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National  
Economic and  
Social Council

An Chomhairle  
Náisiúnta Eacnamaíoch  
agus Sóisialach

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Education:  
The Implications of  
Demographic Change

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- (v) the balanced development of all regions in the country, and
- (vi) the social implications of economic growth, including the need to protect the environment

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6. The Council shall have its own Secretariat subject to the approval of the Taoiseach in regard to numbers, remuneration and conditions of service.

7. The Council shall regulate its own procedure.

# NATIONAL ECONOMIC AND SOCIAL COUNCIL

## *Education: The Implications of Demographic Change*

by

Dennis Murphy

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ERRATA

- Page 9 Table 4, row for 19 year olds,  
1st column: read 58.5 and not 68.5  
3rd column: read 60.4 and not 70.4
- Page 13, Table 7, Column "1991 Age Survival Model, First Level":  
read 6.0 and not 6.6.  
  
Column "PIHE, Average" : insert (6.3) under 6.2.
- Page 14 Paragraph 28 (i) sixth line of sub-paragraph (a),  
read 11.2 and not 10.7  
(ii) 1st line of (e), read "imply" and  
not "yield"
- Page 15 Paragraph 30, 4th line, insert after "lower": "than  
those generated by the age survival model"
- Page 17 Table 8, column "1991 This Study, High, Total," read  
1011.6 and not 1001.6
- Page 23 Table 10, Column "Replacement, Third level",  
read 80 and not 250,  
read 80 and not 350,  
  
Column "Total, Third Level,"  
read 377 and not 547  
read 209 and not 379

APPENDICES

- Page 31, Table A2. Insert the following explanatory footnote:  
"The differences between this table and Table 2 (page  
4) arise from the exclusion from the latter of (i)  
first level pupils aged 14 and over and (ii) second  
level pupils aged 19 and over."
- Page 39, Table D1, for "Senior Cycle, age 18": read 0.472 and  
not 0.469.
- Page 41 Table D3, Column "1986: Total Second level": read  
321.1 and not 320.8  
Column " 1991, Junior Cycle, Community and  
Comprehensive": read 24.7 and not 124.7
- Page 42 Table D3 (Continued)  
Column " 1986, Total: all levels": read 967.3 and not  
978.3  
Column " 1991, Senior Cycle: Community and  
Comprehensive": read 15.5 and not 13.5
- Page 43 Table D3 (Continued)  
Column "1991 Total First Level": read  
(614.5) and not (615.5)  
Column " 1991 Junior Cycle: Secondary": read 141.1 and  
not 111.1
- Page 44 Table D3 (Continued)  
Column "1986, Senior cycle: sub total": read 112.0 and  
not 11.5  
Column "1986, Total: All levels": read  
(963.9) and not (964.9)
- Page 41-44 Table D3 (Continued)  
Insert the following explanatory footnote:  
"While the "Total: All Levels" figures are correct,  
the sub-totals do not add exactly due to rounding".

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## COUNCIL PREFACE

The study of the implications of demographic change for education, published in this report, is the second part of an evaluation of the implications for the social services of the Council's recent report on population projections.<sup>1</sup> The first part was concerned with the implications of population change for housing departments.<sup>2</sup> The study, published through this report, of the implications for education was prepared by Mr Dennis Murphy, Lecturer in Economics, Regional Technical College, Galway. Further studies on the implications of the population projections for health and social welfare are in the course of completion.

This study uses a methodology similar to that used in the previous study of educational expenditure published by the Council.<sup>3</sup> Future enrolments are projected on the basis of projections of population and participation rates. An alternative methodology, the age survival model<sup>4</sup>, which was used by the Department of Education in the 1980 *White Paper on Educational Development*, is also used in this report, thus allowing comparability with the projections in the White Paper.

The study projects a total growth in enrolments of between 6.5% and 13.8% over the decade 1981-1991. Although these represent rates of increase close to the projected 8.3 to 11.5% growth of the population at school age, the increases are lower than the increase of 19.6% in enrolments recorded during 1971-1981. The increases projected up to 1991 also differ from the trend of the previous decade in anticipating a more significant contribution from rising participation rates, particularly at senior second level and at third level.

The enrolment projections are not very sensitive to different population projections. The most problematic aspects relate to trends in participation rates where two important considerations arise. Firstly, the relationship between the demand for further education and overall economic conditions is complex and not clearly understood, although rising unemployment tends to increase participation rates. Secondly, participa-

<sup>1</sup>NESC Report No. 63, *Population and Labour Force Projections by County and Region, 1979-1991*.

<sup>2</sup>NESC Report No. 69, *Housing Requirements and Population Change, 1981-1991*.

<sup>3</sup>NESC Report No. 12, *Educational Expenditure in Ireland*.

<sup>4</sup>The age survival model is based on the projection into the future of present age survivorship rates within the educational system.

tion rates are highly sensitive to levels of educational provision, which in turn, depend for the most part on public funding.

The study gives estimates of the implications for public funding of education of the enrolment projections under certain assumptions. These estimates involve a sharp growth in real public expenditure on education, particularly at third level. The results are highly sensitive to the assumed trend in per pupil costs. The author gives projections for two different assumptions on cost: (a) no real increase apart from effect of salary increments; (b) a real rate of increase of three per cent per annum in addition to salary increments. The lower rate of cost increase would represent a significant reduction on the rates of increase recorded in recent years (see paragraph 51 of report). Such a reduction would require significant changes in respect of cost developments or in the number of pupils per teacher. It was outside the ambit of the present study to attempt an analysis of the impact of such factors as new technology.

Any assessment of the appropriate level of public funding for education must be seen in the context of current problems which arise from, firstly, the imbalance in the public finances and, secondly, the desired development of educational services relative to other areas of public policy, in particular the other social services. The former will involve extremely tight control on all aspects of public finance, with any real increases in provision being matched by either increases in taxation or compensating reductions in other areas of public expenditure. The Council intends to give its own views on the latter topic in a later report which will bring together the four studies referred to above and which will look at the overall implications for the social services.

## CHAPTER 1

### GROWTH IN THE EDUCATIONAL SYSTEM, 1971-1981

1. This chapter examines the growth in student numbers and the changes in their distribution by level and sector within the educational system over the period 1971-1981.<sup>1</sup> The purpose is to review the trends which may influence growth rates and patterns in the future.
2. Total enrolments grew by 149,300 over the decade from 761,500 to 910,800. This represents an annual growth rate of 1.8 per cent on average.<sup>2</sup> While this may appear large, the annual growth rate has declined rapidly from 2.6 per cent during 1966-1971 to 1.3 per cent during 1976-1981. The growth which occurred during the seventies can therefore be said to represent a continuation and consolidation of the major policy initiatives launched in the mid sixties following the report of the "Investment in Education" study team.<sup>3</sup>
3. The impact of the policy changes, in particular the opening up of the second level senior cycle through the introduction of the "free" scheme and allied measures, can be seen by examining the annual growth rates by level since 1965.
4. It is evident from the figures in Table 1 that the explosive growth at second level is petering out gradually, while growth at third level continues unabated. Within each level there has been a considerable change in the distribution of pupils by administrative sector. The private sector experienced an absolute decline of 7,500 pupils over the decade at first level. At junior cycle second level, the vocational sector experienced virtually no absolute growth while the Community and Comprehensive schools grew very rapidly from a very low base. The vocational sector fared better at senior cycle level, nearly doubling its numbers during the period. This resulted from a significant increase in the annual

<sup>1</sup>The years given refer to those school years, the greater part of which falls in the year named — e.g. 1971 refers to the school year 1970-1971.

<sup>2</sup>This, and other rates of growth in the text are compounded annually.

<sup>3</sup>For a full discussion of the educational policy changes over the period 1965-1974, see NESC Report No. 12, *Educational Expenditures in Ireland*, Dublin 1976, Stationary Office.

retention rate of 14 and 15 year olds. The community and comprehensive sector grew rapidly at senior cycle level but the real impact of the growth at junior cycle level has not yet been felt. As a consequence of the relative growth of the other two sectors the secondary schools share of senior cycle pupils declined from 77 per cent to 68 per cent over the decade.

The major growth sector at third level was the vocational/technology sector, accounting for over one half of the total growth in enrolments. The other H.E.A. designated sector (non-university) also grew rapidly, with the result that the universities share of third level enrolments fell from 75 per cent to 55 per cent.

Table 1

Average annual growth rates in enrolments by level, 1966-1981

	1966-1971	1971-1976	1976-1981
First Level	0.9	0.9	0.6
Second Level:	7.8	5.4	2.1
Junior cycle	6.7	4.2	1.3
Senior cycle	11.4	8.3	3.7
Third Level	4.8	4.8	4.8

Sources: Table 1 of *White Paper on Educational Development*, Dublin, 1980, Stationary Office; Department of Education, *Statistical Report*, 1980-1981, Dublin, 1983.

5. Enrolment growth is the result of growth in the school age population and/or changes in participation rates (the percentage of a given age group registered as attending full-time educational courses). As the school age population (4-24) grew by 17.4 per cent over the period 1971-1981, enrolments would have grown by 106,400 without any change in participation rates, representing 71.3 per cent of the growth that actually occurred. While rising participation rates account for only 28.7 per cent of the total growth recorded, they had a far greater impact on the enrolment growth among 15-24 year olds, where they accounted for 56.3 per cent.<sup>4</sup>

6. Tussing<sup>5</sup> has noted that participation rates do not rise in a linear fashion over time but rather exhibit an s-shaped growth pattern. (The

<sup>4</sup>These figures are calculated by comparing the actual age-specific enrolment growth with the growth which would have occurred if the base year participation rates had remained constant.

<sup>5</sup>Tussing, A Dale, *Irish Educational Expenditures – Past Present and Future*, ESRI Paper No. 92 Dublin, 1978. Page 89 and figure IV, 1 to 8.

age specific rates for the period 1966-1981 are given in Table A1 of the appendix.) This pattern involves moderate but increasing growth initially, followed by rapid growth, and culminating in a return to moderate growth or a cessation of growth altogether. The logic of this pattern is suggested by the standard theory of human capital, where education is perceived as both a consumption and investment good.<sup>6</sup> According to this theory, the investment view of educational expenditure initially predominates, but this is supplemented by a consumer good demand as the level of economic welfare increases, due partially at least to the returns from the initial investment.<sup>7</sup>

7. It is clear that participation rates among the compulsory age groups are in the final growth phase; indeed they are close to saturation (100%) in many cases. An exception to the general pattern is the rate for 4 and 5 year olds which has begun to decline in recent years. This decline is concentrated among 4 year olds and may be due to the increased availability of pre-school facilities in urban areas. Examination of the rates also indicates the considerable length of time it is taking to eliminate the problem of the 14 year old school leaver, despite the fact that the minimum school leaving age was raised to 15 in 1972.<sup>8</sup>

8. It is more difficult to determine precisely where post-compulsory age specific participation rates are on the s-sloped growth cycle. While the annual growth rates remain high in many cases, they have fallen considerably from the levels reached during the mid-sixties for all age groups except 17 year olds. As the Irish participation rate for the 15-19 age group is already one of the highest among OECD countries,<sup>9</sup> international experience provides little guidance.

