

Knowledge Studies in Higher Education 3

Hugo Horta
Manuel Heitor
Jamil Salmi *Editors*

Trends and Challenges in Science and Higher Education

Building Capacity in Latin America

 Springer

Knowledge Studies in Higher Education

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Editors

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Editors

Hugo Horta
Faculty of Education
University of Hong Kong
Hong Kong, Hong Kong

Manuel Heitor
Instituto Superior Técnico
University of Lisbon
Lisbon, Portugal

Jamil Salmi
University Diego Portales
Santiago, Chile

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Prologue I. Engaged Development: Paying Homage to Albert Hirschman and Oscar Niemeyer

Why Pay Homage?

Albert Hirschman (April 7, 1915 – December 10, 2012) and Oscar Niemeyer (December 15, 1907 – December 5, 2012) were men of their time and of the future.

Albert Hirschman was always uncomfortable with attempts made by others to confine him to a particular discipline or to a specific group of thinkers. He ventured into as many disciplines as necessary to unfold a phenomenon that caught his attention. One of his most well-known statements is that “the idea of trespassing” was a constant in his thinking. He permanently called us to search for and propose (new) categories that could lead to a better understanding of development processes.

Oscar Niemeyer clearly contributed to changing the aesthetics of buildings and cities worldwide. While his designs are landmarks, Niemeyer was equally an outstanding personage in the political domain to the extent that he would consider architecture less important than a political engagement to change society and, above all, to celebrate life and friends. He constantly called for us to dream, to make things happen.

The lives and works of Hirschman and Niemeyer inspired me to question what development is (or should be). To what extent has the breadth and depth of the very concept of development been explored and expanded since the end of WWII when it first entered the agendas of intellectuals and policymakers? Is not development time- and place-specific in the sense that it may have different meanings and dynamics for each and every society? Is not every society permanently challenging and pursuing changes to its status quo? If history shows that there is no end in the search of development, does not this “time- and place-specific” concept has to be elastic enough to constantly incorporate new and, to a great extent, unforeseen dimensions?

Substantive theoretical, historical, and empirical efforts are urgently required to investigate and propose frameworks that can be analytically and policy-wise useful. Different approaches must be tried to experiment with those meanings, determinants, and policy implications surrounding the concept of development, understood

as changes (incremental or radical) on a specified state of advancement over time. It is necessary to go far beyond generic—and relatively indisputable—statements, for example, that development is associated with transformation to and determined by a complex interaction of different realms of life (e.g., cultural, environmental, economic, social, technological, political).

This article is but a small contribution to the debate but with very specific purposes: to propose the need for a political standpoint for the concept of development. Departing from the Schumpeterian concept of paradigm change, this article suggests the world is going through a transition period with a prevalence of uncertainties (in the sense of unpredictability) in different dimensions. Such prevalence of uncertainty imposes a series of questions concerning what is considered “development.” Such questioning then opens the way for the proposition that the time has come to bring into the limelight, explicitly, a political dimension to the development processes. Thus, this article introduces not an analytical but a normative concept—“engaged development”—as a concept to be taken up by those political actors involved with the promotion of processes of change in different societies.

Where to, World? The Trends and Uncertainties Around Us

History—and Hirschman—teaches that processes of change occur as a result of a conjunction of extraordinary circumstances. It is quite undeniable that the world is going through a time of intense, difficult changes. Such intensity still requires a strong narration, as provided by John Steinbeck in *The Grapes of Wrath*, exposing the shocks between the “old” and the “new” during the great depression in the United States.

In Schumpeterian terms, the world may very well be going through a period of paradigm change, not only in the technological domain but far beyond, reaching into, for example, political, environmental, and competitive domains. As the transition unfolds, old values, assets, and competencies become obsolete but resist disappearing while the determined search for innovative alternatives continues. However, even among innovators, mortality rates are very high. Financial crises become “functional” as they accelerate the process of asset liquidation. Uncertainty prevails until an emerging paradigm (in Schumpeterian terms) and their associated norms and institutions become dominant.

Can such generic statements be translated into factual and credible narrative? Is it possible to “organize” how to observe intense changes? Again, Niemeyer and Hirschman are valuable. Niemeyer defended that it is not important to look at forests or trees but at the spaces among trees (and forests!) when observing processes of social change. Hirschman always took a stand that continuous and unexpected changes require the constant need to search for new explanatory ideas that could, indeed, contradict one’s old and long standing concepts.

The concepts of diversity and heterogeneity, derived from the structuralist school of the United Nations Economic Commission for Latin America and the Caribbean,

Table 1 World trends and uncertainties

<u>Trends ⇒ diversities?</u>
More voices in world decisions: old protagonists remain; newcomers (trying to) joining in <i>Indignados</i> (“the outraged”) worldwide... Nontraditional mass protests
Crisis of long duration
Inclusion of many into markets
Pressure on resources—of all kinds
Fierce competition for the generation, appropriation, and distribution of wealth
Strong, unstoppable rhythm of technical progress
Activism by states: protection against crisis; defense of national interests
Extreme availability of and access to information
<u>Uncertainties ⇒ heterogeneities?</u>
Negotiated or conflictive multipolarity?
<i>Indignados</i> : common or different outrage? Democracy? Democracies?
Out of the crisis: When? Who?
Emerging countries or emerging middle classes? Aspirations? Aesthetic ideals?
Resources and the environment: are we doomed?
Competitive practices... which ones will prevail?
Is mass-customized production achievable?
The state: which public goods to provide? What are public goods, nowadays?
Information abound; but Eliot’s knowledge and wisdom?

will be used to narrate trends and uncertainties in political, economic, social, environmental, and technological domains. The consequence of applying the concept of diversity for the description of trends is that there are strong indications that the “one size fits all” solution is doomed to disappear for each and every domain considered here. Concurrently, when and where uncertainty prevails is very difficult, if not impossible, to foresee the directions of change that open the possibility that heterogeneity may prevail. That is, the capacity to act and react upon events may be very different among different actors, leading to the maintenance of strong divisions among and within societies, even if these differences are expressed in new forms (Table 1).

