Chapter 1. Overview, achievements and issues

This chapter opens with a brief description of the Colombian context, the country's education system, how Colombia fares in international comparisons and key aspects of its tertiary education system, including institutions, students enrolled, the returns from education, access and admission, quality and relevance, financing, academic staff, research and the government's future plans for the tertiary sector.

The chapter records Colombia's significant achievements, which include recent growth in participation, diverse institutions, sound national planning, public agreement on the importance of equitable access and excellent student support and educational evaluation agencies. Many challenges are also recorded: these include limited resources to fulfil plans, students under-prepared for tertiary education, as-yet-unequal access, high dropout, quality issues, limited research and internationalisation and a lack of institutional accountability.

Overview

About Colombia

Colombia is the fifth largest country in Latin America, covering an area of 440 831 square miles (1.14 million square kilometres). The country's geography and ecology are among the most varied in the world. Though most urban centres are located in the highlands of the Andes mountains, Colombian territory also encompasses Amazon rainforest, tropical grassland and both Caribbean and Pacific coastlines.

There is also great diversity among Colombia's population of 46.5 million people.[1] Latin America's third largest after Brazil and Mexico. Colombia's ethnic mix includes descendants of the original native inhabitants, Spanish colonists, Africans brought as slaves and twentieth-century immigrants from Europe and the Middle East. This diversity has produced a rich cultural heritage.

The country is rich in natural resources with substantial oil reserves and is a major producer of gold, silver, emeralds, platinum and coal. Historically, the rich families of Spanish descent benefited from this wealth to a greater extent than the majority, mixed-race population. Colombia's history in the 20th century was marked by very high levels of political violence, with armed conflicts between Conservatives and Liberals and a succession of agrarian uprisings, leading to the creation of several left-wing guerrilla groups that took control of large parts of the country's territory, especially in the jungle areas of the north and east. Subsequently, the lucrative returns from drugs and kidnapping came to dominate the rebels' agenda, and left-wing guerrillas were joined by right-wing paramilitaries. The conflict has lasted four decades. At one stage the government lost control of large swathes of Colombian territory, especially in the jungle areas of the north and east, to the rebels. Over the past ten years, the government has had some spectacular successes, regaining control of much of the rebel-held territory. Though the conflict is by no means resolved, hopes that the end may be in sight were further boosted by recent progress against armed insurgents.

Despite the armed conflict, Colombia's economy has experienced positive growth over the past decade. The economy continues to improve, mainly because of austere government budgets, focused efforts to reduce public debt levels, an export-oriented growth strategy, an improved security situation, high commodity prices and government policies that have engendered growing business confidence. Recent economic success culminated in 2011 in the passage of the Free Trade Agreement with the United States. Colombia is very proud of its "economic miracle", and the government now aspires to join the OECD.

Government and politics

Colombia is a republic with a democratic government, headed by the president, who is both head of state and head of government, the vice president and the council of ministers. The president is elected by popular vote to serve four-year terms (a maximum of two, though since 2006 they can be consecutive). Members of both houses of the Colombian congress are elected by popular vote, two months before the president is elected – the 102 senators on a national basis and the representatives by every region and minority group. They too serve four-year terms and can be re-elected indefinitely.

Colombia has seven major political parties – in rough order of congressional seats held in January 2011, these are: Social National Unity (U) Party, Conservative (PC) Party, Liberal (PL) Party, Radical Change

(CR) Party, National Integration (PIN) Party, Alternative Democratic Pole (PDA) Party and Green Party – and numerous smaller movements.

Colombia is divided into 32 departments plus the capital district of Bogota, which is treated as a department (Bogota also serves as the capital of the department of Cundinamarca). Departments are subdivided into municipalities, each of which is assigned a municipal seat, and municipalities are in turn subdivided into *corregimientos*. Each department has a local government with a governor and assembly directly elected to four-year terms. Each municipality is headed by a mayor and council, and each *corregimiento* by an elected *corregidor*, or local leader. At the provincial level the legislative branch is represented by department assemblies and municipal councils. All regional elections are held one year and five months after the presidential election.

Other cities which have been designated districts (in effect special municipalities) are Barranquilla, Santa Marta, Cartagena and Buenaventura. Some departments have local administrative subdivisions, where towns have a large concentration of population and municipalities are near each other (for example in Antioquia and Cundinamarca). Where departments have a low population and there are security problems (for example Amazonas, Vaupés and Vichada), special administrative divisions are employed, such as "department *corregimientos*", which are a hybrid of a municipality and a *corregimiento*.

Economy and society

The country's labour force is estimated at 21.78 million. Of those employed, 9% are believed to work in agriculture, 38% in industry and 53% in services. The country's most important industries are textiles, clothing, leather products, footwear, processed food and beverages, paper and paper products, chemicals and petrochemicals, cement, construction, iron and steel products, metalworking, coal and petroleum. Also its diverse climate and topography allows the country to benefit from a great variety of crops, including coffee, sugar cane, flowers, cacao beans, rice, cotton, and tobacco, among others (CIA World Factbook, 2010 estimates).

The national unemployment rate was 9.6% in the trimester August-October 2011. The unemployed are defined by the National Admnistrative Department of Statistics (DANE, *Departamento Administrativo Nacional de Estadística*), as people 12 years of age and older who did not work for at least one hour during the last week and who actively sought work during the last two weeks and are available to start working. In the same trimester 31.9% of the employed were regarded as "subjectively underemployed" (workers who want to earn more income, work more hours, or work in a job

more relevant to their skills) and 11.6% as "objectively underemployed" (workers with the same aspirations as the subjectively underemployed but who have taken steps to change their situation and are available for work of the desired type).

Colombia's economy has a large "informal sector", defined as including all those who work independently or in very small firms that do not have to comply with some or all the legal requirements applying to larger firms, in relation to company registration, paying taxes, registration in the national social security system and book-keeping. The 2010-2014 National Development Plan (DNP, 2011) notes that in Colombia in 2009, over 60% of workers did not contribute to social security and were thus considered part of the informal sector**.**

The country's currency is the Colombian peso (COP). In 2010 its GDP was USD 285.5 billion and its GDP per capita was USD 6 273 (World Economic Forum, 2011). The World Bank classifies Colombia as an upper middle income country, with the fourth largest economy in Latin America. The economy expanded faster than the rest of Latin America (5.0% vs. 4.1% per year) between 2002 and 2008. Following this period of broad-based economic growth, the economy was not affected too severely by the global economic crisis: it remained one of the few countries in the world with positive growth between 2008 and 2009. By 2010, the economy had largely recovered from the slowdown, although a collapse in exports to Venezuela has held back some economic expansion. GDP growth increased by 4.3% in 2010 compared with 1.5% in 2009. The main factors that cushioned Colombia and helped it to recover steadily from the effects of the global economic crisis were a responsible fiscal policy; a monetary policy based on an inflation targeting regime complemented by a floating exchange rate; and sound macro and micro prudential policies combined with a solid financial system (World Bank, 2011).

Economic growth in Colombia has been accompanied by poverty reduction. Between 2002 and 2010, poverty fell from 49.4% to 37.2%, while the proportion of the population that could not satisfy basic nutritional needs (the extreme poor) declined from 17.6% to 12.3%. The decline in poverty is commendable, but given Colombia's economic performance since 2002, the country's progress in reducing poverty falls below that of regional peers. Factors contributing to poverty in Colombia are high food prices and transport costs, in comparison with other countries in the region, and an over-protected agricultural sector (World Bank, 2011).

While poverty has been reduced, inequality remains stubbornly high. Colombia has the 7th highest Gini coefficient (0.578) worldwide, with inequality levels comparable to countries such as Haiti, Angola and South

Africa, all of which have much lower GDP per capita than Colombia. The main reason for Colombia's relative rise in the ranks of inequality is that other countries are becoming more equal. This is particularly true for other upper-middle income economies in Latin America, such as Brazil. Another important reason is limited fiscal redistribution, in terms of taxation and transfers, by Colombia's government. In 2008 almost 80% of all monetary transfers benefited the richest 20% of the population, while the poorest quintile received only 3% (Núñez Méndez, 2009; World Bank, 2011).

Another reason why inequality remains high is that Colombian labour markets have been unable to translate growth into widespread access to high quality jobs. Unemployment and informality in Colombia are among the highest in the region, driven by relatively high minimum wages (relative to Colombia's GDP per capita), high non-wage labour costs, and high payroll taxes as a fraction of wages. Gender inequality in the labour force contributes directly to inequality and to further labour market rigidities. High inequality levels are also reflected in relatively low levels of social mobility in Colombia, compared to Mexico, Peru and especially the United States (World Bank, 2011).

Disparities across and within the departments of Colombia are significant. This is one of the main issues mentioned in the National Development Plan 2010-2014. For instance, per capita income in Bogota is five to six times higher than that of the departments of Chocó and Vaupés; also, while the percentage of the population with unsatisfied basic needs is less than 20% in Bogota, in the Departments of La Guajira, Vichada, and Chocó this percentage is greater than 65%. Therefore, considerable differences are found in many areas, such as education. The rate of illiteracy exceeds 20% in the Departments of La Guajira, Chocó, Guaviare, Vaupés, and Vichada, while in Bogota, the Departments of Atlántico, Quindío, Risaralda, San Andrés or Valle del Cauca this rate is close to 6%. Furthermore, inequity within departments is alarming. For instance, within the Department of Bolívar, while the percentage of population with unsatisfied basic needs in Cartagena is 25%, this proportion is more than 76% in twelve municipalities of the same department such as San Jacinto, El Carmen de Bolívar and Santa Rosa.