9. Evidence that the rates for those aged 16+ have not yet entered the final growth phase is given in Table 2 where the absolute differences and contrasting patterns of change between males and females are detailed. Female participation is higher in the 15 to 18 age groups and the absolute gap has actually widened over the period 1973 to 1981. The gap

<sup>6</sup>For a complete outline of the theory see Becker, G.S. *Human Capital*, Columbia University Press, 2nd edition, New York (1975).

<sup>7</sup>A recent study of the demand for post compulsory schooling in England and Wales, showed that demand responded significantly to changes in real per capita consumption and relative changes in the financial rewards and unemployment experience of persons with different educational backgrounds. Pissarides, C.A. *Staying-on at School in England and Wales*, *Economica*, 48.

<sup>8</sup>For a review of the problem see, Rudd, J. *Geographical and Educational Characteristics of Second Level School Leavers, 1974-1975*. Paper read to ESRI 1975.

<sup>9</sup>OECD *Observer*, No. 115, January 1982.



between the male and female rates for those aged 19 and over has narrowed considerably over the period, with the female rates growing at close on 5 per cent annually. (Table A2 in the appendix gives the total age specific participation rates by sex.)

Table 2

Participation rates by sex for 14-24 age group, 1974, 1979, and 1981 (%)

	Males			Females		
	1974	1979	1981	1974	1979	1981
<i>Second Level</i>						
15	74.2	79.8	83.3	81.2	84.6	88.4
16	52.4	61.6	63.5	67.4	73.6	76.5
17	32.9	35.5	36.6	44.3	50.6	52.2
18	10.4	10.7	8.9	14.0	18.2	17.1
<i>Third Level</i>						
17	4.3	4.6	6.0	4.2	4.9	7.1
18	12.1	12.6	14.9	9.3	11.4	13.9
19	12.8	13.9	15.0	8.8	11.8	12.6
20-24	8.7	8.6	8.6	4.4	5.6	5.9

Notes: Enrolment data refer to February.  
Age-specific population data refer to April.

Source: 1974 data are taken from Tables 5.3 and 5.5 in NESC Report No. 38, *Universality and Selectivity; Social services in Ireland*, Dublin (1979); 1979 figures are calculated from *Statistical Report*, Department of Education 1978-1979 and *Census of Population 1979*, Vol. II; 1981 figures are based on enrolment data provided by Department of Education and author's estimates of the age specific 1981 population derived from NESC Report No. 63, *Population and Labour Force Projections by County and Region 1979-1991*.

10. There is also a clear indication from the figures that participation by 17 and 18 year olds of both sexes in third level is rising rapidly. Female participation of 17 year olds in third level is now higher than males and the gap in favour of males in other age groups is narrowing rapidly. Indeed, females comprised 43.6 per cent of all third level students in 1981 compared to 36.5 per cent in 1971. This trend is reflected in other EEC countries, although their rate of increase in the female/male ratio is lower.<sup>10</sup>

11. The rapid growth in female participation in the post-compulsory age groups, relative to males, is due to a combination of legislative, economic and socio-cultural factors. The introduction of equal pay and

<sup>10</sup>The Irish Female/male ratio at third level was above the EEC average in 1980 (see *Education and Training*, 2-1981, Eurostat).

equal employment opportunity legislation, coupled with the removal of the marriage bar in the public service, have resulted in increased employment opportunities for young women. The increased social acceptance afforded to married women working outside the home, and the availability of a growing number of time and labour saving devices within the home, have raised the returns from investment in further education. The returns have been further augmented by the improvement in the female/male earnings ratio. Over the period 1971-1981 average female weekly wages in manufacturing industry rose from 48 per cent of male wages to 59 per cent.<sup>11</sup>

12. It is to be expected that year to year changes in participation rates should respond to changes in employment opportunities, particularly for those age groups transferring from one level of the educational system to another.<sup>12</sup> A change in an age-specific participation rate occurs if the survivorship rate for the preceding age group changes. The changes in the male and female rates over the period 1973-1981 are given in Table A3 of the appendix. For males aged 16 and over the survivorship rate fell between 1978 and 1980, a period during which teenage (15-18) and young adult (20-24) male unemployment rates were falling.<sup>13</sup> Survivorship rates all turned upwards when unemployment began to rise appreciably in 1981.

13. The impact of short-term changes in labour market conditions for young women appear to be less clear cut in their effect on female participation rates. The survivorship rate for those aged 19+ compares to the male pattern, while those for 17 and 18 year olds indicate the presence of time lags. Pissarides' study of the survivorship rate of teenage girls in England and Wales found that unemployment had no discernible influence on post compulsory second level survivorship rates.<sup>14</sup> A possible explanation for the different female response may be due to young women (15-24) withdrawing from both the labour force and education.<sup>15</sup>

<sup>11</sup>For a detailed analysis of the relative performance of female wages, over the period 1970-1977, classified by wage income level, see Mooney, P.J. *Incomes Policy in Irish Economic Policy: A Review of Major Issues*, ESRI, Dublin 1978.

<sup>12</sup>17 and 18 year olds comprised 80.5 per cent of third level entrants in 1980-1981. Clancy, P. *Participation in Higher Education*, HEA, Dublin 1982.

<sup>13</sup>Unemployment data for young workers are given in Table 13 of *Review of Youth Employment Policies in the Republic of Ireland*", OECD, Paris (forthcoming).

<sup>14</sup>op. cit, page 354.

<sup>15</sup>The 1979 *Labour Force Survey* showed 13.9 per cent of young women as having the status "other".

## Summary

14. While the educational system continued to expand over the decade, although at a declining rate, the growth point shifted from senior cycle second level to third level. By the end of the period it was apparent that the changes in participation rates were beginning to dictate the overall rate of growth of enrolments, whereas population growth was a more important influence in the early years. The increases in participation rates, particularly those for females aged 17 and over, were extremely large and represent significant social change. The factors which explain the participation rate increases in the post compulsory age groups are complex and require further study, in particular their relationship with the female labour market.

## CHAPTER 2

### ENROLMENT PROJECTIONS, 1986 and 1991

15. The conventional methodology of enrolment forecasting involves combining projections of population by year of age and associated participation rates. This methodology was employed by both Sheehan<sup>1</sup> and Tussing<sup>2</sup> in previous studies of enrolment growth in the Irish educational system. An alternative method, which minimises the importance of changes in certain demographic variables is the age survival model. This model uses projections of first time child entrants to the education system in combination with one year survivorship rates (the proportion of an age group who remain in full-time education for a further year) and was employed in the 1980 *White Paper on Educational Development*.

16. Both methods are subject to a considerable margin of error. Population projections in Ireland are sensitive to changes in migration flows/patterns and fertility rates, while participation rates and age survival rates vary in response to economic circumstances and institutional developments, in addition to exhibiting a trend rate of change over time. While the two methodologies are closely interconnected, in that both require that the number of births be forecast in order to determine the number of new entrants, and participation rates can only rise if (some) age survival co-efficients rise, there remains sufficient differences to warrant the use of both methods.<sup>3</sup> Consequently, both methods are used in this study.

17. The population projections employed are those prepared by Blackwell and McGregor for the Council.<sup>4</sup> The projections are based on five year age groups and two different assumptions concerning net migration flows. Assumption I is based on zero net migration per annum, giving a projected population, PI, while Assumption II assumes net outward migration of 5,000 annually, giving a lower projected population, PII. Within these overall flows, inflows are assumed for the three five year

<sup>1</sup> NESC Report No. 12, *Educational Expenditure in Ireland*.

<sup>2</sup> Tussing, A. Dale, *Irish Educational Expenditure, Past Present and Future*, ESRI, Paper No. 92.

<sup>3</sup> It also facilitates a crosscheck on the results.

<sup>4</sup> NESC Report No. 63, *Population & Labour Force Projections by County & Region, 1979-1991*.

age groups up to 14 and outflows for the two groups 14-19 and 20-24. The details are given in Table 3.

**Table 3**  
Assumed net migration flows, 1981-1986 & 1986-1991

Age Group	1981-1986 & 1986-1991			
	Assumption I		Assumption II	
	Male	Female	Male	Female
0-4	3000	3000	2200	2200
5-9	3000	3000	2100	2100
10-14	3000	3000	2100	2100
15-19	-5000	-5000	-5900	-5900
20-24	-15000	-14000	-15900	-14900

Source: Table 10, NESR Report No. 63, *Population and Labour Force Projections by County and Region, 1979-1991*.

18. The enrolment forecasts require that the population projections be disaggregated and presented on an individual year of age basis. This has been done, working from the age specific 1979 Census data, using the survivorship rates from the Irish Life Tables, 1970-1972.<sup>5</sup> The allocation of the assumed migration flows within each five year group to single year of age was made following a detailed examination of the 1971-1979 intercensal patterns. The methodology and results are given in appendix B.

19. The annual average projected number of births is given in Blackwell and McGregor's study. By combining their assumptions concerning future trends in fertility rates and nuptiality rates with each of the migration assumptions, the actual number of births each year implicit in the projections has been calculated. Two alternative fertility rate assumptions are used. Assumption I assumes a continuation of the 1971-1979 declining trend, while Assumption II assumes that the annual rate of decline will be halted. Table C1 and C2 in the appendix make clear the sensitivity of the projections to fertility rate changes. Assumption I on fertility yields a small annual decline in births to 1986 which accelerates thereafter. There is a 1 per cent annual growth rate in births to 1986 with fertility rate Assumption II and a near constant level of births thereafter. In view of the sensitivity of the results, and their implica-

<sup>5</sup> *Irish Life Tables, 1970-72*, Irish Statistical Bulletin, March 1976.

tions for first level enrolments by 1991, both sets of figures are used below. The actual 1979 school age population and the projected 1986 and 1991 results are shown in Table 4.

