings Commission on the Future of Higher Education in the United States. The report recommended measuring learning outcomes to complement the existing accreditation system.

... by law, student learning is a core part of accreditation. Unfortunately, students are often the least informed, and the last to be considered. Accreditation remains one of the least publicized, least transparent parts of higher education—even compared to the Byzantine and bewildering financial aid system. (NACIQI, 2007)

Initiatives to measure students learning outcomes in an international perspective have also been received with little enthusiasm. In 2012, the OECD conducted a pilot experience to measure the achievement of generic competencies and the acquisition
of professional skills in the areas of economics and engineering in the context of the AHELO project (Assessment of Higher Education Learning Outcomes). Even though seventeen countries participated in the feasibility study and the pilot, the future of the project, presented as an alternative to the global rankings, remains uncertain (OECD, 2013).

The recent emergence of private companies specializing in testing the work readiness of young graduates has introduced a new twist with respect to the assessment of student learning outcomes. In India, for example, several large multinational firms make it compulsory for anyone interested in applying for a job to take one of these professional tests.

More than 1.5 million people in India have taken a test called the AMCAT (Aspiring Minds’ Computer Adaptive Test). The assessment measures aptitude in English, quantitative ability and logic. … It also includes a variety of situational and judgment tests, which scrutinize personality types and soft skills to see how they might apply in specific fields. (Fain, 2014)

Labor market observatories. Another noteworthy development has been the establishment of Labor Market Observatories (LMOs) in a growing number of developing and transition countries, following the example of the many OECD countries that have employment observatories either at the supra-national level (European Union employment observatory), the national level (e.g., Bureau of Labor Statistics in the USA, Destination of Leavers from Higher Education survey in the UK, survey university-based AlmaLaurea observatory in Italy), and the sub-national level (e.g., Learning and Skills observatory in Wales, OREF in France, Education-Employment Information system in Florida). The examples of Bulgaria, Chile and Colombia are worth mentioning in this context.

Since 2012, the Bulgarian government has published detailed data on the labor market results of university graduates. Using data from the Registry of Tertiary Students and statistics from the National Social Security administration, the Ministry of Education is able to provide a wealth of information on the types of jobs and levels of remuneration of graduates who left university in the previous five years. The database indicates, for instance, if the graduate found a job, if the position corresponds to the field and level of study, what type of employer she/he is working with, if the graduate has a permanent or temporary job, and the level of salary based on social security contributions.

Supported by the Chilean Ministry of Education and jointly run by the School of Government of the private University Adolfo Abánez and the University of Chile’s Department of Industrial Engineering, Futuro Laboral aims to equip youths and students with academic orientation tools. Futuro Laboral provides information on the occupational situation of graduates of hundreds of professional and technical careers that represent 75% of technical and professional graduates. The information available to the public includes detailed data on salaries and employment
opportunities. The portal displays, for each program of every tertiary education institution, detailed information on dropout rates, average time to degree, average earnings of the graduates after 4 years of graduation, current tuition fees for the program, and accreditation status of the program. Employment and earnings data are not self-reported, but gathered from the database of the national tax revenue authority. Earnings are matched to the databases of graduates provided by the tertiary education institutions. The privacy of the information is maintained, as the tax service issues only the average values for each program in each institution, provided there are at least 25 individuals in each program/institution’s cohort for whom earnings data are available.

Graduados Colombia (Observatorio Laboral para la Educación) was launched in 2005 and is managed by the Ministry of Education. It collects and presents information on the demand and supply of graduates. Students, families, tertiary education institutions, researchers and the productive sector have access to statistics on the academic level of the graduates of technical institutes and universities, the salaries they receive, the average time for finding the first job, as well as the cities where they work. The website serves as a tool for students trying to choose a career, and it is also useful for tertiary education institutions intent on renewing and adapting the programs they offer according to labor market needs. Graduados Colombia’s site provides links to job offers in Colombia and in other countries as well as advice and tips on how to write and present a good resume. Visitors are able to look for the results of the graduate and employer surveys, as well as studies on specific disciplines and economic sectors.

These three initiatives show relevant examples of labor market observatories that aim to provide a better understanding of and match among individuals’ professional aspirations, tertiary education, and occupational trends. As such, they help to address one of the main challenges of tertiary education: its relevance to individuals and societies.

Rankings. The power of public opinion is nowhere more visible than in the growing influence of rankings. Initially limited to the United States, university rankings and league tables have multiplied in recent years, existing today in more than 35 industrial and developing countries.¹

The U.S. News [& World Report] rankings have become the nation’s de facto higher education accountability system—evaluating colleges and universities on a common scale and creating strong incentives for institutions to do things that raise their ratings. (Kevin Carey, 2006).