The table below presents, in a stylized form, world trends and uncertainties for political, economic, social, environmental, cultural, and technological dimensions.

Regarding the geopolitical dimension, while the established post-WW II order is long gone and substituted by others, such as the G20, it is still not clear whether the upcoming multipolarity will be negotiated one or whether a conflictive ambience will remain for a long period.

As for the political dimension, the world is seeing the eruption of mass protests in different regions, usually organized by the young, deeply dissatisfied with dictators, autocrats, or traditional forms of political representation. The rage and demands are directed at different targets in different countries, e.g., for political freedom; for more, better, and more efficient states; against the economic and financial establishments; and against the economic policies being implemented in reaction to the 2008

crisis. What is not known is, first, the extent to which these claims will be taken up by decision makers, and second, in places where political change has occurred, what type of new order will come about, and how long it will take for a new set of norms to prevail.

The economic dimension has been very much in the limelight recently. After 6 or more years of deep economic crisis, it is now possible to state that this is a crisis of long duration. What has been seen is the unfolding of a succession of economic problems of different natures, hitting different countries. Regardless of the very welcome willingness of policymakers to apply heterodox formulas to face specific challenges, uncertainty still prevails as the different engines of growth (understood as most relevant economies) have not and are not running at the same revolution and speed.

Remaining still with the economic dimension, the most relevant phenomenon the twenty-first century has seen is the process of the social and economic inclusion of dozens, even hundreds of millions of people into the mass markets of different countries, the so-called emerging markets. They are benefiting from the growth process these countries are experiencing as well as by the deliberate economic policies to increase minimum wages above inflation rates. As a result, these “emerging middle classes” are becoming consumers of goods and services that are helping to spur economic activities for local and foreign producers. However, this process of inclusion remains unconsolidated, at least in respect to the following three dimensions. First and more importantly, their consolidation as middle classes is still to be achieved; regression is still a plausible scenario. Second, the level of quality and sophistication of goods and services being consumed still has a long way to go to reach the quality of that being consumed by the established middle classes or by the middle classes in the United States, Europe, and Japan. Third, these emerging middle classes are experimenting with new ways of life that are not yet considered cultural or aesthetic norms.

Regarding the environmental dimension, for some time now, there has been an increasing amount of clear demonstrations that the pressure on resources—of all kinds—has been steadily mounting. The process of the economic inclusion of millions applies further stress to the sustainable reproduction capacity of economic systems. Is the world doomed to face the consequences of the overuse of its resources? Are decision makers and citizens willing to engage in investments and to change behaviors towards a different approach to resources?

In the competitive domain, the world has seen an increasing transnationalization of production: production systems, enterprises, and suppliers are increasingly involved in a deep and extensive web of international transactions. What is really at stake here is an environment of very fierce competition by economic agents for the generation, appropriation, and distribution of wealth. Established patterns of competition—cost or differentiation, for example—are just simplistic manifestations of modes of competition. It is relatively unknown which code of competitive practices will be dominant in the years to come.

Looking at the technological domain, regardless of the high intensity of the recent crisis, the rhythm of technical progress has not abated. Scientific advances

are a constant and are being translated into new devices. However, uncertainty is very much embedded in technical progress. First, general-purpose technologies, like information and communications technologies and new materials, are being applied to any type of investment for increased efficiency and quality of services. Second, contemporary innovations potentially leading to disruptive changes are increasingly dependent on advanced scientific knowledge and on the convergence of different technologies. Innovation is nowadays more complex and interdisciplinary. That is, innovations depend on cooperation among firms, scientific institutions, and technology labs encompassing deep and wide capabilities, the so-called systems of innovation. Stand-alone research laboratories within a particular firm simply do not have the means to accumulate all the necessary competencies for a given innovation challenge. Thus, uncertainties arising from innovation are not only associated with pursuing something “inexistent” but also with the extent to which innovators—firms or research institutions—are able to bring together partners that have complementary technological capabilities for a “convergent process of building up innovations.”

Contrary to the prevailing norms of the 1990s and early 2000s, the period after the economic crisis brought about, to Western countries, an activism by national states that were thought to be long buried and never to return. This was not the case for a country where high and steady growth rates have been a constant for the past 30 years: China. However, even though not explicitly supporting their economies, Western countries, in different formats, have never eluded the task of supporting their productive systems. What the crisis clearly highlighted was that in different modes, national states have always had a relevant role in economic development. In short, national states have played relevant roles in the many dimensions of development. However, what is unknown is through which mechanisms and how effective these institutions will be to deal with the related development uncertainties.

The political, economic, social, and technological trends and uncertainties stylized above could not come about if an increasing mass of information was not made available. Big data is useful to increase the efficiency of urban transport in urban centers, to decode the DNA of the human body, and to control mass protests. Information abounds but, paraphrasing T.S. Eliot, one can question whether information is leading to knowledge and, above all, to wisdom.

