



2005/ED/EFA/MRT/PI/15

Background paper prepared for the
Education for All Global Monitoring Report 2005
The Quality Imperative

Innovation and reform to improve the quality of primary education: Chile

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2004

This paper was commissioned by the *Education for All Global Monitoring Report* as background information to assist in drafting the 2005 report. It has not been edited by the team. The views and opinions expressed in this paper are those of the author(s) and should not be attributed to the *EFA Global Monitoring Report* or to UNESCO. The papers can be cited with the following reference: “Paper commissioned for the *EFA Global Monitoring Report 2005, The Quality Imperative*”. For further information, please contact efareport@unesco.org

Innovation and reform to improve the quality of primary education: CHILE

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April 2004.

2005 Education for all Global Monitoring Report

Introduction

Throughout the 1990s and into the present decade, Chile's educational system has undergone major changes. Coinciding with a transition to democracy process, after a prolonged authoritarian military regime, three successive governments and the country's economic and political *elites* have defined education as a strategic mean for reaching economic development and a socially more just and integrated society. In a context of economic growth, political stability and consensual policies, public expenditure in education more than tripled between 1990 and 2003, and private expenditure increased accordingly. A range of major programs for improvement of both quality and equity of education were agreed upon and implemented, and a set of reforms, including curriculum, the time frame of schooling and institutional features regulating the teaching profession, were accomplished.

In such favorable social and political context for educational reform, the object of this paper are the changes observable in the quality of primary education and their linkages with policies, programmes and innovations implemented during the past decade. In the first section, basic institutional features of the school system of the country are sketched out. Then, changes in the quality of primary education are examined, according to four dimensions: access, learning conditions and materials, teaching practices and learning results. A third section reviews the political framework, and the policies and programmes responsible for the observed changes in primary education. In the final section, an attempt will be made to define the main challenge facing Chilean primary education at present.

1. School system context

Chile's school system has an 8-4 structure: eight years of primary education are compulsory for pupils aged six to 13 years old. These are followed by four years of secondary education, which until 2003 were not compulsory for pupils between the ages of 14 and 17. A reform to the Constitution, passed in May 2003, which comes into effect in 2004, will make 12 years of education mandatory.

Chile achieved universal coverage in primary education in the early 1970s and since then the expansion of enrollments in secondary education (years 9 to 12) has been a consistent trend, throughout the 1980s (when its expansion was not a governmental priority) and the 1990s (when it was).

Administrative categories of schools

Chilean Schools are defined by their administrative and funding relationships, in the following categories (created by a 1981 decentralising and privatising reform of the military regime):

- *Municipal* schools are administered by the country's 341 municipal governments
- *Private subsidised* schools are financed through an attendance-based, per-pupil public subsidy.
- *Private paid* schools receive no government subsidies and operate entirely on parental contributions.
- *Corporation schools* are vocational high schools managed by business corporations with government funding, especially established for this purpose (not a per-pupil subsidy).

The relative sizes of these categories, in terms of enrolment and trends in the past decade appear in Table 1.

Table 1. Enrolment by School Administrative Categories, Percentages, Primary and Secondary Education, 1990-2002.

	1990	1995	2002
Municipal Education	58.0	56.8	52.1
Private, state-subsidized education	32.4	32.5	37.8
Private, paid education	7.7	9.2	8.5
Corporation schools	1.9	1.6	1.6
Total enrolment school system	2,973,752	3,150,629	3,601,214

Source: Ministerio de Educación,(2003) *Estadísticas de la Educación 2002*, Table 2.6 , Santiago

2. Improvements in the quality of primary education in Chile since 1990.

We shall distinguish four dimensions of improvements in the quality of Chilean primary education in the 1990-2002 period: access and progress in primary education; school time and learning resource basis; teaching practices; and learning results. Regarding the first dimension there is a consistent improvement which particularly affects the lowest income quintile; there is a radical improvement in school-working hours and the learning resource basis of primary education; there is a gradual change regarding teaching practices; with respect to the fourth and critical dimension of learning results, there are slight improvements in the first half of the decade and then stability, of the results obtained in language and mathematics at grades 4th and 8th.

1.1. Coverage, drop-out rates and efficiency of primary education

One result of the past decade's changes to the school system is that it now receives and retains more students than it did in 1990. This expanded access, affects fundamentally secondary and tertiary education. However, in the primary level there is also an improvement in access during the 1990s, which contrasts with the evolution experienced during the 1980s, when coverage dropped, as Table 1 shows. Also, primary education became better at attending children from the poorest two quintiles of the population, as Figure 1 reveals.

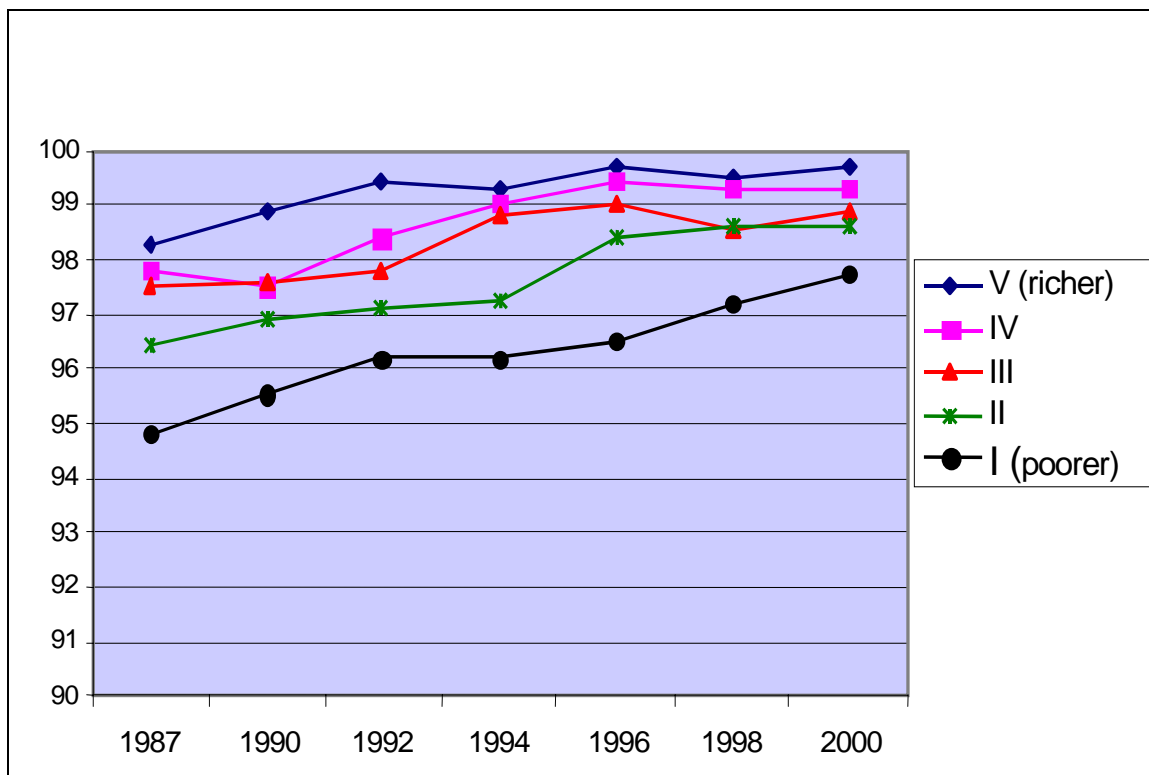
Table 2.
Enrolments and coverage, primary education. 1982-2002

Year	Primary Education		
	Enrolments (8 grades)	Coverage (6-14 years old)	Average years of schooling 15 + population
1982	2,116,397	95.2	7.7
1990	2,022,924	91.3	8.6
2000	2,355,594	97.0	10.2
2002	2,341,519	97.0	-----

Source: Ministerio de Educación, Compendio de Información Estadística, 1991, 2000, 2002.

If coverage's evolution in primary education is considered by income quintiles, a sharper view obtains, in which the most positively affected group is the lowest quintile, which increases its participation from 95% in 1987 to just below 98% in 2000.

