

# **BEYOND COMPULSORY SCHOOLING**

## **A Numerical Picture**

**Alan Smithers and Pamela Robinson**  
School of Education, University of Manchester

THE COUNCIL FOR INDUSTRY AND HIGHER EDUCATION

## **The Council for Industry and Higher Education**

John Raisman CBE (Chairman)

Professor Laing Barden CBE - Sir Peter Baxendell CBE FEng  
Peter H Blackburn - Dr Clive Booth – R J Bull - Sir John Cassels CB  
A B Cleaver- J A Collins - Sir Brian Corby- P J Davis  
Sir Graham Day - K H M Dixon - R Evans - Sir Archibald Forster  
R D Galpin - Sir Anthony Gill FEng - John Gillespie  
Sir Paul Girolami - Sir Nicholas Goodison - C B Gough  
Sir Christopher Harding - Dr David Harrison CBE FEng  
Christopher Haskins - Carolyn Hayman - M G Heron - Dr G R Higginson  
Sir Simon Hornby - Robert B Horton - F R Hurn - Sir Alex Jarratt CB  
J S Kerridge - Lord Lewis FRS - Robert Malpas CBE FEng  
Sir Bryan Nicholson - Sir Edwin Nixon CBE DL- H T Norrington  
Sir Edward Parkes FEng - Brian Pemberton - David Pennock  
Catherine Pestell - The Rt Hon Lord Prior PC - Sir Bob Reid  
Dr Derek H Roberts CBE FRS FEng - J D Rowland  
The Hon David Sieff- Dr R C Smith CBE - John Stoddart  
Professor S R Sutherland - Sir Michael Thompson DSc FInstP  
Dr W A Turmeau CBE - Leslie Wagner - Frank Whiteley

Patrick Coldstream (Director)

---

In preparing this paper the authors have benefited greatly from the thinking of John Akehurst, Michael Bax, Valerie Bayliss, Malcolm Deere, Roger Ellis, Brenda Hatton, Margaret Maden, Ruth Silver, John Sutton, Jason Tarsh, Trevor Thomas, Leslie Wagner, Tony Webb.

---

# **BEYOND COMPULSORY SCHOOLING**

## **A Numerical Picture**

**Alan Smithers and Pamela Robinson**  
School of Education, University of Manchester

THE COUNCIL FOR INDUSTRY AND HIGHER EDUCATION

Copyright © The Council for Industry and Higher Education,  
and Alan Smithers and Pamela Robinson, 1991

First published November 1991

ISBN 1 874223 00 9

The Council for Industry  
and Higher Education  
100 Park Village East  
London  
NW1 3SR

Alan Smithers and  
Pamela Robinson  
School of Education  
Manchester University  
Manchester  
M13 9PL

## The Council's Purpose

The Council for Industry and Higher Education is an independent body made up of heads of large companies and vice-chancellors, polytechnic directors and heads of colleges. It came together in 1986 to encourage industry and higher education to work together and to represent their joint thinking to government.

Academics and business people alike believe that the UK's prosperity and vitality depend upon our rapidly becoming a more highly and broadly educated nation at every level and that, in particular, the perspectives and skills associated with mathematics, science and technology must be central to that education. UK industry (in which we include commerce and the whole range of services) will flourish best in that context, since its future success and competitiveness depend on responding creatively to continually more sophisticated surroundings, whether in building its workforces, identifying markets, developing products, structuring its own organisations, negotiating with governments, or defining its responsibilities towards the community at large.

The Council has consistently stressed that higher education's successful expansion depends on raising the attainment of many more young people beyond the age of 16.

But it has expressed concern that:

- emphasis on higher education should *not* overshadow the paramount need to offer a useful education and training to all those young people post-16 *not* immediately destined for higher education. The UK's competitive future depends not only on graduates but also particularly on a wide range of supporting technical and professional people;
- higher education should become more naturally available to those from families outside the professional classes, and those with practical as well as academic talent;
- sixth-form and higher education should broaden rather than narrow young people's options for later employment and study, especially in scientific and technological areas.