**Table 4**  
School age population; 1979 actual, 1986 and 1991 projected (000's)

Age/Year	1979	1986		1991	
		I	II	I	II
4	69.4	74.2 (75.7)	73.5 (75.3)	73.0 (79.9)	72.1 (78.8)
5	70.1	74.8	74.4	74.0 (80.5)	73.0 (79.3)
6	71.4	73.6	73.2	74.2 (79.5)	73.3 (78.4)
7	70.5	72.8	72.5	73.9 (78.1)	73.1 (77.2)
8	60.2	60.8	69.4	74.1 (77.1)	73.3 (76.2)
9	69.2	69.0	68.7	75.0 (76.6)	74.0 (75.8)
10	66.8	69.6	69.2	75.9	75.2
11	66.0	71.4	71.1	74.7	74.0
12	67.3	72.1	71.7	73.9	73.2
13	67.5	73.1	72.7	70.9	70.2
14	68.6	72.2	71.8	70.1	69.4
15	68.0	70.5	70.5	70.4	70.1
16	65.6	68.2	68.2	70.3	69.9
17	63.2	66.1	65.7	71.1	70.3
18	62.0	63.2	62.9	69.9	69.3
19	68.5	61.5	70.4	65.9	64.5
20-24	266.3	296.6	294.8	299.4	295.8

Note: Assumptions I and II refer to the migration assumptions. The figures in brackets represent the projections, based on the fertility II assumption.

20. The overall growth projected in the school age population over the decade 1981-1991 ranges from 6.8 per cent (8.9) on the migration I assumption to 5.6 (7.6) per cent on the migration II assumption.<sup>6</sup> These projections are considerably less than the 17.4 per cent estimated growth which occurred during the 1978-1981 period. Under both migration assumptions the growth rate is higher in the later years than in the earlier years of the decade.

21. The projection of future participation rates on the basis of recent trends is hazardous, given the developments that occurred during the 1971-1981 period, particularly the contrasting experience of males and females in the post-compulsory age groups. However there are additional difficulties the most important of which are:

- (a) the different bases of resource allocation by level, with demand

<sup>6</sup> The bracketed figures refer to the fertility II assumption.

factors predominating at first and second level and supply factors at third level;

- (b) the influences of the future levels of economic activity, particularly per capita income and unemployment levels;
- (c) the impact of changes in the occupational structure and the raising of educational requirements within occupations;
- (d) The existence of human and institutional constraints. There are, undoubtedly, limits to human ability and motivation, and, there exists at any point in time, only a certain range of educational courses and institutions.<sup>7</sup>

22. A further factor which must be considered is the influence of international comparisons. There is a growing tendency to define educational expansion in relation to enrolment levels attained by other countries in the post compulsory age groups. As already mentioned, this is of little concern for the 15-19 age group, but of considerable importance for the 20-24 age group, as our participation rate is well below that of many other OECD countries.<sup>8</sup> Caution however must be exercised in comparing participation rates in the 20-24 age group as much of the observed inter-country variation is due to the length of studies and the range of age of third level students. Clancy (1982) found that the modal age of entry in Ireland was 17 in 1980-1981, and given that a large proportion of students attend courses of only two or three years duration, this means that many have completed their studies at the age of 20.

23. It is clear from the above that a mechanistic replication of historical trends in participation rates is inappropriate for projecting.<sup>9</sup> Accordingly, two assumptions concerning participation rates are used, in which the post compulsory ages are distinguished by sex: lower enrolments (LE) higher enrolments (HE).

#### LE Assumption

The rates change at half the average annual rate experienced during 1974-1981.

#### HE Assumption

The rates change in accordance with the trend in average annual rates

<sup>7</sup>Clancy has found that rates of admission to third level, in total and by sector, vary significantly by county (op. cit. pages 31 and 32).

<sup>8</sup>See *OECD Observer*, No. 89, January 1978, Paris.

<sup>9</sup>Previous studies have come to the same conclusion. Sheehan, NESR Report No. 18, *Population Projections 1971-86: The Implications for Education* favoured "Less formal methods of forecasting" while Tussing considered "vigorous forecasting models" inappropriate.

during 1974-1981 with two exceptions; the rate for 4 and 5 year olds is held constant at its 1981 level, and a maximum rate of 80 per cent for males and 85 for females aged 16 is imposed.<sup>10</sup>

As explained earlier it is most unlikely that a linear growth trend will continue indefinitely. Accordingly, an allowance for the s-shaped growth pattern has been made for both the LE and HE assumptions by reducing the annual rate of change by one quarter of one per cent per annum from 1986 onwards, with an annual rate of growth of 0.25 per cent as the minimum. The projected participation rates are set out in Table 5.

Table 5  
Participation rates projections, 1986 and 1991

Age	1986				1991			
	LE		HE		LE		HE	
4-5	72.7		75.5		70.0		75.7	
6-13	99.5		99.5		99.5		99.5	
14	97.5		99.0		98.6		99.5	
15	88.5		91.0		91.0		97.0	
	Male	Female	Male	Female	Male	Female	Male	Female
16	69.1	80.3	75.5	83.9	77.8	82.1	80.0	85.0
17	45.3	64.4	46.8	68.6	46.2	67.0	49.0	74.5
18	24.4	34.5	24.9	39.7	24.6	36.8	25.5	48.6
19	16.9	17.1	17.8	21.3	17.1	18.6	18.6	28.8
20-24	8.8	7.2	9.0	8.6	8.8	7.7	9.1	11.1

24. In the case of the age survival model, the 1981 post compulsory survivorship rates are used (see Table A3 in appendix) in combination with the projections of births under both fertility rate assumptions. However the 14-15 year old survival co-efficient is presumed to increase from 0.906 to 1.000 in 1991. The assumptions concerning the time of entry of young children into the system are the same as those used by the Department of Education in its projections.<sup>11</sup> They make allowance for a diminishing rate of net *immigration* among young people, which is projected to cease in 1986.<sup>12</sup>

<sup>10</sup>The justification for these exceptions is that the reasons for the recent decline in the rate for 4 and 5 year olds are not clear. Rates for 16 year olds are already high and further substantial increases raise questions concerning ability to meet qualifying standards for the present mix of education courses.

<sup>11</sup>*White Paper*, op. cit. Table 12.

<sup>12</sup>No allowance is made for net inflow in older age groups. During the period 1975/76 to 1979/80, an average of 915 pupils entered 1st and 2nd year of the second level system from outside the state Department of Education *Statistical Report*, 1979-1980, Section VII, Table 2.1.

25. In order to translate the enrolment projections by age into projections by level, the age-level distribution ratios for 1981 were calculated. (See Table C1 in appendix.) While it appears reasonable to presume that these ratios will remain broadly stable over the projection period for ages up to 16, an increase in the proportion of 17, 18 and 19 year olds in third level as against senior cycle second level has been allowed in recognition of the trend apparent in the 1976-1981 period (outlined in Chapter 1).

26. The high<sup>13</sup> (PI HE) and the low<sup>14</sup> (PII LE) projections which emerge from the participation rate model, and the results which emerge from the age survival model<sup>15</sup> classified by level, are set out in Table 6 which shows the projected numbers of enrolments. The percentage increase in 1986 and 1991 over the actual 1981 enrolments are presented in Table 7.

For 1986, enrolments are projected to increase by 6.2 per cent on assumption PI HE and 3.7 per cent on assumption PII LE based on Fertility I assumption. Use of Fertility II assumption gives an increase of between 3.9 per cent and 6.3 per cent. The age survival model indicates an increase of 5.6 per cent. Thus the range of all the enrolment projections for 1986 is between 3.7 per cent and 6.3 per cent increase over 1981.

For 1991 the range is from 6.5 per cent to 13.8 per cent. In all cases the projected increases are highest for the older age groups, particularly third level where the percentage increases are twice those at senior cycle second level.

27. Tables D3 and D4 in the appendix give a breakdown of the projections by administrative sector within each level. The disaggregation is calculated through the use of coefficients linking level – cycle and administrative sector (secondary, vocational etc). The initial coefficients are derived from the 1981 enrolment data and change over the projection period, as per the White Paper projections, to reflect "present trends and policies as regards building institutions of different administrative types."<sup>16</sup> These trends reflect a continuation of those evident during the 1970s and outlined in Chapter 1. (See Table C2 in appendix.)

<sup>13</sup>Based on the combined high population projection, PI, and the high projected participation rate, HE.

<sup>14</sup>Based on the combined low population projection, PII, and the low participation rate LE.

<sup>15</sup>The age survival model has not been calculated on a male/female basis for those aged 16 and over.

<sup>16</sup>White Paper op. cit. p. 105.

Table 6

Enrolment projections by level, 1981-1991 (000)

	1981	1986			1991		
	Actual	PI HE	PII LE	Age Survival Model	PI HE	PII LE	Age Survival Model
First level	568.0	585.9	578.6	581.1	606.8	591.6	601.9
Second level	300.7	329.7	319.7	329.1	341.6	326.7	334.8
Junior cycle	199.8	217.9	214.4	216.5	218.5	212.9	213.3
Senior cycle	100.9	111.8	105.4	112.6	123.1	113.8	121.5
Third level	41.9	51.2	46.1	51.5	63.3	51.2	58.9
Total	910.8	967.3 (968.4)	944.8 (945.9)	961.8	1011.6 (1036.6)	969.7 (992.6)	995.6 (1013.2)

Notes: The figures in parentheses are based on the Fertility II Assumption, use of which changes the first level totals only.

The figures in the rest of the Table are based on Fertility I Assumption.

PI – Zero net emigration per annum.

PII – 5,000 net emigration per annum.

LE – Participation rates change at half the 1974-1981 trend.

HE – Participation rates continue largely on 1974-1981 trend.

Fertility I – continuation of the 1971-1979 trend of a decline in the fertility rate.

Fertility II – continuation of the 1979 fertility rate.

Table 7

Percentage increase in various enrolment projections over 1981 actual enrolments

	1986			1991		
	PI HE	PII LE	Age Survival Model	PI HE	PII LE	Age Survival Model
	%	%	%	%	%	%
First Level	3.2	1.9	2.3	6.8	4.2	6.6
Second Level	9.6	6.3	9.4	13.6	8.7	11.3
Junior Cycle	9.1	7.3	8.4	9.4	6.6	6.8
Senior Cycle	10.8	4.5	11.6	22.0	12.8	20.4
Third Level	22.2	10.0	22.9	51.1	22.2	40.6
Average	6.2	3.7 (3.9)	5.6	11.1 (13.8)	6.5 (9.0)	9.3 11.2

Notes: The figures in parentheses are based on the Fertility II Assumption and the changes involved apply only at first level. The figures in the rest of the Table are in Fertility Assumption I.

PI – Zero net emigration per annum.

PII – 5,000 net emigration per annum.

LE – Participation rates change at half the 1974-1981 trend.

HE – Participation rates continue largely on 1974-1981 trend.

Fertility I – continuation of the 1971-1979 trend of a decline in the fertility rates.

Fertility II – continuation of the 1979 fertility rate.

28. A number of general observations may be made concerning the results of both forecast models for the decade 1981-1991.