The Time Has Come for Engaged Development

Can development, understood as changes (incremental or radical) on a specified state of advancement over time, be foreseen in any of the above dimensions? The trends and uncertainties depicted above, if convincing, open up the need to reconsider the perspective within which to place the very concept of development. The point of departure is history. First, development is time-, place-, and dimension-specific. Second, the search for progress does not lessen, despite periods of uncertainty. In short, even with different meanings and dynamics for each and every

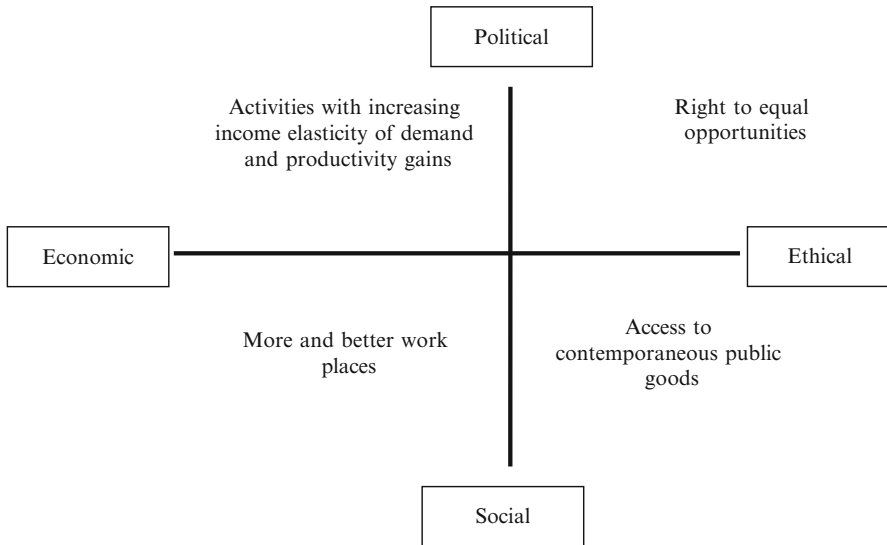


Fig. 1 Dimensions and directions of development: a normative vision

society, and in a context of uncertainty, it is very unlikely that societies will abandon the search for changes in their current status quo. As a consequence, the concept of development must be elastic enough to constantly incorporate new dimensions.

Even if theorizing development may be a difficult, almost impossible, endeavor, it is possible to postulate that development implies and demands societal choices; it is a political process by its very nature. Political choices and processes, largely by definition, may be hard to be conceptualize, but this does not impede the proposal of appropriate frameworks to the fitting of policy directives as a contribution to the political debate.

Four dimensions—political, economical, social, and ethical—are proposed in this article and organized in two axes, as shown in Fig. 1. For each quadrant a development directive is suggested. As development is time- and place-specific, this diagram must be specified to the stage of advance of each society.

Regarding the combination of political and economic dimensions, the normative directive is to pursue and foster dynamic economic activities, in two senses: the expansion of (i) markets and (ii) productivity. This directive is on a political–economic quadrant because if successful, it will generate income and taxes that will induce productive and policy sustainability.

For the economic–social quadrant, the development directive concerns more and better workplaces. Such a directive encapsulates most of the concerns of workers as it leads to their concrete well-being. Such a development directive is powerful not only for the concrete contribution to the well-being of workers but also because it includes a very relevant component closely associated to the previous quadrant. Not only does the quantitative expansion of workplaces matter, but these must qualitatively improve in time.

Regarding the social–ethical quadrant, the development directive is access to contemporaneous public goods. Societies today are urgently calling for fundamental public goods—education, transport, safety, and health—to be made readily available. However, there are other public goods that must be made widely available as demonstrated by a number of societies already: culture, leisure, and a clean environment.

The last quadrant, a combination of the ethical and political dimensions, is to a great extent relatively intangible but is possibly the most relevant in ideologically influencing the other quadrants: the right to equal opportunities. Development, in the last instance, should imply an environment in which rights of any kind are respected and enforced. It is a directive towards a transparent, efficient, and accountable rule of law, but is also more than that: it is a directive for a set of rights to directly imply the right to equal opportunities, in which all citizens have the similar chance to acquire the necessary skills and competencies for access to progress. Individuals then will be differentiated according to competencies, having had similar opportunities to access and acquire them.

The combination of these development directives implies one specific postulate: development is a political process. Thus, which development form is appropriate? I advocate engaged development, the ethical commitment to processes leading to inclusiveness, competitiveness, and sustainability. However, the question arises: is this a utopian ideal?

João Carlos Ferraz Professor (on leave) at the Instituto de Economia, Universidade federal do Rio de Janeiro. This article is based on two conferences I was invited to attend: The Sir Patrick Gillam Lecture, at the London School of Economics in January 2013, and ALTEC 2013, Porto, in October 2013. The views expressed here are my own. They do not reflect those of the Brazilian Development Bank, the institution I was affiliated to (as Executive Director) at the time of these conferences and of writing this article (October 2014).

Instituto de Economia, Universidade federal
do Rio de Janeiro,
Rio de Janeiro, RJ, Brazil
jcferraz@bndes.gov.br

João Carlos Ferraz

Prologue II. *Todos por la Educación*: Advocacy for Education in Colombia. Everyone for Education

The social movement *Todos por la Educación* (Everyone for Education) is one of the main social innovations promoting education in Colombia. The movement was launched on January 30, 2014, by a group of young community leaders. Our objective is to ensure that education is a key priority in Colombia. The movement aims to address inequality and promote peace via high-quality education for all Colombians.

Country Context

Colombia has high levels of poverty and inequality. Although poverty has decreased by 9.7 percentage points in the last 5 years, Colombia is still one of the most inequitable countries in the world. Colombia's Gini coefficient is 0.593, unaltered between 2012 and 2013 (DANE 2014). Inequality is acute between urban and rural areas, regions, and municipalities. For example, 49.9 % of the population of Quibdó (194 miles from Bogotá) is considered to be living in poverty, compared with 10.2 % of the population in Bucaramanga (185 miles from Bogotá) and 10.3 % in Bogotá.