At a time when political choices are to be made and the reform of school qualifications is under active discussion, the debate - and business's part in it - is hampered by lack of a clear numerical picture. To fill the gap the Council is glad to publish this study which it commissioned from the Centre for Education and Employment Research at the University of Manchester. It sets out in an accessible form how many young people stay on into the sixth form and how good they are, but also how the excellence of English academic education for the few casts a shadow on everyone else.

## Contents

1. Focus of Concern	1
2. The English Education System	3
3. Attainment	7
4. Participation	13
5. A Brief History	18
6. Academic Expansion	23
7. Flows into Science and Engineering	30
8. Technical and Vocational Education	33
9. Qualifications of Workforce	39
10. Improving the System	42

## **Acknowledgements**

*We are very grateful to the Council for Industry and Higher Education for the opportunity of carrying out this study. Especial thanks to Patrick Coldstream, the Council's Director, who has guided and supported us, but who has honed our thinking in his usual kind and courteous way. We are grateful too to the Steering Committee for their expert advice.*

*We should also like to express our appreciation to BP for help in publishing this report, and to Jeremy Nicholls of BP Educational Affairs for commenting on an earlier draft and his kind foreword.*

*The views expressed are, however, those of the authors alone and are what the numerical picture suggests to us might be done.*

**Alan Smithers**  
**Pamela Robinson**  
*October 1991*

## Foreword

*In 1986 we undertook an internal study of BP's links with and policies towards further and higher education in the UK. Among other things, we sought to identify the three or four key issues of concern to industry which should be the focus of a developing programme of support for the UK education service at this level.*

*The first issue we identified was that of 'access and participation'. We realised that the root of Britain's persistent worries about skill shortages lay in a failure to educate enough people to a high enough level.*

*The second and third issues we called 'relevance' and 'teaching'. Our perception was that it not only matters how many people we educate but the nature of their learning and the processes by which they learn are also important.*

*Alan Smithers and Pamela Robinson helped us to understand the numbers behind the access and participation issue with a special report they prepared for us, later published as *Increasing Participation in Higher Education*. The evidence not only convinced us that we were thinking along the right lines but, just as importantly, it helped us to decide what we as a company could do about it.*

*In the intervening years people's ideas have moved on: the need to test them against the evidence, and if necessary revise them, remains the same. In this new study Alan Smithers and Pamela Robinson look mainly at what happens in the two years immediately following compulsory schooling. One of the major themes they take up, however, is that it is what people get out of education which matters, as well as how many people get into it.*

*I am personally very pleased, therefore, that the Council for Industry and Higher Education commissioned their study and very pleased that BP has been able to help publish their report.*

**Jeremy Nicholls**  
*Education Adviser, BP*

The English education system is distinctive in being both highly selective and highly specialised.

It is highly selective in that its examinations at ages 16 and 18 sharply separate those qualified to continue with mainstream academic education from those who are not. Some of the many who fail find their way into technical and vocational education, but this lacks the coherence of the academic stream.

The system is also very specialised in that it is usual for young people of 17 and 18 to take only three subjects (compared to nine or more in some countries). Historically, this arose through the arts and sciences coming to be seen as alternatives in the sixth form rather than aspects of the same curriculum.

The English education system has important strengths:

### **Achievement at A-level**

Those (few) who remain in education beyond the age of 16 reach a high level of attainment. International studies of achievement in science (which is reasonably similar throughout the world so that comparisons can be made) show that the best four per cent of 18-year-olds in England come behind only Hong Kong and Japan of the 15 countries tested.

### **Efficient Higher Education**

Advanced sixth form study makes possible a higher education system which produces graduates educated to a high standard in a short time with relatively few drop-outs. It can therefore be argued that English education is effective and efficient, picking out and educating to a high level many of the most academically able.

But it also has weaknesses:

### **Caters for Minority**

Only one young person in three attains the five (or more) GCSEs at grades A-C that are the main qualification for academic sixth-form study; and only one in six, the two (or more) A-levels that are the usual requirement for going on to higher education.