In the World Economic Forum's (WEF) 2011-12 *Global Competitiveness Index*, Colombia ranked 68th of 142 countries, the same position as the previous year but with an improved score. Colombia's overall ranking was below those of Chile (31), Panama (49), Brazil (53), Mexico (58), Uruguay (63) and – by a whisker – Peru (67), but significantly above those of Argentina (85), Ecuador (101), Bolivia (103), Paraguay (122) and Venezuela (124). Overall, the country's competitiveness rankings are fairly typical of what the World Economic Forum calls "efficiency driven

economies". As the WEF report noted, the country's competitive strengths include a sound and stable macro-economic environment characterised by a low inflation rate and manageable levels of public debt and deficit; an improving education system; and a large domestic market. On the other hand, the report noted that despite the government's sustained efforts to improve social pacification and eradicate organised crime, security concerns remain very high on the list of factors dragging down the country's competitive potential; and that Colombia also needs to improve regulation and transport infrastructure. The four most problematic factors for doing business identified in the WEF's survey of Colombian executives were: corruption; inadequate infrastructure; inefficient government bureaucracy; and difficulties in accessing financing.

The country's official language is Spanish, and 90% of the population is Roman Catholic. Life expectancy is 74.55 years (71.3 for men, 78 for women) (CIA World Factbook, 2011 estimates). The population is concentrated in the Andean highlands and along the Caribbean coast. The nine eastern lowland departments, comprising about 54% of Colombia's area, have less than 3% of the population and a density of less than one person per square kilometre. Traditionally a rural society, movement to urban areas was very heavy in the mid-twentieth century, and now over 75% of the population live in urban areas (CIA World Factbook, 2010 figures). Over 7.5 million people live in the capital Bogota while Medellin and Cali have populations of over two million people each, and Barranquilla is home to over one million. Sixty-two other Colombian cities have populations of 100 000 or more.

Colombia's education system

The Constitution of 1991 defined education in Colombia as a civic right and a public service, with a social function. It made school compulsory from five until fifteen.

Colombian children go to pre-school up to the age of 5; primary education from 6-10 (grades 1-5); lower secondary education from 11-14 (grades 6-9); and upper secondary education from 15-16 (grades 10-11). Colombia has both public schools, which are attended by 85% of secondary pupils, and private schools, which are attended by 15% of secondary pupils.[2] From 2012, public schools are free until the end of upper secondary schooling, though previously they were free only until the end of primary schooling; private schools are fee-paying. Table 1.1 shows gross and net enrolment rates. The gross enrolment rates are much higher than the net enrolment rates, indicating a considerable degree of repetition (*i.e.* making under-performing students repeat school years) in the system. The review team understands that the Colombian government tried to reduce the amount of repetition by issuing a decree limiting it to 5% of pupils; but repealed the

decree when it became clear that pupils were reaching higher classes without the preparation to succeed there. Another issue in Colombia is that a large percentage of students do not enter the first grade on time.

Table 1.1 **Net and gross enrolment in the Colombian education system, 2010 (%)**

Education level	Net enrolment rate	Gross enrolment rate
Preschool (ages 3 to 5, grade 0)	61.8	89.4
Primary (ages 6 to 10, grades 1 to 5)	89.7	117.4
Lower secondary (ages 11 to 14, grades 6 to 9)	70.8	103.7
Upper secondary (ages 15 to 16, grades 10 to 11)	41.6	78.6
Tertiary (ages 17 to 21)	N/A	37.2

*Notes***:**

(1) Gross enrolment rate (UNESCO definition): total enrolment in a specific level of education, regardless of age, expressed as a percentage of the eligible official school-age population corresponding to the same level of education in a given school year. For the tertiary level, the population used is that of the five-year age group following on from secondary school leaving.

(2) Net enrolment rate (UNESCO definition): enrolment of the official age group for a given level of education expressed as a percentage of the corresponding population.

Source: MEN.

Since 2002, when the government of Colombia committed itself to a major education improvement programme called the Education Revolution (*Revolución Educativa*), coverage has been improving in all phases, but particularly in secondary education – between 2002 and 2009 net enrolment rates rose from 57.1% to 70.5% in lower secondary and from 29.5% to 39.8% in upper secondary. However, as the figures in Table 1.1 clearly show, substantial numbers are still not reaching the end of upper secondary schooling. Low coverage tends to be associated with rural rather than urban areas: upper secondary education is not offered in many rural areas, meaning that students must travel long distances if they are to continue to this level. Also, in the period to which the figures in Table 1.1 relate, the fees chargeable in the upper secondary phase, even by public schools, could well have been a disincentive to staying on.

Upper secondary education may be completed in either academic or vocational streams or schools. The Colombian school-leaving qualification is the *Bachillerato/Diploma de Bachiller,* broadly equivalent to a US high school graduation certificate. The graduation certificate is awarded by the student's school if teachers at the school consider the student's grades to be satisfactory. All students who wish to go on to a tertiary education

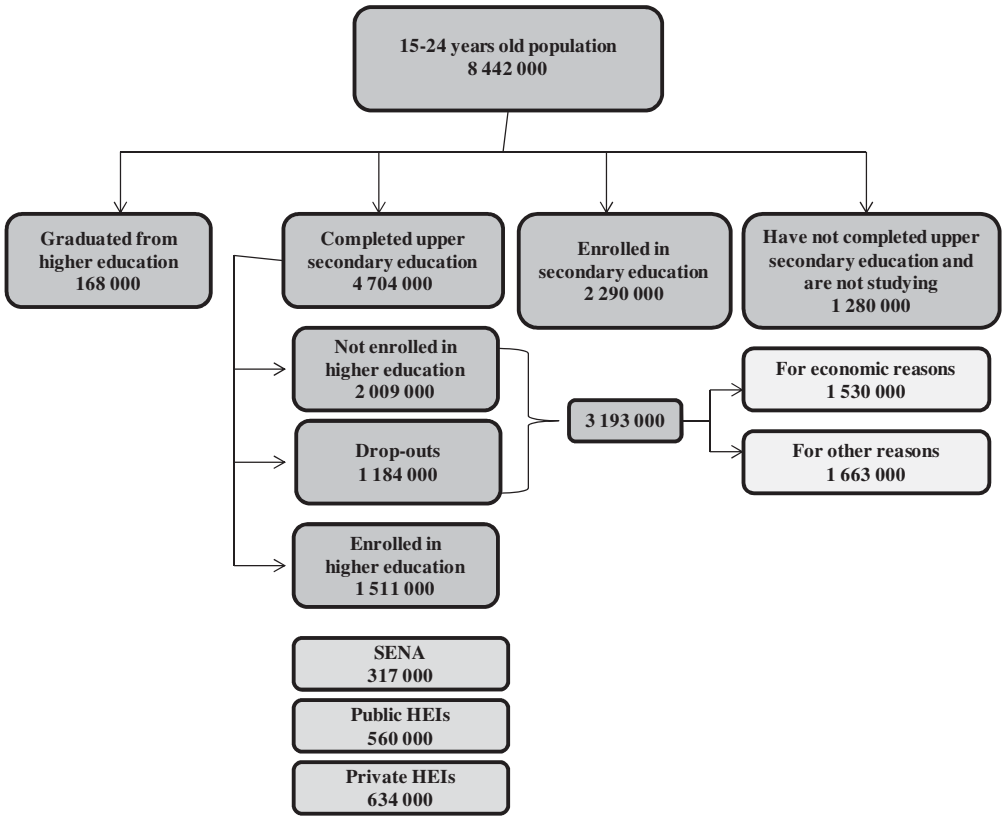
institution must also have taken a national exam set by the Colombian Institute for Educational Evaluation (ICFES, *Instituto Colombiano para la Evaluación de la Educación*) for 11th grade students (formerly known as the ICFES test and now officially known as SABER 11). However, schools may not take the test results into account when deciding whether or not to award a graduation certificate. As Table 1.1 shows, the gross enrolment rate in upper secondary education is just over 75%. The numbers who graduate from the 11th grade rose from 414 424 in 2002 to 691 852 in 2009, a 67% increase over 7 years (MEN, 2010). In 2010, 570 846 young people took the SABER 11 test.[3] Those who have both achieved a school graduation certificate and taken the SABER 11 test constitute the base population for entry to tertiary education.

Figure 1.1 shows what stage of education the 8 442 000 young people aged 15-24 in Colombia in 2010 had reached. Of the 15-24 year olds, 15.2% had not completed secondary education and were no longer studying; 27.1% were still in secondary education; 23.8% had left secondary education but never entered tertiary education; 17.9% had entered tertiary education and were still there; 14% had entered tertiary education but dropped out before graduating; and 2% had both entered tertiary education and graduated from it. Among the 37.8% who had either not entered tertiary education or had entered but then dropped out, 18.1% gave economic/financial reasons, 19.7% gave other reasons. Among the 17.9% who had entered tertiary education and were still there, 3.8% were in SENA centres, 7.5% were in private tertiary institutions and 6.6% were in (other) public tertiary institutions.