- (a) The overall growth rates in all the models are considerably lower than the growth rate recorded during the 1970s. Even with the high fertility assumption, overall growth is forecast at 125,800 or 13.8 per cent by 1991 on the PI HE assumption. The age survival model generates a growth in enrolments of either 9.3 per cent or 10.7 per cent depending on the fertility rate chosen.
- (b) The rate of growth moderates in the second half of the projection period for the low fertility rate assumption in all the models. The effect of the different fertility rate assumptions is to slightly more than double the growth rate at first level during the second half of the decade.
- (c) The decline in the annual growth rates of both junior and senior cycle enrolments, evident in the 1971-1981 period, continues under all the projections, with one exception.<sup>17</sup> Indeed, the rate of growth at junior cycle level will be either zero or negative by 1991. Third level enrolments show the highest growth rate over the decade under all models, but only the HE model generates an annual rate close to that experienced during the 1971-1981 period.<sup>18</sup>
- (d) While the male-female share of total enrolments will be broadly equal by 1991, females will dominate the post compulsory age groups with a share of 53 per cent to 56 per cent depending on the growth pattern of participation rates. Females will be in the majority at third level by 1986, if the current trends in participation rates by sex continue.
- (e) All of the results yield an increase in the overall participation rate of 4-24 year olds. From an estimated rate of 66.8 per cent in 1981, it rises to 67.3 per cent on the PII LE assumptions and 69.4 per cent on the PI HE assumptions.

29. When the implicit participation rates in the age survival model are calculated for 1981 (based on the PI projections) and compared with the composite participation rates (HE and LE assumptions) the influence of net migration flows by age becomes apparent. As the age survival model builds on those already in the educational system and new child entrants, it ignores migration flows. If the age specific flows we have assumed are

<sup>17</sup>The exception is the senior cycle rate on the PII LE assumption during 1986-1991. It arises because of the mini-population bulge which occurred during the 1970s as a result of child immigration.

<sup>18</sup>The age survival model shows a fall in the third level annual growth rate during the 1986-1991 period because of the fact that only the 14-15 year olds survivorship rate is allowed to increase over the decade.

built into the model for each year of the projection period, the participation rates which would emerge would approximate closely to the HE assumptions. There would still be a gap in the case of 18 and 19 year olds because the HE rates imply significant increase in the survival coefficients at these ages, particularly for females.<sup>19</sup>

30. The participation rate model is clearly a more complete forecasting technique, embodying as it does all the relevant demographic variables. Since the age survival model is built on the 1981 survival coefficients, and the LE projection enrolments are lower, it is clear that the LE assumption would, if realised, represent a substantial decrease in educational requirements. The age survival projection represents the base line projection if it is accepted that current demand patterns should continue to be satisfied. The HE assumptions for third level would represent a modest increase in educational demand by the end of the decade.

<sup>19</sup>For 17, 18 and 19 year olds, the gap between the age specific participation rates in 1991 is 3%.

## CHAPTER 3

### COMPARISONS WITH OTHER STUDIES

31. As already noted, a number of studies have been published in recent years incorporating enrolment projections for the period to 1991. A comparison between their results and this study could serve to highlight the difficulties in educational projecting. For reference, Table 8 sets out the comparative figures with some brief notes on their respective assumptions. While there is a close approximation between certain figures, the similarity is of dubious significance on account of the different assumptions employed.

32. The previous NESC study<sup>1</sup> and Tussing<sup>2</sup> both employ the conventional participation rate model, and as is to be expected at a time of rapid demographic change, differences in the underlying population projections explain much of the variation in the results. The differences centre on the assumptions concerning net migration flows, in particular the pattern, size and duration of child immigration, and the trend in fertility rates. While Tussing believed that child immigration would generally cease by 1981, NESC took the view that the "1975-1976 recession and the very high unemployment levels would act as a brake on immigration".<sup>3</sup> It did in fact continue, and Blackwell and McGregor assume it will continue, though at a reduced level, throughout the projection period to 1991.

33. While the population projection differences are understandable, the substantial differences in the participation rate assumptions are less so. In general, our rates for four and five year olds and those for the fifteen plus age groups are lower than Tussing's but higher than those in the previous NESC study. While the different assumption concerning the age of entry of young children to the educational system is based on a trend which only emerged in the late seventies, after the other studies were published, the variations for the older age groups reflect fundamental differences.

<sup>1</sup> Report No. 18 *Population Projections 1971-86: The Implications for Education*.

<sup>2</sup> *Irish Educational Expenditures, Past, Present and Future*, ESRI, Paper No. 92.

<sup>3</sup> op. cit. page 10.

Table 8  
Results of other published enrolment forecasts and this study  
( '000)

	1986					1991					
	NESC (1976) Low	NESC (1976) High	Tussing	White Paper	This Study Low	This Study High	NESC (1976) Low	NESC (1976) High	White Paper	This Study Low	This Study High
First Level	587.3	653.8	631.6	577.9	578.5 (579.8) <sup>a</sup>	585.9 (587.0)	607.5	738.6	602.5	591.6 (615.5)	606.8 (630.7)
Second Level	301.9	305.9	307.3	331.8	319.8	329.7	313.3	343.3	336.1	326.7	341.6
Junior Cycle	-	-	208.4	215.8	214.4	217.9	-	-	213.5	212.9	218.5
Senior Cycle	-	-	98.9	116.0	105.4	111.8	-	-	122.6	113.8	123.1
Third Level	-	-	65.9	49.1 <sup>b</sup>	46.1	51.2	-	-	55.8	51.2	63.3
Total	-	-	1,004.8	958.8	944.8 (945.9)	967.3 (968.4)	-	-	994.4	969.7 (992.6)	1,001.6 (1,036.6)

Notes: (a) The bracketed figures are based on the fertility II Assumption.

(b) These figures are the revised projections given by the Minister for Education. See Dail Reports 12/5/81, Col. 976.

Sources: NESC results are from NESC Report No. 18, op. cit., Table III.3. The high enrolment results only are shown. Tussing's results are from ESRI Paper No. 92, op. cit., Table 4.7. *White Paper on Educational Development* op. cit., Table 1 is the source of White Paper data. This study's low is based on PII LE Assumptions, the high is based on the PII HE Assumptions.

NESC Two population projections were used, derived from NESC Report No. 5, *Population and Employment Projections, 1971-1986*, with adjustments for child immigration. Two participation rate projections were also made; a low which holds the 1974 rates constant, and a high which allows rates to rise until 1978 and remain constant thereafter. Projections were confined to first and second level only.

TUSSING: The population projection lies midway between the NESC high and low figures for all school-going age-groups, except the 15-19 cohort. His participation rate assumptions for the 15+ age cohorts imply high rates of growth by historical standards.

WHITE PAPER: The age survival model incorporates a rise in births over the period 1981-1986 of ½% per annum, with a small and diminishing amount of child immigration. The post-compulsory age survival rates are the average rates over the three years 1977-1980 with three exceptions; the 14/15 year old rate is assumed to rise from 0.995 to 1.000, the 18/19 year old rate from 0.563 to 0.576, and the 19+/20+ rate from 0.703 to 0.714 by 1991.

The NESC low projection for births to 1986 corresponds closely to our Fertility I figures though it diverges thereafter. However, Tussing believed the drop in births during 1976/1976 was only temporary, with the result that his projection for 1981 is 18,000 larger than ours, and that for 1986 is 23,000 higher than even our high fertility figure.

34. The previous NESCS study assumed that the participation of 14 to 18 year olds would rise between 1974 and 1978 and remain constant thereafter. This assumption, which has not been borne out, was a product of the methodology which derived participation rates by applying constant survivorship ratios to a base participation rate. In effect the rates were an output of the model, rather than an input. This method can only generate projections for the number of years it takes the base cohort to pass through the educational system,<sup>4</sup> unless the base participation rate is allowed to rise over time.

35. Tussing's study draws on international experience of the growth in participation rates and projects that Irish rates will grow in much the same manner. This has considerable merit in the case of second level age cohorts, but is quite unrealistic at third level where a rationing of places, in many disciplines, has been the norm for many years. Indeed, the very basis of this type of projection is questionable as no reference is made to the economic variables which underpin the demand.<sup>5</sup> A further argument against the general use of international standards is the wide difference between countries in the socio-cultural role of education and the extent to which the system is viewed as a system of social advancement, a vehicle for research, and a means for individual development. As Tussing's projections for 1981 were well wide of the mark, his projections for 1986 must be considered unrealistic.

36. The White Paper projections lie midway between the overall results of our participation rate models (Fertility I Assumption) and almost coincide with the results of the age survival model, with the exception of third level, where there is a difference of 3,000 in 1991. The age survival technique of forecasting is well suited for year to year planning as the most recent survivorship rates by age can be used. For longer time periods it cannot be regarded as more than a specification of minimum supply requirements,<sup>6</sup> unless the underlying trend in post-compulsory survivorship rates is incorporated. The *White Paper* adopted very conservative assumptions on survivorship rates, which effectively ignored

<sup>4</sup>In this case 4 years, as 14 year olds would then be 18, which explains the 1978 cut-off point. Essentially the method involved an examination of the impact of a rising 14 year old survivorship rate.

<sup>5</sup>It also fails to take into account the structural differences between third level education systems (see paragraph 22). If Tussing's participation rate for 20-24 year olds in 1986, 15%, were attained by 1991, our forecast enrolments at third level would rise by an additional 14,000.

<sup>6</sup>This assumes that there is a commitment to satisfy the current demand pattern in the future.

changes in the demand for third level education.<sup>7</sup>

37. While the *White Paper* does not specify any targets for enrolments it does estimate that 45 per cent of students who obtain a minimum of Grade D in five subjects in the Leaving Certificate will be able to obtain a third level place in 1991, compared to 41.3 per cent in 1979. Sheehan<sup>8</sup> devised a measure of the chance of a person obtaining a third level place by comparing general senior cycle enrolments of 16 and 17 year olds with third level enrolments of 18 and 19 year olds two years later. He calculated that there was a 32 per cent chance prior to the introduction of the "free scheme" in 1967, which fell to 22 per cent in the mid seventies. Our calculations suggest that there was a rise to 31 per cent in 1981 and that it will be at the same level in 1991, using our age survival forecast.<sup>9</sup> It follows that there would probably be a slight increase if our HE high projection is realised. This is a product of the projections, not a built-in specification.

38. The lack of objectives concerning enrolments at third level poses considerable difficulties for projectors. There is no evidence to indicate that a manpower requirements approach is being adopted, save in the case of engineering personnel.<sup>10</sup> In this vacuum projections inevitably differ, and rest entirely on the validity of their assumptions.

<sup>7</sup>Only three rates are allowed to rise over the forecast period and two of them had, in fact, been attained in 1981.

<sup>8</sup>Sheehan, J., *Future Enrolments in Third Level Education*, HEA, Dublin 1978.

<sup>9</sup>The 1981 figure corresponds quite closely to the admission rate of 20% calculated by Clancy (1982), pages 31-33.