In Colombia, African Colombians, indigenous populations, children, and women represent the populations with the highest poverty levels, vulnerability, and exclusion. According to the 2011 National Report on Human Development, 63 % of Colombia's indigenous populations live under the national poverty line, 47.6 % in extreme poverty, and 28.6 % of those under age 15 are illiterate. Additionally, in the regions with high concentrations of African Colombians, poverty is higher still: numbers exceed 30 % of the population, and the proportion of poor people based on Unmet Basic Necessities (*Necesidades Básicas Insatisfechas*) (43.1 %) is almost double the national average.

Other social statistics are also alarming. In Colombia, 19.5 % of teenagers between 15 and 19 years old have children or are pregnant. Teenage pregnancy affects education because most teenagers who are pregnant or parents do not attend

school, dropout, or attend a lower grade than corresponds to their age. According to the Ministry of Education, in 2011 between 20 % and 45 % of the school dropout rate was attributed to teenage maternity or paternity.

Education in Colombia

The most important education challenge in the country is improving the quality of education, while also increasing enrollment rates in preschool and higher education. In terms of quality, Colombia's poor results in the 2012 OECD PISA exams ignited a strong national debate. Compared with Latin American results, Colombia was second to last, only above Peru. In terms of enrollment, in 2013, 1,706,807 children were enrolled in pre-kindergarten programs. Regarding high schools, the country needs to increase access and reduce the number of grade repetitions and late enrollments, which affect the difference between gross and net enrollment (Table 1).

Regarding quality, and linked to the results of the PISA tests, challenges such as those identified by Vasco (2006) should be noted. Vasco, as a member of the *Misión de Sabios* (Sabios 1996) claims Colombia should “reconcile the need for high levels of education in mathematics, natural science and technology with the growing apathy of young people regarding these areas.” Furthermore, he states that we need to “reconcile pluralism and postmodern amorality through the teachings of coexistence, ethics, morality, democracy and citizenship” and to “move from teaching and assessment based on achievements and specific goals to competency assessment.”

In 2012, the coverage rate for higher education reached 37 %, a rather modest percentage made worse by the fact that approximately 45 % of incoming students at this level do not graduate (MEN 2013). In addition to the limited access are various quality issues: the educational gap regarding the basic skills of students when they enter university, the lack of relevance of the curricula, and restrictions of both access and quality faced by students with fewer financial resources.

Another important factor is the inequality among regions regarding both coverage and quality of education. This disparity can be clearly observed by comparing coverage figures and the SABER State exams for fifth, ninth, and eleventh grade students (eleventh grade is the senior year in Colombia). For example, in 2012, the gross coverage rate for secondary school education ranged among regions from 33.19 % in Guainía to 91.74 % in Boyacá (MEN 2013). Regarding SABER exams, Barrera-Osorio (2012) analyzed the results of these tests by region and socioeconomic status, finding that “the knowledge and skills of students are quite unevenly distributed. Students in rural areas have a worse performance than in urban areas

Table 1 Education coverage rate for Colombia 2012

Enrollment	Preschool	1st to 5th grades	6th to 9th grades	10th and 11th grades
Gross	97.10 %	110.99 %	101.89 %	75.40 %
Net	63.39 %	87.10 %	71.48 %	40.98 %

Source: Ministry of Education

and students from lower socioeconomic strata have worse performance than those of higher socioeconomic strata. All these differences are statistically significant. A similar message is obtained by calculating the average results in these tests by region: the gap between regions is also important” (CEDE 2012).

It is also essential to consider the level of skills of teachers in Colombia. In this regard, Osorio (2012) analyzed a number of variables such as educational characteristics of new teachers and the Teachers’ Statute and concluded that Colombian teachers have low skill levels compared with those of other professionals. Thus, Osorio (2012) advised that a policy should be introduced whereby appropriate incentives are provided to attract better-educated graduates to teaching, the provision of more and better undergraduate programs, and the strengthening of the status of teaching in terms of regulation, evaluation, and career incentives.

A recent study shows the possible benefits of increased funding to transform Colombia’s education policy. The Compartir Foundation study, *After teaching excellence: Improving the quality of education for all Colombians* (2014), proposes a systemic policy focused on teaching excellence. Research shows that it is financially feasible to achieve the suggested management changes and adjustment of funding sources: “the initial annual cost is approximately 1.8 billion pesos, which would amount to about 3.4 billion dollars per annum.... The cost would not exceed in any year 0.3 % of Gross Domestic Product (GDP), 1.7 % of the central government or 9 % of the Ministry of National Education’s budget.”

A greater investment in education is one of the main determinants when addressing the improvements required for Colombia’s educational policy and its implementation. It is clear that we need to achieve increased and sustainable public investment where allocations to education are sustainable, given that the education investment in Colombia (4.4 % of GDP) is lower by more than one point of GDP than Mexico, Brazil, Uruguay, Venezuela, Costa Rica, and Argentina.

Birth of a Movement

Everyone for Education is a citizen-organized movement seeking to include education as a national priority. Its young founders view Colombia’s poor-quality education system with great concern, as it increasingly marks inequalities in the country, particularly in rural areas and vulnerable populations. Recognizing that education is the main tool to build socially inclusive development and therefore peace, the movement has focused its efforts on proposals to structurally transform education.

Inspired by models like those of Brazil, Chile, and Mexico, Colombia’s Everyone for Education is built upon permanent citizen mobilization and an awareness of the importance of education as a national priority, as a matter that pertains all: families, young people, teachers, social, political, and economic sectors, and the media. In a diverse country marked by armed conflict for over 50 years, Colombia requires an inclusive educational process that takes into account local realities and draws on the strengths and initiatives that have emerged, even amidst conflict.

