

STATISTICAL AND COMPARATIVE ANALYSIS OF EDUCATION IN MELILLA (SPAIN)

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ABSTRACT

We describe the main results obtained in a statistical study carried out at the request of the Economy, Employment and Tourism Council of Melilla (Spain). These results were used in drawing up the first phase of the Strategic Plan: Diagnosis and Analysis of the Situation of Melilla. The data analyzed were obtained from the National Educational Council, the Ministry of Education and Science and the Spanish National Institute of Statistics (INE), and the conclusions reached are set out in the present article. For purposes of comparison, we also made a comprehensive analysis of the real situation of the population in the education sector, including a comparative study of Ceuta (Spain). These two Spanish enclaves in the north of Africa in general present similar characteristics.

KEY WORDS:: Education, Strategic Planning.

MSC: 97U60; 97U70

RESUMEN

En este trabajo, presentamos los principales resultados obtenidos en el estudio estadístico realizado a petición de la Consejería de Economía, Empleo y Turismo de la Ciudad Autónoma de Melilla (España). Estos resultados se utilizaron para diseñar la primera fase del Plan Estratégico: Diagnóstico y Análisis de Situación de Melilla. Los datos analizados fueron obtenidos del Consejo Escolar del Estado, del Ministerio de Educación y Ciencia y del Instituto Nacional de Estadística de España (INE) y las conclusiones obtenidas se presentan en este artículo. Para ello, realizamos un exhaustivo análisis de la situación real de la población en el sector educativo, incluyendo un estudio comparativo con la Ciudad Autónoma de Ceuta (España). Estas dos ciudades españolas del Norte de África, en general, presentan características similares.

1. INTRODUCTION

In February 2007, the Autonomous City of Melilla³ presented the first phase of its “Strategic Plan: Analysis and Diagnosis”, authored by Marmolejo et al. [5]. This study was focused on six broad areas: social structure; education, culture and heritage; economy; trade and tourism; territorial management and town planning; the environment. The results presented in this paper are those corresponding to the education sector. The data employed for this purpose were compiled from diverse sources, including the municipal register of inhabitants, the National Educational Council, the Ministry of Education and Science and the Spanish National Institute of Statistics (INE), and refer to the period from 2003 until (in some cases) 2006.

Diverse benefits are to be expected from a plan of these characteristics. It is intended to produce a strategy to design a city that meets everyone’s requirements, for which purpose mechanisms should be established to ensure the participation of local agents; it creates a framework regulating decision-making and the actions undertaken by local authorities; it improves coordination among public and private initiatives; and it defines a strategy to promote the most promising sectors, incorporating new technologies into this process. In summary, it offers a long-term model to create the best possible future for the city.

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³ Under the Spanish Constitution, administrative and political power is devolved among 17 “Autonomous Communities”, each composed of one or more provinces. The two enclaves in North Africa, which do not form part of any province, are termed “Autonomous Cities” in reference to their comparable level of political autonomy.

In the education sector, the following specific areas can be distinguished: nursery education, primary education, special education, secondary education, high school, occupational training, adult education and social needs programmes. A study was also made of educational failure and its possible causes. These results are accompanied by the data obtained from a survey of the population of Melilla.

2 METHODOLOGY

In carrying out this study, we wished to involve our own students, and considered it would be interesting to apply the knowledge learned in class to the performance of an investigation using real data. Accordingly, we selected students from the Statistics 2 class of 1st year Business studies students, and from the survey design class of 2nd year Management and Public Administration students.

Why these students in particular? As mentioned above, the project included a survey made of the population of Melilla. To do so, we chose ten groups of three students from the above courses, and trained them as investigators during four intensive sessions, re-examining all the aspects studied in class.

During these sessions, the students were explained the task to be performed, who would make use of the results, and how, what the investigators' role would be within the overall structure of the study and how the quality of their work could affect the survey results. They were also given a small handbook describing the work to be done, defining the terms used in the questionnaire, summarizing the phases involved and clarifying the aims of the project. Aspects such as survey design and the construction of a questionnaire were reviewed.

As regards the questionnaire to be produced, the students were reminded that it should be easily manageable, constructed in such a way that the replies could be readily coded, error-corrected and prepared for computer processing, that the interviewee's interest should be maintained (according to Morton Williams, interest is normally maintained for about 40 minutes) and that the vocabulary used should be appropriate for the cultural level of the persons to whom it is addressed.