While fully acknowledging their methodological limitations, it is undeniable that the rankings have often played a useful educational role by making relevant information available to the public, especially in countries lacking a formal system of quality assurance. In Poland, for example, when the transition to the market economy started in the early 1990s, there was a thirst for information about the quality of
the rapidly proliferating private education institutions. This demand for information pushed the owner of *Perspektyvy* magazine to initiate the country’s first university ranking. Similarly, for many years the annual ranking published in Japan by the *Asahi Shimbun* fulfilled an essential quality assurance function in the absence of any evaluation or accreditation agency. In France, after the publication of the 2008 edition of the Shanghai ranking, while the Secretary General of the national teacher union (SNESUP) complained that it was unfair to compare the performance of universities to a race at the Olympic Games, the French Minister of Higher Education declared that “these lists of winners may not be ideal, but they do exist. … They show the urgency of reform for the [French] university” (Floc’h, 2008).

Some of the rankings include information from student engagement surveys and/or labor market observatories as key indicators. In Chile, for example, the country’s main weekly magazine (*Que Pasa?*) uses the results of *Futuro Laboral* to rank universities and programs every year on the basis of the labor market outcomes of their graduates. Similarly, in Bulgaria, the Ministry of Education has developed a ranking that incorporates the labor market results of university graduates.

Since the 2003 publication of the first international ranking of universities by Shanghai Jiao Tong University and the subsequent emergence of competing global league tables (THE, HEEACT, QS, etc.), students have used the results of the rankings to select study destinations while governments have increasingly relied on league tables to grant eligibility for scholarships and student loans, and even make immigration decisions.

The proliferation of rankings has provoked intense reactions, ranging from disagreements about the very principle of rankings, criticism about the methodology used to produce them, outright boycotts, and even court actions to stop their publication.

The expansion of league tables and ranking exercises has not gone unnoticed by the various stakeholders and the reaction they elicit is rarely benign. Such rankings are often dismissed by their many critics as irrelevant exercises fraught with data and methodological flaws, they are boycotted by some universities angry at the results, and they are used by political opponents as a convenient way to criticize governments. (Salmi & Saroyan, 2007, p. 80)

Despite the controversies surrounding them, there are good reasons why rankings persist. These include the benefits of information provided to students who are looking to make an informed choice among various institutions and programs, either domestically or for studies abroad. Further, rankings contribute to promoting a culture of transparency, providing institutions with incentives to collect and publish more reliable data. Finally, rankings can be used to define stretch goals at the institutional level. In so doing, universities may find themselves analyzing key factors explaining ranking as part of their efforts to improve teaching, learning and research, proposing concrete targets to guide (but not replace) strategic planning and entering into mutually advantageous partnerships.
Globalization

Globalization, declining communication and transportation costs, and the opening of political borders have combined to facilitate increased movements of people. In the tertiary education domain, this has translated into rapidly rising numbers of international students and, more recently, a growing number of academics moving from one country to the other in pursuit of more attractive professional opportunities.

According to the OECD (2015b), more than 4 million students studied overseas in 2013, up from 1.3 in 1990 and 2.1 in 2000. The five countries with the highest proportion of international students are Australia, Austria, Luxembourg, New Zealand, Switzerland and the United Kingdom. More than half the international students enrolled worldwide come from Asia, especially China, India and South Korea. International students are predominantly present at the most advanced levels of tertiary education. Whereas the proportion of international students in OECD countries is 9% on average, 24% of students enrolled in doctoral programs are citizens of other countries.

The growing influence of the international rankings and the related movement to establish world-class universities, fueled by the various excellence initiatives launched by governments in more than 30 countries, have led to a global race for talent (Salmi, 2009a and 2016b). As documented in Wildavsky’s book (2012), international mobility of advanced human capital is not only about students but also, increasingly, about academics recruited by institutions from other countries. New universities in Asia and the Middle East are competing with the likes of Cambridge and Stanford in trying to attract top faculty members. Some countries, Denmark and the Netherlands for example, have put in place accelerated visa procedures to facilitate the immigration of highly qualified professionals coming from top ranked universities.

The trend towards the rapid increase in international collaborative projects among university researchers is another important new dimension of the global tertiary education scene. Research production has increased exponentially in the past decades, and collaborative research activities have followed the same pattern. Figure 3 illustrates this trend and presents the evolution of co-authored articles, revealing a faster growth of multiple author articles than single author ones. While the number of articles published over the past decade went from 1.3 million in 2003 to 2.4 million in 2013, the number of authorships has increased at a far greater rate from 4.6 million in 2003 to 10 million in 2013 (Plume and van Weijin, 2014).