Figure 1: Primary Education coverage by income quintiles, 1987-2000

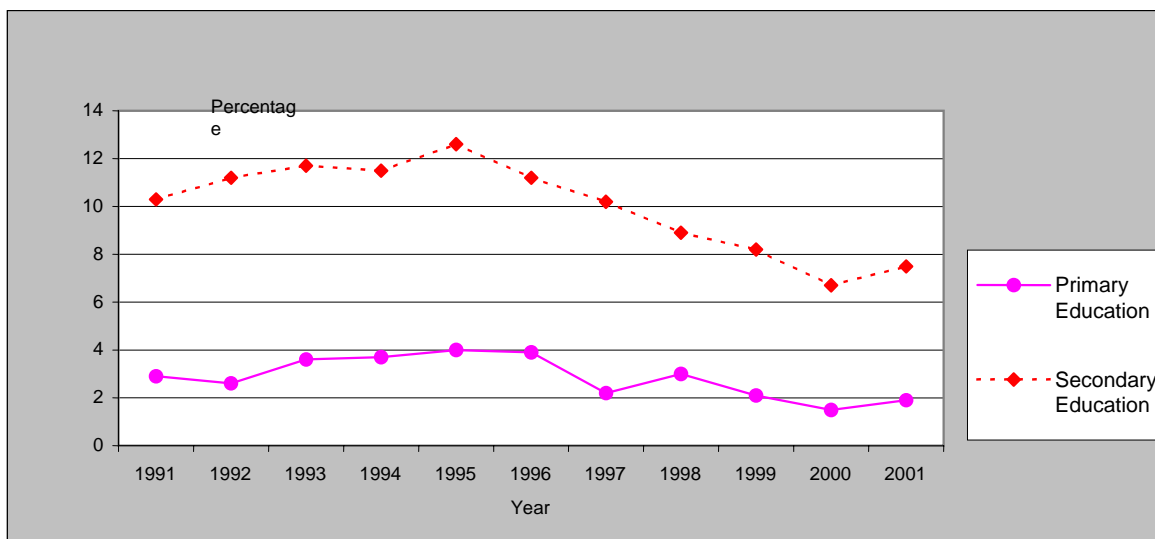


Source: CASEN Survey 1987, 1990, 1992, 1994, 1996, 1998, 2000, Mideplán.

Drop-Out Rates

In Chile, virtually all children start primary education at some point, but they do not necessarily remain in, or complete, the 8 grades of the level. Figure 2 provides the drop-out rate for both primary and secondary education during the 1990s. In the case of primary education, the drop-out rate, which concentrates in grades 6 and 7, hovered around 4% during most of the first half of the decade, to drop to 2% as from 1997.

Figure 2. School Drop-Out Rates by Levels, 1991-2001 (%)

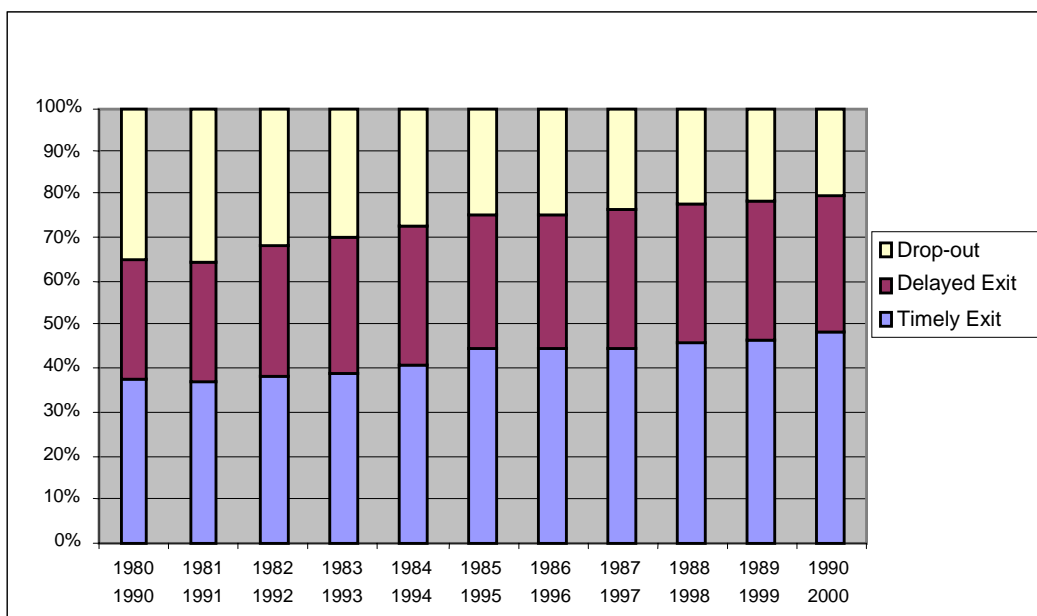


Source: Ministry of Education, Research and Statistics Department, 2002.

Primary education's completion

There is a drop in the repetition as well as in the drop-out rate in primary education during the Nineties. The relationship between these two factors determines the proportion of each cohort which completes grade 8 at the expected age, without repeating a grade. Figure 3 shows the increase, along the decade, of the percentage of each cohort which completes the level at the expected age and without repeating: from little more than a third in 1990, to almost half of the cohort. The proportion of students which finishes the level but repeating some grade, has not experienced change, whilst the percentage which does not complete primary education has decreased.

Figure 3: Timely and delayed primary school exit; drop-out rates: 1980-2000 cohorts.



Source: Bellei ,Ha tenido impacto la reforma educativa chilena (2003), Figure 7.

Social Assistance

The observed improved access and retention rates among the poorer groups have been, to an important degree, supported by drastically expanded and improved forms of social assistance. These consist of food, health care, school-materials supply and grant programmes. In primary education, the main support comes in the form of school meals and health care. In 2003, 867,589 primary students (39.8% of total enrolment in publicly funded education) received lunch at school. The same state agency, *JUNAEB*, looks after 100% of the demand for eyeglasses and hearing-aids (100,415 children in 2003).

1.2 Extension of school time and substantial up-grading of Learning Resource Base

The temporal and material conditions affecting access to information and knowledge during the primary educational experience were drastically transformed during the 1990s in Chile. We shall focus on three main factors: the extension of school time, provision of text-books, and the system-wide introduction and use of ICT.

Time

Chilean primary education worked, throughout the 1980s, in a time-frame of 880 teaching hours per year. Normative decisions of 1994-95 prolonged the school year in 2 weeks, bringing the mentioned figure to 940 hours per year. A major reform was decided in 1996 – the *Full Day School Reform* (see next section), whereby the school day was extended, from

6 to 8 daily class-periods, bringing the annual average to 1,200 chronological hours. The implementation of this reform has been gradual though, as the school- buildings infrastructure of the country had to be expanded by close to a third in order to have one shift of students per building the whole day. In 2003, 70% of enrolments in primary education was working in the new time-frame and conditions.

Textbooks

Up to 1990, the state distributed text-books only in language and maths, and in a focalised form, reaching 50% of enrolments. In 1991 this was expanded to 85% of enrolments. In subsequent years, the entire enrolled population in subsidised primary education (92% of the total) started to have access to textbooks in five subjects (Spanish language, mathematics, history, science and English), as well as book collections with literacy-enhancing purposes in the classroom.

Table 3: Textbooks, N° of titles and coverage 1990-2001

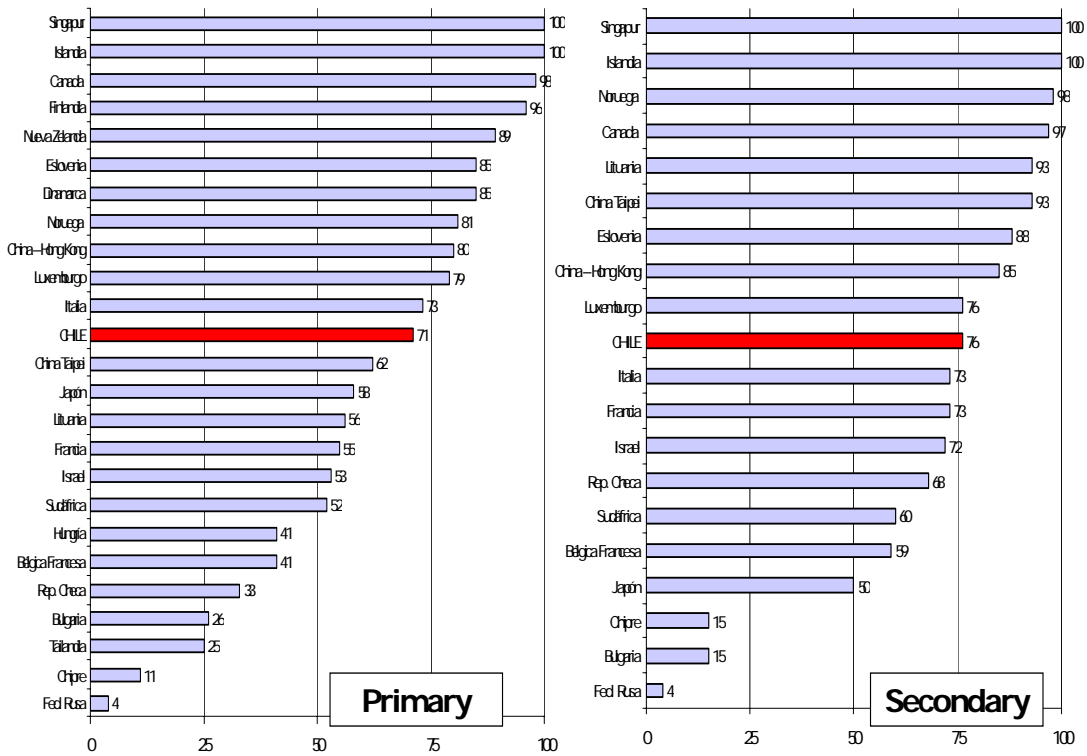
<i>Year</i>	Total N° of Distributed textbooks	N° de		Coverage		Total investment in USD Millions (2001)
		N° of titles	Students	Primary education	Secondary education	
1990	1,900,000	14	960,000	52%	No existent	1.5
1991	4,500,000	26	1,573,590	85%	n/e	3.6
1992	5,500,000	26	1,779,688	95%	n/e	4.2
1993	6,100,000	26	1,860,680	95%	n/e	4.3
1994	6,300,000	26	1,979,304	95%	n/e	4.4
1995	5,700,000	26	1,792,368	85%	n/e	4.2
1996	6,700,000	26	2,066,064	98%	n/e	5.6
1997	7,200,000	28	2,318,000	100%	25%	6.2
1998	8,200,000	30	2,587,181	100%	50%	8.1
1999	7,200,000	33	2,563,196	100%	75%	8.4
2000	9,500,000	36	3,109,735	100%	100%	11.9
2001	11,400,000	41	3,109,896	100%	100%	14.8

Source: Ministry of Education, *Unidad de Curriculum y Evaluación*, 2001.