Standards in Colombian secondary education, according to international comparisons

The World Economic Forum's 2011-12 Global Competitiveness Report included rankings on a number of indicators relevant to education, training and research. Compared to its overall ranking of 68, Colombia ranked relatively well on university-industry collaboration on R & D (43), secondary enrolment (47), quality of management schools (53) and capacity for innovation (59); about the same for tertiary enrolment (64), internet access in schools (68), quality of scientific research institutions (69), brain drain (69), availability of research and training services (70) and quality of the education system (72); and less well on availability of scientists and engineers (77), quality of primary education (80), quality of math and science education (83), extent of staff training (84), net primary enrolment (100) and the ratio of women to men in the workforce (122, though the data underlying this indicator has now been questioned).

Figure 1.1 **Educational stages of young people aged 15-24**



Source: *Programa Colombiano de Crédito Educativo: Impactos y Factores de Éxito*, ICETEX, December 2010, p. 41.

The government of Colombia is keen to raise its national education performance to the levels typical of OECD countries and committed to learning from international experience. International comparisons suggest that the performance of Colombia's secondary students has some way to go to reach average OECD standards. Students' chances of entering and completing the tertiary programmes of their choice depend very much on the educational standards they have achieved by the end of secondary education; therefore it is worth looking in some detail at Colombia's results in international comparative studies of secondary students' performance.

In 2009 Colombia participated for the second time in OECD's Programme for International Student Assessment (PISA). PISA is a triennial survey of the knowledge and skills of 15-year-olds. It has been designed to

allow valid comparisons across countries and cultures. PISA 2009 (OECD, 2010) focused particularly on reading but also covered maths and science. PISA performance scales are constructed so that for each of the three subjects, the mean score among OECD countries is around 500, with about two-thirds of students scoring between 400 and 600 score points. A difference of 39 points equates to a year of schooling.

In the main domain tested, *reading*, Colombian students achieved a mean score of 413. This is 80 points below the OECD average of 493, indicating that at age 15 Colombia's students lag behind students in an averagely-performing OECD country such as the United Kingdom, by the equivalent of two years of schooling. When citing PISA rankings, OECD prefers to cite a range bounded by the highest and lowest possible rank where there is any statistical uncertainty. Colombia ranked 50th-55th among the sixty-five participating countries. Therefore Colombia's 15-year-olds performed less well than those in Chile (449, 44th), Uruguay (426, 46th-50th) and Mexico (425, 46th-49th); similarly to those in Brazil (412, 51st-54th); and significantly better than those in Argentina (398, 55th-59th), Panama (371, 61st-64th) and Peru (370, also 61st-64th).

In *mathematics*, the OECD average score was 496. Colombian students achieved a mean score of 381, or nearly three years' schooling behind an averagely-performing student in France, giving the country a rank of 56th-59th. Three Latin American participants scored significantly higher in maths: Uruguay (427, 45th-49th), Chile (421, 47th-51st) and Mexico (419, 49th-51st). Two, Argentina (388) and Brazil (386), scored higher but not significantly so. The remaining two, Peru (365) and Panama (360) scored significantly below Colombia. It is perhaps worth noting that all Spanish and Portuguese-speaking countries in PISA 2009 were further below the OECD average in maths than they were in reading.

In *science,* the OECD average score was 501. Colombian students achieved a mean score of 402, or two and a half years' schooling behind an averagely-performing student in the United States, giving the country a rank of 53rd-58th. Chile was Latin America's best-performing country in science (447, 43rd-45th), followed by Uruguay (427, 47th-49th) and Mexico (416, 50th-51st). The scores of Brazil with 405 (52nd-56th) and Argentina with 401 (53rd-59th) were not significantly different from Colombia's. Panama (376) and Peru (369) again lagged behind.

An in-depth analysis by the World Bank of the PISA 2009 results of the eight Latin American participants (Garcia-Moreno *et al*., 2011) notes that Colombia's results show big improvements since PISA 2006:

- In all subjects, Colombia's PISA 2009 scores showed statistically significant improvements over PISA 2006. Mean scores rose by

28 points in reading, 11 points in maths and 14 points in science. These gains are all the more impressive given the 6 percentage point increase in secondary education coverage between 2006 and 2009.

- Between 2006 and 2009, Colombia significantly reduced the numbers of low achievers, particularly in reading. Student scores are grouped into seven proficiency levels, with level 6 representing the highest scores and below level 1 the lowest scores. In each subject, level 2 is the baseline level. The proportion of Colombia's sample scoring below level 2 fell from 55.7% to 47.1% in reading, from 74% to 70.4% in maths and from 61% to 54.1% in science. However, Colombia's latest results still fall some way short of OECD averages: 18.8% below level 2 in reading, 22% below level 2 in maths and 18% below level 2 in science.

- Between 2006 and 2009 the difference between the best and worst five per cent of Colombia's PISA test-takers narrowed – by 48 points in reading, 37 points in maths and 11 points in science. This, combined with the fact that the average score of the lowest performing students rose in all three subject areas, indicates that both equity and quality of education improved over the period. Indeed, Colombia shows the smallest equity gap of all the Latin American participants in PISA 2009.

- Colombia's improvement in reading scores between PISA 2006 and PISA 2009 was the biggest in Latin America and put it among the top six countries in the world for improvement.

Despite the impressive recent progress, PISA 2009 outcomes show that there is still substantial room for quality improvements in the secondary education system which prepares Colombian students for tertiary education, employment and their future lives. Concerns include:

- The large numbers of 15-year-olds who scored below PISA level 2 – the baseline level – in one or more subject areas. Young Colombians with PISA scores below level 2 will have real difficulty achieving the standards required to function effectively in tertiary education and skilled jobs. This is particularly so because in the Colombian system young people leave secondary school after the 11th grade, at age 16 if in the age-appropriate year group, and thus many students have just one more full year of secondary education after the year in which PISA tests are typically taken – see description of Colombia's education system below.

- The very few 15-year-olds who scored at the highest levels, levels 5 and 6. Across the OECD, 7.6% did so in reading, 12.7% did so in maths and 8.5% did so in science. In Colombia, the equivalent figures were 0.5%, 0.1% and 0.1%, respectively.
- In maths, compared to other middle-income countries in PISA 2009 (Brazil, Argentina, Mexico, Uruguay, Montenegro, Romania and Bulgaria), Colombia had the lowest mean score of all – though, as mentioned above, the differences are not significant in the cases of Brazil and Argentina.
- Girls in secondary schooling in Colombia are further behind boys in mathematics and science, and less far ahead of boys in reading, than in any other PISA 2009 country:
  - In reading, girls outperformed boys in all participating countries and regions: the difference averaged 39 points across the OECD. However Colombia had the smallest difference of any of the 65 PISA 2009 participants – just 9 points, less than half of the difference in Chile and Peru, the two countries with the next smallest gender gaps. Though most Latin American countries have a smaller gap than average, as does Spain, Uruguay's bigger gap of 43 points proves that this need not be so.
  - In mathematics, by contrast, boys outperformed girls in most countries. The OECD average gender gap was 12 points in boys' favour. In Colombia the gap was 32 point in boys' favour, the biggest gap of any participating country. Of the other Latin American countries, Argentina's gap was less than the OECD average and in Panama, though boys outperformed girls, the difference between them was not statistically significant.
  - In science, there was no significant gender gap across the OECD, but there was in Colombia, where girls performed, on average, 21 points below boys. In no other participating country were girls at such a disadvantage. It is worth noting that girls outperformed boys in science in three Latin American countries, Uruguay, Panama and Argentina (although not by statistically significant margins).

The scale of Colombian girls' relative under-performance in secondary education will not only be dragging down the country's scores in international comparisons, but also leaving many girls less well-prepared than their male counterparts to compete for places in tertiary education and for future employment. This may contribute to low participation of women in the workforce in Colombia.[4]

Colombia has also participated in other international assessments of student performance, such as the Trends in International Mathematics and Science Study (TIMSS) of the International Association for the Evaluation of Educational Achievement (IEA). The most recent TIMSS results available are from 2007. They will not reflect all the quality improvement Colombia had achieved in secondary education by the time of PISA in 2009, but the results give the same key messages:

- Colombian students' average scores were some way below the scale average, which in TIMSS is 500. Fourth grade students (aged 10) scored 355 in maths, coming 30th out of 36 participating countries, and 400 in science, coming 29th. Eighth grade students (aged 14) scored 380 in maths, coming 40th out of 48 countries, and 417 in science, coming 39th.

- Colombia did however achieve dramatic improvement between the two TIMSS assessments in which the country had participated, 1995 and 2007. Only Colombia's eighth graders had participated in both years, but they demonstrated the biggest score increase of any participating country in maths (+47 points) and the second biggest score increase after Lithuania in science (+52 points).

- In all four TIMSS tests – 4th and 8th grade maths and 4th and 8th grade science – results showed more difference in favour of boys in Colombia than in any other participating country.

Tertiary education: institutions

This report will use the term "tertiary education" to encompass all the post-secondary formal education which Colombians call "e*ducación superior*", though the literal translation of this is 'higher education'. Traditionally, the term higher education referred only to academic education leading to degree qualifications, and was considered a subset of tertiary education, which also encompasses every other form of education leading to qualifications above the level of secondary schooling, such as vocational and technical education. Throughout the world, and certainly in Colombia, distinctions between tertiary and higher education are blurring. The government of Colombia has asked that this review cover education in both universities and the range of other institutions which provide technological and/or professional-technical training; and the review team believes that all forms and levels of tertiary education, university and non-university, have an important place in the system and in Colombia's future. Therefore this report will in general refer to tertiary rather than higher education.