Drawing from a pioneering analysis of publications over the past three decades, Jonathan Adams announced the “fourth age of research”, the age of collaborative research and international research networks, following the age of individual researchers, the age of the research institution, and the age of the national research enterprise (Adams, 2013). He went on to demonstrate that international collaborative research is of higher quality and has a greater influence than traditional research, as shown in Figure 4, which compares the citation impact of international collaborative publications and domestic publications in the United States and the United Kingdom.
Figure 3. Evolution of Number of Authors and Number of Joint Authors. 
Source: Scopus database

Figure 4. Citation Impact of International Collaborative Publications. 
Source: Thompson Reuters database
Collaborative research yields faster results and facilitates a quicker transfer of these results, thereby serving the needs of both producers and users of knowledge in a more effective and efficient manner.

Finally, as part of their internationalization and resource diversification strategy, a growing number of universities in industrial countries have opened branch campuses in developing and emerging economies. These branch campuses are usually brick-and-mortar facilities delivering the same degree(s) as the mother institution to students coming predominantly from the host country. The most recent estimate puts the number of branch campuses at 229, with 20 being currently developed (C-BERT, 2015). Half of the branch campuses are affiliated to US universities; the others belong mainly to Australian, British and French universities, in declining order. In recent years, universities from emerging economies, such as India and Malaysia, have also opened branch campuses in other countries. The large majority of branch campuses have been established in the Middle East and in South-East Asia.

The main advantage, for the host country, is that its students can get access to a good quality education from a foreign university without actually needing to live overseas and pay the full cost associated with a foreign degree, as a recent global survey of transnational education found out (Knight and McNamara, 2015). Anecdotal evidence from Chinese universities confirm the growing quality of programs offered in branch campuses (Box 1).

**Box 1. Offering a Relevant Overseas Experience at Home: Examples from China**

Overseas universities with joint ventures in China are now attracting a better class of student. For example, New York University Shanghai has worked to build its reputation by promising good knowledge resources as well as international exposure and better job opportunities for graduates.

More high-quality young people are now flocking to such colleges, not least because of their mature recruitment policies. According to Yang Guohua, a senior executive with the Sino-Foreign Cooperative Universities Union, “apart from accepting students based on their performance in the Gaokao, China’s national college entrance examination, these universities have developed diverse ways to find students who can better meet their expectations.” NYU Shanghai, for example, a joint venture launched in 2013 by NYU and Shanghai’s East China Normal University, has a pre-selection process in which promising students are interviewed before the all-important exam, with the goal of enrolling the most excellent Chinese students.

China has seven universities that are jointly operated by domestic and foreign institutions. The oldest, the University of Nottingham Ningbo China, was established in 2004 by Zhejiang Wanli University and Britain’s University of Nottingham. The Ministry of Education has approved plans for two more in the
southern province of Guangdong. Statistics from the Sino-Foreign Cooperative Universities Union, which the joint ventures established in 2014 to advise the Chinese government on such collaboration, show that the seven universities accepted more than 7,300 Chinese students in 2015.

Jeffrey S. Lehman, vice-chancellor of NYU Shanghai, said the university fosters its students’ capacity to deal with multicultural situations. To do that, “the first lesson a freshman receives is to learn how to live and communicate with someone from another country, as it’s essential to share a room with a person from a different country in the first year,” he said. “A fraternity with organizers from at least two nationalities is also needed to have a better fusion of cultures.” Yang added that while internationalization is a distinct characteristic of such universities, “they also prepare students with a lot of knowledge on Chinese culture and general education, to ensure the young people gain a global vision while understanding the Chinese context”.

With quality resources and lower tuition fees (compared with studying overseas), these universities are a good option for students who want to get an overseas education experience in China. A survey of graduates from these colleges, released during a forum in April for presidents of the Sino-foreign cooperative universities, found the employment rate was 95 percent in 2014. Seven out of 10 graduates went on to work for multinational corporations or international organizations, while more than 90 percent said they were satisfied with their joint-venture alma maters.

(Source: Zhao and Yu, 2016)

With these reasons in mind, a number of governments have offered financial and fiscal incentives to encourage foreign universities to set up branches locally. Dubai, for instance, constructed the Knowledge Village in 2003 as a free trade zone for foreign institutions interested in operating there without needing to build facilities or pay taxes.

