



SECTION 1. Scope of the Project



SECTION 1.1



ABSTRACT/PROJECT PROPOSAL

This thesis proposes an alternative design for public primary and secondary schools in Mexico City, based on principles of the Montessori philosophy of education. The purpose of this project is to create a positive educational environment, which maximizes learning and is integrated into the community. The Montessori philosophy was selected to drive the project because it emphasizes the importance of an environment specifically tailored to the child's physical, intellectual, social and emotional needs.

The school will be designed for Pedregal de Santo Domingo, a low-income neighbourhood in Mexico City. The site will accommodate a small school, community gathering areas, space for after-school programs and a small teachers training center to staff the school with trained Montessori teachers.

This document is an initial project proposal and investigation and forms the first part of the thesis design process. Sections 1-5 include a quick look at Mexico City's demographics, a brief history of education in Mexico, a look at the Montessori Method and how this philosophy can be used publicly and expressed architecturally, and a thorough site analysis. Section 6 explores Participatory Design theory, a methodology that has been implemented as a design tool to help formulate a systematic analysis of the site and its potential spatial configuration.¹

1. Participatory Design theory has been used as part of former coursework completed at Universidad Nacional Autonoma de Mexico (UNAM) in Mexico City.



SECTION 1.2



A LOOK AT EDUCATIONAL FACILITIES

'For decades, educational leaders have discussed the components of a successful educational program, yet they have regarded the physical setting as an institutional backdrop, giving it scant attention... Inadequate school facility planning carries fiscal, human, and academic costs. Whether a school building is old or new, problems in design and planning can take a devastating toll (Davis p105).'

For many children, school is a second home. It is a place where they receive care, make social connections, and most importantly, learn. A simple definition of a school is 'an institution which is intended to nurture, care for and educate children within the framework of structured age-related class groups (Dudek p41). In addition to this, schools also 'ought to be an expression of the fact that exploration and discovery are important parts of obtaining knowledge (Davis p106).'

Part of the process of discovery is being given a certain amount of freedom and flexibility. It is alarming then when authors Michel Foucault, Mark Dudek and Mike Davis in their articles *Utopias and Heterotopias*, *The New Learning Environments*, and *Ecology of Fear* respectively, all make references to how both the planning and general appearance of public schools are similar to that of offices, hospitals and prisons. Mark Dudek states that in the UK 'the domestic home environment, the institutional workhouse, or even the prison, helped to provide the pattern for state schools during their early development (Dudek pxiii)'. Similarly, Foucault when commenting on the flexibility of panoptic structures lists schools as one of the possibilities of its uses. 'All that is needed, then, is to place a supervisor in the central tower and to shut up in each cell a madman, a patient, a condemned man, a worker or a schoolboy (Foucault p360)'. These comments refer to schools that were built during the late 1800's and early 1900's in Europe; since then there have been significant developments in the understanding of school design. Nevertheless, when it comes to public schools, many are designed with limited funds and have security and minimum cost as top priorities. In Mike Davis' article *Ecology of Fear*, he describes the state of public schools in Los Angeles in the mid-1900's.

'Schools also have become more like prisons. Even as per capita education spending has plummeted in many local school districts, scarce resources are being absorbed in fortifying school grounds and hiring more armed security police. Teenagers complain bitterly about overcrowded classrooms and demoralized teachers, about decaying campuses that have become little more than daytime detention centers for an abandoned generation (Davis p276).'

Although this may seem like an extreme example, some similarities can be seen in Mexico City's public schools where almost all of them are barricaded (some more aggressively than others depending on the area). Public schools in Mexico suffer from low funds, maintenance problems and overcrowded classrooms as well. Common architectural problems include badly ventilated classrooms, insufficient day lighting, limited or no green-space, and disrupting noise.

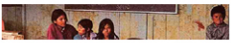
The comparison and similarities between the design of schools and prisons is enough to cause one to step back and assess what it is to learn and to be taught and what kind of environments facilitate what kind of learning.