Colombia has undertaken various construction processes for proposals that seek to improve the quality of education in different areas; for many years, there has been collective construction and documents containing specific proposals to implement improved quality and access to education.

In its initial phase, the Everyone for Education movement raised an agenda to transform the vision of education in the country, and this has been endorsed by over 9,000 members who joined via the website www.todosporlaeducacion.co. Using the movement's 10-point proposal, "Pact for Education," members have gained the support of various institutions, other citizens, and politicians towards the national mobilization around education. Furthermore, 26 elected members of congress and five 2014 presidential candidates have joined and expressed a commitment to install education as a national priority of the next government.

The 10 Points of the Pact for Education

Education Is a National Priority

The fate of the country depends on education. We believe that investing in education is a pathway to economic and social development for Colombia. Therefore, education should always be a priority of government at all levels, political parties, labor organizations, and civil society in general. In particular, the priority should be reflected by the state in national plans and regional development, financial projections, and resource allocation. This requires coordination and work beyond what is already established.

The Objective of Education Is to End Inequality and Build a Democratic and Peaceful Society

Education should be directed to form analytical citizens, independent, respectful of diversity, innovative, peacemakers, and responsive to local and global needs. Global needs demand innovative and creative solutions, people who are able to solve problems, work in groups, speak other languages, and understand technologies. Education must be accessible to any person born in Colombia—regardless of their ethnicity, gender, social class, religious creed, visible or invisible disability, political affiliation, or sexual orientation—to ensure that all persons have access to the same opportunities to enter the labor market and have the necessary skills to develop as engaged citizenry. This concept of education will build a democratic, egalitarian, prosperous, and competitive population, able to meet the challenges peace-building brings society. To achieve this, it is essential that education is a priority to close the existing gaps between urban and rural areas, public and private schools, and socioeconomic differences. Instead of a space of segregation, a school should be a place for social integration.

Quality in the Education Policy

Recognizing the significant advances achieved in coverage in primary and secondary education, Colombia's education policy should focus on quality improvement via the following measures:

- (i) The effective implementation of the standards defined in law and education plans with particular emphasis on the development of quantitative skills and literacy.
- (ii) Increasing and constant maintenance of school equipment and infrastructure, and municipal schools should be supported by national, local government, and civil society.
- (iii) The implementation of extended daily attendance at school with a view to the gradual implementation of a full day at school at all levels of preschool, elementary, and secondary education (currently, many students study part-time to enable other students to study in the afternoons) via extracurricular activities in spaces designed to enhance their learning, such as libraries and sports complexes.
- (iv) The continued implementation of universal and controlled tests that will be corrected and improved with a defined periodicity, and to inform students, schools, and teachers about their progress and areas for improvement. Tests should be focused on promoting students' critical and analytical skills.
- (v) Respecting the ethnic and linguistic diversity of our country, bilingualism should be a priority on education and teachers and students should be able to improve their skills in a second language that is internationally competitive and provide them with access to knowledge developed in other countries. Student exchanges and salary incentives for teachers and an adequate mastery of a second language must be taken into account when designing a new public policy in education.

Excellent Teachers for Better Education

Teachers are a key element in improving the quality of education in Colombia. Thus, teaching excellence deserves an extra point in the present pact. We propose the following:

- (i) Strengthen teaching degree programs and search tools to improve previous and in-service training with actions such as financing the costs of college prospects or developing special programs in teaching service.
- (ii) Encourage the vocation of teaching in the best graduates and students through scholarships for their training as teachers.
- (iii) Encourage the involvement of professionals who are not teachers, exploring options such as scholarships for a university degree in education.
- (iv) Support those entering teaching with strategies such as mentor support with quality teachers to ensure proper development in the early years of service.

- (v) Ensure the effective implementation of periodicals for the continuous improvement of teaching quality assessments.
- (vi) Implement a competitive compensation for faculty that encourages a greater range of salary scales or performance bonuses to teachers and those better skilled and qualified according to assessments, to acquire a higher vocational training and those working in remote areas.
- (vii) Undertake an awareness campaign for the dignity of the teaching profession and increase recognition for teaching.

Education Is the Point of Integration for Families, Communities, the Government, and the Corporate Sector

We need to increase the involvement of families in education and create awareness at the community level of the importance of promoting education and the quality of education received by children and young people in Colombia. Communities need to strengthen their participation in decision making for the development of schools, and the government needs to ensure effective options. Once done, all educational establishments must publicly post the annual results of institutional assessments so that the entire educational community is aware of the scope of the educational quality of the institution. Education and infrastructure should be seen as a cornerstone for building cities and creating community, offering open schools to families. In addition, the family will participate in the governing bodies of the schools and in the choice of governing bodies by education departments.

Improve Control, Monitoring, and Accountability

Mechanisms and tools that guarantee the proper implementation of education policy and more effectively monitor and regulate the education sector must be created. Follow-ups must be conducted on the quality of each campus and ensure that any complaints and grievances of parents and students are heard and incorporated without compromising the decentralized nature of the education sector in Colombia. Local success stories should be replicated while monitoring educational quality.

Increase Funding for Education

Education spending must respond to the fact that education is a top priority of Colombia. The distribution of resources among different categories of domestic spending should reflect this. The financing of the objectives in this pact, with a focus on the quality of education, should become viable with additional tax revenue or reallocations in the national budget.

Understanding Early Childhood as the Basis of the Educational Process

The educational component must be consolidated from a fundamental axis in the effective implementation of a public policy of comprehensive early childhood care. The early years of a child's life are crucial to their chances of future development and are the basis of the entire education system. Thus, the possibility of improving the quality of education and closing the existing achievement gap can come from the appropriate public provision of pre-kindergarten programs, sufficient food, and access to quality educational spaces for children during their early years of life. There must be an integration with preschool education and the strengthening of the technical capacities of national and regional institutions and actors (including the professionalization of community caregivers) who are responsible for the care and development of children in their early childhood.