In carrying out the survey, the students were told that **the investigator had to establish direct contact with the respondents**, and that this was no easy task in some areas of the city, such as in districts four and five. They were also reminded that the respondent had to understand what information was being asked of him/her and had to have some motivation for collaborating. Finally, the students were recommended to be outgoing, presentable, to use their memory so as to be able to jot down notes after the interview, and to be patient, not pressurising the respondent to answer.

The students were informed that the sampling method to be used in this case was that of simple random sampling with proportional allocation (this subject had been studied in class). This method was considered highly suitable for Melilla, a city with a total population of 69184 inhabitants, according to the municipal register of inhabitants (at 31 May 2006), and which is divided into eight clearly defined districts, with populations of 2599, 5690, 2300, 7053, 13817, 4510, 7104 and 26111, respectively. A total of 1051 interviews were performed, in all of the districts and neighbourhoods of the city, applying proportional allocation by districts, achieving a level of confidence of 95% and a margin of error of $\pm 3\%$. The rate of non-response was barely 0.5%.

How was the sample determined?

In calculating the total and per-district sample size, a simple random sample was established, according to:

$$n = \frac{k^2 NPQ}{e^2(N-1) + k^2 PQ}$$

where N = total population, e = sampling error ($\pm 3\%$), $k = 1.96$ (a normal random variable at a confidence level of 95%, and $PQ=0.25$. This latter value reflects the fact that, being an unknown variance, the least favourable case is applied, i.e. in which $P=Q=0.5$).

In apportioning the sample size among the eight districts (strata), the following proportional allocation was made:

$$n_h = n \frac{N_h}{N}$$

The aim of this survey was to compare the diagnostic reports made with public opinions held regarding all aspects of the city, and regarding the problems encountered, and to include these results in the final reports.

Having performed the above calculations, the questionnaire was re-examined to detect possible errors. Finally it was reduced to 29 questions, some open and others semi-open (the latter type, in some cases with possible responses of *strongly disagree*, *disagree*, *normal*, *agree*, *strongly agree*; in other cases, *yes* or *no*). The interviews, always at the respondent's home, were carried out by the students, who selected at random the households to be addressed, from the 2006 municipal register of inhabitants.

When the questionnaire responses had been obtained, the students interpreted the data using SPSS statistical software. We also participated in this second phase, checking how the real data were entered and how conclusions were subsequently drawn.

In our opinion, the experience was a complete success, making our students aware of the importance of statistics and of just how the finally published results are obtained.

3. RESULTS

In this section, we present the most significant results obtained in the study for the Education Department. In some cases, the results are those deduced from the survey, while others are real data (from the Municipal Register of Inhabitants, the Ministry of Education and Science and the Spanish National Institute of Statistics), obtained with the participation of the students.

Table 1 shows the data for educational failure, district by district, as follows:

- District 1: Melilla la Vieja, General Larrea (Mantelete) and Ataque Seco.
- District 2: Héroes de España, General Gómez Jordana and Príncipe.
- District 3: Polígono, calle Margallo, El Carmen.
- Districts 4 and 5: Monte María Cristina, Barrio Hebreo, Polígono de la Paz, Tiro Nacional, Cañada de Hidúm, Los Cuernos, Cabrerizas, Cristóbal Colón, Batería Jota, Hernán Cortés, Reina Regente, Las Palmeras.
- District 6: Concepción Arenal, Isaac Peral.
- District 7: El Real.
- District 8: Paseo Marítimo, Minas del Rif, Carretera Alfonso XIII, Carretera de Farhana, El Industrial, General Sanjurjo (Hipódromo), General Primo de Rivera, La Libertad, La Victoria.

Table 1: Level of studies achieved, by districts

	<i>D1</i>	<i>D2</i>	<i>D3</i>	<i>D4</i>	<i>D5</i>	<i>D6</i>	<i>D7</i>	<i>D8</i>
<i>A</i>	3.68	1.16	5.23	11.40	9.18	1.54	3.49	1.58
<i>B</i>	15.62	13.82	30.41	38.14	43.62	20.31	24.18	24.59
<i>C</i>	14.18	9.83	15.26	25.82	16.78	16.41	21.82	18.68
<i>E</i>	35.48	28.61	29.26	16.66	22.17	27.35	21.22	23.83
<i>F</i>	2.07	0.90	0.83	1.08	1.03	1.70	2.82	2.35
<i>G</i>	3.43	3.37	5.12	3.18	2.16	3.93	3.63	3.85
<i>H</i>	13.34	20.16	6.28	1.81	3.10	15.10	12.62	13.43
<i>I</i>	5.63	9.26	3.69	0.93	1.05	7.22	6.24	6.29
<i>J</i>	6.44	12.31	3.86	0.94	0.88	6.25	3.80	5.11
<i>K</i>	0.13	0.59	0.06	0.04	0.04	0.18	0.17	0.30