ICT

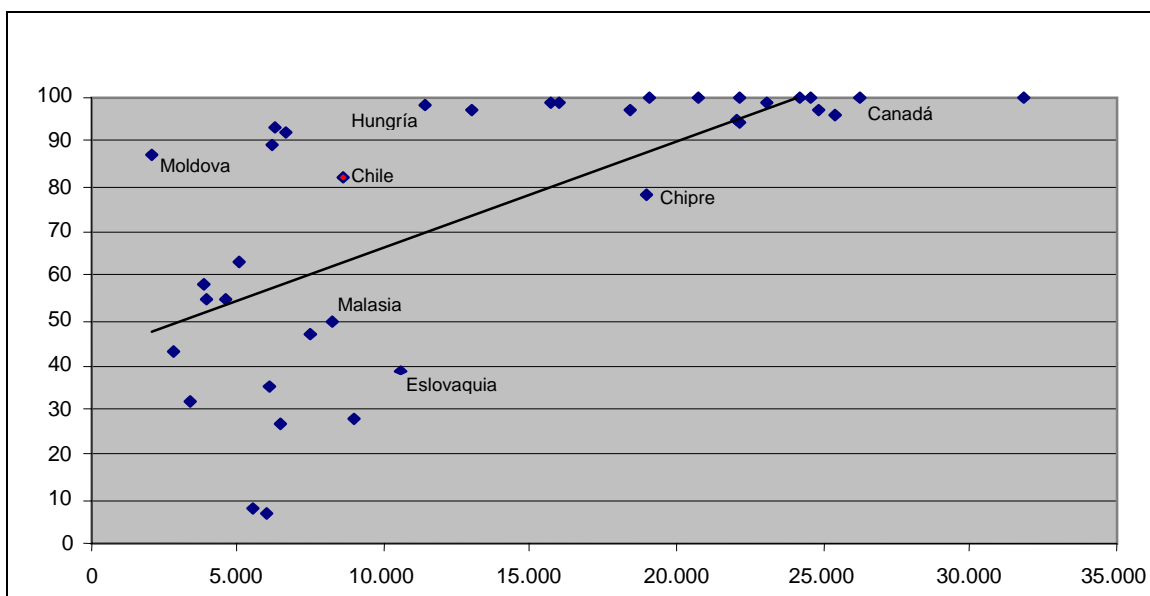
Chilean publicly subsidised primary education leapt during the 1990s from not having computers in schools, to making this resource and the access to Internet, a common feature of school experience for both teachers and pupils. Since 2000, 88% of enrolments in primary education and 97% of secondary education, have access to computers and Internet. (Hepp, 2003) As the following two figures show, this has put the country's school system, well above countries of comparable income, and just below the average of OECD countries

Figure 5 : Percentage of students with access to Internet : Chile and countries participating in IEA's SITES study.



Source :Ministerio de Educación- Programa Enlaces.*Estudio Internacional SITES MI (IEA) .El caso de Chile*, Santiago.

Figure 6: Percentage of students with computers in their school, by per capita income. Chile and countries of TIMSS –1999 Study.



Source: Bellei (2003) based on i) TIMSS 1999 International Science Report, Michael O. Martin et al, International Association for the Evaluation of Educational Achievement (IEA), Dec.2000; ii) Informe sobre Desarrollo Humano 2000, PNUD 2001, Santiago.

1.3 Process: changes in Teaching Practices

Are Chilean primary teachers and students working in new ways, which are coherent with the definitions of a new curricula implemented in the 90s, responsive to demands of the ‘knowledge society’? In contrast with the previous two dimensions, comparatively easier to assess and with clear-cut positive results, this third dimension is more complex to evaluate and with mixed results. There are aspects of teaching and the work of students which have evolved towards a more active and richer work in learning, whereas, at the same time, there is consistent evidence of a lack of focus in learning objectives and the predominance in classrooms of an ‘activism’ which, learning results’ evolution show, is not producing the expected results.

If three aspects of teachers’ work are distinguished – extra-curricular activities, management of student groups, teaching – the overview that emerges from the set of existing evaluations of trends in the 1990s is as follows ¹.

- *Teachers’ relationships with peers and extra-curricular activities:* The prevailing practices among teachers, along with the ideas and values behind them, have

¹ From evaluations of the following programmes: P-900 (Sotomayor, Medina 2001) and Rural (Universidad Austral, 1998), MECE-Secondary, (Cide, 1999), from the *Observatorio del Currículum* (curriculum observatory, Mineduc - UCE, 2001), and from MECE-Primary (World Bank, Audit Report 2000). This section follows closely a report of the Chilean Government to OECD on its educational policies during the 1990s. See, OECD (2004), *Reviews of National Policies of Education. CHILE*, Paris, Chapter 1. ‘Background Report prepared by the Chilean Authorities’.

evolved towards a more professional and pro-active stance regarding their institution and own activities; teamwork as crucial to professional work is appreciated not only in discourse but practically. Two major facts related to these tendencies are, the recent acceptance by the teachers' union of external evaluation of teaching, and the experience by the immense majority of schools of designing and implementing educational improvement projects, generated by teachers and which annually compete for public funding.

- *Social relationships and work with students.* The current evidence on this aspect² coincides in indicating that teaching practices have moved towards favouring a closer relationship with students and what they can bring into the teaching-learning process, which is conducive to including more of their life elements and contexts within formal teaching experiences. Students participate more actively now than they did in the past and group work has become a typical feature of Chile's classrooms: apparently to the point of imbalance with respect to individual work.³
- *Teaching:* According to a Ministry of Education report to OECD (see footnote 1) "In this area, the heart of the teachers' role, teaching contents, skills, values, and achieving learning, the evidence suggests qualities typical of a "transitional" or "mixed" nature. Thus the evaluation of MECE-Secondary concluded that *both innovative and traditional practices* were present and that the most common fell between the two and could be considered *transitional*. These typically combine a better relationship with students and their lives, improving the teaching relationship and making teachers more active, but with a diverse educational purpose. The evidence available on teaching practices at the elementary level suggests similar conclusions. The World Bank's *Audit Report* on MECE-Primary (World Bank, 2000) concludes that typical classrooms at this level (at both municipal and private, subsidized schools) reveal that a new pattern has emerged, whose features include *more student activity than in the past, more closeness in their relationships with teachers, and more variety and richness in the use of learning resources, but the whole lacks a focus on achieving learning objectives*. This reveals a certain activism within new social relationships and heightened sensitivity to the students' vital context, but one that remains only weakly associated with learning targets". (OECD, 2004, p. 36).

² Consistently remarked in the evaluations, national and international, quoted in the preceding footnote.

³ International qualitative evidence, based on a comparison of mathematics primary level classroom practices in Brasil, Cuba and Chile, found that in Chile, 34.6% of total teaching time was employed in group-work, compared to 29.6% of Brasil and 11.3% of Cuba. Only 6.5% of total time was employed in individual work by students in Chile (copying instructions, solving problems) against 22.5% of Brazilian and 40.9% of Cuban schools. (Carnoy, Gove, Marshall, 2003)

1.4 Learning Results

Chile's school system has been nationally evaluating its learning results, for the whole cohort, in grades 4 and 8 of primary education, every other two years, in language, maths, history and science, since the mid 1980s.⁴ There is ample evidence therefore for answering the fourth and key dimension of evolution of the quality of primary education in the last decade.