There are four types of tertiary institution in Colombia:

1. Universities – these offer academic undergraduate programmes and graduate programmes leading to master's and doctoral degrees, and engage in scientific and technological research.
2. University institutions – these offer undergraduate programmes up to professional degree level and a type of graduate programme known as "specialisation" (a level of career-related qualification above bachelor's but below master's level).
3. Technological institutions – these offer programmes up to technologist level (distinguishable from professional technical level by their scientific basis), and may go beyond this to professional degree level provided the programmes in question are taught as "propaedeutic cycles". In the Colombian context this means that students proceed to their professional degree via first a technical, then a technological qualification conferring progressively wider and higher-level knowledge and skills in the same subject area.
4. Professional technical institutions – these offer professional/technical level training for a particular job or career.

A high school graduation certificate is the basic requirement for entry to tertiary institutions of the first three types. However, every institution decides its own admission standards and processes. Most (78%) use the results of the SABER 11 test, but most of these (72%) use the test in combination with other criteria.[5] As the SABER 11 test has no specific pass-mark, each institution sets its own minimum. Some institutions specify minimum grades in school graduation certificates, or require students to have taken particular subjects. Some set their own tests. Some interview candidates. Many use a mixture of methods. In Chile and a number of European countries, there is a national body co-ordinating the application processes of different institutions and/or acting as a clearing house for offers of places; no such body exists in Colombia, so students complete multiple applications to comply with the individual requirements of their chosen schools.

Table 1.2 shows the number of Colombian tertiary institutions, public and private, in each category in 2010. Figures in brackets show how the numbers in 2011 differ from those of 2007. It would appear that in both public and private sectors the numbers of higher-level tertiary institutions have risen while the numbers of technological and technical (T&T) institutions focusing on preparation for the labour market have fallen. It is not clear whether former T&T institutions have closed or been absorbed into larger institutions, or whether there has been "mission creep" and they have become higher-level institutions.

Table 1.2 **Tertiary institutions in 2011**

	Public 2011 (change from 2007)	Private 2011 (change from 2007)	Total 2011 (change from 2007)
Universities	32 (no change)	48 (+ 4)	80 (+ 4)
University institutions	27 (+ 4)	88 (+ 16)	115 (+ 20)
Technological institutions	12 (- 4)	42 (- 1)	54 (- 5)
Professional technical institutions	9 (-2)	30 (- 8)	39 (- 10)
Total	80 (-2)	208 (+ 11)	288 (+ 9)

Source: Background Report (MEN, 2011*a*).

Numbers in Table 1.2 exclude the training centres run by the following:

- SENA, the *Servicio Nacional de Aprendizaje* (National Training Service). SENA's main objective is to promote productive activities that contribute to the social, technological and economic development of the country. It is financed by a levy on employers of 2% of their payroll and has a number of functions, including running the public employment service. SENA provides a wide range of training programmes fee-free to learners, and enrols millions of people every year, though the vast majority are not in tertiary degree programmes. In 2010 SENA had 116 training centres. Table 1.3 breaks down SENA's total enrolment; only the T&T provision, which accounted for less than 4% of total enrolment in 2011, is tertiary. Labour technician training is at the level below professional technical; complementary training is mostly courses arranged for employers, but also training programmes for the unemployed and vulnerable groups. SENA has expanded its coverage remarkably over the last decade, including T&T enrolment. Although SENA enrolment in T&T accounts for 55% of total T&T students in the country, the institution itself remains primarily a provider of training services.
- The CERES, Regional Centres of Higher Education (*Centros Regionales de Educación Superior).* These centres were launched in 2003 with the aim of expanding educational opportunities for under-served regions. CERES programmes rely on regional resource-sharing partnerships between education institutions, government (national and local), the productive sector and, on occasion, SENA. Each CERES is run by one of the tertiary education institutions in the partnership. By 2010 164 CERES centres had been created in 31 departments; the 155 in operation had enrolled a total of 34 799 students, or just over 2% of the total enrolled undergraduate students.

Table 1.3 **SENA enrolment**

Programme type	2003	2004	2005	2006	2007
T&T and above	48 123	93 029	97 468	141 765	197 486
Labour technician	144 408	172 965	258 145	292 120	283 544
Complementary	2 070 851	2 698 805	3 497 739	3 714 924	4 672 158
Total	2 263 382	2 964 799	3 853 352	4 148 809	5 153 188

Programme type	2008	2009	2010	2011
T&T and above	249 654	255 422	296 686	353 104
Labour technician	322 999	509 463	667 544	666 389
Complementary	5 470 775	7 155 388	7 251 686	7 910 207
Total	6 043 428	7 920 273	8 215 916	8 929 700

Source: SENA, Sofía Plus. Disaggregation of tertiary figures (T&T and above) is from additional background data provided by MEN and SENA to the review team.

There are also some "virtual" tertiary programmes, offering 80% or more of content online, available at undergraduate (including T&T) and graduate level. The Colombian government is encouraging more institutions to offer online options as a means of increasing participation by students in remote areas. By 2009, 36 institutions offered such programmes, with over 4 000 students enrolled.

The structure of the tertiary education system, and the parts played in its governance by both the institutions and national agencies, are considered further in Chapter 2.

Tertiary education: students

Table 1.4 shows enrolment from 2002 to 2010. Undergraduate numbers have grown every year throughout the period, both on technical and technological programmes and on bachelors' degree programmes, as has the undergraduate coverage rate – from 24.4% to 37.1% over the period. This growth is impressive, but Colombia still has some way to go to reach the coverage rate of most OECD members: Table 1.5 shows comparable figures for a selection of OECD countries.

Table 1.4 **Tertiary students enrolled, 2002-2010**

	2002	2003	2004	2005	2006
Technical and technological (percentage of undergraduate total)	183 319	215 285	263 375	295 290	347 052
	(19.55)	(21.60)	(24.77)	(25.95)	(28.45)
Bachelor's	745 570	781 403	799 808	842 482	872 902
Total undergraduate (coverage as percentage of population 17- 21)	937 889	996 688	1 063 183	1 137 772	1 219 954
	(24.43)	(25.65)	(26.96)	(28.44)	(30.01)
Specialisation	55 133	43 783	39 893	45 970	47 506
Master's	6 776	8 978	9 975	11 980	13 099
Doctoral	350	583	675	968	1 122
Grand total	1 000 148	1 050 032	1 113 726	1 196 690	1 281 681

	2007	2008	2009	2010
Technical and technological (percentage of undergraduate total)	394 819	462 646	482 505	**542 358**
	(30.22)	(32.47)	(32.31)	**(34.16)**
Bachelor's	911 701	961 985	1 011 021	**1 045 570**
Total undergraduate (coverage as percentage of population 17- 21)	1 306 520	1 424 631	1 493 525	**1 587 928**
	(31.68)	(34.07)	(35.26)	**(37.05)**
Specialisation	40 866	44 706	54 904	**60 358**
Master's	14 369	16 317	20 386	**23 808**
Doctoral	1 430	1 532	1 631	**2 326**
Grand total	1 363 185	1 487 186	1 570 447	**1 674 420**

Source: Background Report (MEN, 2011*a*).

Table 1.5 **Coverage rates in selected OECD countries, 2008 (%)**

Country	Coverage rate	Country	Coverage rate
Korea	98.1	Hungary	65.0
Finland	94.4	Portugal	60.2
United States	82.9	Czech Republic	58.3
New Zealand	78.5	Japan	58.0
Denmark	78.1	United Kingdom	57.4
Australia	76.9	Austria	54.7
Norway	73.2	France	54.6
Sweden	71.1	Slovakia	53.6
Spain	70.6	Switzerland	49.4
Poland	69.4	Turkey	38.4
Italy	67.2		

Source: UNESCO, reproduced in MEN summary statistics.

The percentage of undergraduates enrolled in technical and technology programmes in Colombia has also grown every year except for a small reverse in 2009 – from 19.55% to 34.16% over the period. This is despite the fall Table 1.2 shows in numbers of professional and technical and technological institutions between 2007 and 2010. One explanation is that SENA provision in its own centres expanded, from 197 486 (49.4% of the T&T total) in 2007 to 296 686 (54.7% of the total) in 2010; but enrolment in other tertiary institutions expanded too, from 197 333 in 2007 to 245 672 in 2010.

Every type of graduate enrolment increased over this period too. Numbers on specialisation programmes fell, rose, fell and rose again but were 9.5% higher in 2010 than in 2002. Numbers on master's and doctoral programmes grew every year: by 2010 master's enrolment was over 250% higher and doctoral enrolment nearly 550% higher than in 2002.

Of the growth in total enrolment over this period, 75.7% was in public institutions, including SENA centres, and 24.3% in private institutions. Whereas 41.7% of students were enrolled in public institutions in 2002, by 2010 the figure was 55.4% (*Background Report* [MEN, 2011*a*]). Between them, the tertiary institutions of Colombia were offering nearly 11 000 programmes in August 2011.[6]

The distribution between disciplines of students who graduated from tertiary institutions excluding SENA in the period 2001-2010 was:

- Economics, management and accounting – 30.5%
- Engineering, architecture, urban planning and related degrees – 23.4%
- Social and human sciences – 19.3%
- Education – 11.4%
- Health – 9.0%
- Arts – 3.4%
- Mathematics and natural sciences – 1.6%
- Agronomy, veterinary and related degrees – 1.4%.[7]

Some students have a wider choice of tertiary institution than others. Places are not evenly distributed across Colombia's many and geographically varied departments and municipalities. Unsurprisingly, thinly-populated rural and jungle regions are least well-served. Table 1.6 shows gross enrolment rates by department 2002-2010. By the end of the period, all except two departments had places for at least 10% of the 17-21 age group. However, percentages ranged from 4.2% in Vaupés and 9.9% in Vichada (both in the Amazon jungle) to 50.4% in Quindío (between the cities of Bogota, Medellin and Cali) and 73.7% in Bogota.