<sup>10</sup>The one-year conversion courses are an example. Also, see *Proceedings of the joint RIA/Manpower Consultative Committee Conference on Engineering Manpower Requirements*, (Dublin 1980).



## CHAPTER 4

### TEACHER AND BUILDING REQUIREMENTS

39. Projections of the number of teachers required for each of the enrolment projections can be made using pupil/teacher ratios. These ratios reflect policies concerning the organizational system and learning mode employed at each level. In National Schools there has been a consistent policy to reduce the number of large classes (40+).<sup>1</sup> This has led to a reduction in the pupil/teacher ratio over the last seven years, from 32:1 to 29:1. The *White Paper for Educational Development* (1980) stated that this policy will continue, but employs a ratio of 29:1 for projection purposes in ordinary classes and 10.2:1 in special schools and classes.

40. Since 1977, the Department of Education has applied a pupil-teacher ratio of 19:1 in secondary schools, 18:1 in community and comprehensive schools, and 16.5:1 in vocational schools, in determining teacher allocations. The reasons advanced for the lower ratio in vocational schools are the practical bias in the curriculum, the higher proportion of disadvantaged pupils, and the relatively smaller classroom size in many older school buildings. However, the actual ratios of full-time pupils to full-time teachers averaged 17.4:1 in secondary, 16:1 in community and comprehensive, and 14.7:1 in vocational schools in 1979 and 1980. The difference between the actual ratio and the allocation ratio is accounted for by "ex quota" teachers, such as career guidance and remedial teachers and principal/vice-principals. "Ex quota" teachers accounted for between 9% and 12% of total full-time teachers in 1981. (In other words teacher numbers are 10.5% greater than the allocation ratios would suggest.)

41. In December 1982, the Minister for Education announced that pupil-teacher ratios were to be increased to 20:1 in secondary, community and comprehensive schools, and between 17:1 and 19:1 in vocational schools. The increases are to be introduced over a period of time as vacancies occur. In addition, the Minister also announced that

<sup>1</sup> 16.4% of pupils were in classes of 40 and over in 1980.

only schools with more than 250 pupils would be allowed a vice-principal ex quota and only those with more than 500 pupils would be allowed a career guidance teacher ex quota. While it is difficult to calculate exactly the impact of these changes, they will probably result in an effective reduction of nearly a third in ex quota teacher numbers over time.

42. Our projections at first level are based on the *White Paper* ratios, while those at second level are based on the recently announced ratios. In order to take account of ex quota teacher numbers at second level, the impact of a 7 per cent increment to the allocation is also calculated. The required stock of teachers at both levels is set out in Table 9.

Table 9

Projected total full-time qualified first and second-level teaching force

Projection Level	1980 <sup>a</sup>		1986		1991	
	First	Second	First <sup>b</sup>	Second <sup>c</sup>	First	Second
PI HE	19,356	18,214	20,526	16,698 (17,867) <sup>d</sup>	21,321 (22,162) <sup>e</sup>	17,289 (18,499)
PII LE	19,356	18,214	20,267	16,200 (17,333)	20,789 (21,594)	16,540 (17,698)
Age Survival	19,356	18,214	20,355	16,672 (17,839)	21,152 (21,770)	16,945 (18,130)

Notes: (a) Actual figures.  
 (b) Based on 29:1 pupil/teacher ratio in ordinary classes, and 10.2:1 ratio in special schools and classes.  
 (c) Based on pupil-teacher ratios for secondary, community and comprehensive schools of 20:1 and for vocational schools of 18:1.  
 (d) 7 per cent added to allocation to reflect ex quota teacher numbers.  
 (e) Fertility II Assumption.

43. If a 4 per cent per annum wastage rate<sup>2</sup> is assumed at first level, and allowance is made for teacher requirements in the non-aided sector on the basis of a 20:1 pupil-teacher ratio, average annual recruitment during 1981-1986 will range between 980 and 1,050. Recruitment needs in the later years of the decade are more conjectural because of the greater differences in the enrolment projections but could rise to between 1,010 and 1,210 on the PI HE projections, depending on the Fertility rate Assumption. These projections are of course dependent upon the retirement age of teachers not being changed and wastage rates for other reasons remaining stable. It would appear from the projections

<sup>2</sup> Wastage due to retirement or disability has averaged less than 2% in recent years.

for teacher training that there will be little difficulty in meeting requirements.<sup>3</sup>

44. It is evident from the projected teacher numbers for second level in Table 9 that no net additions to the teaching stock will arise throughout the decade, save to a marginal degree with the PI HE projection. Recruitment requirements will be dictated by the wastage rate,<sup>4</sup> although demand will be reduced for some years by the fact that the current stock is in excess of the officially approved level. These projections have serious implications for the Higher Diploma in Education courses in the universities, given that 1,359 persons graduated from these courses in 1981, a figure in excess of projected recruitment levels to 1986. If the pre-December 1982 ratios had remained in force, teacher requirements in 1986 would be 7 to 10 per cent larger than indicated above.

45. Estimates of teacher requirements at third-level are particularly hazardous on account of the differences which exist between the component elements. There is little doubt that there are presently substantial differences between the student/teacher ratios in universities and the vocational/technological colleges. Barlow has estimated, using post 1968 data, that 100 extra university students give rise to an additional 7 teaching staff (one professor and 6 lecturers), which implies a student/teacher ratio of 14:1.<sup>5</sup> The Department of Education has estimated that the *White Paper* projection of 12,100 additional third-level students by 1991 would require 1,000 extra teaching staff, implying an overall student/teacher ratio of 12:1.<sup>6</sup> If this latter figure is used, our high (PI HE) enrolment projections would generate a demand for an additional 1,783 teaching staff.

46. Estimates of building requirements are difficult to make because of the rapid change in many of the underlying factors. Sheehan has identified three factors which determine requirements: population movements and residential construction, obsolescence of existing buildings and enrolment growth by sector.<sup>7</sup> Population movements have been very important during the last decade at second-level and would appear

<sup>3</sup>Output has been close to 900 in recent years.

<sup>4</sup>Every 1% increase in the wastage rate would create a demand for 180 teachers.

<sup>5</sup>Barlow, A. *The Financing of Third Level Education*, ESRI Paper 106. Demonstrators are included in the teaching staff numbers and this probably explains the difference between the derived rate of Barlow and the more typical recorded ratio of approximately 20:1.

<sup>6</sup>NESC Report No. 62, *Economic and Social Policy 1981*, Table 41.

<sup>7</sup>See NESC Report No. 12, *Educational Expenditure in Ireland*.

to be becoming important at third-level, particularly in the Dublin area.<sup>8</sup> Replacement of existing buildings and pre-fabricated structures, which were brought into service during the late 1960s, has been an increasing priority in the last few years.

47. The *White Paper* includes an estimate of the amount of space that will be required in 1991 by way of expansions and replacement to satisfy their enrolment projections.<sup>9</sup> If these figures for replacement are adopted, the space required to satisfy the enrolment growth in our projections can be determined using the square metres per student formula at each level implied in the *White Paper*. The results are set out in Table 10 and indicate that our high enrolment projections for first and third-level would impose a considerable burden on the Public Capital Programme, in so much that our estimates are 17.5 per cent higher than those in the *White Paper*. In 1982, capital expenditure on education was 9 per cent of the Public Capital Programme.

Table 10  
Projected building requirements by sector to satisfy demand in 1991  
(000's sq. metres)

		Expansion <sup>a</sup>	Replacement <sup>b</sup>	Total
First-level: <sup>c</sup>	high	284	365	649
	low	182	365	547
Second-level:	high	314	305	619
	low	200	305	505
Third-level:	high	297	250	547
	low	129	350	379
Total	high	895	750	1,645
	low	511	750	1,261

Notes: (a) Based on square metres per student ratio implied in *White Paper*, Table 6.  
(b) *White Paper* figures.  
(c) High is PI HE projection; low is PII LE projection.

<sup>8</sup>The case for four new Regional Technical Colleges in the Greater Dublin Region, partly in response to population movements was made by Benson and Clancy in *Higher Education in Dublin: A Study of some Emerging Needs*, HEA 1979.

<sup>9</sup>Op. cit., Table 6.

## CHAPTER 5

### FINANCIAL IMPLICATIONS

48. The National Economic and Social Council has previously noted in its comments on the growth of public expenditure that proposals for additional public expenditure should be fully costed in order to evaluate the "capacity and willingness of the community to finance them".<sup>1</sup> This chapter attempts to place a money figure on the current costs of the enrolment projections presented in Chapter 2. A costing of capital requirements is not attempted because, as explained in our discussion of building requirements, there are too many unknowns.

49. In view of the fact that current public educational expenditure absorbed 13.2 per cent of total Government current expenditure, it is regrettable that there is no comprehensive data source for cost analysis. The information presently provided for first and second level in the annual statistical report of the Department of Education, and for part of third level in the H.E.A. accounts, falls far short of what is required. Indeed, Burke and Nolan have recently shown that the use of certain official data can generate seriously misleading results.<sup>2</sup>

50. The total public cost of education in 1980 is shown in Table 11. It has been drawn up on the same basis as that employed by Tussing for 1974<sup>3</sup> in order to facilitate comparison. The most striking feature of the table is the extent to which resources are distributed disproportionately between the different levels. While National School pupils comprised nearly 63 per cent of publicly supported enrolments, they received only 38.6 per cent of current public spending on education. Second level pupils comprised 33 per cent of enrolments and received 42 per cent of the financial resources, while third level students, slightly over

<sup>1</sup>NESC Report No. 21, *Report on Public Expenditure*.

<sup>2</sup>A. Burke and J. Nolan, *Recent Trends in the Financing of Primary Teacher Education in Ireland*, Irish Journal of Education 1982. The authors found that the figures quoted by McDonagh in his 1977 study of the financing of education, taken from the Book of Estimates, were very different from those in the Appropriation Accounts for the same year. (Mac Donagh, *The Way the Money Goes*, Oideas 1977).

<sup>3</sup>Op. cit., table 4.9.

4 per cent of enrolment, absorbed 19.5 per cent of current spending. While differences in resource distribution by level are hardly surprising they raise questions concerning the distributional impact of public educational expenditures within society.<sup>4</sup>

51. While total expenditure growth over the period 1974-1980<sup>5</sup> is due in part to changes in the demographic ratio and participation rates, the increase in total costs per pupil is the most important element. The unit costs, expressed in constant prices,<sup>6</sup> increased in the various sectors by the following amounts.