The evidence provided by comparing SIMCE results throughout the 1990s is summed-up by the mentioned official report to OECD in four main results:

“ First, there is a consistent although slight tendency for national achievement averages to improve in the first half of the decade, thus slightly closing the achievement gap between municipal and private-paid schools. This stagnated from 1996 to 2002⁵ and the gap widened. Second, the social distribution of learning reveals a highly stratified, inequitable structure, similar to that of 1990. Third, the improved performances are higher than average in the case of primary schools receiving special attention from specific programmes, (...), which have reduced the performance gaps between these students – the poorest – and the rest of the country. Finally, the differences in learning performance among schools with different administrative systems (municipal and private-subsidized) are minimal and do not always favour private education, when socio-economically homogeneous groups are compared”. (OECD, 2004. p.37)

We shall present data coming from successive national tests of learning in mathematics and language for fourth and eighth grade, primary students. These tests are practically universal (less than 5% of eligible students are not tested) and were applied by the system for measuring educational quality (*Sistema de medición de la calidad de la educación*, SIMCE) from 1992 to 2002.

Results for Grade 4.

Inter-annual comparisons using the 1992-1996 series, while not submitted to equating procedures, are based on tests prepared and applied using identical processes. The 1996-2002 comparison involves tests submitted to IRT (item response theory) measures and rigorous equating procedures (Cox, 2003)⁶.

⁴ In grade 4, a combination of social sciences and science is examined by a single test; whereas in grade 8, there are separate testing for each curricular area. The SIMCE evaluating system was set up in the 1980s as a key component of a demand-driven, decentralized educational system, where parents needed information on school results for choosing the better ones. The original *pro- accountability* rationale of SIMCE, at present is being complemented by a shift towards a *teachers' support and capacity building* rationale. (Comisión SIMCE, 2003).

⁵ However, this was not the case for eighth grade students of history and science, who did improve from 1997-2000, (see Figure N° 4)

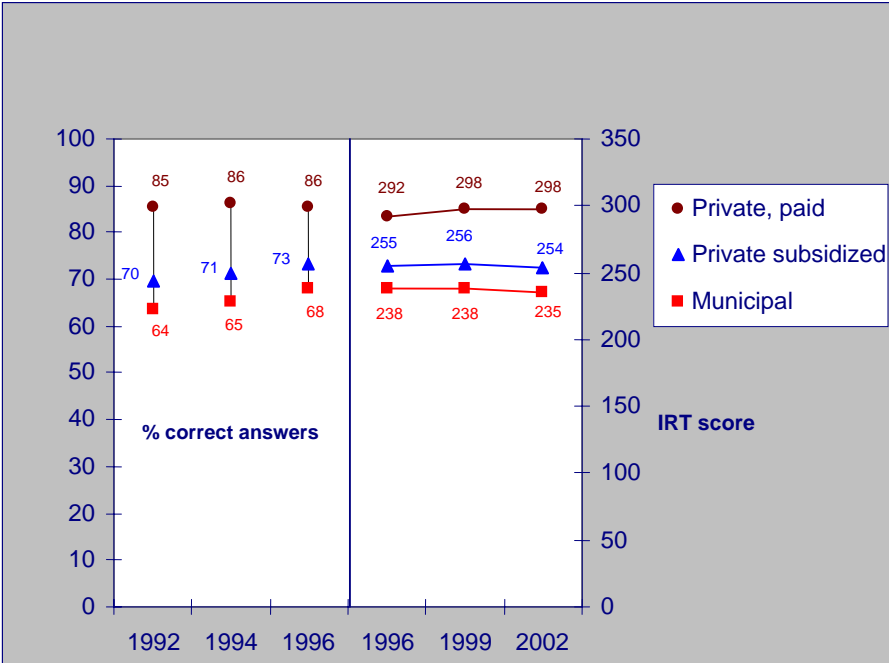
⁶ Scores on the different fourth grade tests are not directly comparable throughout the decade. Between 1992 and 1996, although the same scale was used (percentage of correct replies) no equating procedure was applied (common questions used for different measures to control for inter-annual differences among

For the set of comparable SIMCE measures in the 90s, fourth grade students' results tended to improve slightly in both mathematics and language between 1992 and 1996 (see the reduction in differences between categories of schools), and then stagnate. None of the school categories regressed during this period and note that none of the variations are statistically significant.

Mathematics.

The higher results were for paid education (85%-86% average, correct responses between 1992-1996; and then 292 and 298 points on the IRT scale in 1996, 1999 and 2002). The gap between these and municipal schools fell between 1992 and 1996 (as the latter's average scores rose from 64% to 68%), and then rose between that year and 2002 (from a 54- to a 63-point gap) as a result of an increase in paid education scores (from 292 to 298), and a slight drop of municipal scores (from 241 to 239). Private, subsidized education shows a similar pattern as municipal education, with higher scores as Figure 7 shows.

Figure 7: Fourth Grade Mathematics: Trends in SIMCE Scores, 1992-2002



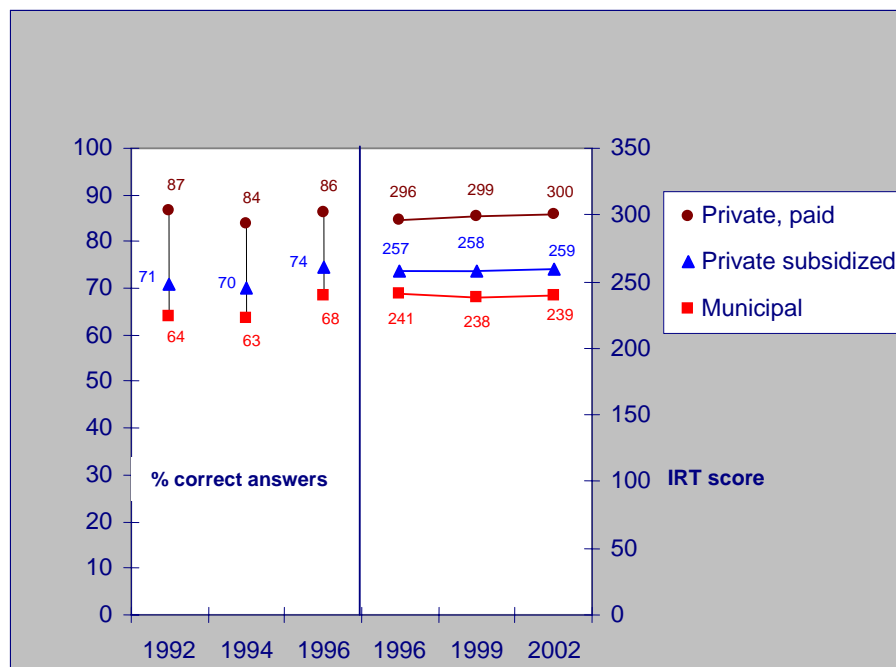
Source: C. Bellei (2003), based on the Ministry of Education, SIMCE, Research and Statistics Department. 1992-1996 series are expressed as percentages; 1996-2002 series are expressed as an IRT score.

instruments) and strictly speaking it is not clear that test difficulty remained constant throughout. Thus, the following figures do not combine the values for different years for the same school administrative category. For this period, the most reliable comparisons are those that compare the three types of schools (vertical lines) for a single measure (year). The SIMCE changed its measurement model in 1999, including IRT (Item Response Theory) score calculations and changing its scale (from 0-100 or percentages to an average 250 and 50 point standard deviation). An ad hoc study equating between measures for 1996 and 1999 makes it possible to compare these.

Language

In language, the general trend after 1996 is also of stability, within which all categories of schools alternate episodes of small increases with slight declines in results. There is a reduction in the gap between publicly financed and private schools during the 1992-1996 period, -same as in mathematics- a trend that changed sign during the 1996-2002 period, as paid schools improved whereas both categories of subsidized ones did not.

Figure 8. Fourth Grade Language: Trends in SIMCE Scores, 1992-2002



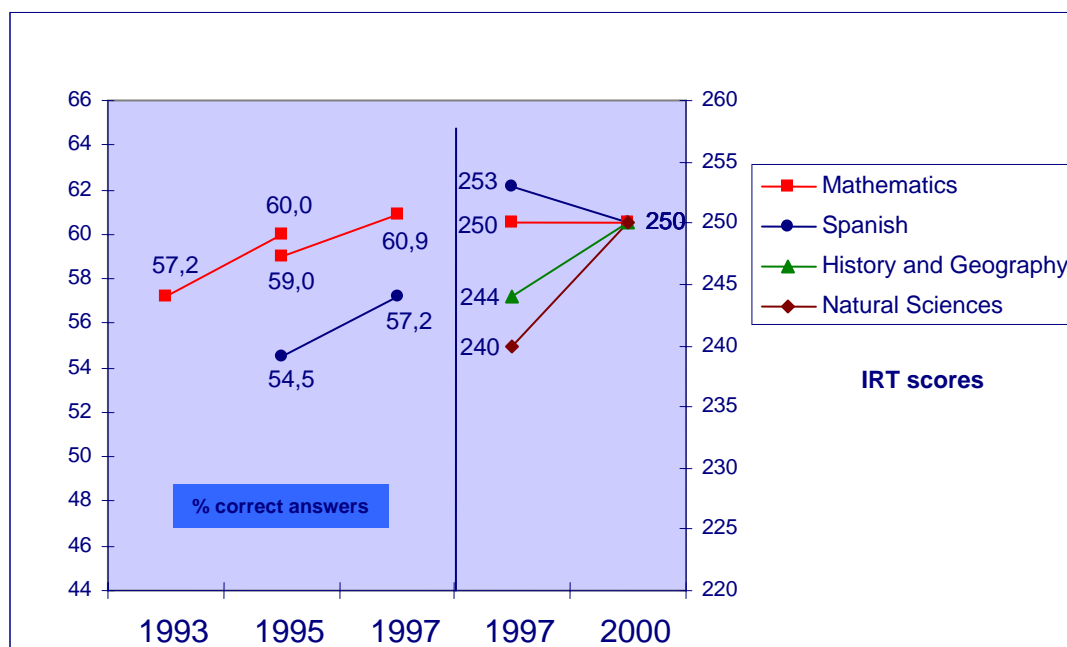
Source: C. Bellei, (2002) based on Ministry of Education SIMCE and Research and Statistics Department. 1992-1996 series expressed in percentages; 1996-2002 series expressed as an IRT score.