New Providers and New Education Technologies

Big breakthroughs happen when what is suddenly possible meets what is desperately necessary. (Thomas Friedman)

In 2002, the World Bank’s *Constructing Knowledge Societies* identified several new trends likely to translate into significant changes in the tertiary education landscape, notably the emergence of new providers and new modes of delivery. These trends have but accelerated in the past fifteen years. Three developments are particularly worth reviewing in that respect: (i) the rapid growth of for-profit providers, (ii) the multiplication of alternative modes of delivery in the form of MOOCs, and (iii) the impact of open science, big data and open education resources.
CHAPTER 1

For-Profit Providers. The growth of for-profit providers has continued and even accelerated in a number of industrial and developing countries. In the United States, for example, enrolment in for-profit institutions increased by 235% in the past decade, reaching a market share of almost 10% of all students, according to estimates from the Carnegie Foundation for the Advancement of Teaching (Zhao, 2011). The sector represented close to 30% of all tertiary level institutions in 2011. The economic downturn as a result of the 2007-2008 financial crisis triggered a 30% jump in enrollment in the largest 11 for-profit universities in just three years, as many laid-off employees sought to retrain whereas in most states funding for public institutions was significantly cut down. Almost 80% of the newly accredited tertiary education institutions during the 2005-2010 period were for-profits.

In many cases, the success of for-profit institutions relies on their ability to take advantage of the Internet and new technologies for designing and offering new, flexible and less expensive teaching and learning delivery models that are appealing to the mature student population that they serve in general. The University of Phoenix, whose enrolment reached a high of 600,000 in 2010 but had declined to 162,000 by 2016, is perhaps one of the most emblematic cases of a for-profit university effectively championing a blended learning model. Box 2 documents University of Phoenix’ experience in Southern Arizona.

**Box 2. Example of For-Profit University:**

*The University of Phoenix in Southern Arizona*

Complementing the work of the University of Arizona and the local community colleges, the private, for-profit University of Phoenix (UoP) fulfills an important role in support of training and retraining for the adult population in Southern Arizona. In the words of its President, Bill Pepicello, the University owes its success to the recognition that “...education needs to be something that fits people’s lives and becomes part of it... It needs to be that kind of accessibility, and many people are willing to pay a premium price for that.”

Over the past 30 years, UoP has developed a unique pedagogical model to fit the characteristics and needs of its adult student body (average age of students is 34), who are looking to earn a degree corresponding to their actual work activity or for starting a new career. The students go through a sequence of 6-week modules that usually combine actual class time and online learning, although UoP offers four different modalities to match the variety of learning preferences of the students (classroom, blended, online, and directed study mode with a one-on-one instructor). Faculty members do not lecture generally, but facilitate self-learning among the students. UoP has a comprehensive quality assurance and standards system to train the practitioner faculty and ensure that students achieve the prescribed learning objectives. Learning is
enhanced through a wide array of online resources, including a digital library, e-texts and pedagogical software (tutorials, grammar support, plagiarism checker, etc.).

(Source: OECD, 2011)

While for-profit tertiary level institutions are not allowed in many parts in the world, in those countries where they can operate legally they have also witnessed rapid growth. In Brazil, Peru, the Philippines and South Korea, for instance, enrollment in for-profit colleges and universities account today for 40 to 50% of the total student population. For-profit providers are also quite prominent in Chile, Jordan, Malaysia, Mexico, Peru, South Africa and Ukraine. Box 3 documents the role played by for-profits in Brazil.

**Box 3. Evolution of For-Profits in Brazil**

Brazil’s for-profits enrolled over two million students in 2010, representing 43% of the private sector and 32% of the overall tertiary education system. By 2000, just a year after full legal approval to allow for-profit higher education, the sub-sector already enrolled 18% of the private sector’s student population and 12% of the total tertiary education population. For-profit boosted its size by 537% in the 2000 to 2010 period, displacing the public sector from its second position in enrolments, while the private non-profit and the public sectors increased by only 88% and 85%, respectively.

Consistent with major trends in private tertiary education globally, the for-profit sub-sector accumulates its largest share of enrolments in the fields of social science, business and law (51%), education (17%) and health and social welfare (15%). By contrast, the public sector shows a greater concentration on education (41%), followed by social sciences et al. (15%), and engineering, production and construction (12%). For-profits tend to offer programs with low costs and high rates of return to institutional investment.

Through planned and unplanned factors, Brazil has given the private sector overall—now very much including the for-profit sub-sector—a major role in access, keeping most selective institutions in the public sector. This reality, coupled with the fact that an overwhelming 95% of for-profits are non-university institutions, has generated concern about quality in the for-profit sub-sector. However, Brazil’s large-scale test of undergraduate students (Provaõ) found a wide range of quality in both the private and public sectors, with for-profits outperforming what conventional wisdom expected.