### **Casts a Shadow**

Although 18-year-olds in England come out very well in international terms, 10-year-olds and 14-year-olds perform badly. Younger English children fail to reach levels of educational attainment, not just in science but maths and language also, that are common in the rest of Europe. Many lose faith in education so that truancy levels can reach 50 per cent from some classes.

## Summary

### Quantitative Subjects

Those taking the science and mathematics exclusively have not increased in step with the general growth of A-levels, their proportion fluctuating at around five per cent. The percentage of sixth formers studying some science or maths has gone up to 13 per cent of the age group, but the increase arises from combining the sciences with other subjects. Only one in five of those doing 'mixed' A-levels, however, continues in science and technology.

### Lack of Coherent Technical and Vocational Tracks

Although there have been a number of initiatives in technical and vocational education, they lack the coherence of the academic stream; practical/technical/vocational education is still entered mainly by those who have failed the academic. Inevitably, it is seen as second best.

### Workforce Under-Qualified

The British workforce seems seriously under-qualified. About two-thirds of the workers lack vocational qualifications compared to only about a quarter in Germany (the old West Germany) and just over a third in The Netherlands.

The distinctive shape of English education arises from its history. A-levels are the direct descendant of university entrance examinations. The organisation of schools has grown up piecemeal, so that, in practice, England has never truly had a system for educating everyone. Although about 90 per cent of children attend comprehensive schools, and about 90 per cent take a common examination at age 16, the system is essentially geared to developing academic talents in a minority.

Three A-levels are the standard passport to higher education and the jobs it leads to, yet only eight per cent of pupils in comprehensive schools (including the sixth form colleges) obtain them compared to over 40 per cent in independent and grammar schools.

To put it another way, 40 per cent of the three A-level pupils came from the independent and grammar schools which have only 11 per cent of the 16-year-old population. Since some present-day comprehensives were once first-class grammar schools and maintain much of their academic strength, there are very few A-level pupils (relatively speaking) spread among all the others. A-levels therefore cater for a minority, much of it outside the comprehensive system, and since vocational education looks so messy, **there is effectively no mainstream post-16 education for most of the school population.**

# 1. Focus of Concern

- 1.1 Education and training in the two years beyond compulsory schooling has recently become the centre of attention. There is a widespread feeling that all is not well; numerous pamphlets and reports<sup>1</sup> have suggested what might be done. Greater breadth of studies, reform of the qualifications and increased participation post-16 have been advocated. The government has recently set out its proposals in a White Paper<sup>2</sup> and both of the main opposition parties have put forward statements of policy<sup>3</sup>. The Commons Select Committee on Education, Science and Arts has considered the issues.
- 1.2 But the debate so far has been hampered for lack of a clear quantitative overview. There is some information on some 17- and 18-year-olds (see Box A), on those who take A-levels or BTEC courses for example, but the data for vocational education are scattered, incomplete and not always easy to prise from the awarding body. Neither have the statistics been brought together as a whole so that it can readily be seen where the young people are, what they are doing, and where they are going.

## **Box A: Who is Being Considered?**

Our focus is the two years after compulsory schooling, and we refer to young people in those years as 17-year-olds and 18-year-olds respectively.

But settling on a label was difficult. People know about ‘sixth formers’, but not everyone stays on at school, and to use ‘the equivalent of first-year sixth’ and ‘the equivalent of second-year sixth’ is to be stuck in the academic mould out of which we are trying to break. ‘Post-compulsory 1’ and ‘post-compulsory 2’ would be strictly accurate but inelegant. National curriculum year labels could, by extension, enable us to talk about ‘year 12’ and ‘year 13’ but the terms have yet to catch on. The DES in its statistics uses age at the beginning of the academic year and so refers to ‘16-year-olds’ and ‘17-year-olds’ but this has led to the confusion we discuss in Box C, page 14.

We have therefore chosen to talk about ‘17-year-olds’ and ‘18-year-olds’ because most young people will reach their seventeenth birthday in the year following compulsory schooling and their eighteenth in the year after that. We find these labels the most meaningful but whichever are used it is important to hold on to the fact that we are talking about two years in the education and training process.