Results for Eighth Grade⁷

Figure 9 provides national averages for learning achievement for the final grade of the primary level, for the 1993-2000 period. Inter-annual comparisons in this case were based on equating procedures for all years: comparisons are based on the same sub-sets of questions answered in different years

For the complete period only language and mathematics can be compared and both subjects posted minor but consistent increases between 1993 and 1997⁸. In the comparison for 1997-2000, there is a three-point decline (on the scale averaging 250) in language, while mathematics remains stable. At the same time, significant rises occur in science (10 points) and history (6 points).

Figure 9. Changes in SIMCE Results, Eighth Grade, 1993-2000



Source: C.Bellei (2001) based on i) María Inés Álvarez "Antecedentes de la evaluación Simce en la década 1988-1998" Mineduc- SIMCE 2001; ii) SIMCE 2000, Mineduc

⁷ Unlike the situation with fourth grade results, for the eighth grade, inter-annual comparisons can be made (expressed in the following figures by the horizontal lines that denote the inter-annual trends for a single category of schools) given that the tests for some subjects contained common questions. Unfortunately, the common core of questions is not always the same and as a result comparisons are only possible between pairs of years and do not permit the reconstruction of a series for the decade (this is due to the presence of two different values for the same subject during the same year. As with fourth grade, the last eighth grade measure involved a change in the measurement system (from the percentage of correct answers to IRT values).

⁸ There are two scores for mathematics in 1995 because the question subset to compare with 1993-1995 was not the same for the 1995-1997 comparison.

Regarding eighth grade results for the decade it is important to remember that while in 1993 there were 216,000 students in this grade, in 2000 there were 21% more, or 261,000. This makes the increases, while slight, more significant because they affect more children, particularly of the poorest quintile.

Learning results of schools supported by compensatory programmes

The following tables show evidence on learning results obtained by schools which during the 1990s were object of two compensatory programmes of the Ministry of Education: the P.900 programme, targeted to the 10% of schools with poorer SIMCE results, both in urban and rural areas, and MECE-Rural, a programme specifically designed to support rural small schools where one to three teachers work with combined age groups of children. Both programmes focused on language and maths skills, and consisted in the provision of special teaching and learning materials to teachers and pupils, and intensive teachers' professional support and development activities, provided by the supervision system of the Ministry of Education.

The improvement of results in both subject-areas in the P.900 schools is sustained along the decade and greater than in the rest of schools. The growth means a shortening of the gap that historically separated the social groups attending these schools and the average schools of the country.

Table 4. SIMCE results, grade 4: P.900 schools and 'rest of schools', 1996- 2002

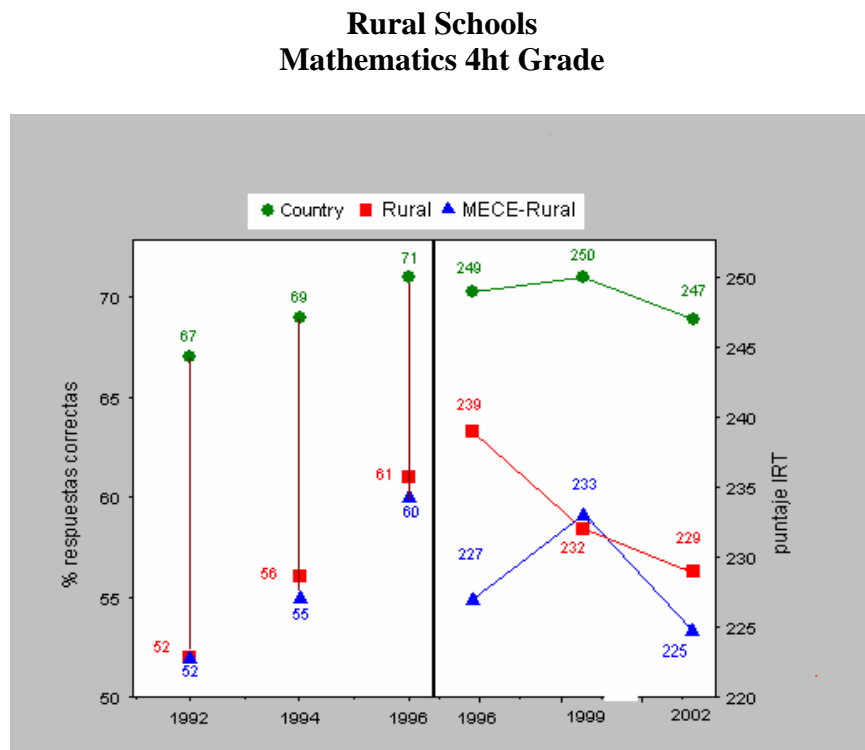
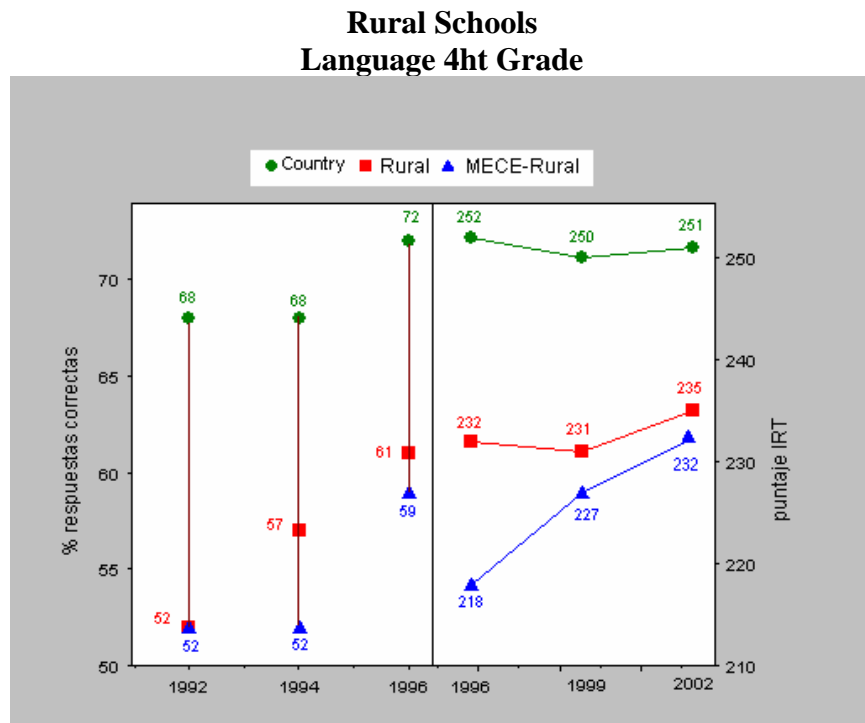
	P-900 Schools					Schools without P.900				
	1996	1999	2002	Difference 1996 -1999	Difference 1999 -2002	1996	1999	2002	Difference 1996 - 1999	Difference 1999 - 2002
Language	216	223	230	7	7	256	253	258	-3	5
Maths	215	227	227	12	0	252	252	254	0	2
Understanding one's environment		223	229		6		253	258		5

Source: Mineduc SIMCE, Agosto 2003. "Without P900 schools" includes private paid schools. In 2002, 1,455 schools were attended by the P.900 compensatory programme, enrolling 24% of the students that took the 4th grade SIMCE test that year.

The schools attended by the MECE-Rural programme show a consistent improvement in language along the decade, which shortened the gap which separated them from the rest of the system at the start of the 1990s, from 16 to 13 percentual points between 1992 and 1996. Between 1996 and 2002, -with equating procedures making the comparison between years more valid and precise- the rural programme's schools increase their SIMCE average from 218 to 232 points, reducing the gap with the national average (250 points) from 34 to 19 points.

In mathematics, a similarly consistent positive evolution was interrupted in 2002, when there is a drop, along the rest of the subsidized schooling system, from a score of 232 in 1999 to 225 in 2002.

Figure 10. Rural compensatory programme. SIMCE results in language and maths, 1996-2002.



Source: C. Bellei (2003) based on i) 1992-1996 series, Universidad Austral de Chile - Universidad de Playa Ancha de Ciencias de la Educación (1998); ii) 1996-2002 series, SIMCE.