Trends seem to point toward continuing growth of the Brazilian for-profit sub-sector through two developments: first, more non-profit institutions have switched their legal status; and second large domestic and international publicly
traded companies have incorporated non-profit institutions in their business portfolios.  
(Source: Salto, 2014)

From a national policy viewpoint, the main advantage of for-profit institutions is their ability to absorb part of the enrolment expansion at no cost to the State and provide relevant professional training that is directly related to labor market needs. While available data from the US confirm that for-profit tertiary education institutions actually help increase access beyond public sector provision and often offer training opportunities in fields not always served by public institutions, concerns about quality and fraudulent practices—from questionable marketing methods to inappropriate student loans—remain (Kinser, 2009). In recent years, for-profits have been accused of exploiting minorities, poor people and veterans.

The institutions that have failed to meet regulatory standards or been accused of violating legal statutes include tiny beauty schools with staggering loan default rates and online law schools with dismal graduation rates and no bar association accreditation. Without government money, few of these institutions could attract students or stay in business. (Harris, 2016)

The 2016 trial and 25 million dollar settlement around the Trump University brought to light questionable practices, including accusations of unscrupulous exploitation of vulnerable students, high-pressure sales tactics, use of unqualified instructors and deceptive claims about the academic offerings (Barbaro et al., 2016).

Alternative modes of delivery: the MOOCs explosion. Awed by their potentially disruptive character, the New York Times declared 2012 “the year of the MOOCs”, referring to the explosion of the so-called Massive Open Online Courses and the growing perception that they could challenge traditional universities or even threaten their very existence. Unlike traditional online courses, which charge tuition, have limited enrolment and give credits to their students, the MOOCs are supposed to be free, expected to reach thousands if not millions of students, and usually do not carry credits. Made famous by the likes of EdX (non-profit partnership between MIT and Harvard), Udacity (for-profit startup launched by Stanford Professor Ng), Coursera (for-profit organization working closely with several Ivy League universities), and FutureLearn (the UK’s Open University venture into MOOCs, which overtook Coursera in 2015 as the third largest provider), the MOOCs have grown at exponential speed in the past few years. In the United States, where 400 universities have produced a total of 2,400 such online courses, the MOOCs have become an integral part of the tertiary education landscape. Worldwide, estimates indicate a total of 35 million students participating in MOOCs in 2015, compared to 18 million the previous year. Figure 5 illustrates the tremendous increase in MOOCs in the past 5 years.
Supporters of the MOOCs hail them as the most important innovation in tertiary education, with the potential of offering unlimited learning opportunities to millions of people all over the world by giving them free access to courses from the best professors in the best universities. The MOOCs come complete with exams and electronic feedback from teaching assistants. Some are also providing certificates to the students who complete the course. A few universities—Georgia Technology Institute for example—have even packaged an entire degree around MOOCs.

Not everyone is taken by the MOOCs, however. The critics point to a number of serious limitations evidenced by the low completion rates. How much learning does actually take place in a course with 100,000 students? How can the MOOCs successfully help the students who most need new learning opportunities, but who at the same time are less prepared for university-level autonomous learning? How can students be effectively assessed, electronically? How can widespread cheating—apparently an endemic phenomenon with online education—be avoided? How can students combine a set of courses into a consistent program that can be recognized by other academic institutions and employers?

The results of a recent survey of students in three developing countries, Colombia, the Philippines and South Africa, shed a more positive light on the potential of MOOCs (UWN, 2016a). In contrast to findings among users of MOOCs in industrial countries, in the three developing countries included in the study, low-income and middle-income students made up 80% of MOOC users. The proportion of users who actually completed the courses was quite high (30%) and 49% of users received a certificate, with women being more likely than men to complete a MOOC or get certification. Lack of computer access or prior skills was not highlighted as a significant barrier.
At the end of the day, the success of the MOOCs will by conditioned by two factors. The first constraint is the ability of MOOCs providers to find a sustainable business model. The fact that many of them have abandoned the tuition-free approach illustrates the difficulty of maintaining a very low cost for the students while raising the resources necessary for the development of high quality online courses. The second, even more important challenge consists in developing a credible system of certification and recognition of qualifications. To operate truly as a viable alternative to on-campus studies at regular tertiary education institutions, the MOOCs must offer professional qualifications that give proper access to the labor market. In addition, students enrolled in regular on-campus programs, who want to take some of their courses online, need the assurance that their institution recognizes their MOOCs credits.