In my opinion, education is liberating and should require a 'liberating environment'. Schools should be designed with flexible spaces that nurture and promote innovation and discovery. Learning should not be about blind obedience but about creative thought and self-driven discipline that stems from a personal desire to learn. The classroom should not be a space that confines the child but one that opens them to new ideas and skills. This kind of free environment should be available to everyone.



La Escuela. Mural by Pablo O'Higgins, 1949

SOURCE: CAPFCE



SECTION 1.3



CURRENT PROBLEMS IN MEXICAN PUBLIC SCHOOLS¹

The Mexican education system is organized into four levels: preschool (K1-K3), compulsory basic education (grades 1-9), upper secondary education (grades 10-12), and higher education. Since 1917 grades 1-9 have been mandatory and controlled by the government. Public schools serve 87% of all students in the country and their governance is centralized at the national level with the Secretaria de Educaci?n (SEP). This body is responsible for selecting the curriculum, selecting textbooks, hiring and dismissing school personnel, and setting salary schedules. Although basic education was decentralized and diverted to Mexico's 32 states, this was more of an administrative move. In reality, much of the decision-making is still in the hands of SEP leaving local teachers and school administrators with little autonomy in the system.

Mexico's public spending on education amounts to 5.9% of gross domestic product (GDP) per capita. The government currently spends about \$28 billion yearly on education, almost a quarter of its programmable budget. On average, states fund 85% of education spending through federal transfers.

The main problems in Mexico's education system have to do with high dropout rates after the primary level and low student achievement.² National problems also include lack of teacher training and lack of research and evaluation that can inform school improvement efforts.

Basic education enrollments increased significantly from the 1970's to 2000. In 1970, 9.1 million students attended primary school and in 2000 this number increased to 21.6 million. In order to accommodate this quick influx, schools went into double shifts³ and began using distant learning models for grades 7-9.

1. The information for the is section has been taken from the RAND Corporation documented briefing series *Education in Mexico Challenges and Opportunities*

2. "Mexico has not fared well in recent international examinations. On the Third International Mathematics and Science Study (TIMSS) conducted in 1995, Mexican students placed last or second to last among a group of countries that included mostly developed nations. Even in Latin America, Mexican student-performance is among the lowest (RAND)"

3. Double shifts in Mexico mean that schools have both morning and afternoon sessions. In general the quality of the morning session tends to be superior to that of the afternoon session and in many cases breaks down into students from higher and lower income families. In some schools children who attend in the afternoon are not required to wear uniforms because many cannot afford them and are generally not pushed as hard to perform well in class.

Although school is mandatory from grades 1-9, enrollments vary for each level. Attendance in preschool is quite low at 56%. Enrollment picks up in grades 1-6 at 93%, but drops again in grades 7-9 to 86%. Upper secondary school enrollment drops considerably to 51%.

These enrollment rates mean that out of every 100 students entering the first grade of primary school in Mexico, around 68 of them will complete all nine years of basic education, and thirty-five of these will go on to graduate from upper secondary. Only slightly more than 8% of the population aged 18 and older in Mexico holds a bachelor's degree.

As a comparison, on a per capita basis, in 2002 Mexico graduated 1.4 education Ph.D.'s per every million inhabitants, while the United States graduated about 22.

The following charts give a clear picture of the shortcomings of the current public education system.

The following map displays the average educational attainment of the Mexican population aged 15 and older. The chart to the right shows the average years of education obtained in each state of the country. There were some improvements seen from 1993-2003. In 2003, the average was 7.9 years; in 1993, it was 6.8 years. Regardless, these numbers are still quite low as the average Mexican is not finishing junior high school.