3. Policies, programmes and innovations.

The changes observed in the quality of primary education are the result of policies of reform and improvement applied since the transition to democracy of 1990. In this second section, we shall attempt to summarily describe those policies, distinguishing between those which affected major financial and labor *conditions* of the educational system, from *reform policies* and *programmes*.

Before describing the policies, it is important to visualize the political and institutional framework within which the policies were designed and implemented. The policies that affected primary education are embedded in a larger political and policy-generating framework which is important to consider.

3.1 Political and policy-generating framework.

The period under examination -1990-2003- includes more than a decade and three governments of the same political alliance. Their educational policies are accumulative and consistent; at the same time they evolve together with their impact upon the school system and the consequent redefinition of issues and challenges. The mentioned Governments' overriding policy goal has been to substantially improve the quality and equity of publicly financed education. This meant redefining the state's role in this sector: from a *subsidiary* role, (defined in the 1980s by the *pro-choice* and decentralising principles of the military regime's policy framework), which consisted of assigning resources and supervising educational institutions where competition for enrolment produced specific standards of achievement and patterns of social distribution, to a *proactive* role, working towards quality objectives throughout the system and specific equity-related goals. The latter involved a dual approach that shaped all policies in the 1990s and thus redefined the nature of public action in education: this included universally applied, comprehensive programmes to improve learning and specific, compensatory programmes, focusing on primary and secondary schools for disadvantaged groups with poor learning results, to improve equity. (Delannoy, 2000; Gauri, 1998; Cox 2003; OECD 2004)

Four important political traits characterize the larger context in which the policies for improvement and reform of the schooling system took place in the 1990-2003 period. Firstly, consensus of the political system –government and opposition-, not only on education's strategic importance for economic growth, social integration and democracy, but also on the fundamental policies that were required. That consensus included agreement on the use of both state and market policy tools for improving school education. Secondly, resources. Chile's economic growth throughout the considered period, plus tax agreements for funding some of the educational reform measures, ensured a comparatively robust financial basis. Thirdly, high political priority to sector policies: major decisions regarding the reform involved the Presidency of the Republic and, as said, crucial political agreements with the opposition in parliament. Finally, continuity: the policies of the period, though belonging to three different governments, and clearly evolving in time, are accumulative and continuous. (Arellano, 2000; Cox 2003; OECD 2004)

In this framework, the policies of the period substantially changed the financial as well as the governance basis of the school system; defined a major curriculum and time-frame of schooling reform; and implemented a series of programmes, both universal and focalized in terms of coverage, aimed at the improvement of the quality and equity of primary education.

Financial and governance conditions

Public expenditure on education in Chile went from 2.4% of Gross Domestic Product in 1990 to 4.4% in 2001, rising on average more than 6% yearly. Education's prime importance to individuals and Government was clearest in the magnitude of the new resources invested in this sector, as Table 5 reveals. Public expenditure in education almost tripled, going from USD 907.8 million to USD 3.017 billion (in constant dollars) from 1990 to 2002; per student spending rose accordingly.

Per-student public expenditure by educational levels show that primary education's increase was 151.4% between 1990 and 2001; the largest increase being in secondary education - almost 200% between 1990 and 2001 in constant US dollars.

Table 5. Public Expenditure on Education; Spending per Student, by Level, 1990-2002

YEAR	Public expenditure on education USD million 2001	Public expenditure on education:		Ministry of Education spending per student		
		a) percentage of GDP		Each year, by educational level (in USD from the year 2001)		
		b) percentage of total public expenditure		Primary	Secondary	Post-Secondary
1990	940.3	2.4	12.5	231.8	213.8	832.3
1991	1 035.5	2.6	12.6	244.8	216.5	1 109.3
1992	1 176.4	2.7	13.7	270.1	270.7	1 111.9
1993	1 328.5	2.8	13.9	302.8	296.3	1 097.4
1994	1 461.3	2.9	14.6	325.5	324.5	1 148.0
1995	1 620.2	2.9	15.3	371.0	396.3	1 180.0
1996	1 840.6	3.2	15.8	402.3	441.1	1 240.1
1997	2 017.8	3.4	16.5	443.4	494.3	1 319.5
1998	2 214.7	3.7	17.0	480.5	546.0	1 333.0
1999	2 412.3	4.0	17.4	518.7	550.0	1 417.1
2000	2 617.8	4.1	18.1	539.5	609.6	1 374.0
2001	2 788.8	4.4	18.5	582.8	623.5	1 360.5
2002	3 017.7	n.d.	n.d.	n.d.		
% growth in per student spending				151.4	191.7	63.5

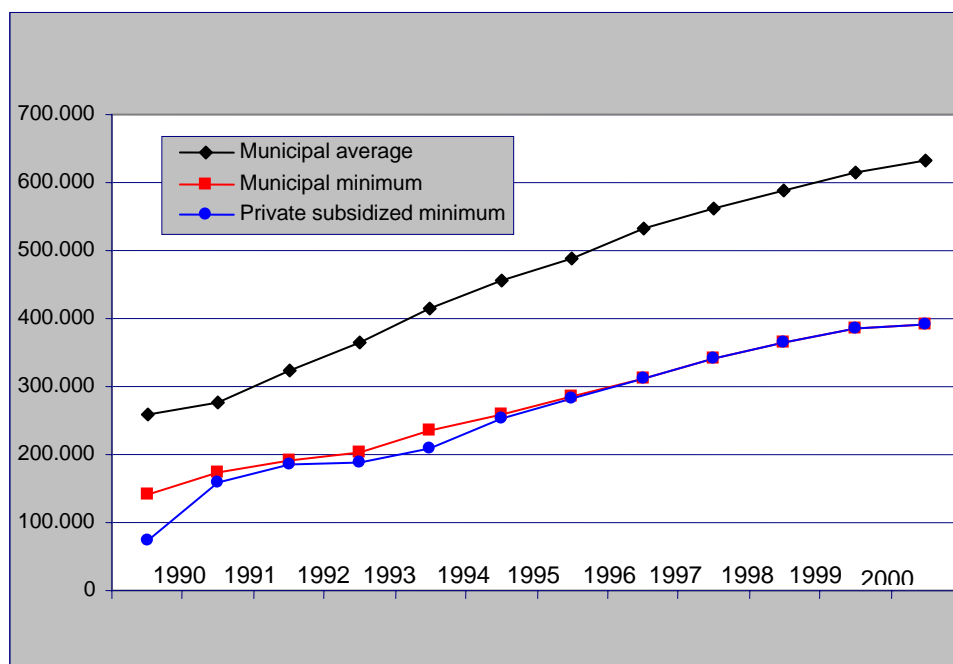
Source: Ministry of Education, Estadísticas de la Educación (Education Statistics), 2001, Table 4.5, pg. 131.

In the 1990s, private expenditure, mainly by families and particularly on post-secondary education, also rose substantially. The country's total expenditure on education increased from 3.8% of GDP in 1990 to 7.4% of GDP in 2000.

Two thirds of the increased resources in the schooling system went to improve the teachers' salaries. (Gonzalez, 2003). The following Figure shows the substantial increase in wages of the teaching profession throughout the Nineties and the present decade.

Figure 11 . Teachers' Average Monthly and Annual Wages, 1990-2000

(44 hours per week, 2001 CH \$)



Source: *Estadísticas de la Educación. Año 2001*, Ministry of Education 2002 USD 1(2001) = approximately CLP 635.

Governance

Through the 14 years that go from March 1990 until March 2004, there were 48 days of teachers strike in Chile (tantamount to 36 days of lost classes), of which 20 correspond to one conflict, in 1998, as the following table shows. Every strike was in the context of salary negotiations.

Table 6 : Days of teachers' strike 1990 to 2003

Years	1990	91	92	93	94	95	96	97	98	99	2000	01	02	2003
Strike days	---	1	---	1	4	---	14	---	20	---	---	---	---	---

Source: Cox (2003)

3.2. Policies' contents

Against the sketched background of general conditions, the policies referred to primary education included, as mentioned, both *reform* and improvement *programmes*. We understand as reform policies, a change of the *curriculum* and the mentioned *Full Day School reform*. To this, the period adds *nine programmes of improvement*, some universal, some focalized; some comprehensive in terms of components and others specialized –like the ICT programme-, which are schematically presented in the following table.