Table 1.6 **Gross tertiary enrolment by department (%)**

Department	2002	2003	2004	2005	2006	2007	2008	2009	2010
Amazonas	1.5	4.0	5.1	4.4	6.4	6.5	6.5	12.4	13.3
Antioquia	26.6	28.0	29.6	31.3	33.3	33.1	35.1	39.6	40.9
Arauca	1.6	1.7	3.0	3.2	4.5	8.6	12.5	14.0	12.7
Atlántico	34.0	32.2	32.2	34.9	35.2	36.0	36.5	33.4	37.9
Bogota	55.4	55.5	59.9	61.3	66.8	63.0	68.3	71.7	73.7
Bolívar	13.2	17.9	18.3	18.5	18.3	22.2	24.9	21.8	28.0
Boyacá	21.0	22.5	23.1	26.3	25.7	33.7	36.5	37.4	39.7
Caldas	22.4	23.2	25.0	26.5	26.2	29.3	28.3	33.7	35.0
Caquetá	7.6	7.5	8.9	12.2	14.8	20.3	22.5	26.1	19.1
Casanare	2.6	4.5	5.0	8.2	9.9	18.4	26.0	26.1	23.8
Cauca	12.8	13.5	15.1	15.8	16.4	20.1	22.1	23.2	26.6
Cesar	10.9	11.7	12.0	14.0	15.5	19.2	21.0	25.0	21.6
Chocó	19.1	17.0	18.4	19.3	22.0	19.3	19.5	22.1	25.8
Córdoba	11.1	12.1	12.5	12.7	15.2	17.6	17.4	10.9	17.0
Cundinamarca	11.5	13.4	13.6	13.8	14.8	15.9	18.8	21.4	21.1
Guainía	N/A	0.0	3.3	4.2	9.7	17.0	19.4	14.0	11.5
Guaviare	N/A	0.0	1.7	3.1	7.3	11.6	13.0	14.2	12.8
Huila	11.5	13.7	14.4	16.2	17.0	21.1	23.3	26.0	25.7
La Guajira	13.0	13.2	12.8	14.3	15.3	14.6	17.7	20.8	17.5
Magdalena	6.7	7.9	9.4	11.5	13.0	21.5	23.1	24.6	20.5
Meta	13.2	14.2	14.1	17.9	20.0	24.9	26.5	25.3	24.4
Nariño	10.6	11.0	10.6	11.9	12.2	16.6	17.5	18.9	18.3
Norte de Santander	21.9	26.9	25.9	29.0	26.2	36.6	39.8	42.2	42.8
Putumayo	2.8	3.3	4.2	4.1	5.1	6.1	9.1	6.8	11.5
Quindío	22.7	25.0	25.3	24.6	29.6	40.6	47.8	49.4	50.4
Risaralda	17.6	21.0	24.2	26.6	28.7	35.3	39.4	37.1	42.2
San Andrés	18.1	7.1	9.4	7.2	12.2	18.7	19.2	17.3	25.7
Santander	31.2	32.2	34.4	36.1	36.1	39.7	44.8	38.2	48.0
Sucre	9.2	10.6	9.1	10.7	11.4	14.8	17.3	17.2	17.0
Tolima	18.1	25.8	27.6	27.9	27.9	24.2	26.5	26.5	25.6
Valle del Cauca	23.8	22.9	23.2	24.3	24.7	26.5	27.8	29.7	31.7
Vaupés	N/A	0.0	0.7	2.7	4.1	12.0	7.8	9.6	4.2
Vichada	N/A	0.0	0.5	2.0	2.7	7.6	8.3	10.9	9.9
National Total	24.5	25.6	27.0	28.4	30.0	31.7	34.1	35.3	37.1

Source: MEN, SNIES.

Dropout rates from Colombian tertiary education are regarded by the Ministry of National Education as unacceptably high, though they have come down from 48.4% of students failing to complete their programmes in 2004 to 45.4% in 2010, and the Latin American and Caribbean average is 50% (*Background Report* [MEN, 2011*a*]). The government of Colombia set up a special monitoring tool, known as SPADIES (see below), to track the incidence of dropout and the factors associated with it. SPADIES information helps institutions to identify which of their students are most potentially vulnerable and to take preventive measures.

However those who complete their courses find that tertiary education makes a considerable difference to future earnings, and that the higher their education level, the more they earn, as Table 1.7 shows. Average starting earnings for an individual with a bachelor's degree are almost four times as high as those of high school graduates. Although the figures below do not control for unobservable factors such as ability or self-selection, World Bank estimates show that returns to tertiary education in Latin America are high by international standards, and Colombia is no exception (Gasparini *et al.*, 2011). As economic theory predicts, returns decline as the supply of new graduates increases, but the rate of the decline is slower than the rate of growth of new graduates.

Table 1.7 **Average monthly earnings by education level**

Highest education level achieved	Average monthly earnings of 2009 graduates at 2010 prices (USD[1])
High school certificate	220
Technician title	507
Technologist title	590
Bachelor's degree	804
Specialisation	1 508
Master's degree	1 896
Doctorate	2 930

Notes:

(1) USD exchange rate of 2 April 2012: COP 1 792/USD.

Data from Labour Observatory for Education (OLE, *Observatorio Laboral para la Educación*) do *not* include SENA graduates.

Source: MEN estimates based on Labour Observatory for Education (OLE); data for high school earnings are DNP-DDS-SESS (*Departamento Nacional de Planeación*, *Dirección de Desarrollo Social*, *Subdirección de Educación*, *Subdirección de Salud*) estimates based on DANE-GEIH (*Departamento Administrativo Nacional de Estadística-Gran Encuesta Integrada de Hogares*) of July-September 2010 and represent all workers with a high school certificate as the highest level achieved.

Chapter 3 considers access to and retention in Colombian tertiary education, whether tertiary opportunities are equitably distributed and the impact of the student support system.

Tertiary education: national agencies

The Ministry of National Education (MEN, *Ministerio de Educación Nacional*), first appeared in the government structure in 1886. Today it sees its role as managing and overseeing every stage in the formation of human capital in Colombia.

Within the MEN is the Vice-Ministry of Higher Education (*Viceministerio de Educación Superior*), established in 2003. The Vice-Ministry is in charge of applying national policies on higher education and planning for and overseeing the sector. Internally it divides into two main offices, the Directorate of Higher Education Promotion (*Dirección de Fomento de la Educación Superior)* and the Directorate of Higher Education Quality (*Dirección de Calidad de la Educación Superior).* The Directorate of Higher Education Promotion's responsibilities include: strategies for developing human capital; expanding the supply and improving the regional distribution of tertiary places; improving retention; promoting technical and technological education; and tertiary funding, efficiency and information systems. The Directorate of Higher Education Quality is concerned with quality improvement; developing the current quality assurance system; strengthening the development of undergraduate programmes, including the extent to which they are based on generic and specific competences; and "preventive and corrective" monitoring and control.

The National Council of Higher Education (CESU, *Consejo Nacional de Educación Superior)*, established in 1992, is an advisory body of the Ministry of National Education. Its members are from the tertiary education (TE) community, not ministry officials. It arranges bi-monthly meetings where they discuss relevant matters such as the creation of new tertiary institutions, what to do about problem institutions or the approval of postgraduate programmes.

The National Intersectorial Commission for Higher Education Quality Assurance (CONACES, *Comisión Nacional Intersectorial de Aseguramiento de la Calidad de la Educación Superior)*, is a consultative institution of the Ministry. It advises on quality assurance issues and specifically on whether institutions and individual degree programmes should be included in the Qualified Registry (*Registro Calificado)*: members are divided by subject area, and peer reviewers assist in the evaluation process. CONACES also advises on quality improvement policies, on the recognition of foreign qualifications and on the legislative framework for tertiary education.

The National Accreditation Council (CNA**,** *Consejo Nacional de Acreditación*), is another consultative institution of the Ministry, advising mainly on applications institutions submit for "high quality accreditation", for the institution or for individual programmes. The council consists solely of academic members nominated by the CESU and bases its operations on CESU guidelines.

The Administrative Department of Science, Technology and Innovation (acronym DACTI, *Departamento Administrativo de Ciencia, Tecnología e Innovación*, though the name COLCIENCIAS is still much more widely used in Colombia and is used in this report), works closely with higher education institutions. COLCIENCIAS aims to promote policies that increase scientific research and the production of knowledge, and provides funding for many scientific research projects conducted in universities and university institutions.

The Colombian Institute for Educational Evaluation (ICFES, *Instituto Colombiano para la Evaluación de la Educación*)**,** is responsible for evaluation at all levels of education. It designs and manages four different tests. SABER 5 is taken at the end of primary school, SABER 9 at the end of lower secondary school. Then, as already mentioned, at the end of the 11th rade every student who may wish to enter tertiary education takes the SABER 11 test. SABER 11 includes evaluation in core subjects – Spanish, mathematics, biology, chemistry, physics, philosophy, social sciences and foreign languages – and a flexible component where deeper knowledge is required, either of a specific core subject or of cross-cutting problems related to Colombian society and the environment. As undergraduates taking bachelors' degrees reach the end of their programmes, they take another test, formerly known as ECAES but now officially known as SABER PRO. This test, incorporating several different tests for different fields of knowledge, is intended to evaluate the quality of higher education and is mandatory as of 2009. Its results show not only the attainment levels of students in different institutions, but also – when compared to their SABER 11 scores at the end of upper secondary school – the distance they have travelled since joining those institutions, in other words the value those institutions have added.