- 1.3 Conscious of the gap, the Council for Industry and Higher Education commissioned the Education and Employment team at the University of Manchester to provide a numerical picture of the two years following compulsory schooling. In particular, the Council asked us to:
- (a) establish what education/training (formal or semi-formal) is in practice undertaken by our young people in order to

- (b) judge its adequacy in developing **all** the available talent from the points of view of both the people themselves and economic need;
- (c) discern what pointers there may be from the facts on what might be changed or supplemented to improve things.

The Council has enabled us to make the report more widely available as a contribution to the ongoing debate.

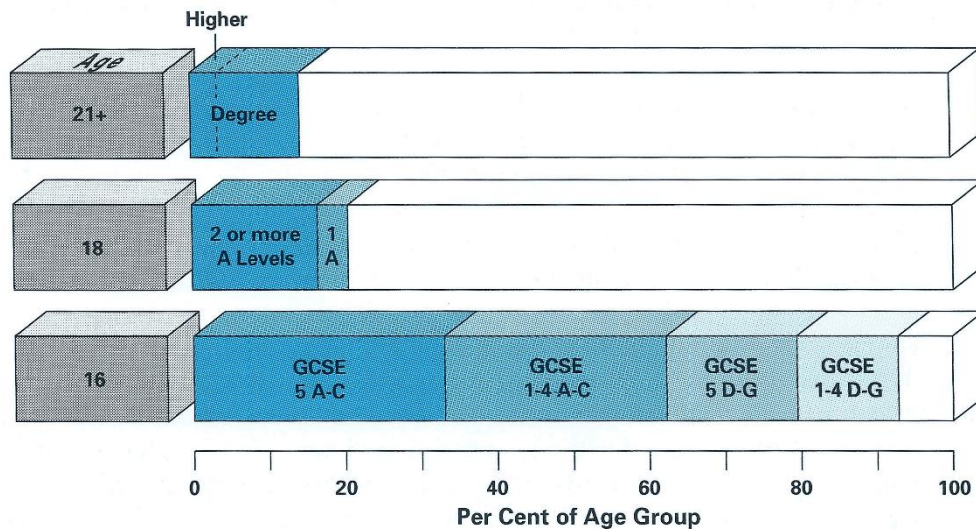
- 1.4 We begin by exploring why the two years after compulsory schooling should be so important by looking at the distinctive shape of the English education system. Then, in Chapters 3 and 4, we examine its strengths and weaknesses in terms of attainment and participation.
- 1.5 We follow this with a brief history (Chapter 5) exploring how education in England comes to be as it is. The English system has long been recognised as selective and specialised, and there have been various attempts to broaden its appeal. As a result more young people take A-levels and go on to higher education, but it is still mainly geared to developing academic talents in a minority (Chapter 6). Specialisation post 16 has meant that the ‘swing against science’ experienced in a number of industrial countries becomes apparent in England at an earlier age (Chapter 7).
- 1.6 English education is seriously weak in having never included a coherent pattern of technical and vocational education; this is examined in Chapter 8. An important consequence is that the British workforce appears under-qualified in comparison with those in other advanced industrial nations, particularly in intermediate vocational qualifications (Chapter 9).
- 1.7 In Chapter 10 we bring the data together and point to two main concerns:
  - whether the current academic pathway is functioning as well as it might;
  - whether and how the absence of a coherent technical track should be remedied.

Within these two broad areas we identify some more specific issues for debate.

## 2. The English Education System

2.1 The English education system (the Scots do things rather differently) is highly selective. It is also specialised (see Chapter 7). Its examinations at age 16 and age 18, as Chart 2.1 shows, make sharp distinctions between those qualified to continue with academic education and those who are not. (The rest of the report shows how little **mainstream** provision is available outside the academic.)

Chart 2.1: The Academic Ladder



Source: Education Statistics for the United Kingdom (1990 edition), London: HMSO.