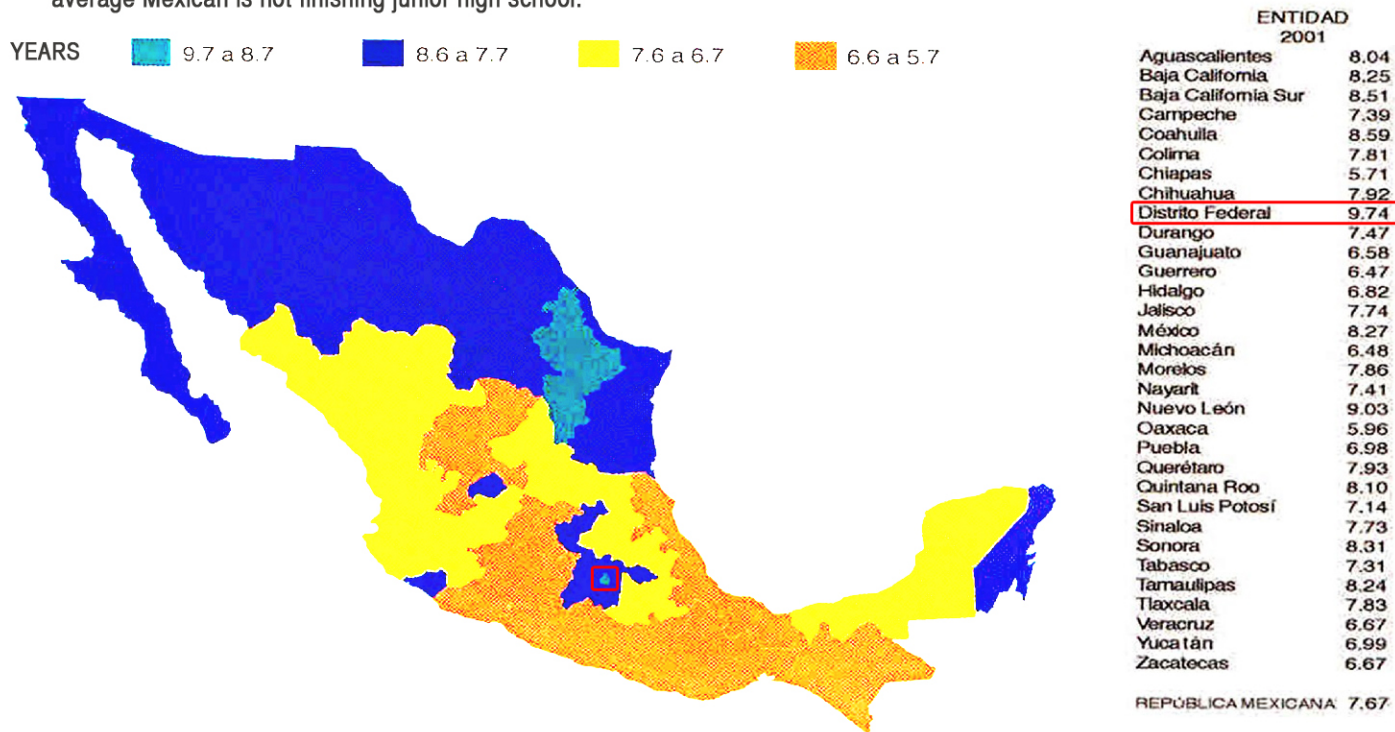


Fig 1. PRIMARY SOURCE: CAPFCE document

Secondary Source: Programa Nacional de Educacion 2001-2006. "El Sistema Educativo Nacional en 2001".

3.3. Equidad. Pagina 59. Septiembre. 2001

This chart displays the number of public schools available in Mexico City from 1950 until 1990. One can notice the significant differences between the number of pre-schools, primary schools and secondary schools. Even in 1990, the number of primary schools doubles as compared to pre-schools while the number of secondary schools drop to nearly a quarter of the number of primary schools.

Number Of Schools Per Level 1950 - 1990

	Total	Preescolar	Primaria	Secundaria	Media Sup	Normal	Superior
1950	25,413	835	23,818	411	192		157
1955	29,812	1,294	27,520	611	220		167
1960	36,018	1,852	32,533	1,140	360		133
1965	42,358	2,469	37,288	1,858	505		238
1970*	53,885	3,077	45,074	4,249	869	250	366
1975	68,893	4,156	55,618	6,798	1,494	324	503
1980	101,638	12,941	76,024	8,873	2,428	538	834
1985	135,154	35,649	76,690	15,657	4,953	858	1,347
1990	156,165	46,736	82,280	19,228	6,222	461	1,238

Fig. 2 PRIMARY SOURCE: CAPFCE document p95
Secondary Source : INEGI (1990); Salinas (1993a)



This chart shows the number of enrollments for each level of education. One can see from this data how the enrollments drop significantly after primary school. In 2001 14,833,889 primary students dropped to 5,465,167 secondary students. There is clearly a problem with this transition.