The Colombian Institute of Educational Credit and Technical Studies Abroad (ICETEX, *Instituto Colombiano de Crédito Educativo y Estudios Técnicos en el Exterior*), aims to promote enrolment in tertiary education and increase coverage by providing financial support to less affluent students. ICETEX was set up initially to provide students with loans to access higher education abroad; it still manages most support to graduates studying abroad, all bilateral programmes through which foreign governments give scholarships to Colombians and all arrangements for

short-term study visitors from abroad. However, its mission has now expanded to offer a wider range of support mechanisms addressed mainly to domestic students.

The National Training Service (SENA, *Servicio Nacional de Aprendizaje*) has already been mentioned. Though attached to the Ministry of Labour rather than the the Ministry of National Education, SENA has had great influence on the professional technical and technological education of Colombians during the last decade. By 2010, over 55% of professional technical and technological enrolment was in SENA centres.[8]

Tertiary education: national information systems

The National System of Higher Education Information (*Sistema Nacional de Información de la Educación Superior*), SNIES, gathers and is the official source of data from tertiary education institutions on enrolment, number of applicants, number of graduates, finance structure, internationalisation, student welfare etc. The system includes data on all research and investigation done by higher education institutions: COLCIENCIAS keeps similar information, but only for the projects it funds.

The Higher Education Quality Assurance Information System (SACES**,** *Sistema para el Aseguramiento de la Calidad de la Educación Superior*), keeps track of the programmes on the Qualified Registry and the programmes and institutions granted high quality accreditation.

The Higher Education Institutions Dropout Prevention and Analysis System (SPADIES, *Sistema de Prevención y Análisis de la Deserción en las Instituciones de Educación Superior*) tracks higher education students, their socio-economical and academic characteristics. Through SPADIES it is possible to identify the variables that have a significant influence on the drop-out rate of every institution and thus formulate policies to improve the efficiency of the higher education sector.

The Labour Observatory for Education (OLE, *Observatorio Laboral para la Educación*), tracks graduates from the tertiary system once they enter the labour market, to establish their later employment history and earnings and so shed light on the relevance of their study programmes. Results by degree programme and by institution are published.

The quality and relevance of tertiary education

Dramatic expansion of higher education during the 1990s made quality a major issue in Colombia. The current quality assurance mechanisms were mainly set up from 1998 onwards. The main mechanisms are:

- The Register of Qualified Programmes (Registro Calificado). Tertiary institutions are not permitted to offer programmes unless they are listed on the Register, the institution having demonstrated that they meet specified minimum quality requirements.
- The system of high quality institutional and programme accreditation, which is voluntary and based on applications from the institutions.
- The SABER PRO tests of student outcomes.

OLE information on graduates' subsequent employment history and SPADIES information on dropout levels are also relevant to assessments of institutional quality.

The Colombian government is very conscious of the key contribution tertiary education can make to the country's development and prosperity, and committed to ensuring its relevance (*pertinencia).* Policies to ensure relevance include raising quality, developing student competences, designing programmes and assessing their quality on the basis of outcomes, seeking to raise the proportion of professional/technical and technological programmes, introducing more ICT and other new technology in the education system, promoting innovation and research, encouraging more students to learn a second language (particularly English) and, in general, achieving a better match between business demand and education system supply.

SENA offered the review team a comparison between Colombia's need for trained manpower at various levels, and what the education and training system is currently providing. SENA's premise is that the system should be shaped like an equilateral triangle, providing the highest numbers of trained people at the lowest level (operative/assistant with at most labour technical training) and progressively fewer trained people at the higher levels. On SENA's analysis, current provision falls short of the country's needs for operatives (by about a quarter), for technicians and technologists (by about half) and for holders of master's and doctoral degrees (by about three-quarters), but supplies considerably more bachelors' degree-holders than industry and the economy require. While such analyses are always difficult to confirm unless they are based on up-to-date and comprehensive data on the earnings of workers with different levels of qualifications, and the review team did not have access to the data SENA used, their analysis does appear consistent with calculations of recent relative changes to wage premia. When normalised for the respective rates of growth of graduates, the wage premium for T&T graduates has declined less than the wage premium for graduates with bachelor's degrees; and both wage premia are substantial

in Colombia. These phenomena could have various causes, but they do suggest that T&T graduates are in demand by employers, and that demand is reasonably robust.

A full discussion of the quality and relevance of tertiary education in Colombia is in Chapter 4. Chapter 5 considers the quality assurance system.

Financing

Figure 1.2 shows how, over the period 2007 to 2011 (projections), Colombia's GDP has increased by nearly 35% and its total education spending by over 43%. The percentage of GDP spent on education has risen from 7.19% to 7.65%, and there has been a corresponding rise in the percentage devoted to higher education, from 1.84% to 1.96%. Within these spending totals, public spending has risen significantly – from 4.28% to 4.75% of GDP on education at all levels and from 0.86% to 0.98% of GDP on tertiary education (Table 1.8). This tertiary education figure is higher than average for Latin America and approaching the OECD average – see Chapter 9 Table 9.2. Private spending, though, has declined very slightly. As a result, by 2011 public and private expenditure on higher education are exactly equal at 0.98% of GDP each.

Colombian public universities are funded in a specific way, defined in Articles 86 and 87 of Law 30 of 1992. Article 86 spells out that their government funding will be based on their 1993 revenues and costs, inflation-adjusted. But because this does not allow for other changes, such as increases in student numbers, Article 87 provided for general increases in government contributions corresponding to at least 30% of the percentage increase in annual GDP growth. The Ministry of National Education has developed a model for calculating the contribution to each university: the model takes account of staff numbers, student enrolment and research output, among other things. All types of tertiary institutions other than universities are funded through direct central or local government contributions from their sponsoring ministry.

Universities enjoy full autonomy in how they may use their income from public and private sources. Other institutions classed as Public Establishments are also granted financial and administrative independence; operational autonomy may be granted provided they remain within the national policy framework for higher education.

All tertiary institutions other than SENA centres charge fees to students. For a single semester of a law degree programme, these range from USD 106 at the public Universidad del Atlántico, to USD 621 at the private Corporación Universitaria Rafael Núñez, to USD 5 500 at the private University of Los Andes[9] (which, in the Times Higher Education World

Rankings 2011, achieved Colombia's highest ranking and the fourth highest ranking in Latin America). Private tertiary institutions, naturally, rely on student fees for a substantial part of their income; but all are required by law to have not-for-profit status.

A full discussion of the financing of tertiary education will be found in Chapter 9.

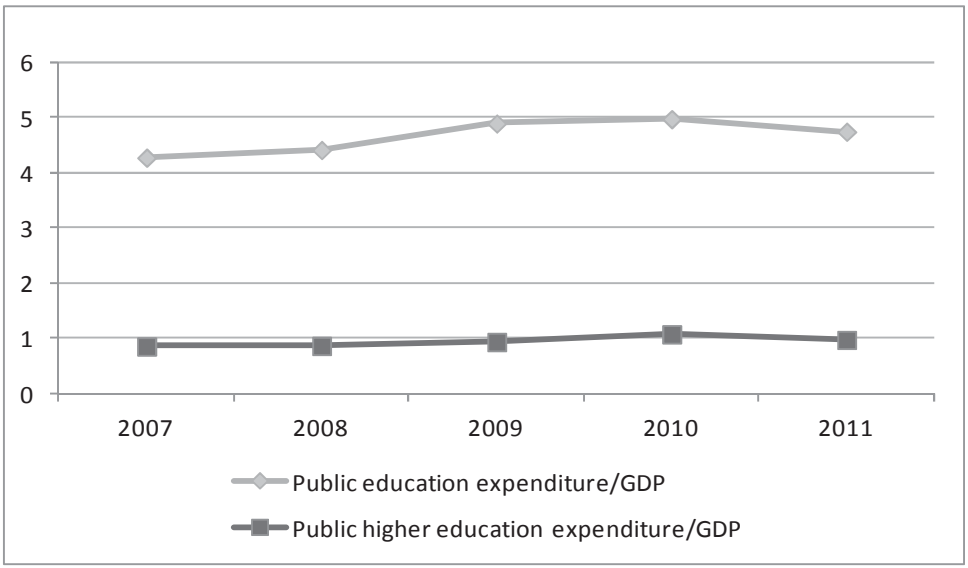
Table 1.8 **GDP and education spending, 2007-2011**

	2007	2008	2009	2010	2011
Nominal GDP (USD millions)[1]	240 982	267 060	280 852	302 144	324 956
Total education spending (USD millions)[1]	17 332	19 700	22 254	23 868	24 844
Public education expenditure/GDP (%)	4.28	4.42	4.90	4.98	4.75
Private education expenditure/GDP (%)	2.91	2.96	3.02	2.92	2.89
Total education expenditure/GDP (%)	7.19	7.38	7.92	7.90	7.65
Public higher education expenditure/GDP (%)	0.86	0.87	0.94	1.08	0.98
Private higher education expenditure/GDP (%)	0.99	1.00	1.02	0.99	0.98
Total higher education expenditure/GDP (%)	1.84	1.87	1.96	2.06	1.96

Note (1): USD exchange rate of 2 April 2012: COP 1 792/USD.