National schools	42.6%
Secondary Community and Comprehensive schools	28.1%
Vocational schools	11.4%
Third level sector	38.8%
Total System	40.6%

52. One of the most important elements in these changes in inputs per student has been the behaviour of prices. The price index for the public sector has tended to rise faster than that for the private sector. The contribution of price changes, measured by the rise in the public consumption deflator relative to the GDP deflator, over the period 1974-1980 was 12.7 per cent. This would not explain all of the increases in unit costs, in particular in National Schools and third level. In these sectors it appears that there was a change in "relative real" inputs. There was a reduction in class size in National Schools over the period, while at third level, the most rapidly expanding sector, the Regional Technical Colleges has a low student/teacher ratio partially due to the structural characteristics of the buildings.

53. Projections of current costs are hazardous, particularly in view of the relative price effect mentioned earlier. In addition, the impact of incremental salary scales, particularly at second level where there has been rapid growth in teacher numbers over the last 15 years, has to be taken into account. Two projections of total cost by level are made:

<sup>4</sup>The most comprehensive information is given in Rottman, D. et al., *The Distribution of Income in the Republic of Ireland: A Study of Social Class and Family Cycle Inequalities*, ESRI, Dublin, 1982.

<sup>5</sup>The implied income elasticity of demand (rise in educational expenditure relative to rise in GDP in current prices) was 1.58.

<sup>6</sup>The implicit net current expenditure of Public Authorities (1974 = 100) is used, derived from CSO *National Income and Expenditure 1980*.

Table 11  
Public educational expenditure, 1980  
(x £1,000)

	Salaries <sup>a</sup>	Pensions	Other <sup>b</sup> current	Sub-Total 1+2+3	General <sup>c</sup> overhead	Transport	Total current	Current per pupil	Capital	Grand Total
1st Level: National Schools	142,947	21,964	9,591	174,502	3,995	10,213	188,710	345	23,504	212,214
2nd Level: Total Secondary and Community + Comprehensive Vocational	135,478	1,655	50,793	187,926	5,210	10,212	203,348	677	26,224	229,572
Residential Homes <sup>f</sup> + Special Schools	86,622	163	39,486	126,271	1,406	7,853	137,928	616	13,474 <sup>g</sup>	151,512
Total: 1st + 2nd Levels	417,866	1,292	18,377	61,655	15	2,359	65,420	856	1,211 <sup>g</sup>	77,532
Total: 3rd Level				1,413	9,220	6	1,434		538	1,972
R.T.C.'s + Technological Teacher Training <sup>h</sup>				363,841	1,002	20,431	393,492	2,049	49,728	443,758
Universities <sup>i</sup>				94,097	271		95,099		12,615	107,714
Other H.E.A. Designated <sup>k</sup>				23,793	72		24,064		2,107	26,171
Other Higher Education Expenditures				6,380	599		6,452		548	7,000
Total: All Levels				50,868	61		51,467		5,206	56,673
				5,295			5,355		5,754	10,109
				7,762	10,223		7,582		62,343	551,472
				457,938			488,591			

Sources: Except as indicated in notes, data are from the financial statements contained in the Department of Education Statistical Report, 1980-1981, the Appropriation Accounts, 1980, and the Accounts Series, number 9, of the Higher Education Authority.

Notes:  
(a) For National Schools, includes grants to Capitation Schools; for Secondary Schools, includes only incremental salaries; for Vocational Schools, it is based on a breakdown of the VEC's "instruction" budgets between second level schools and third level colleges.  
(b) In general, includes all other current expenditure, other than transport and general departmental overheads. Vocational expenditure is split between second and third level (other than RTC's) by reference to student numbers.  
(c) The total is extracted for Vote 29 (office of the Minister for Education) and allocated by either stated purpose (details from Book of Estimates) or in proportion to expenditure in column 4, except "other higher education expenditures".  
(d) Allocated as per financial statement for first level and within second level by number of pupils in each sector.  
(e) Students numbers are for 1979-1980 and include part-time students converted to full-time equivalents.  
(f) Teachers salaries and pensions in Special Schools are included in the figures for National Schools.  
(g) Includes some element of spending on Technological Colleges.  
(h) Includes expenditure on Training Colleges of Home Economics as per Book of Estimates. Excludes Thomond College.  
(i) Includes grant aid from the Department of Agriculture to certain University faculties.  
(j) Includes Thomond College.  
(k) Includes expenditure on grants and scholarships from vote 29, VEC scholarships, the Higher Education Authority, the National Council for Education Awards, the Central Admissions Office, and the Dublin Institute for Advanced Studies.

Assumption I: Zero real increase save that an allowance is made for the incremental salary effect at second level, (4 per cent for one third of the teachers in vocational schools, and half the teachers in other schools).

Assumption II: 3 per cent real increase in costs per pupil in addition to the incremental salary effect.

No attempt has been made to quantify the capital costs of our enrolment projections in view of the number of imponderables involved. The financial projections are given in Table 12.

Table 12  
Projected public expenditure on education by level, 1986 and 1991 in 1980 prices  
(x £1,000)

Level	Assumption I				Assumption II			
	1986		1991		1986		1991	
	PI HE	P II LE	PI HE	P II LE	PI HE	P II LE	PI HE	P II LE
First Level	196,891	194,407	204,516	199,410	221,432	218,638	253,718	247,384
Second Level	227,037	220,262	251,658	240,648	254,479	243,433	293,957	279,135
Third Level	125,890	113,350	155,640	125,890	141,742	127,620	193,470	156,385
Total: All Levels	549,818	528,019	611,814	565,948	617,653	589,691	741,145	682,904

Notes: Pensions are assumed to remain at the same proportion of salaries as they did in 1980, Transport expenditure at second level has been reduced by 10% to take account of the introduction of charges for certain pupils in 1983. Part time student numbers, converted to whole-time equivalents have been included in the calculations for vocational schools and the third level sector.

54. The financial projections indicate the sensitivity of educational expenditures to changes in relative prices. Growth in total current costs would be 51 per cent over the period 1980-1991 if a three per cent real increase in costs occurs annually. There would be a 25 per cent increase if there is a zero real increase. The figures also indicate that third level expenditure will be the single largest component in the overall growth in expenditure. It is interesting to note that the OECD found that there was some evidence to indicate an inverse relationship between unit costs and participation rates at third level.<sup>7</sup> However Barlow<sup>8</sup> has found that the projection of the rate of growth in current

<sup>7</sup>Public Expenditure on Education, op. cit., page 24.

<sup>8</sup>Barlow, A., *The Financing of Third-Level Education*, ESRI Paper No. 106, Dublin, 1981, Chapter 8.

costs per university student is relatively insensitive to changes in the growth rates in student numbers but directly related to the assumed growth in earnings.

55. The financial projections assume implicitly that the current pattern of demand for particular courses and the manner in which that demand is satisfied will remain constant over the period. This may be unrealistic, particularly at third level, in view of the developments occurring in educational technology.<sup>9</sup> If there were to be a shift towards a less labour intensive system, the projected rise in costs could be reduced.

<sup>9</sup>The development of the distance learning project by NIHE, Dublin, is an example.

## CHAPTER 6

### CONCLUSIONS

56. A general review of our projections indicate that the coming decade is likely to be one of consolidation for the educational system, with overall growth (in terms of both absolute numbers and rate of change) considerably lower than that experienced during the Seventies.

57. While demographic changes,<sup>1</sup> in particular the rate of decline in fertility, determine enrolments up to Junior Cycle level, it is clear that they are also becoming the dominant factor at Senior Cycle second level. Senior Cycle enrolments exploded during the Seventies, with a growth of 79 per cent. With the scope for further rises in participation rates now diminishing, growth is not likely to exceed 23 per cent over the coming decade. After a period of very rapid growth, this will afford an opportunity for consideration of the qualitative aspects of education at this level.

58. Considerable uncertainty must surround our projections for third level enrolments in the absence of any specific statement of objectives for the sector. Our highest projections of 63,300 students in 1991, while 7,500 higher than the revised *White Paper* projections, still represent a lower growth rate than the 60 per cent which occurred during the period 1970-1980. As the third level enrolment ratio on the HE model in 1991 would still be below that of many developed economies, fundamental policy decisions still remain to be made.

59. On the basis of our projections of additional teacher requirements, the existing capacity at first level appears quite adequate. The position at second level, in the wake of the increased pupil-teacher ratios and changes in the allocation of ex quota teachers, is that there are excess numbers pursuing Higher Diploma in Education qualifications. A close monitoring of the wastage rate of second level will be necessary as its behaviour will largely dictate recruitment requirements.

<sup>1</sup>The demographic forecasts for the decade indicate not just a change in the overall size of the population, but also a change in the age-structure.

60. The *White Paper* envisaged a replacement rate of school buildings at first and second level in addition to expansion requirements. Our projections indicate that this may not be the case at second level if the HE projections prove correct. Notwithstanding this reservation, there would appear to be ample opportunity to continue concentration on replacement work. It is third level new building requirements which are most uncertain. Given the high capital costs involved, a careful assessment of the respective merits of new institutions versus expansion of existing ones appears warranted.

61. The fact that this study deals only with national aggregates means that possible variations in participation at the county or regional level for the post compulsory age groups are ignored.<sup>2</sup> It should also be recognised that we have confined ourselves to the educational system and ignored the rapidly growing training system. There is a case for producing more comprehensive statistical information on both education and training at the regional level, particularly in view of the growth in youth unemployment.

62. Perhaps the most pertinent point to emerge is the case for a ten year rolling projection based on the latest demographic data and survivorship rates. This could be published annually in conjunction with the annual statistical report of the Department of Education.<sup>3</sup> At present, educational policy decisions concerning participation rates come to the fore only in the wake of an occasional report. The long term ramifications of growth in the educational system and the associated resource requirements warrant a regular and comprehensive review.

<sup>2</sup>Clancy (1982) has shown that the admission rate to third level varies considerably by county.

<sup>3</sup>At present the Higher Education Authority is responsible for producing annually statistical information on universities and other designated institutions. This might be extended to embrace the technological sector.

## APPENDIX A

Table A.1

### Educational Statistics 1971-1981

Actual participation rates 1966, 1971, 1974, 1979, and estimated participation rates 1981, by age

Age/Year	1966	1971	1974	1979	1981
4-5	66.2	79.3	84.7	77.4	75.2
6-13	95.8	98.6	99.8	99.0	99.3
14	68.7	84.7	92.5	95.5	96.9
15	54.2	70.7	77.5	83.2	86.9
16	39.0	55.0	60.4	68.4	70.7
17	27.3	39.4	43.1	48.2	51.3
18	14.7	20.8	22.4	26.6	27.4
19	9.6	12.1	12.5	15.7	15.7
20+	7.2	7.5	6.8	7.6	7.6
TOTAL	60.2	65.7	67.1	66.8	66.8

Sources: 1966, 1971, 1974 are from Tussing (1978) op. cit., Table 4.6. 1979 derived from Department of Education Statistical Report with 1978-1979 enrolment data (February) related to April 1979 Census figures. 1981 is estimated from provisional enrolment data provided by Department of Education related to estimated age-specific 1981 population.