Level of studies: A: Reading and writing, unable or very limited; B: No educational qualifications; C: Primary education certificate or equivalent; E: Secondary (obligatory) education certificate or equivalent; F: Level 1 of occupational training; G: Level 2 of occupational training or other non-university certificate of further education; H: High school certificate or university entrance exam certificate; I: Lower university degree; J: Bachelor's degree; K: PhD, Master's degree or similar.

All the following data were obtained from the Ministry of Education and Science and the Spanish National Institute of Statistics

According to the data for officially registered *students*, in the academic year 1999/2000 there were 14910 students registered, and this value rose to 15431 by the year 2005/2006. Of these students, the numbers in nursery, primary, special and obligatory secondary education rose from 12511 to 13201. Thus, in six academic years, the number of students increased considerably. However, during the academic year 1999/2000, a total of 1494 students left school during primary or secondary education, while in 2003/2004 (the latest date for which information is available) the corresponding figure was 1443 students. Therefore, while the first data set reflects the existence of a young population requiring attention, the second one reveals that educational failure is an increasing problem and that it could become a serious problem for this city.

Table 2: Officially registered students, by type of education. Variation between 2005/2006 and 2004/2005. Comparison with Ceuta.

<i>Academic year</i>	<i>2005/2006</i>		<i>2004/2005</i>	
	<i>Ceuta</i>	<i>Melilla</i>	<i>Ceuta</i>	<i>Melilla</i>
<i>Nursery Education</i>	2961	3237	64	86
<i>Primary Education</i>	5948	5996	23	- 64
<i>Special Education</i>	95	45	2	8
<i>Obligatory Secondary Education</i>	3874	3923	66	155
<i>High School Education</i>	1298	1339	36	25
<i>Occupational Training</i>	970	841	22	78
<i>Social Insertion Programmes</i>	462	188	23	- 54
<i>Total</i>	15608	15431	+ 236	+ 234

With respect to foreign students, during the latest academic year there were 878 students of foreign origin registered in Melilla, in nursery, primary, obligatory secondary and high school education, together with occupational training, social insertion programmes, artistic education and the Official School of Languages. This figure was 13.7% higher than the one corresponding to the 2004/2005 academic year. Of these students, 817 were at publicly funded establishments, while 61 were studying at private institutions. Thus, of every 1000 students registered in Melilla, foreigners represent 36.5 of those in nursery education, 63.4 in primary education and 58.4 in secondary education. Of these 878 foreign students, 731 came from Morocco, with the others as shown in the table below. This datum in itself might not be considered significant, were it not for the comparison to be made with the foreign-origin students registered in 1996/1997, when there were only 136. The complete sequence is shown below (although the table omits the information for Special Education: Ceuta had one such student, and Melilla, none).

Table 3: Students of foreign origin, by type of education in 2005/2006

	<i>Ceuta</i>	<i>Melilla</i>
<i>Nursery Education</i>	27	118
<i>Primary Education</i>	114	380
<i>Obligatory Secondary Education</i>	34	229
<i>High School Education</i>	12	41
<i>Occupational Training</i>	39	19
<i>Social Insertion Programmes</i>	24	16
<i>Artistic Education</i>	0	6
<i>Official School of Languages</i>	0	69
Total	250	878

Table 4: Foreign students, by continent/country of origin, in 2005/2006

<i>Continent/Country of origin</i>	<i>Number of students</i>
<i>European Union</i>	51
<i>Other European countries</i>	4
<i>Morocco</i>	731
<i>Other African countries</i>	7
<i>North America</i>	8
<i>Central America</i>	1
<i>South America</i>	8
<i>Asia</i>	10
Total	820

In addition, there were 58 students of unknown origin; with the 820 accounted for above, there were thus 878 foreign students. Of the 51 from European Union countries, 13 were German, 11 Belgian, 10 French, 9 Dutch, 4 Swedish and 4 British. Of the North American students in Melilla, 5 were from the USA and 3 from Mexico. The Central American student was born in Cuba. Of the South American students, 4 were from Colombia and 1 each from Venezuela, Peru, Bolivia and Argentina. Of the 10 Asian students, 8 were from China, 1 from India and 1 from a non-specified Asian country.