Source: Presentation made by the Minister of National Education to the review team (MEN (2011*b*).

Figure 1.2 **Public expenditure on education (% of GDP)**



Source: Presentation made by the Minister of National Education to the review team (MEN (2011*b*).

Academic staff of tertiary institutions

As Table 1.9 shows, from 2002 to 2009 the number of tertiary education teaching staff rose by 32.6%, though numbers of students increased by 57%. Over the same period there was a limited but significant upward shift in teachers' qualifications. Whereas in 2002 the figures had been 47% with bachelor's degrees, 33% with specialisations, 17% with master's degrees and 3% with Doctorates, by 2009 42% had bachelor's degrees, 34% had specialisations, 19% had master's degrees and 4% had Doctorates. The quality of teaching and teaching staff in tertiary education will be considered in Chapter 4.

Table 1.9 **Teaching staff in tertiary institutions and their qualifications, 2002-2009**

Highest qualifications	2002	2002 (%)	2003	2004	2005
Bachelor's degree	39 063	47%	38 985	38 597	39 265
Specialisation	27 420	33%	33 244	33 760	36 221
Master's degree	14 414	17%	15 457	17 309	19 657
Doctorate	2 445	3%	2 617	2 871	3 193
Total	**83 342**	100%	**90 303**	**92 537**	**98 336**

Highest qualifications	2006	2007	2008	2009	2009 (%)
Bachelor's degree	39 616	42 929	46 555	46 741	42%
Specialisation	37 979	36 406	37 958	38 076	34%
Master's degree	19 471	19 288	21 026	21 093	19%
Doctorate	3 540	3 522	4 105	4 578	4%
Total	**100 606**	**102 145**	**109 644**	**110 488**	**100%**

Source: MEN, SNIES.

Research, innovation, internationalisation and information

Only in the last two decades has Colombia made a concerted effort to develop science, technology and research, recognising that the country's economic growth is substantially influenced by advances in scientific and technological research and innovation and development processes. Colombia starts from a low base. The level of business innovation is relatively low. Less than 1% of GDP is dedicated to R&D. In 2007, only 4 002 people in Colombia had doctoral degrees, 9.3 for every 100 000 inhabitants, 50% of the number proposed by the Mission for Science, Education and Development in 1994.

There have been recent advances, however. A new law on science, technology and innovation was passed in 2009. Its declared aims are to develop a new research-supported production model in Colombia that allows value to be added to all products and services; and to implement the results of research to solve the country's problems. Additionally, funding for science, technology and innovation was substantially increased recently, with the allocation of 10% of the country's coal and oil production royalties to the Science, Technology and Innovation Fund (*Fondo de Ciencia, Tecnología e Innovación*). Colombia's ranking for the innovation pillar of the World Economic Forum's *Global Competitiveness Index 2011-12* was 57, significantly higher than its 2010-11 ranking of 65, thanks to improved scores in all the relevant rankings, particularly the quality of scientific institutions (up 12 places from 81 to 69); the country's capacity for innovation (up 11 places from 70 to 59); the availability of scientists and engineers (up 9 places from 86 to 77) and the protection of intellectual property (up 7 places from 93 to 86).

COLCIENCIAS, now officially re-named the Administrative Department of Science, Technology and Innovation (DACTI), is the institution in charge of developing and overseeing the research sector. COLCIENCIAS seeks to interest young people in science, through projects starting in primary education such as ONDAS and Little Scientists: more than a million schoolchildren took part between 2002 and 2009. For higher education, programmes such as Seedbeds for Young Researchers were designed; these programmes aim to get young people involved in science, technology and innovation, help the Colombian research community to grow and develop, strengthen high level research groups and centres, connect Colombian researchers with international centres and encourage co-operation between university science and the productive sector. COLCIENCIAS also manages the Science, Technology and Innovation Fund.

With government encouragement, universities have given more attention to research, promoted graduate programmes, increased their links with business (Colombia's highest ranking in the World Economic Forum's *Global Competitiveness Index 2011-12* was for university-industry co-operation on R&D) and increased the number of faculty members with doctoral degrees (see above).

The number of researchers has also grown rapidly. In 2003, there were 12 276 active researchers and 809 research groups recognised by COLCIENCIAS. Today, 14 983 researchers and 3 489 research groups are active, with support from COLCIENCIAS, universities, the Bank of the Republic (Colombia's Central Bank), the Foundation for Promoting

Research, state entities with important research programmes (for example, the Ministry of Agriculture and the Ministry of Mines) and private research organisations: 94% of these groups are from higher education institutions (*Background Report* [MEN, 2011*a*]).

Annual output of PhDs, though still low, is on a rising trend. From 139 in 2002 and just 85 in 2003, the numbers produced rose to 483 in 2009 and 500 (provisional) in 2010. A target of 1 000 has been set for 2014.[10] The numbers of scientific articles published by Colombians in international journals, and the recognition of Colombian publications in international reference indexes, have also continued to increase. Colombian citations in the Science Citation Index increased from 774 in 2001 to 2 676 in 2009.[11]

The state is also promoting the development of academic programmes in areas that foster economic growth. Strategic development areas where the country can develop its competitive advantages are thought to include outsourcing services, software and information technology services, cosmetics and tourism. And as well as increasing doctoral programmes in engineering and science within the country, interchange programmes with ally countries are encouraged.

COLCIENCIAS has not so far had the resources to finance more than a small proportion of the research projects for which its support is sought, but hopes that this will change, following a recent government decision to devote 10% of the royalties from coal and oil production to funding science, technology and innovation. Nonetheless, as Chapter 7 on Research and Development explains further, there remains a serious need for more and better-targeted funding for research in universities and other research centres; for more rapid growth in doctoral programmes for Colombians at home and abroad; and for better co-ordination among the various participants in these activities in both the public and private sector.

Graduate studies abroad are also supported by ICETEX – which in 2011 funded 2 293 young people to enrol on postgraduate studies abroad with an investment of COP 31 340 million (66% for master's and PhDs), and also managed 904 grants for a total of COP 22 414 million on behalf of governments and international organisations – and by another national organisation, COLFUTURO. This is a public-private not-for-profit partnership benefiting from both private and state funding. COLFUTURO funds students for an amount not exceeding USD 25 000 per year, for a maximum of two years. In general half the money provided is a government scholarship, the other half a repayable loan (for certain subjects, less of the money is non-repayable). Students compete for funding; to apply they need the backing of the university where they attended their previous course

(which will have pre-selected its best candidates) and to have already been accepted onto the programme abroad. If students have limited means and the percentage COLFUTURO pays is not enough for essential costs (such as fees in the United States, for example), they may get extra support from ICETEX or from the university which nominated them. Though COLFUTURO does not exclude any discipline, each discipline has a limited number of places; students applying for popular subjects have a lower success rate. COLFUTURO sends over 1 000 Colombian graduate students abroad every year, of whom around 150 are initially supported for PhD programmes; some 20% of those on master's programmes go on to PhDs with COLFUTURO support. Students are expected to return to Colombia; the incentive is that if they do not, they must repay their entire funding.

Another example of Colombia's internationalisation effort is the national Bilingualism Programme. The objective is to deliver teaching in a second language at all levels of education. The Common European language framework was adopted and the goal set was that students should achieve B1 level by the time they graduated from high school. First, teachers were tested. To address the low standards thus revealed, courses were set up for them to take, in person or on line, at universities and English language centres. Measurable improvements were achieved. The government recommended tertiary institutions to include English teaching in all programmes. SENA was a key player in delivering the English teaching, to students in other institutions as well as its own. Also, ICETEX offers a reciprocity programme in which foreign teachers, researchers and language assistants support the teaching of their mother tongue (including English, French, German, Mandarin, Portuguese, etc.), and final semester students complement their studies, at universities in Colombia. In 2011 the ICETEX invested COP 42 729 million in this programme.

Colombia is very keen to internationalise further and attract more international students and teachers to its tertiary institutions, particularly universities. The institutions themselves have set up a number of internationalisation initiatives. However, as Chapter 6 on Internationalisation explains, Colombia cannot yet be said to have in place either an effective country-wide internationalisation strategy, or the key planks on which such a strategy should rest.

Chapter 8 on Information and Transparency reviews the various information sources available to students, institutions, employers and the general public – most have already been mentioned in this chapter – and considers whether they are fit for purpose, sufficient and transparent.

Government policies and plans for tertiary education in the future

During the fieldwork visit the Minister of National Education presented to the review team the National Policy on Education for 2011-14 (MEN, 2011*c*). The government is proud of the recent increase in coverage, the growing proportion of students entering the technical and technological courses important to the nation's future prosperity, the steps already taken to achieve better coverage in under-served regions and the number of tertiary institutions and programmes with high quality accreditation. However, important policy objectives remain to be realised.

The Plan envisages reform of the current basic law on tertiary education, Act 30 of 1992. The aims of the reform are:

- To create better conditions in order to increase the number of Colombians who obtain a higher education degree. This will involve having a larger and more flexible range of higher education quality programmes; promoting access, improving retention and offering more funding sources for students; and increasing regional participation.
- To create the conditions for improving the tertiary education offer to students. This will involve a continuous improvement in quality standards, and increasing the size and range of resources put into the sector.
- To adapt the tertiary system better to the country's needs and align it with regional and international trends and standards.
- To strengthen good governance and transparency in the sector.