Table A2

Participation rates by sex for 14 to 20 year olds, 1974, 1979 and 1981

Age	1974		1979		1981	
	Male	Female	Male	Female	Male	Female
14	95.3	95.5	95.2	95.8	96.4	97.4
15	75.1	81.9	81.1	85.5	84.5	89.3
16	52.4	68.5	62.6	74.5	64.5	77.2
17	37.4	48.9	40.6	56.1	43.1	59.8
18	22.6	22.3	23.6	29.8	23.9	31.1
19	14.7	10.8	16.1	15.2	16.3	15.1
20-24	9.0	4.6	9.0	6.3	8.8	6.4

Note: The enrolment data refer to February and state age as of 1st January of the same year. The age-specific population date is based on April.

Table A3

Survivorship rates (a) by sex 14 to 20 year olds, 1972-1973 to 1980-1981

	1972-1973 to 1973-1974		1974-1975 to 1976-1977		1976-1977 to 1977-1978		1978-1979 to 1979-1980		1978-1980 to 1980-1981	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
14-15	83.8	89.0	87.3	89.2	86.6	89.3	86.7	90.6	88.8	92.4
15-16	73.2	87.0	77.9	88.6	75.7	88.0	75.3	88.1	77.7	88.7
16-17	70.6	74.7	70.2	74.1	68.5	76.9	65.8	77.3	69.7	78.7
17-18	58.0	46.2	63.6	57.2	53.4	54.8	51.7	54.5	56.2	52.4
18-19	69.6	45.8	71.7	47.9	70.0	50.8	62.2	48.9	73.0	46.4
19+-20+	71.3	64.3	79.8	71.7	74.1	67.8	71.5	62.8	73.7	65.3

Note: (a) A survivorship rate is the proportion of the age group N to year t who remained in full time education for a further year. The rates are calculated by taking pairs of enrolment figures in successive years, i.e. 15 year olds in 1979-1980 and 16 year olds in 1980-1981, and dividing the former into the latter.

Source: Calculated for *Statistical Report*, Department of Education, various years

## APPENDIX B

## MIGRATION BY AGE

The net migration flows for the relevant five year age groups for the 1971-1979 intercensal period (Table B1) shows that substantial child immigration occurred and the traditional pattern of net emigration among 20-24 year olds continued.

Table B1

## Effects of migration 1971-1979

Age group	Males	Females	Total
0-4	+2,100	+3,000	+5,100
5-9	+11,000	+10,900	+21,900
10-14	+11,600	+10,700	+22,300
15-19	+3,800	+2,800	+6,600
20-24	-10,100	-10,400	-20,500

Source: Census of Population, 1979; Bulletin No. 1.

It is possible that the measured intercensal effect masks the real pattern of net youth migration, because the migration effect on any individual age-cohort aged X in April 1979 embodies the impact of migration flows in each of the preceding eight years (X-8, X-7, etc.). This would be particularly true if immediately adjacent cohorts displayed migration flows in opposite directions.

A clearer picture of intercensal migration flows by individual year of age can be obtained by calculating the expected 1979 population, using survivorship rates applied to the 1971 census data and intercensal births (Table A2). Initial examination of the age specific net migration flows suggests a division into three broad age groups for analysis, 0-7, 8-15, 6-23.<sup>a</sup>

The 0-7 flows, where each successive cohort has been exposed to migration for one additional year, indicate a general upward trend. The deviation from this trend at age 4-5 may be due to the influence of the school entry age on family migration decisions, while possible over-counting of infants explains the large migration effect at age 0.

The migration patterns for all ages over eight, reflects differences in the migratory experience of the relevant age-cohort, rather than the duration of such experience.

<sup>a</sup>This analysis was suggested by Terry Corcoran (Department of Labour) in a private paper.

For the ages 8-15, the measured inflow appears broadly stable, averaging 300 per annum for males and 250 per annum for females. The slight bunching at ages 9 and 10 is possibly related to the bulge referred to above, and the fact that in-migration was at its highest in 1974-1975 when the group would have been 4 and 5.

The migration flows display a sharp change after the age of 15. The flows decline at each successive age, becoming negative at age 18. It is not until the age of 24 that the outflow begins to decline. Given the sharp change which occurs after age 15, and the apparent stability of the pre-15 annual migration experience, it appears possible to break down the cumulative effect of migration on the ages 16 to 23. By subtracting from the intercensal migration for any cohort aged 16 and over the number of years it spent in the pre-15 age groups, a derived measure of migration may be obtained. The results of the calculations are set out in Table A3.

The results suggest that there is a turnover in the migration flows after the official school leaving age, even for those cohorts where the measured intercensal effect is positive. There appears to be a steadily rising outflow up to the age of 23, with the two deviations from trend at 18 and 20 possibly due to features of the educational system.<sup>b</sup>

In the light of these patterns, Table A4 sets out the allocation of migration flows within each five year age group for each forecast period.

<sup>b</sup>The annual School Leavers Survey published by the National Manpower Service indicates that approximately 2% of leavers go abroad shortly afterwards. The steady inflow of foreign students to third level institutions, who are generally older than their Irish counterparts, may explain the relatively low outflow at age 20.

Table B2

Estimated effect of migration, 1971-1979, on individual age-cohorts

	Male			Female			Total Migration Effect
	1971 Expected Population	1979 Expected Population	Migration Effect	1971 Expected Population	1979 Expected Population	Migration Effect	
0	34394	36171	777	34251	34182	931	1708
1	35049	35027	-22	33145	33302	157	135
2	34160	34291	131	32291	32772	481	612
3	34119	34581	462	32347	32752	405	867
4	34526	35567	1041	32630	33830	1200	2241
5	33888	35778	1890	32412	34303	1981	3871
6	34923	36639	1716	32785	34726	1941	3657
7	34157	35895	1738	32498	34571	2073	3811
8	33040	35569	2529	31428	33622	2194	4723
9	32605	35206	2601	31344	33831	2487	5088
10	31571	34316	2745	28830	32442	2512	5257
11	31603	33897	2294	30285	32099	1814	4108
12	32302	34637	2335	30306	32709	2403	4738
13	32362	34506	2144	30975	33043	2068	4212
14	32917	34950	2033	31803	33694	1891	3924
15	32667	34784	2117	31505	33192	1687	3804
16	31960	33539	1579	30568	32100	1532	3111
17	31377	32390	1013	29945	30859	914	1927
18	31805	31697	-103	30597	30337	-260	-368
19	30499	29869	-730	29675	28601	-1074	-1084
20	29891	29098	-793	28528	27505	-1023	-1816
21	29542	27959	-1583	28747	26862	-1885	-3468
22	29434	27011	-2423	27976	26039	-1937	-4360
23	28488	25558	-2930	27458	24705	-2753	-5683
24	28613	26182	-2431	27559	25352	-2207	-4638

Notes: The eight year survivorship rates used to calculate the expected population are based on the 1970-1972 Irish Life Tables with an adjustment for reduced mortality rates.

Table B3

Derived migration flows for the population aged 16-23 for the period 1971-1979

Age 1979	Male			Female			Total Net Flow
	Migration Effect	Inflow to Age 15	Net <sup>(1)</sup> Flow	Migration Effect	Inflow to Age 15	Net Flow	
16	1579	+2100	-521	1532	+1750	-218	-739
17	1013	+1800	-787	914	+1500	-586	-1373
18	-108	+1500	-1608	-260	+1250	-1510	-3118
19	-730	+1200	-1930	-1074	+1000	-2074	-4004
20	-793	+900	-1693	-1023	+750	-1773	-3466
21	-1583	+600	-2183	-1885	+500	-2385	-4568
22	-2423	+300	-2723	-1037	+250	-2187	-4910
23	-2030	-	-2930	-2753	-	-2753	-5683

Note: (1) The Net Flow is the difference between the measured intercensal migration and the number of years of immigration experienced by a particular age cohort.



**Table B4**

**Distribution of migration flows by age and sex, 1979-1991**

Age	1979-1981		1981-1991 & 1986-1991			
	Male	Female	Assumption I		Assumption II	
			Male	Female	Male	Female
0	300	400	550	550	400	400
1	300	400	550	550	400	400
2	300	400	550	550	400	400
3	300	400	550	550	400	400
4	500	500	800	800	600	600
5	500	500	750	750	550	550
6	450	430	750	750	550	550
7	450	450	500	500	340	340
8	300	300	500	500	330	330
9	300	300	500	500	330	330
10	220	220	600	600	420	420
11	220	220	600	600	420	420
12	220	220	600	600	420	420
13	220	220	600	600	420	420
14	220	220	600	600	420	420
15	550	550	500	500	500	500
16	-300	-300	-500	-500	-500	-500
17	-700	-300	-600	-300	-800	-500
18	-1500	-1500	-1400	-1600	-1600	-1700
19	-2900	-3100	-3000	-3100	-3500	-3800

**APPENDIX C**

**BIRTH PROJECTIONS**

The bases for the calculations of births is the combination of nuptiality and fertility rates, both legitimate and illegitimate, applied to the number of women in each five year age group at risk (15-49).

In Blackwell and McGregor's study, births are calculated for the initial and terminal year of each five year period, averaged, and multiplied by five, to yield 0-4 population at the end of the period. We have replicated the calculations and fitted the intervening years by interpolation. The results do not correspond exactly but the margin of errors is less than 0.5% in all cases.

**Table C1**

**Births<sup>a</sup> by sex and year 1980-1981**

**Fertility I assumption**

Year <sup>b</sup>	Assumption I		Assumption II	
	Male	Female	Male	Female
1980 <sup>c</sup>	37490	35023	37490	35023
1981 <sup>c</sup>	37930	35781	37930	35781
1982	37738	35587	37466	35515
1983	37498	35443	37399	35356
1984	37401	35337	37275	35239
1985	37278	35282	37161	35132
1986	37174	35208	37036	35013
1987	37024	34963	36641	34794
1988	36614	34576	36413	34408
1989	36203	34188	35972	33992
1990	35793	33801	35616	33657
1991	35383	33635	35359	33411

*Notes:* (a) Actual births not adjusted by survivorship rates.  
 (b) Year ending March.  
 (c) Actual figures.

**Table C2**  
**Births<sup>a</sup> by sex and year 1980-1981**

**Fertility II assumption**

Year <sup>b</sup>	Assumption I		Assumption II	
	Male	Female	Male	Female
1980 <sup>c</sup>	37490	35023	37490	35023
1981 <sup>c</sup>	37930	35781	37930	35781
1982	38441	36278	38385	36225
1983	38952	36774	38840	36648
1984	39462	37271	39295	37112
1985	39973	37767	39750	37555
1986	40484	38264	40205	37999
1987	40571	38343	40241	38032
1988	40658	38422	40277	38065
1989	40746	38502	40313	38097
1990	40833	38481	40349	38130
1991	40920	38660	40385	38163

Notes: (a) Actual births not adjusted by survivorship rates.  
(b) Year ending March.  
(c) Actual figures.