2.2 Secondary schooling is now organised so that about 90 per cent of children attend comprehensives; 90 per cent also take a common examination at sixteen, the General Certificate of Secondary Education (GCSE). But the system sorts so that only about one 16-year-old in three attains the five (or more) GCSEs at grade A-C which are the standard qualification for academic sixth-form study.

2.3 GCSE results largely determine 16-year-old pupils' next destination. Chart 2.2 shows that:

- 80 per cent of those with five or more GCSEs at grades A-C continue with academic study, usually A-levels, either at school or in Further Education;
- those with 1-4 grades at A-C or five or more at D-G tend either to return to school to recoup, or move on to FE to take vocational qualifications;
- the proportions embarking on Youth Training and entering employment increase down the GCSE scale;
- many of those with no graded results, possibly including the persistent truants from the later years of schooling (estimated at six per cent<sup>4</sup>), seem simply to have disappeared from the statistics.

**Chart 2.2: Destinations of 16 Year-Olds by GCSE Result, 1989** *per cent*

Destination (N*)	5 or more A-C (203.1)	1-4 A-C (175.8)	5 or more D-G (112.5)	1-4 D-G (81.7)	No Graded Result (46.6)	All (619.8)
School	69.2	28.7	14.3	8.7	6.1	35.0
FE:	19.1	24.8	15.1	7.4	2.4	17.2
A-level	11.3	4.1	0.5	0.2	0.0	5.0
GCSE	0.3	2.8	1.8	1.2	0.5	1.4
VQ	7.5	17.9	12.8	6.0	1.9	10.8
YTS	2.0	12.7	23.7	26.1	17.8	13.3
Employment	5.3	20.5	27.7	30.4	27.1	18.6
Other, NK	4.4	13.3	19.2	27.4	46.6	15.8

\* Thousands

Source: Statistical Bulletin 1/91, London: DES.

- 2.4 The sieving process continues at A-level. Chart 2.3 shows that over half those obtaining two or more A-level go on to degree courses and many of the others remain in education and training. Those with only one A-level are more likely to turn to vocational qualifications or enter employment. Vocational qualifications, in short, are usually a route for people who have failed something.

**Chart 2.3: Destinations of 18 Year-Olds by A-level Result, 1989** *per cent*

Destination (N*)	2 or more A/AS		1 A/AS <sup>†</sup>	
	Male (55.0)	Female (52.3)	Male (9.5)	Female (10.4)
Degree Course	58.6	49.9	5.1	3.3
Teacher Training	0.6	4.5	0.1	1.2
Other HE	4.1	5.5	11.1	10.5
FE A/AS	2.6	3.6	8.0	11.4
FE VQ	2.6	5.7	10.0	15.0
Employment	19.2	18.1	37.2	34.2
Other/NK	12.2	12.6	28.4	24.5