Table 7 . Programmes for Improving Educational Quality and Equity in primary education during the 1990-2003 period: components, coverage and annual resources

Universal	Programmes	Components and/or distinctive strategy	Units covered	Coverage (a)	Average annual resources (b)
	Primary education MECE 1992-1997	Infrastructure: PME (c), Rural (d), Enlaces, Pre-school, Text books, Classroom libraries, Educational learning materials School health care	8,000 primary schools	100% primary school enrolment	USD32 million
	Literacy and mathematics Campaign (2003-2006)	Renewed curriculum, materials for parents, intensive on-site peer tutoring for didactic improvement	416 primary schools	4.3% primary school enrolments	USD 1.5 million
Focalized	P-900 1990- post 2000	Learning workshops and community monitors, materials and technical assistance focusing on language and mathematics, teachers' workshops, support for school management.	1,200 primary schools	11% primary school enrolment	USD 4.8 million
	Rural Education 1992 – post 2000	Support for rural schools with one, two or three teachers, local training opportunities, "microcenters", ad hoc curricular and educational material for the rural medium.	3,285 small rural schools	5.9% primary school enrolment	USD 3.2 million
	Critical schools (2002-2005)	Intensive pedagogical and teachers' professional development support in literacy and mathematics (first four grades)	66 schools of metropolitan region with the worst learning results	1.3% of primary school enrolments	US D 0.7 million
Teacher training	Initial teacher training 1997- 2002	Substantial resources for a project involving institutional and curriculum renewal at teacher training centres.	17 education faculties	79% of enrolments of teacher training institutions	USD4.9 million
	Fellowships abroad, 1996- post 2000	Fellowships to study abroad for six to eight weeks and six-month diplomas, 3 months abroad and 3 in Chile.	800 teachers per year	3.8% of primary and secondary teachers from 1998-2001	USD5.4 million
	Curricular training 1998-2002	Training in the new curriculum provided by universities	44,000 teachers per year	100% of teachers involved in implementing the new curriculum (1997-2002)	USD7.5 million
Information technology	Enlaces ("Links") 1992 – post 2000	Computer laboratory per school, two-year training for the teaching team, university network providing technical assistance.	8,300 primary and secondary schools	92% of total enrolments of publicly funded system (2003)	USD20.1 million

(a) Figures for coverage refer to subsidized enrolment (excluding the paid sector, which accounts for about 8% of total)

(b) USD million, 2000

(c) Projects for educational improvement assigned through an annual competition

(d) The Rural, Enlaces and PME programmes began as part of MECE-primary and continued on their own.

We shall briefly refer the *curriculum* and *Full School Day reforms*, and then describe the main programmes of improvement: *MECE*, *P.900*, *Rural programme*, and the larger in terms of coverage of those referred to teachers' professional development. Of the programmes in Table 7, we shall leave out the *Literacy and mathematics campaign* (2003-2006), the *Initial Teacher training initiative* (1997-2002) and the *Enlaces (ICT)* programme (1992-post-2000).

Curriculum Reform

The curriculum reform of the 1990s in Chile has three major needs as original source: the need to make school experience harmonious with profound and secular changes in society; the need to up-grade the quality of the educational experience and expectations offered to the majority; the need to modernise the value basis of the school experience, strengthening its democratic orientation after 17 years of authoritarianism. The characteristics of the changes converge upon the need to form more flexible persons, able to adapt to change and use knowledge for innovation; able to continue learning and prepared for active citizenship (Gysling 2003). The new curriculum had to answer both to competitiveness and citizenship requirements; to new demands of knowledge and abilities demanded by the world of work and employment as well as social cohesion.

The curriculum reform of the Nineties in Chile includes changes in its control, devolving the power to determine programs of study to individual schools, and also in its structuring of secondary education, where the need of a more ample and richer general education for all determined a re-drawing of the boundaries between general and vocational education. The changes that affected primary education were of two levels. Firstly, *Curricular organization*, where three changes were introduced: i) multidisciplinary (cross-curricular) themes including values and skills; ii) the inclusion of a new subject, *Technology*; iii) and the teaching of a foreign language as from grade 5 (previously, this started in grade 7). Secondly, changes in *orientation and content within subjects*, according to three criteria: i) Changing the emphasis from content to skills or competencies; ii) updating and enriching of contents in the different disciplines, or requiring higher standards; and iii) meaning or relevance of the curriculum in terms of connecting with people's lives. The skills emphasized by the new curriculum, thought out as those demanded by an information and knowledge-intensive society, include: ability for abstraction, systemic thought, experimentation and learning to learn, communication and cooperative work, problem resolution, managing uncertainty and adapting to change (Ministry of Education, 1998).

The new curriculum was decreed in 1996 and started to be implemented gradually in 1997. Only in 2002 the reform reached grade 8 of primary education.

Full school day reform: expansion of the time-frame of schooling

In 1996, a major decision by the government on a simple but decisive reform in education started: to redefine the temporal frame of schooling, abandoning a scheme predominant since the mid Sixties of two shifts of six pedagogical periods to a full school day, consisting of eight 45-minute pedagogical periods. This change involved an absolute improvement to students' available time for curricular subjects, as well as extra-curricular activities, as only one group of students would make use of each school's facilities. The change imported major infrastructure investments as well as organisational adjustments in schools, with important implications for both quality and equity goals.

According to the mentioned report of the Ministry of Education to OECD: *“The longer school day was based on quality requirements: the higher cognitive skills required by the new curriculum to meet teaching objectives take more time; the time required for exploring and analysing is greater than that occupied by lectures and dictation; developmental tests and project pedagogy assumes longer test times than multiple choice tests or responses from “closed” sources”, such as summaries and fact sheets. It was also based on criteria of equity: there is an intimate link between the time factor and learning in socially vulnerable contexts. For poor groups, with different socio-linguistic codes from those of the general school culture, this experience requires learning a whole new code, which takes them more time than students from middle and upper income groups, whose family socialisation already includes school codes”.* (OECD, 2004, p. 31)

The impact in terms of longer school hours for each level of the school system is:

- 232 chronological hours per year from third to sixth grade⁹.
- 145 hours per year in seventh and eighth grades.
- 261 hours per year in the first two years of secondary education.
- 174 hours per year in the last two years of secondary education.

The change in the length of the school day has required a considerable investment in school infrastructure (about US\$ 883 million between 1997 and 2003), and more resources for hiring teaching hours. In 1997, the country had 9,013 schools with public funding. Of these, 3,384 (mostly rural) established the full school day that same year, because they already had the necessary infrastructure. As of May 2003, 6,966 Schools (primary and secondary) with an enrolment of 2,281,827 students, (65.6% of the subsidised enrolment) had applied the full school day (Ministry of Education, Planning Division, 2003).

Programs of improvement

MECE

MECE-Básica was a systemic intervention in primary education to upgrade the conditions, processes and outcomes of municipal and private subsidized schools through investment in material inputs and innovations in pedagogy and school-management. It was launched in 1992 with the financial and technical support of the World Bank. Covering the whole of the primary level, it cost US\$ 243 million, and it was concluded as an externally supported project in 1997. All its actions were subsequently institutionalized as part of the routine programs of the Ministry of Education. (Cox, Lemaitre, 1999).

For achieving its purposes, MECE programme combined several types of intervention in schools: improvement of the material basis for learning (textbooks, classroom libraries and computers), actions for creating conditions and incentives for the schools' generation of

⁹ 232 chronological hours amount to 309 45-minute periods and 9.3 additional weeks of classes per year.

betterment and innovation, and a focalized action in rural schools (which later became a programme on its own; the same occurred with the ICT programme *Enlaces*).

MECE included a mechanism for stimulating teachers teams' capacities for autonomously responding to new challenges, or their pro-activity, consisting in the public funding, through the program, of *School-based quality improvement Projects*. These were elaborated by the schools, which annually competed for the said funding (USD 6,000 on average per project) in an institutional framework which assessed the relevance and quality of the projects in terms of their potential impact upon learning in key subjects.

Table 8

School-based quality improvement Projects: N° that apply and were implemented. Primary education, 1992-2000.

<i>Year</i>	N° of presented projects	N° of projects that earned public funding	N° of benefited schools	N° of students
1992	1,255	475	475	182,980
1993	1,700	807	807	301,110
1994	1,543	895	1,445	326,616
1995	1,354	934	1,675	322,202
1996	1,116	642	879	214,743
1997	1,700	1,097	1,780	312,597
1998	1,851	794	800	204,423
1999	1,500	598	812	157,440
2000	1,908	698	1,132	286,588
Total	13,927	6,940		

Source : García-Huidobro, Sotomayor, (2003), Table 11.

Note :As from 1994, the number of schools differs from that of projects, because there are schools which obtain more than one Project; additionally, in the case of 'Rural microcentres' ,each Project is implemented by an average of 8 small rural schools.

900 Schools Program (P.900)

The P.900 program inaugurated in Chile (in 1990) the positive discrimination principle, through which a set of special measures were implemented to support the improvement of learning results in the 10% of primary schools with worst results. With a donation of the Norwegian Government it was started in March 1990, coinciding with the inauguration of the transition to democracy Government. The program supports teachers and students, particularly of the first four grades of primary education, with learning materials for language and mathematics; develops teachers workshops in every school on both subjects; and thirdly, it implements in every participant school a *Learning Workshop* for the pupils with more difficulties –in learning or in the affective domain-, who in extra-curricular time are tutored by a monitor from the community, who is paid and trained by the program. The schools participate in the program for three years, and those which improve their learning results –as measured by the national evaluation system (SIMCE)-, leave the program and start to participate in the universal programs of school and teachers' support of the Ministry of Education.