**Open science, big data and open education resources.** Open Science, defined broadly as “a systemic change in the modus operandi of doing research and organizing science,” offers new opportunities for tertiary education in developing countries. The paradigm shift embodied by Open Science refers to the rapid development of interactive and collaborative modes of knowledge acquisition, generation and dissemination, facilitated by networks that rely on modern information and communication tools. This recent evolution encompasses several interrelated trends and phenomena, ranging from citizen science to web 2.0., which can greatly benefit tertiary education systems and institutions. Figure 6 proposes a representation of how the various dimensions are connected and interact.

Two developments are worth mentioning here: predictive analytics and open education resources. In the first instance, big data and predictive analytics have arisen in just a few years as powerful tools to assist policy-makers and practitioners in making data-driven decisions through mathematical modeling, digital simulation and scientific computation. In particular, big data may be a promising avenue to address the issue of low internal efficiency and high dropout rates that plagues many institutions in both industrial and developing nations.

A recent survey estimated that about 40% of US universities have experimented with novel data analysis methods to follow the digital footprint of their students and detect, very early on, behavioral changes associated with potential academic difficulties (Ekowo and Palmer, 2016). Administrators and professors can use digital dashboards and “heat maps” that highlight who might be in academic trouble. Ball State University in Indiana monitors not only the academic engagement of students but also their social activities in order to identify unexpected shifts in patterns that may reflect study difficulties. Retention specialists immediately contact the students to offer academic or psychological support as needed. Special attention is given to Pell Grant beneficiaries (low income students) through a mobile app. Arizona State University’s eAdvisor system, which flags students at risk of lagging behind, is credited with a significant increase in completion rates for students from vulnerable groups, from 26 to 41%, since its establishment in 2007.
The Minnesota State Colleges and Universities system, which used to allow students to apply for enrollment until a few days before the beginning of classes, recently terminated this practice after administrators realized that students who enrolled closer to the start of the semester were more likely to fail than those who enrolled earlier (Kelderman, 2012). A new University Innovation Alliance of 11 large public universities, backed by several major foundations, was constituted in September 2014. It will use data analytics in its first set of projects, which are aimed at improving graduation rates for low-income students (Blumenstyk, 2014).

The University of Maryland System has adopted the PAR Framework’s Student Success Matrix to improve student success programs through the use of predictive analyses and benchmarking collaborative to identify students at risk. Our culture of evaluation and our use of learning analytics have created a new way of thinking about learning. Our focus is not solely relegated to individual courses or processes, but rather to all of the activities that
contribute to educational improvement… The process of leveraging analytics and improving student outcomes requires institutions to add capacity in understanding the data, applying evidenced based research practices for the student populations served, and a willingness to measure the effectiveness of the initiatives applied. (Karen Vignare, Vice Provost for UMUC’s Center for Innovation in Learning and Student Success (CILSS))

The experience of Georgia State University in Atlanta is perhaps the most telling example of the use of predictive analytics in the United States. Georgia State University (GSU), whose students are sixty percent nonwhite and many are from first generation families, uses predictive analytics to advise students on which majors they are most likely to succeed in, based on their grades in prior courses (Blumenstyk, 2014; Kamenetz, 2016). GSU relies on an early-warning system built on the analysis of 2.5 million course grades received by students over 10 years to identify the critical factors that reduce changes to graduate. For example, an academic adviser will get a red flag if a student does not receive a satisfactory grade in a course needed in her or his major, or does not take a required course within the recommended time, or signs up for a class not relevant to his or her major. As part of establishing the Graduation and Progression Success program, GSU recruited more academic advisers and managed to bring down the caseload from 700 to 1 to 300 to 1. The University has obtained impressive results: graduation rates are up 6 percentage points since 2013; to get their degree, graduates are spending on average a semester less than before, saving an estimated $12 million in tuition; and low-income, first-generation and minority students have closed the graduation rate gap, even in tough STEM majors.

Canadian universities have also started to use predictive analytics to identify and help students at risk (Chiose, 2016). At the University of Toronto, for example, the use of big data has influenced the decision to do away with the practice of allowing students with poor scores in their first term to continue taking classes with their cohort under the condition that they would take again the courses that they failed. Data on graduation rates showed that the majority of these students did not finish their degree. So moving them along did not work. Instead, the University asks them now to repeat their first year and participate in a special program called Refresh, which includes academic, professional and personal development courses. Along similar lines, the University of British Columbia has a pilot project to link the academic trajectory and preparation of incoming students with their participation in extracurricular programs, their university grades, and their labor market results.