Diversified and Inclusive Access to Technical, Technology, and Professional Education

Technical and technological education is an engine of economic progress and higher education, and a key to innovation that also enables mobility and social integration. We seek to promote the following:

- (i) An increase in the resources invested in science and technology. In particular, resource royalties for innovation, which should be used in a relevant, timely, and efficient way along with assessments and monitoring of their destination.
- (ii) Substantial systems of public and private scholarships to students with good academic performances who demonstrate financial need. Civil society support initiatives of universities and tax incentives for donations will be strengthened. The state will fund scholarships for the most vulnerable population.
- (iii) The integration of technical and technological education and the business sector, using mechanisms such as dual training. SENA (Colombia's technical public school) must focus on increasing teacher quality and relevance. It is necessary that the state explore alternatives to increase coverage for scholarships at other institutions providing technical and technological training program accreditations.
- (iv) Investing in improvements in the quality of education in public universities via a quality faculty. The number of PhDs in teaching must also increase.
- (v) Increase coverage, especially in regions with reduced access and lower-income populations.
- (vi) Enter a general integral approach to the internationalization of higher education.
- (vii) Strengthen career exploration of students. Internships should be encouraged especially in the final grades of school, enabling better informed decisions.

We Will See that This Pact Is Fulfilled

The supervision and monitoring group that will accompany the development of the present pact will comprise a technical team as well as a Technical Advisory Committee. The committee will define indicators and targets to ensure compliance and accompany government actions so that the pact's goals are achieved. The group will continue month-to-month meeting commitments, with reports made through appropriate channels.

After the publication of the pact and the commitment of over 22,000 citizens throughout Colombia, the movement created a 30-year plan, the Grand National Education Agreement, outlining essential goals and indicators for the new period of government. For this, the movement has the support of organizations like Fundación Empresarios por la Educación, Fundación Compartir, Fundación Corona, the Chamber of Commerce of Bogotá, Ford Foundation, Federación Colombiana de Educadores, Naciones Unidas, and various universities and higher education institutions including CESA, EAFIT, CENTRAL, and UTP.

We have invited all sectors of society to engage, discuss, and contribute to the formation of the agreement, which is based on an initial seven-point agenda that will be made available to Colombia's citizens during a consultation process, which aims to bring together various stakeholders. We see the stakeholders as not only experts and decision makers but also those who are involved in the daily functioning of the education system. The methodology included virtual consultations, participatory workshops in different parts of the country, and expert panels on each of the points. The contributions were intended to feed the agenda and lead to the construction of policy guidelines that will be eventually accepted by the relevant authorities and the general public, to guide the management of education in the medium and long term.

Eight roundtable discussions included consultation with experts, focused on four themes: Early Childhood, Primary and Secondary Education, Higher Education, and Funding. Two discussions will include meetings with members of the Mission of the Wise for the validation of the 30-year vision for education in Colombia, and eight regional roundtable discussions will focus on regional themes in Caquetá, Boyacá, La Guajira, Santander, Valle del Cauca, Atlantic, Antioquia, and Bogotá. Additionally, the education agreement will include forums and debates at universities and other social settings on the importance of education and the objectives of the initiative. Furthermore, the initiative will include fun days, marathons for education, symbolic activities, social mobilization, and communication networks to increase awareness about the importance of ensuring that education is regarded as a national priority.

Juan David Aristizábal BA in Business, CESA Business School. Co-founder of Buena Nota, Ashoka Fellow, awarded Fulbright scholarship, one of the 30 Under 30 by Forbes Magazine, MTV Millennial Award, and a professor and member of the CESA board.

CESA Business School, Carleton University
Ottawa, ON, Canada

Juan David Aristizábal

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Chapter 1

Introduction. Democratizing Higher Education and Science in Latin America

Manuel Heitor and Hugo Horta

1.1 Introduction

This introductory chapter reflects the overall goal of this book to discuss the role that integrated science and higher education policies may play in further democratizing and promoting socioeconomic development in Latin America. The chapter suggests that this may be achieved via two complementary goals: (i) broadening access to knowledge via the formal learning processes of higher education, as well as fostering informal processes of science culture; and (ii) promoting the advanced qualification of people while strengthening research institutions. The rationale for our approach is related to the need for a sufficiently stable environment to train and supply talented people, including researchers, for knowledge-intensive, fast-paced, and uncertain labor markets. This gains relevance vis-à-vis the growing demand for higher education by populations seeing education as necessary for social mobility (Altbach et al. 2009). In response to the explosive social demand for higher education, competitive globalized markets, and the vast sociopolitical transformations already induced by new waves of educated youth, countries face the need and the opportunity for greater investment in science, technology, and higher education (Roberts and Hite 2007). This is a fundamental issue for Latin America. Social

M. Heitor (✉)

Center for Innovation, Technology and Policy Research, IN+, Instituto Superior Técnico,
University of Lisbon, Lisbon, Portugal
e-mail: mheitor@ist.utl.pt

H. Horta

Division of Policy, Administration and Social Sciences Education, Faculty of Education,
The University of Hong Kong, Hong Kong, Hong Kong

Center for Innovation, Technology and Policy Research, IN+, Instituto Superior Técnico,
University of Lisbon, Lisbon, Portugal
e-mail: hugo.horta@ist.utl.pt; horta@hku.hk

unbalance in education and the need to enlarge the human capital pool have been longstanding challenges for Latin American countries attempting to sustain socio-economic development (Carlson 2002).