Table 9 : P.900 Program's Coverage, 1990-2000

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Schools	969	1,278	1,123	1,097	1,06	988	900	862	893	913	909
Pre-school teachers									633	959	960
Teachers, Grades 1° to 4°	5,237	7,129	6,494	5,406	5,626	5,135	4,806	4,414	4,72	4,833	4,838
Teachers, Grades 5° a 8°									5,442	5,575	5,577
Pupils, pre-school grades									24,63	25,35	25,452
Pupils, grades 1° a 4°	160,18	219,594	191,45	170,21	165,76	152,3	141,3	137,69	141,5	145,389	145,92
Pupils, grades 5° to 8°									119,7	123,264	123,72
Community monitors	2,086	2,8	2,5	2,35	2,3	2,186	1,802	1,745	1,8	1,826*	1,818
Pupils, Learning Workshops	34	50	40	38	35	32,9	28	26	36	36,520*	36,369

(*) Estimation

Source: García-Huidobro, Sotomayor (2003), Table 1.

We already mentioned the programme's impact in terms of learning in language, mathematics and a subject which combines science and social sciences contents, throughout the decade. (See table 4). That impact was more marked in the initial years (1990-1992) than in its intermediate phase (1992-1996); it recuperated in the final years of the decade. External assessments determined that the effectiveness of the programme was greater in schools with enrolments between 100 and 300 and with entry scores below 60 points (on a scale of 0-100) . (Santiago-Consultores, 2000) More generally, the programme confirmed the effectiveness of compensatory strategies.

Rural program

There are 4,668 rural schools in Chile, of which 78% are attended by a programme which specifically addresses the needs of multigrade schools (where students belonging to different grades attend the same classroom). The Rural programme provides them with special textbooks, libraries and teaching materials. In-service teacher support includes the organization of rural teachers groups (in *microcentros*) which meets once a month for a full day for mutual professional support and learning based on materials provided by the programme. This started in 1992 in the regions with the largest rural populations and the most vulnerable schools. By 1996 the program had reached the total of multigrade schools (3,293), as the following table shows.

Table 10 : Rural program coverage. 1992-2000

	Years								
	1992	1993	1994	1995	1996	1997	1998	1999	2000
Schools	623	1,322	2,033	2,965	3,293	3,293	3,299	3,302	3,626
Microcentres	104	206	323	474	510	510	510	517	656
Teachers	944	2,032	3,065	4,581	5,058	5,058	5,058	5,068	8,096
Students	20,993	41,431	62,958	87,085	96,346	96,346	96,346	96,446	129,742

Source: García-Huidobro, Sotomayor (2003), Table 7.

The programme's impact in terms of learning results were already mentioned (see Figure 5).

Programs for Teachers' professional development

In the context of the Full School Day and curriculum reforms, two programs for teachers, aimed at the renewal and up-grading of their capacities were designed in 1996 and started to be implemented in 1997: a program to support the reform of the main body of their university training institutions; and a scholarship program for teachers to study abroad.

To these, it was added in 1997, a massive training and upgrading programme for all teachers in every grade adopting the new curriculum. We shall refer only this last programme.

Teachers' training for implementing the curriculum reform

Since 1998, when the fifth grade of primary education started implementing the new, more demanding, contents of the curriculum reform, a massive training and upgrading programme was offered for all teachers. The process was carried out at two points during the school year (at both points, the training courses were free and voluntary for teachers and management): a 70-hour course during summer holidays; upgrading activities during winter holidays, either in person or through distance learning, particularly for those learning areas in which the new curriculum involved most demanding changes

Table 11 Teachers Participating in Courses for implementing the new curriculum

	1999	2000	2001	2002
Primary	22 143	27 050	26 615	23 530
Secondary	11 174	13 107	15 672	9 770
Management	5 504	6 634	5 674	
TOTAL	38 821	46 791	47 961	33 300

Source: Mineduc, CPEIP, 2003.

4. Main challenge.

The strategic and major political and policy issue of Chile's educational policies regarding primary education is the observable gap between the volume and systemic character of the interventions sustained for more than a decade to transform its conditions, inputs, processes and results, and the tenuous nature of their impact upon learning in key disciplines. The gap seems to rest on the difference between two temporal scales: that which affects public budgets, investments in inputs, (textbooks, computer networks, buildings, time), and prescribed curricula; and that which is determined by the rhythm of change of teachers' practices, and their impact upon learning. A country apparently can duplicate or triple its educational budget and change its building as well as learning infrastructure and its prescribed curriculum, in less than a decade, with important effects on access, efficiency and type of educational experience provided. Instead, it is more difficult to find a national case of change of the average profile of teaching practices and expectations in such period of time.

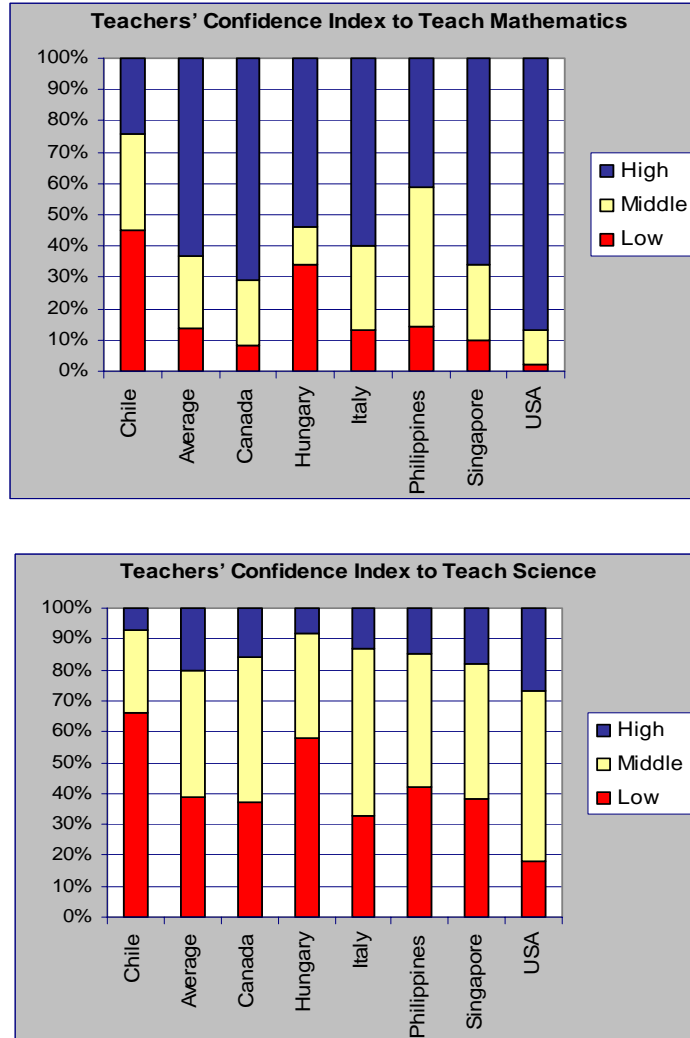
From these temporalities of educational change, it would be misleading to draw the conclusion that it is a matter of time for the changes in teaching practices to become systemic and produce the expected rise in learning results. On the contrary, the analysis underlines the utmost relevance of the teaching factor and the policies aimed at their transformation.

For Chile's Ministry of Education, the main challenge ahead is a 'capacity gap', between the average competencies of Chilean teachers and the requirements of the new curriculum. The following indices from the TIMSS-99 study are based on the teachers' own responses to how prepared they felt (in 1998) to teach different subjects included in eighth grade school mathematics or sciences

In mathematics, one of every four Chilean teachers (24%) feels little confidence in her or his teaching skills, compared to significantly higher percentages in other countries selected. This percentage of unconfident teachers is almost five times higher than the general average (5%). Chile also shares with the Philippines the lowest percentage of teachers who are confident of their mastery of this subject (14% in Chile compared to 34% internationally). In science, the figure indicates that two of every five Chilean teachers (41%) feel little confidence in their own teaching skills, much higher than other countries studied and more than double the international average (16%). Chile also has the lowest

percentage, along with Italy, of teachers who are highly confident of their mastery of science (just 2% of Chilean teachers, versus 9% internationally). (Mineduc, *Country Background Report to OECD*, 2003)

Figure 12. Teachers' Confidence Index



Source: TIMSS. 1999.

Note: The index is built on teachers' responses to the question how well prepared they feel to teach 12 different mathematics or 10 different science topics.

The 'capacity gap' issue at present is partially being tackled via a highly focused support in didactics to practicing teachers in the first cycle of primary education. To this corresponds the recently initiated '*Literacy and Numeracy campaign*' (see Table 7). The scale of this effort though is far from being system-wide.

In a medium term perspective, the initial training of teachers is a prime focus for upgrading and transformation. The crucial actor in this case are autonomous universities, so far weakly linked to the school reform effort and yet decisive for the 'capacity building' agenda lying ahead.

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