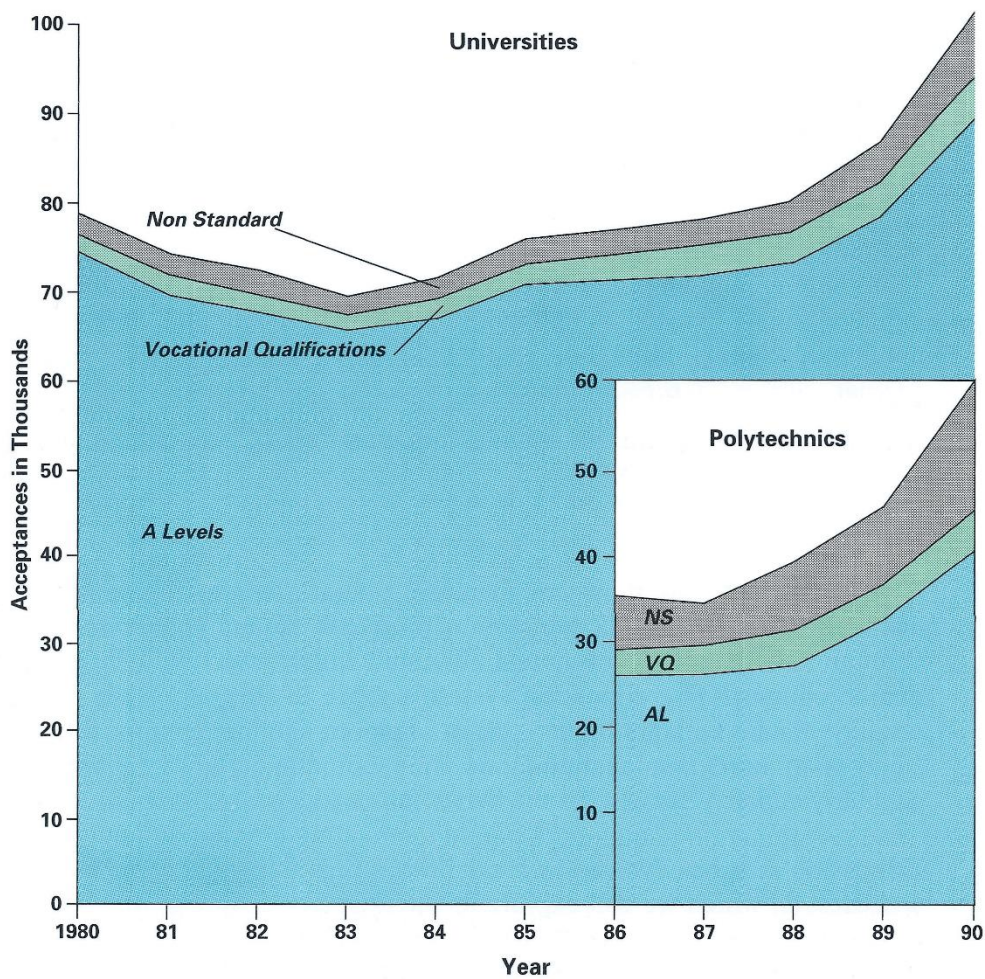
\* Thousands

<sup>†</sup> The destinations of the 14.7% of 18 year-old school leavers with no A-level qualifications are not available.

Source: Statistical Bulletin 1/91, London: DES.

- 2.5 Looking at the education system from the higher education end, as in Chart 2.4, we can see that the bulk of the entrants to universities (90 per cent) and polytechnics (70 per cent) are accepted on their A-levels. Vocational qualifications and access courses do provide alternative routes, but they are small in comparison.

**Chart 2.4: Higher Education Acceptances by Entry Qualifications**



**Source:** Universities Central Council on Admissions, Statistical Supplements to Annual Reports, Cheltenham: UCCA; Polytechnic Central Council on Admissions, Annual Reports and Statistical Supplements, Cheltenham: PCAS.

- 2.6 A-levels are the gatekeeper to higher education. They are increasingly criticised as such but not always on the right grounds. It is often claimed that A-level performance bears no relation to degree result and is therefore an inappropriate entry qualification. Correct statistical analysis<sup>5</sup> shows, however, that good A-levels and good degree results do go quite closely together. Indeed, it would be surprising if there were no relationship, since A-levels and degree examinations are two of a kind, both testing academic skills of a high order.
- 2.7 The better jobs (in terms of the Registrar General's scale), by and large, go to those obtaining degrees. Chart 2.5 shows that 26 per cent of those holding managerial and professional appointments were graduates compared with only about three per cent of those in clerical and other non-manual posts, and one per cent or less in craft or manual jobs. Conversely, nearly half of those in labouring held no recognised qualification compared with only about one in eight of those in managerial and professional posts.

**Chart 2.5: Highest Qualification by Occupational Group, 1989** *per cent*

Highest Qualification (N*)	Managerial and Professional (7.91)	Clerical and Related (4.04)	Other Non-Manual (1.98)	Craft and Similar (4.14)	Labourers and Other Manual (6.98)	All Occupations (25.20)
Degree	26.0	3.6	3.1	1.0	0.8	9.4
Other HE	15.8	2.5	2.6	2.4	1.6	6.5
A-level	25.4	20.6	22.3	52.1	18.0	26.7
O level	14.0	39.4	27.4	8.8	13.9	18.3
Other	6.7	16.3	13.2	9.4	16.3	12.0
None	12.1	17.4	31.2	26.1	49.1	27.1

\* In millions; employed people of working age.