Observers have also suggested that big data could be used effectively to map out future labor market needs and influence the shaping of curriculum and pedagogy. The city of Manchester, for instance, has tried to chart the competencies, skills and attributes in demand in the Greater Manchester area by analyzing 600,000 LinkedIn profiles of people working in the region. Tertiary education institutions
could gain insights into workplace and workforce trends nationally and globally (Hristov, 2016). Big data can also be used to organize the active participation of citizens in data collection, scientific experiments and problem resolution. In recent years, scientists have found it useful to involve volunteers and amateurs in their activities, often benefitting in unexpected ways from these non-professional contributions. One of the most relevant cases in that respect is the “fold-it” biochemistry experiment (Box 4).

**Box 4. Amateurs Solving Complex Science Problems: the Foldit Experiment**

Foldit is a science game designed to tackle the problem of protein folding with the help of ordinary people who enjoy videogames acting as scientists. It was developed by the Center for Game Science at the University of Washington (http://centerforgamescience.org), which creates game-based environments in order to solve important problems that humanity faces today. Over 100,000 amateur players from all over the world, each with different backgrounds, are engaged in the Foldit game. As the official site of the game states, the best Foldit players have little to no prior exposure to biochemistry.

Playing the game implies folding proteins starting from a set of provided tools and models of proteins. Users receive scores for how good they do the fold and these scores can be seen on a leaderboard, therefore stimulating competition among players.

The game was developed with the premise that humans’ pattern-recognition and puzzle-solving abilities are more efficient than the existing computer programs dealing with this kind of tasks. The data gathered can be used to train and improve computers in order to generate more accurate and faster results than they are capable of achieving at present.

So far, Foldit has produced predictions that outperform the best known computational methods. These results have been published in a Nature paper with more than 57,000 authors, most of them being non-experts in biochemistry related fields. This is a great example of how this type of gaming environment can create skilled researchers out of novices.

Other good examples of citizens’ involvement in research can be also found at www.zooniverse.org, the largest global platform hosting projects in different scientific fields ranging from astronomy to zoology. The platform provides opportunities for people around the world to contribute to real discoveries, converting volunteers’ efforts into measurable results. So far, the amateur scientists have contributed to a large number of published research papers and significant examples of open source data analysis can be found as useful contributions to the wider research community. Unexpected,
scientifically significant discoveries have been made by the volunteers as well.

Another strong point of citizen science research is that the citizens’ involvement can help research save money. A recent study made on seven Zooniverse projects followed the activities of 100,386 participants who contributed a total of 129,500 hours of unpaid labor. That would have been worth more than $1.5 million, taking into account the rate normally paid to undergraduate students.

(Source: http://fold.it/portal; Sauermann and Franzoni, 2015)

Similarly, researchers at University College London designed a videogame to analyze the first symptoms of Alzheimer’s disease. Harnessing data from the 2.4 million people who downloaded and played the game, they conducted the world’s largest dementia research experiment (Gallagher, 2016).

Second, the open education movement represents a unique opportunity for tertiary education institutions and learners in developing countries to access free courses, scientific articles, software and other education resources. Since the launch of MIT’s OpenCourseWare website in October 2003, the Open Education Resources movement has spread exponentially and universally. Open Educational Resources (OER) encompass all sorts of educational materials that are free to access and open for use, and that can be adapted and combined in many ways. Here are the most common two definitions of OER (OECD, 2015c, p. 17):

Open educational resources are digital learning resources offered on line (although sometimes in print) freely and openly to teachers, educators, students, and independent learners in order to be used, shared, combined, adapted, and expanded in teaching, learning and research. They include learning content, software tools to develop, use and distribute, and implementation resources such as open licenses. The learning content is educational material of a wide variety, from full courses to smaller units such as diagrams or test questions. It may include text, images, audio, video, simulations, games, portals and the like. (OECD-CERI definition)

OER are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and repurposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials or techniques used to support access to knowledge. (William and Flora Hewlett Foundation definitions)

OECD (2015c) describes OER as a genuine catalyst for innovation because they can, at the same time, drive the transformation of educational practices and facilitate new forms of interaction among teachers, researchers, learners and knowledge
THE CHANGING CONTEXT: NEW CHALLENGES, NEW OPPORTUNITIES

along many dimensions. OER represent a platform for reducing the constraints of geographical location, time and pace of learning. For tertiary education institutions and students in developing countries, relying on OER means being able to access high-quality materials at no cost or very low cost, thereby reducing the barriers to learning opportunities. Free digital resources can help improve the process of teaching and learning by bringing about new forms of learning and a richer learning experience. Teachers can work together to develop their own learning materials and create networks for supporting capacity building among other teachers as well as the educational needs of other learners.