When data for adult education are included, the number of students of foreign origin rises to 1117. Closer analysis reveals that in nursery education there are 118 foreign children, in primary education, 380 and in obligatory secondary education, 229. Particularly striking is the high number of such children in primary education.

The table 5 shows that the number of foreign students practically doubled in six years.

Table 5: Foreign students registered in Melilla

	<i>Academic year 2005/06</i>	<i>Academic year 1999/00</i>
<i>Nursery Education</i>	118	80
<i>Primary Education</i>	380	207
<i>Obligatory Secondary Education</i>	229	176
<i>High School Education</i>	41	29
<i>Other education</i>	349	46
Total	1117	538

To conclude our consideration of the data for educational failure, the following table describes the rates of satisfactory educational achievement at the age of 15 years, premature school leaving and possession of the certificate of basic education.

Table 6: Academic results

	<i>Academic year 2003/2004</i>		
	<i>Ceuta</i>	<i>Melilla</i>	<i>National average</i>
<i>Satisfactory educational achievement (age 15)</i>	43.3	47.8	58.4
<i>Premature school leaving (18 - 24)</i>	43.2 (combined data)		30.8
<i>Certificate of Basic Education</i>	49.3	52.7	70.4

Another problem to be noted is the average number of students per class. Table 7 shows the data published by the Ministry of Education and Science in this respect, for the academic year 2005/2006, comparing Ceuta, Melilla and the national average.

Table 7: Student/Teacher Ratio by type of education

	<i>Ceuta</i>	<i>Melilla</i>	<i>Total</i>
<i>Nursery Education 1</i>	17.0	18.6	13.9
<i>Nursery Education 2</i>	23.8	24.9	21.0
<i>Primary Education</i>	24.2	24.8	20.6
<i>Special Education</i>	5.9	6.4	5.8
<i>Obligatory Secondary Education</i>	24.8	25.1	24.7
<i>High School</i>	24.2	21.7	24.3
<i>Occupational Training 1</i>	20.7	20.5	18.6
<i>Occupational Training 2</i>	22.3	19.1	18.1
<i>Social Insertion Programmes</i>	14.4	15.7	11.7

The data for high school and occupational training only include the information for standard, daytime education. Close examination of the published information shows that in Melilla, in obligatory education, this student/teacher ratio is not just higher than the national average, it is also *practically the highest of all Spanish regions*.

Table 8: Student/Teacher ratio in obligatory education

<i>Geographic/Political Region</i>	<i>Nursery Education 1</i>	<i>Nursery Education 1</i>	<i>Primary Education</i>	<i>Special Education</i>	<i>Obligatory Secondary Education</i>
<i>Total</i>	13.9	21.0	20.6	5.8	24.7
<i>Andalusia</i>	15.8	21.7	21.5	5.5	26.3
<i>Aragón</i>	14.1	20.1	18.7	6.7	23.8
<i>Asturias</i>	13.8	18.1	17.9	4.8	22.5
<i>Balearic Isles</i>	14.4	22.7	23.0	4.8	23.3
<i>Canary Isles</i>	-	21.1	21.1	5.3	25.4
<i>Cantabria</i>	15.3	19.4	18.3	4.9	21.9
<i>Castilla y León</i>	14.9	18.9	16.9	5.0	22.5
<i>Castilla la Mancha</i>	17.2	19.2	19.1	5.7	23.4
<i>Catalonia</i>	13.7	22.5	21.9	6.6	26.8
<i>Valencia</i>	15.0	20.9	21.0	6.9	24.1
<i>Extremadura</i>	14.7	18.3	18.0	6.3	24.8
<i>Galicia</i>	-	18.0	17.3	5.0	21.5
<i>Madrid</i>	13.8	22.4	22.7	6.2	25.8
<i>Murcia</i>	13.9	23.0	22.7	5.6	26.0
<i>Navarra</i>	11.8	19.6	19.1	4.2	23.1
<i>Basque Country</i>	13.7	19.3	19.3	4.1	20.0
<i>La Rioja</i>	13.9	21.9	21.1	5.2	24.8
<i>Ceuta</i>	17.0	23.8	24.2	5.9	24.8
<i>Melilla</i>	18.6	24.9	24.8	6.4	25.1

Table 9: Statistics/Teacher Ratio in 2003/2004*Average number of students per school unit during 2003/2004*

<i>Territory</i>	<i>Schools (public sector)</i>
<i>Ceuta</i>	21.5
<i>Melilla</i>	23.7
<i>National average</i>	19.1

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