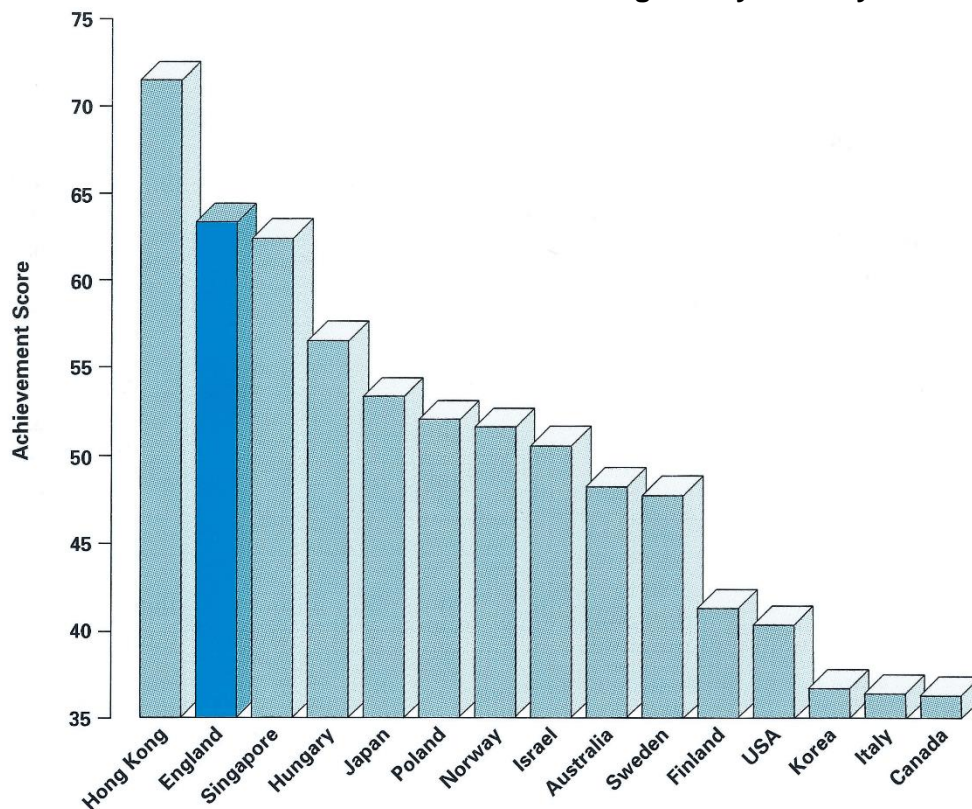
**Source:** Training Statistics 1990, Employment Department, London HMSO.

- 2.8 The English education system therefore operates essentially as an identifier of academic ability. A small proportion (currently about 16 per cent) is selected through GCSE and A-level, and educated quickly and to a high standard on degree courses. The education system's value in this respect is recognised by employers who seek graduates - often irrespective of discipline - for many posts. Success in academic examinations thus not only opens the door to further scholarly activity, but also to the better jobs and a more prosperous future.
- 2.9 Education as it has evolved in England has important strengths but also crucial weaknesses, which we will explore in the next two chapters, first looking at how well young people in England do in comparison with those in other countries, and then how many choose to make use of the opportunities currently available to them.