Because of their flexibility and adaptability, OER are well suited to address some of the new challenges faced by tertiary education institutions in the 21st century discussed earlier in this Chapter. In particular, they can support the transformation of the curriculum, the application of new learning theories, and better respond to the various knowledge and competence acquisition needs of heterogeneous groups of learners. OER also help to build bridges across countries and learning communities of all kinds. They blur the frontier between formal and informal learning, and between degree-focused education and lifelong learning.

Political Commotions

The final trend worth mentioning is the serious deterioration of the political environment in a growing number of countries, resulting in adverse to dangerous situations for tertiary education. In particular, violence against students has erupted in unprecedented ways in recent years. Hundreds of students were abducted or killed in countries as diverse as Kenya, Mexico, Nigeria and Pakistan. The racist killing of an Indian student in Australia in 2010 led to thousands of Indian students switching to Canada as their preferred international study destination. The Scholars at Risk network registered 158 attacks in 35 countries between 1 May 2015 and 1 September 2016 (O’Malley, 2016). The attacks included 40 incidents of killings, violence and disappearances, as well as several cases of university closures or military occupation of campuses.

US colleges witnessed several massacres in the past few years. Paradoxically, this has led to more guns on campuses rather than the opposite. At the University of Texas, the dean of the Faculty of Architecture stepped down in February 2016 in protest against the imposition, by the state legislature, of the right of wearing concealed weapons in the classroom. At the University of Houston, the administration warned professors against discussing sensitive topics during class to avoid angering students who may be armed.

Reduced academic freedom is also becoming a matter of concern. As early as 2001, Professor Altbach documented how academic freedom was coming under attack even in countries with reasonable levels of democracy. From Serbia to Indonesia, from Egypt to Malaysia, or from Hong Kong to Singapore, professors expressing views or researching topics perceived as politically incorrect or
inacceptable can be censored, sacked or even jailed (Altbach, 2001). This downward trend has not stopped, quite the contrary. The Scholars at Risk network documented gross breaches of academic freedom in many parts of the world in the past twelve months, notably in Bahrain, China, Egypt, India, Israel, Malaysia, Nigeria, Pakistan, Thailand and Turkey. In the US, the September 11 terrorist attack has resulted in increased scrutiny of views not deemed to be patriotic enough and condemnation of faculty speech interpreted as critical of official US government positions (Benedict, 2009). In Russia, the justice department sued a professor of history because the research for his doctoral thesis focused on a controversial Soviet general who had turned against Stalin and allied himself with the German army, thereby challenging the orthodox view of the war between the Soviet Union and Nazi Germany (Holdsworth, 2016).

Tightened visa rules as part of the fight against terrorism have often translated into restrictions for foreign scholars and students. The Scottish universities have complained of a decrease in the number of foreign students as a result of the stricter visa regulations put in place for students seeking to study in the United Kingdom.

Finally, the massive influx of Afghan, Iraqi and Syrian refugees into Europe represents a major challenge for the local universities ill-prepared to take on significant numbers of new foreign students without matching additional budgetary resources and an appropriate framework for the recognition of the academic qualifications of the incoming refugee students.

**CONCLUSION: CHALLENGES AND OPPORTUNITIES**

There has never been a time of greater promise, or greater peril. (Klaus Schwab, 2016 World Economic Forum)

The French philosopher Paul Valéry observed with nostalgia that “the trouble with our times is that the future is not what it used to be”. This is particularly true in the realm of tertiary education, which is in great flux. Labor markets requirements are changing drastically. Students and academics are increasingly internationally mobile, and research has gone global. New competitors threaten to displace traditional providers and new learning modalities challenge established ways of teaching and conducting research. The political environment in which tertiary education institutions operate is unstable in many places.

These global trends have brought uncertainty and disruption to tertiary education (Box 5). But they also offer remarkable new opportunities that tertiary education institutions and learners can seize. For this to happen, it is indispensable to ensure the availability of broadband connectivity and end-user devices to support the delivery of educational, research, and administrative services of tertiary education institutions in an efficient, reliable, and affordable way.
In order to ascertain to what extent tertiary education systems in developing countries are ready in that respect, the next chapter looks at the expected role of tertiary education and at the actual state of tertiary education institutions in developing countries.

NOTES

2 http://rsvu.mon.bg/rsvu3/?locale=en
When Stanford Professor Ng offered his course on machine learning, more than 100,000 students signed up. Only 46,000 attempted the first assignment, and less than 13,000 actually completed the course.

This section draws on a recent study on Open Science prepared by the author for the European Commission (Salmi, 2015b).

See http://scholarsatrisk.nyu.edu/