MATRICULATION 1893-2001

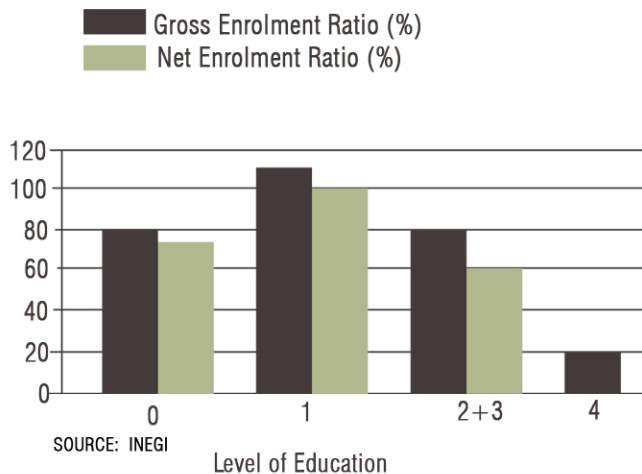
	Total	Preescolar	Primaria	Secundaria	Media superior	Superior	Capacitación para el trabajo
1893	483,337	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1900	713,394	696,168	7,469	N.D.	9,757	N.D.	N.D.
1910	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
1930	1,358,430	17,426	1,299,899	17,392	N.D.	23,713	N.D.
1940	1,994,603	33,848	1,960,755	N.D.	N.D.	N.D.	N.D.
1950	3,249,200	115,378	2,997,054	69,547	37,329	29,892	N.D.
1960	5,941,536	230,164	5,342,092	234,980	106,200	28,100	N.D.
1970	11,538,871	400,138	9,248,190	1,102,217	369,299	271,275	147,752
1980	21,464,927	1,071,619	14,666,257	3,033,856	1,388,132	935,789	369,274
1990	25,091,966	2,734,054	14,401,588	4,190,190	2,100,520	1,252,027	413,587
2000	29,669,046	3,423,608	14,792,528	5,349,659	2,955,783	2,047,895	1,099,573
2001	30,206,150	3,465,916	14,833,889	5,465,167	3,095,361	2,156,470	1,189,347

PRIMARY SOURCE: CAPFCE document

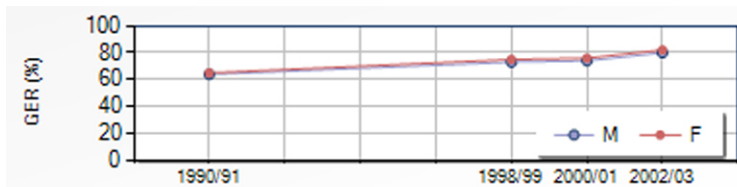
Secondary Source: Direccion General de Planeacion Programacion y Presupuesto (DGPPP). SEP.

Taken from The National Program of Education 2001-2006 "The National Education System in 2001", p.50

These graphs show enrolment ratios over the past 15 years. There is a surprising difference between primary school enrolments and the other levels of education. Many do not attend pre-school and many drop out after primary school.

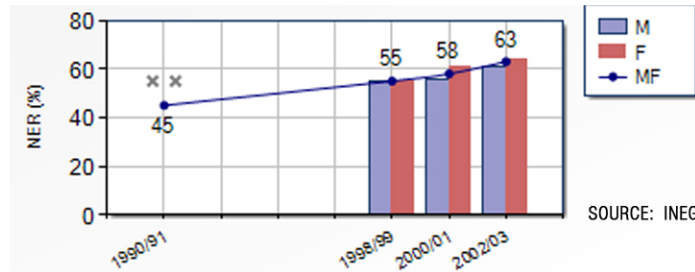


Gross enrolment ratios in pre-primary education (%) 1990/91-2002/03



SOURCE: INEGI

Net enrolment ratios in secondary education by sex (%). 1990/91-2002/03



SOURCE: INEGI