Specific targets to be achieved by 2014 include:

- Increasing the undergraduate coverage rate from 37% to 50%.
- Increasing the proportion of undergraduate students on T&T programmes from 34% to 45%.
- Generating 645 000 new tertiary places.
- Increasing the percentage of students with some public financial support from 66% to 75%.
- Increasing the percentage of students with long-term educational loans from 18.6% to 23%.
- Increasing the percentage of municipalities with tertiary provision from 62% to 75%.

- Decreasing the annual in-year dropout rate from 12% to 9%.
- Increasing the percentage of T&T programmes which are competence-based from 25% to 80%, and the percentage of university programmes which can be accessed by graduation from T&T programmes from 4% to 10%.
- Increasing the percentage of high-quality-accredited institutions from 7% to 10%, the percentage of high-quality-accredited programmes from 13% to 25% and the percentage of SENA T&T programmes on the Qualified Registry from 4% to 100%.
- Increasing the percentage of tertiary teachers with PhDs from 14% to 18%, and the percentage of teachers who have had in-service training in pedagogy to 25%.

Other objectives stated in the Plan are to:

- Strengthen the development of generic and specific competences at all levels of tertiary education.
- Strengthen the quality evaluation and quality assurance systems.
- Incorporate innovation, relevance and internationalisation into all tertiary programmes.
- Improve articulation between high school and tertiary education.
- Strengthen the management of the tertiary sector – by government through the Education Secretariats and by institutions themselves – to make it a model of efficiency and transparency.

A new draft law designed to achieve the ambitions in the National Education Plan was unveiled early in 2011. It aroused great interest and strong passions among various stakeholder groups, including students and public universities: both these groups came to feel that their interests were or might be threatened. A full description and discussion of the draft law is in Chapter 2. The government gave extra time and opportunities for consultation, and undertook to remove the most contentious section of the draft law, a proposal to allow for-profit universities a place in the system. The concessions did not persuade the students, who were at this point making common cause in public protests and demonstrations with students on strike in Chile, although – in the opinion of the review team – the Chilean context is very different. President Santos therefore announced that the draft law would be withdrawn from congressional consideration, if the students agreed to end their protests, on the understanding that the government would review the law, consult again with all stakeholders and introduce a redrafted law in 2012. The law was withdrawn in November 2011.

The review team agrees with the Colombian government that the law of 1992 is no longer fit for purpose, and that a new basic law is imperative if all the worthwhile objectives in the National Education Plan are to be realised. One happy result of the position now reached is that this report and its recommendations will be available to the government and people of Colombia in time to be considered before the new law is finalised.

Achievements

As Colombia moves towards a modern, diverse, relevant and high-quality tertiary education system it can build on a commendable number of strengths and existing achievements. In the team's view, these include:

- The recent growth of participation in the system, to a gross enrolment rate of over 37% in 2010.
- The diverse range of tertiary institutions in the system serving different academic and professional needs at and below university level.
- The high level of agreement within Colombia on the importance of improving access to high-quality tertiary education for less socio-economically advantaged students.
- The government of Colombia's clear, coherent, specific and (in the team's view) well-judged plans for future tertiary growth and development with excellence and equity.
- The international standards being achieved in the country's top universities.
- The scale of the technician and technology programmes available, including those publicly provided without student fees by SENA.
- The country's system of student loans, which was the first in the world and, in the shape of the ACCES system run by ICETEX, is still one of the best.
- The efforts being made to reduce student dropout, and the SPADIES system set up to track the incidence and causes of dropout.
- The ICFES system of educational evaluation, including the SABER 11 tests young people take in order to enter tertiary institutions and the SABER PRO tests taken in order to graduate from them. Developed further and used in combination, these tests could make Colombia a world leader in the assessment of value added by tertiary education.

- Some very good national data systems, which make information on tertiary education and its labour market impact available to policy-makers, institutions, students and the public.
- The Colombian system of propaedeutic cycles, which in theory at least allow students to progress up through the tertiary education levels.
- The high-quality accreditation process, though this is not part of the mandatory quality assurance system.
- The degree of autonomy enjoyed by Colombian tertiary institutions.

Issues

In the following areas, the review team sees actual or potential problems and (sometimes considerable) scope for improvement.

- Though national plans for tertiary education are commendable as plans, it is not always clear how they are to be achieved, particularly where they depend on new resources or higher human capital development.
- The government was unable to gain acceptance for the 2011 legal reform proposals seen as necessary to fulfil its plans, despite wide consensus on many elements in the reform package, because of public suspicions about its motives.
- Tertiary institutions are very conscious of their autonomy, less conscious of their responsibility to help in realising national goals. Autonomy without accountability can make an education system unsteerable.
- Diversity in the range of tertiary institutions faces a degree of threat from upward mission drift.
- The academic standards Colombian students have achieved by the time they enter tertiary education are generally low in comparison with other countries. This lack of "college-readiness" leads to academic struggle and high dropout, with the least advantaged students the worst affected.
- Access to tertiary education is as yet far from equal for students from poorer households.
- One contributory factor is that the fees payable on entering different types and levels of tertiary institution are not related to the quality or value of the education provided, but to public/private status, different sources of funding and historic allocations of public funds. This distorts student choices.

- A second contributory factor is that although ICETEX has increased its resources, these are still insufficient to fund loans for all eligible students who cannot enter tertiary education without them. Furthermore, ICETEX could improve the targeting system in order to better achieve their aim of benefiting qualified-but-financially-needy students. Currently, the institution targets mostly students in *estratos* 1, 2 and 3 (to whom 98% of the loans are allocated) and uses SISBEN as proxies for the socio-economic level of students (as is also done by most of Colombian public institutions). However, as discussed in detail in the Annex to Chapter 3, the *estratos* system – like many income verification tools in Colombian and in other countries – has some inherent deficiencies that limit its ability to accurately determine student financial need. ICETEX, in conjunction with other national institutions such as the National Planning Department (DNP, Departamento Nacional de Planeación) should develop an instrument that more adequately assesses student financial need.
- SENA, which does not charge fees to students on its T&T programmes, is so over-subscribed that only one of every seven applicants is awarded a place and actually enrols.
- ICETEX makes public the eligibility requirements and general loan selection criteria on its website and through other means, such as telephone assistance lines for applicants. Acceptance or rejection letters both contain the applicant's score and the minimum score for successful applicants. However, perhaps because the full formula for calculating applicants' scores is not explained in detail, some students report not fully understanding why they were not approved for loans. ICETEX could remedy this problem by providing specific criteria and their weights in calculating scores along with the abundant general information it makes available to applicants.
- The propaedeutic cycles work less well in practice than in theory because of the gaps between technologist graduation level and professional degree entry standards.
- In general, progress up through the tertiary levels is limited by lack of a National Qualifications Framework, credit transfer, and collaborative arrangements between different tertiary institutions.
- The quality and standards of some programmes – especially T&T programmes and those offered in many CERES – is low. The only mandatory part of the Colombian quality assurance system, the safeguarding of programme standards through the Register of Qualified Programmes, requires improvement.

- Many institutions have only weak links and collaboration with employers over curriculum development and desired competencies and outcomes. This limits the relevance of their programmes to the needs of the Colombian economy and may make their graduates less employable.
- The ICFES SABER 11 tests in their current form are not as reliable at distinguishing between the performance of individual students as is generally assumed. The great potential value of the SABER PRO tests has yet to be appreciated by tertiary institutions.
- Despite national and institutional efforts, by international standards dropout is extremely and inefficiently high.
- Also by international standards, first degree courses – particularly in public universities – are unnecessarily long.
- Internationalisation in the tertiary system is at a very early stage of development.
- Levels of investment in research and innovation are very low by international standards.
- National information and data systems, though often very good individually, are not linked together so as to make it easy for users to bring together information from different databases. The full potential of some systems is not being exploited.
- The review team does not believe that the public sector budget alone can be expected to fund Colombia's important plans for expansion and for improvements in equity and quality.
- Tertiary institutions are not held accountable for the results of their spending or the public value obtained from it, although almost all will have received some public funds or subsidies, directly or indirectly.
- Because of the low level of audit scrutiny applying to private tertiary institutions, it is uncertain whether all are operating, as they should, on a non-profit basis.
- Performance-based funding mechanisms are lacking. Administrative arrangements and financial management rules in public universities are too complex, stifling initiative and innovation. The accounting and financial practices of private tertiary education institutions are not transparent.

Notes

1. 2012 figure from DANE, based on 2005 Census projections.
2. Figures from MEN/SNIES.
3. ICFES website.
4. *World Economic Forum Global Competitiveness Report 2011-12*, p. 478, which states that Colombia has 55 women for every 100 men. According to the WEF, the Latin American countries showing the smallest gender gaps in PISA 2009 have significantly more women in their workforces: for example Uruguay has 77 women for every 100 men and Argentina has 71.
5. Percentage figures from ICFES presentation to the review team.
6. MEN and SACES figures for programmes on the Qualified Registry.
7. 2010 figures from MEN Labour Observatory for Education (OLE, *Observatorio Laboral para la Educación*).
8. SENA presentation to the review team.
9. SNIES, consulted on 10 December 2011.
10. COLCIENCIAS presentation to the review team.
11. Ibid.

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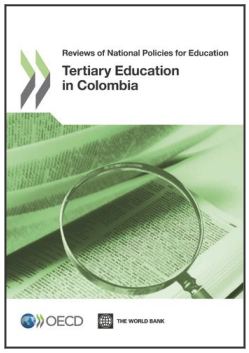

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