**APPENDIX D**  
**DETAILED PROJECTION DATA AND RESULTS**

**Table D1**  
**Age/Level distribution ratios, January 1981**

Age	First Level	Second Level		Third Level
		Junior Cycle	Senior Cycle	
3-5	1.000	—	—	—
6-11	0.998	0.002	—	—
12	0.548	0.452	—	—
13	0.100	0.900	—	—
14	0.024	0.973	0.003	—
15	0.012	0.647	0.341	—
16	0.012	0.136	0.852	—
17	0.011	0.017	0.845	0.127
18	—	0.005	0.469	0.523
19	—	—	0.121	0.879
20 and over	—	—	0.043	0.957

Note: In order to allow for the trend of an earlier age of entry into third level, the ratios for 17, 18 and 19 year olds are presumed to increase to 0.150, 0.550 and 0.890 respectively by 1991, and fall by a corresponding amount for senior cycle second level.

Source: *Statistical Report, 1980-81*; Department of Education (Dublin 1983)

Table D2

Initial and final co-efficients for the distribution of pupils by sector within level

	First Level	National	Secondary	Community and Comprehensive	Vocational	Universities	Other H.E.A. Institutions	Teacher* Training	Other
1981									
First Level	0.971								0.029
Second Level									
Junior Cycle	0.666		0.240						0.030
Senior Cycle	0.677		0.214					0.070	0.025
Third Level			0.260	0.539	0.081				
1991									
First Level	0.997								0.023
Second Level									
Junior Cycle	0.663		0.222						0.035
Senior Cycle	0.614		0.225					0.071	0.025
Third Level			0.260	0.539	0.106				

\*Excluding Thomond College which is included with other H.E.A. institutions.

Sources: 1981 figures derived from 1981 enrolment data made available by Department of Education.

1991 figures taken from *White Paper on Educational Development*, Table II, with the exception of vocational and university sectors at third level which are held at their 1981 levels.

Table D3  
Participation Rate Model  
Enrolments by sector within level, 1981, 1986 and 1991 ('000)  
(A) population 1, low enrolment (P1 LE)

Year <sup>(a)</sup>	1981	1986	1991
National Schools	551.3	566.5 (567.6)	584.8 (607.5)
Other	16.7	15.1 (15.1)	13.7 (14.3)
<b>Total: First Level</b>	<b>568.0</b>	<b>581.6 (582.7)</b>	<b>598.5 (621.8)</b>
Junior Cycle:			
Secondary <sup>(b)</sup>	133.0	143.5	142.4
Community & Comprehensive	18.8	22.3	124.7
Vocational	47.9	49.4	47.7
Sub-Total:	199.8	215.2	214.8
Senior Cycle:			
Secondary	68.3	68.1	70.4
Community & Comprehensive	8.0	10.1	14.5
Vocational	21.6	23.0	25.8
Other	3.0	3.8	4.0
Sub-Total:	100.8	105.6	114.7
<b>Total: Second Level</b>	<b>300.7</b>	<b>320.8</b>	<b>329.5</b>
Vocational/Technological	10.9	11.6	13.5
Universities	23.2	25.8	28.0
Other H.E.A. designated <sup>(c)</sup>	3.4	4.4	5.5
Teacher Training	2.9	3.2	3.6
Other	1.5	1.4	1.3
<b>Total: Third Level</b>	<b>41.9</b>	<b>46.4</b>	<b>51.9</b>
<b>Total: All Levels</b>	<b>910.8</b>	<b>949.4 (950.6)</b>	<b>980.0 (1,003.5)</b>

Notes: (a) These refer to school years, the greater part of which falls in the year named.  
(b) Includes very small element of Secondary Tops enrolments.  
(c) Includes Thomond College.

Table D3 (Continued)

Enrolments by sector within level, 1981, 1986 and 1991 ('000)

## (B) Population 1, high enrolment (PI HE)

Year (a)	1981	1986	1991
National Schools	551.3	570.7 (571.8)	592.8 (616.2)
Other	16.7	15.2 (15.2)	14.0 (14.5)
<b>Total: First Level</b>	<b>568.0</b>	<b>585.9 (587.0)</b>	<b>606.8 (630.7)</b>
Junior Cycle:			
Secondary (b)	133.0	145.3	144.6
Community & Comprehensive	18.8	22.6	25.1
Vocational	47.9	50.0	48.6
Sub-Total:	199.8	217.9	218.5
Senior Cycle:			
Secondary	68.3	72.1	75.6
Community & Comprehensive	8.0	11.4	13.5
Vocational	21.6	24.3	27.7
Other	3.0	4.0	4.3
Sub-Total:	100.9	111.8	123.1
<b>Total: Second Level</b>	<b>300.7</b>	<b>329.7</b>	<b>341.6</b>
Vocational/Technological	10.9	12.8	16.5
Universities	23.2	28.4	34.2
Other H.E.A. designated (c)	3.4	4.9	6.7
Teacher Training	2.9	3.6	4.4
Other	1.5	1.5	1.6
<b>Total: Third Level</b>	<b>41.9</b>	<b>51.2</b>	<b>63.4</b>
<b>Total: All Levels</b>	<b>910.8</b>	<b>976.3 (968.4)</b>	<b>1,011.6 (1,036.6)</b>

Notes: (a) These refer to school years, the greater part of which falls in the year named.  
 (b) Includes very small element of Secondary Tops enrolments.  
 (c) Includes Thomond College.

Table D3 (Continued)

Enrolments by sector within level, 1981, 1986 and 1991 ('000)

## (C) Population II, low enrolment (PII LE)

Year (a)	1981	1986	1991
National Schools	551.3	563.5 (564.7)	578.0 (600.4)
Other	16.7	15.0 (15.1)	13.6 (14.1)
<b>Total: First Level</b>	<b>568.0</b>	<b>578.5 (579.8)</b>	<b>591.6 (615.5)</b>
Junior Cycle:			
Secondary (b)	133.0	143.0	111.1
Community & Comprehensive	18.8	22.2	24.5
Vocational	47.9	49.2	47.3
Sub-Total:	199.8	214.4	212.9
Senior Cycle:			
Secondary	68.3	68.0	69.9
Community & Comprehensive	8.0	10.7	14.3
Vocational	21.6	22.9	25.6
Other	3.0	3.8	4.0
Sub-Total:	100.9	105.4	113.8
<b>Total: Second Level</b>	<b>300.7</b>	<b>319.8</b>	<b>326.7</b>
Vocational/Technological	10.9	11.5	13.3
Universities	23.2	25.6	27.6
Other H.E.A. designated (c)	3.4	4.4	5.4
Teacher Training	2.9	3.2	3.6
Other	1.5	1.4	1.3
<b>Total: Third Level</b>	<b>41.9</b>	<b>46.1</b>	<b>51.2</b>
<b>Total: All Levels</b>	<b>910.8</b>	<b>944.8 (945.9)</b>	<b>969.7 (992.6)</b>

Notes: (a) These refer to school years, the greater part of which falls in the year named.  
 (b) Includes very small element of Secondary Tops enrolments.  
 (c) Includes Thomond College.

Table D3 (Continued)

Enrolments by sector within level, 1981, 1986 and 1991 ('000)

(D) Population II, high enrolment (PII HE)

Year <sup>(a)</sup>	1981	1986	1991
National Schools	551.3	567.6 (568.9)	586.0 (609.1)
Other	16.7	15.2 (15.2)	13.7 (14.3)
<b>Total: First Level</b>	<b>568.0</b>	<b>582.8 (584.1)</b>	<b>599.7 (623.4)</b>
Junior Cycle:			
Secondary <sup>(b)</sup>	133.0	144.8	142.7
Community & Comprehensive	18.8	22.5	24.9
Vocational	47.9	49.8	48.0
Sub-Total:	199.8	217.1	216.6
Senior Cycle:			
Secondary	68.3	71.9	75.1
Community & Comprehensive	8.0	11.4	15.4
Vocational	21.6	24.2	27.5
Other	3.0	4.0	4.3
Sub-Total:	100.9	11.5	122.3
<b>Total: Second Level</b>	<b>300.7</b>	<b>328.6</b>	<b>338.9</b>
Vocational/Technological	10.9	12.7	16.2
Universities	23.2	28.2	33.7
Other H.E.A. designated <sup>(c)</sup>	3.4	4.8	6.6
Teacher Training	2.9	3.5	4.4
Other	1.5	1.5	1.6
<b>Total: Third Level</b>	<b>41.9</b>	<b>50.7</b>	<b>62.5</b>
<b>Total: All Levels</b>	<b>910.8</b>	<b>962.7 (964.9)</b>	<b>1,001.3 (1,025.1)</b>

Notes: (a) These refer to school years, the greater part of which falls in the year named.  
 (b) Includes very small element of Secondary Tops enrolments.  
 (c) Includes Thomond College.

Table D4

Age Survival Model

Enrolments by sector within level, 1981, 1986 and 1991 ('000)

Year <sup>(a)</sup>	1981	1986	1991
National Schools	551.3	566.0	588.1 (605.3)
Other	16.7	15.1	13.8 (14.2)
<b>Total: First Level</b>	<b>568.0</b>	<b>581.1</b>	<b>601.9 (619.5)</b>
Junior Cycle:			
Secondary <sup>(b)</sup>	133.0	144.4	141.4
Community & Comprehensive	18.8	22.4	24.5
Vocational	47.9	49.7	47.3
Sub-Total:	199.8	216.5	213.3
Senior Cycle:			
Secondary	68.3	72.7	74.6
Community & Comprehensive	8.0	11.5	15.3
Vocational	21.6	24.5	27.3
Other	3.0	4.0	4.3
Sub-Total:	100.9	112.6	121.5
<b>Total: Second Level</b>	<b>300.7</b>	<b>329.1</b>	<b>334.8</b>
Vocational/Technological	10.9	12.9	15.3
Universities	23.2	28.6	31.7
Other H.E.A. designated <sup>(c)</sup>	3.4	4.9	6.2
Teacher Training	2.9	3.6	4.1
Other	1.5	1.5	1.5
<b>Total: Third Level</b>	<b>41.9</b>	<b>51.5</b>	<b>58.9</b>
<b>Total: Third Level</b>	<b>910.8</b>	<b>961.7</b>	<b>995.6 (1,013.2)</b>

Notes: (a) These refer to school years, the greater part of which falls in the year named.  
 (b) Includes very small element of Secondary Tops enrolments.  
 (c) Includes Thomond College.

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