For most Latin American countries, the main challenges are threefold: first, to broaden access to higher education; second, to make this access more socially balanced (see, for example, Kohli 2009); and third, to move ahead in terms of investment in knowledge production and diffusion. For example, Brazil's gross enrollment ratio in higher education was 29 % in 2012. Although this figure is above the level of gross enrollment ratio defined by Martin Trow (2007) for typical "elitist" higher education systems (i.e., approximately 15 %), the country's percentage of the population aged 25–64 years that has attained tertiary education was below 12 % in 2011 (Fig. 1.1). A similar trend in net enrollment rates is observed in other Latin American countries, including El Salvador (25 %) and Mexico (29 %), and to a lesser extent in Paraguay (35 %) and Peru (43 %). Puerto Rico (86 %), Argentina (79 %), and Chile (74 %)¹ are evolving towards "universal" higher education systems, with net enrollment rates well above 60 %. Still, the gap in qualifications in these countries is a reality. For example, the percentage of the population aged 25–64 years that has attained tertiary education in Argentina was below 14 % in 2011 (Fig. 1.1). With the notable exception of Chile (as it is characterized by relative qualification levels similar to France and Germany), Latin American countries have low-skilled active populations, sharing with Mediterranean basin countries the challenge to further qualify their population (Giordano and Pagano 2013).

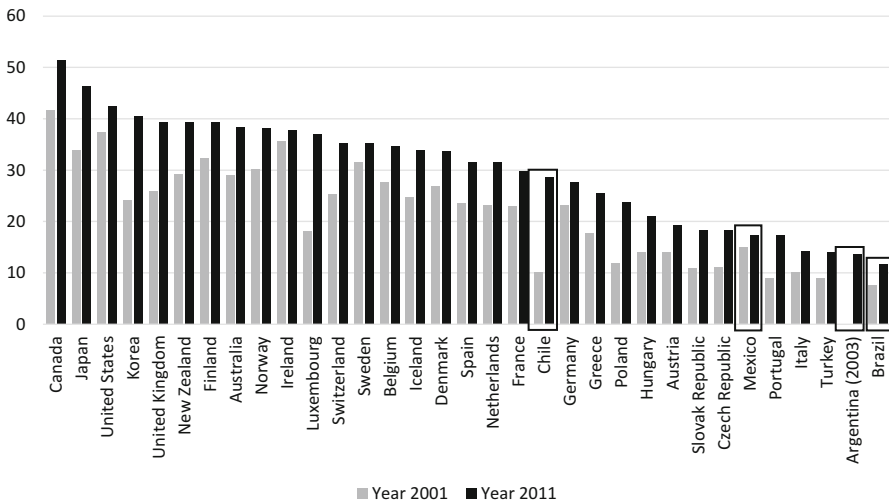


Fig. 1.1 Percentage of the population (aged 25–64 years old) that has attained tertiary education, 2010/2011 or latest available year (Source: UNESCO, OECD, IBGE, CNPQ)

¹Data from UNESCO for 2012 or the last available year; data from Brazil refer to the National Higher Education Census of 2013.

Our analysis suggests that increasing the qualifications of the labor force must be achieved together with the challenge of making access to education more socially balanced. The current unbalance can be seen in Fig. 1.2, which shows that the majority of students enrolled in higher education in Latin American countries are still mostly from those families with the highest income. In Chile, a country with a universal higher education system, 62 % of the highest income quartile population of tertiary education age is enrolled in higher education compared with only 21 % of those from the lowest income quartile. In Brazil, approximately 47 % of the highest income quartile population of tertiary education age is enrolled in higher education, while only 5 % of the lowest income quartile population is enrolled in tertiary education. The social unbalance in higher education access is affecting Latin American countries in different stages of higher education development and maturity. This needs to be tackled to meet globally accepted equity standards towards sustainable societies, where broad access to education potentiates the formation of highly trained labor forces and their contribution to social and economic development.

A trend is, however, observable in Fig. 1.2: the relative participation of students from different income quartiles is always greater in countries with greater enrollment in higher education, underlining the need for policies that foster the enrollment in tertiary education and guarantee that education will be at the center of social mobility processes. To increase participation in higher education, there is the need for a qualified body of teachers, and not only for higher education institutions.

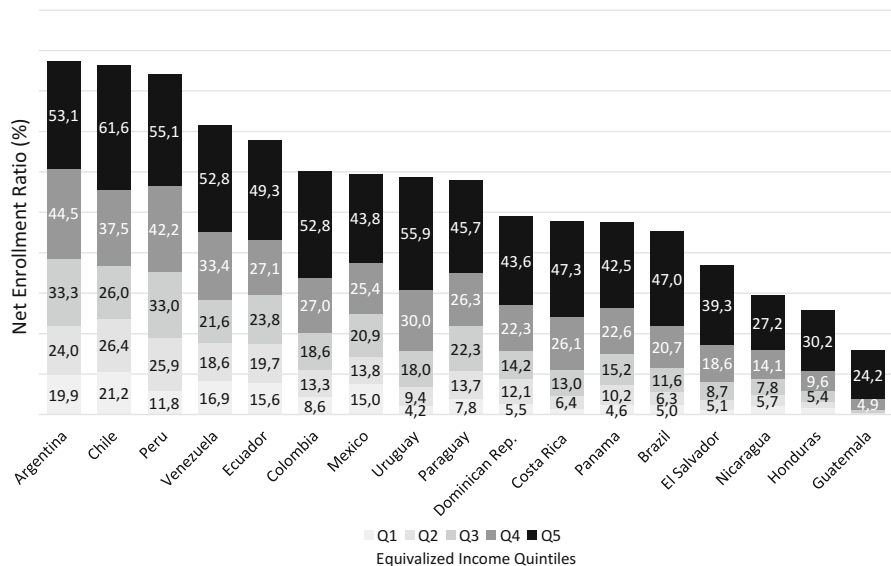


Fig. 1.2 Net enrollment rates for tertiary education by income quintiles, 2012 or latest available year (Source: SEDLAC (Socio-Economic Database for Latin America and the Caribbean) – Universidad Nacional de la Plata and the World Bank)

Students in primary and secondary education must also be prepared with solid learning bases. The analysis of Brazil’s STEM education by Horta and Noronha Lisboa Filho (2014) highlights the importance of training qualified teachers for all educational levels to support learning at tertiary education and also the performance of research and development (R&D). However, investment in R&D, critical to facilitate conditions to nurture knowledge intensive environments where researchers, academics, and teachers can be trained and develop learning activities, remains relatively small (Battelle 2013). The gross expenditure on R&D in Brazil has not surpassed 1.3 % of GDP, and in Argentina it has been as low as 0.6 % (Fig. 1.3). Overall, the region lags in R&D capacity to support new knowledge creation and the adequate training of teachers for all levels of education.

Taking this context into account, the advancement of knowledge institutions together with higher education assumes critical relevance in Latin America. However, how can integrated science and higher education policies be appropriately framed to foster this process? This question has driven the research behind this chapter and the other chapters of this book. The chapters emphasize the way public policy can open new opportunities for modernizing higher education systems in Latin America in the years to come, as well as improve access to higher education, and to better qualify the labor force. In doing so, international references are used wherever appropriate to facilitate the discussion of lessons learned elsewhere, but we avoid the temptation of using them for emulation purposes. Thus, the approach of this book strengthens the message of Nowotny et al. (2003) that science is contextualized and needs to consider the social construction of knowledge-based systems (Bijker et al. 1987), together with the fostering of “inclusive learning” (Conceição and Heitor 2002).

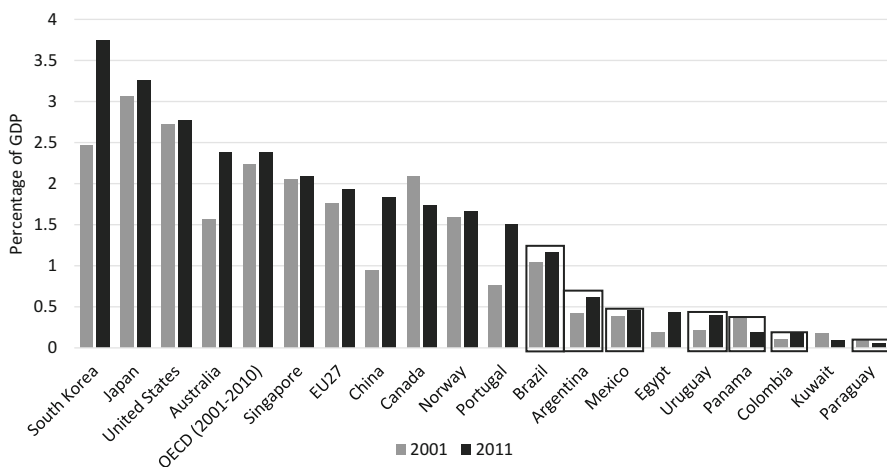


Fig. 1.3 Gross expenditure on R&D as a percentage of GDP, selected countries, 2001 and 2011

1.2 Research Framework and Analysis

In the following paragraphs, we present and discuss our main arguments about higher education systems and related public policies in Latin America. Our analysis draws from international comparative studies, fieldwork, and interviews conducted over the last 3 years, in addition to our own experience as researchers and policy-makers in the field of science and higher education policy. On-site visits and many discussions with researchers and policymakers were carried out in Brazil (Rio de Janeiro, São Paulo, Brasília, Rio Grande do Sul, Fortaleza), Colombia (Bogota, Medellín, Cartagena), Argentina (Buenos Aires), and Chile (Santiago), addressing challenges for higher education and science policies. The work involved participation in a policy research workshop organized by the World Bank, the OCDE and the Brazilian Development Bank in Rio de Janeiro (October 2011), a school of advanced studies at the Federal University of Rio de Janeiro (UFRJ, March 2013), two research workshops in Fortaleza, Ceará (September 2012 and December 2013), and an education and innovation summit in Bogota (May 2014). A major event and research workshop was organized in Porto, Portugal, in October 2013, bringing together over 800 experts in science, technology, and innovation (ST&I) policies based in Latin America.²

These debates, discussions, and exchange of ideas have underlined the need to consider the process of developing human capital, but also the role that higher education and scientific institutions have in facilitating it. Human capital is vital for the creation and dissemination of knowledge (Lall 1990), and striving towards greater human capital is of the utmost importance for both developed and developing countries. This ultimate goal requires, per se, policies and strategies towards effective institutional autonomy and integrity of knowledge institutions. For universities, this is particularly important in a context where alliances and partnerships among universities worldwide, and with corporations, gain significant relevance. Our analysis shows that universities need to be both *adaptable* and *resilient*, and this requires policies towards their institutional autonomy and integrity. It also highlights the need to give constant priority to people and knowledge in a way that provides networks of institutions with a critical mass capable of promoting the international standing of scientific and higher education institutions.

Two further issues should be noted. First, innovation must be considered together with competence building and advanced training in individual skills through the complex interactions between formal and informal qualifications (Helpman 2004). This requires broadening the social basis for knowledge activities, including higher education enrollment, and strengthening the upper levels of the research system leading to top-quality knowledge production. Figure 1.4 underlines the importance of having a critical mass of researchers to create and reshape knowledge. The most developed countries have high rates of researchers per 1000 labor force, and are striving to increase these rates further (see the case of the OECD countries). With

²ALTEC 2013, <http://www.altec2013.org/>