### 3. Attainment

- 3.1 An education system's performance can be judged by a number of criteria. The one most frequently cited in England is the 'level of participation'. Our system is seen to be failing because so few young people continue in education and training beyond compulsory schooling. Since an important aspect of the present study is to describe exactly what young people are doing at ages 17 and 18, participation might be thought the logical place for us to begin.
- 3.2 More important in our view, however, is what is being learned. We have therefore chosen to start with 'attainment' and leave 'participation' to the next chapter (Chapter 4). Beside these two important criteria, there is also what might be called 'value for money', and in this chapter we shall also look briefly at performance in relation to spending.
- 3.3 Data collected by the International Association for the Evaluation of Educational Achievement (IEA) in 1984 but only just becoming publicly available<sup>7</sup> demonstrate the strengths and weaknesses of English education. Chart 3.1 shows that among those 18-year-olds specialising in science (defined as 'studying science for examination purposes in order to study science further at the higher education level') in a range of countries England did very well. It came second behind only Hong Kong which inherited the English system (as did Singapore which came third). At this age-level England is successful also in mathematics, another subject sufficiently similar across the world to allow useful comparisons.

**Chart 3.1: Science Achievement\* at Age 18 by Country**



\* Based on averaging performance across biology, chemistry and physics.

**Source:** Postlethwaite and Wiley (1997), *Science Achievement in Twenty Three Countries*, Oxford: Pergamon.

3.4 The high performance level reflects particular features of the English system. As Chart 3.2 shows, whereas in some countries (for example, Hungary, Poland, Sweden, Korea) nine or more subjects are studied in upper secondary schooling, in England three are the norm, something shared with Ghana. In England also the students are a selected four or five per cent of the age group compared to (depending on subject) 20 per cent or more in, for example, Canada, Finland and Korea. Hong Kong's superior performance is obtained with a percentage of the age group about double that in England. Nevertheless, even when only the top four per cent is considered, England still comes out well - now in third place behind Japan as well as Hong Kong.

**Chart 3.2: Students in Final Year of Full Time Secondary Education**

Country	In School	Per Cent			Number Subjects Studied
		Biol	Chem	Phys	
Australia	39	18	12	11	5
Canada (Eng)	68	28	25	18	6
Canada (Fr)	67(79)*	7	37	35	6
England	20	4	5	6	3
Finland	41(63)	41	16	14	9+
Ghana	1	0.2	0.6	0.6	3
Hong Kong	20	7	12	12	5
Hungary	18(40)	3	1	4	9+
Israel	65	20	8	12	7
Italy	34	4	1	13	7
Japan	63(89)	12	16	11	7+
Korea	38(83)	38	37	14	9+
Norway	40	4	6	10	7
Poland	28	9	9	9	9+
Singapore	17	3	5	7	6
Sweden	28	5	6	13	9+
Thailand	14(29)	7	7	7	6
USA	83	12	2	1	5

\* Figures in brackets include vocational students.

**Source:** Postlethwaite and Wiley (1991), as for Chart 3.1.

3.5 The English system looks to be an efficient way of selecting and educating the most academically able to a high level. This is borne out by what happens in higher education. As Chart 3.3 shows, degree courses in England are usually shorter than in other countries (in Germany notably they can take six or seven years) and relatively few students drop out. Graduate output in the UK is of the same order as the entry, unlike that of some countries, Italy for example, where there appears to be considerable loss. British higher education may admit few students, but graduate output is about the same as in France and Germany and most other countries, except US, Canada and Japan. Moreover Britain's graduates are acknowledged throughout the world to be of high standard.

3.6 This success, however, casts a long shadow. Severe sorting by academic attainment tends to suggest that academic talent is the only kind that matters. The sharp separation of those going on to higher education from the rest tends to create two classes; by contrast the many movements into and out of higher education in other countries makes for more integration.

**Chart 3.3: Graduate Output by Country, 1986\***

Country	Length of Course in Years	Per Cent of Age Group <sup>†</sup>	
		Entrants	Graduates
Australia	5	31	16
Belgium	4-6	18	15
Canada	4-5	-	27
Denmark	4-7	25	13
France	4	20	15
Germany	6-7	19	14
Italy	5	24	8
Japan	4	25	23
Netherlands	4	12	7
Spain	5	30	15
Sweden	3	16	12
UK	3 <sup>§</sup>	18	15
USA	4	30	24

\* Germany, 1985; Belgium, Canada and UK, 1987.

<sup>†</sup> Both entrants and graduates are for the same year so that the difference will be affected by changes in size of system.

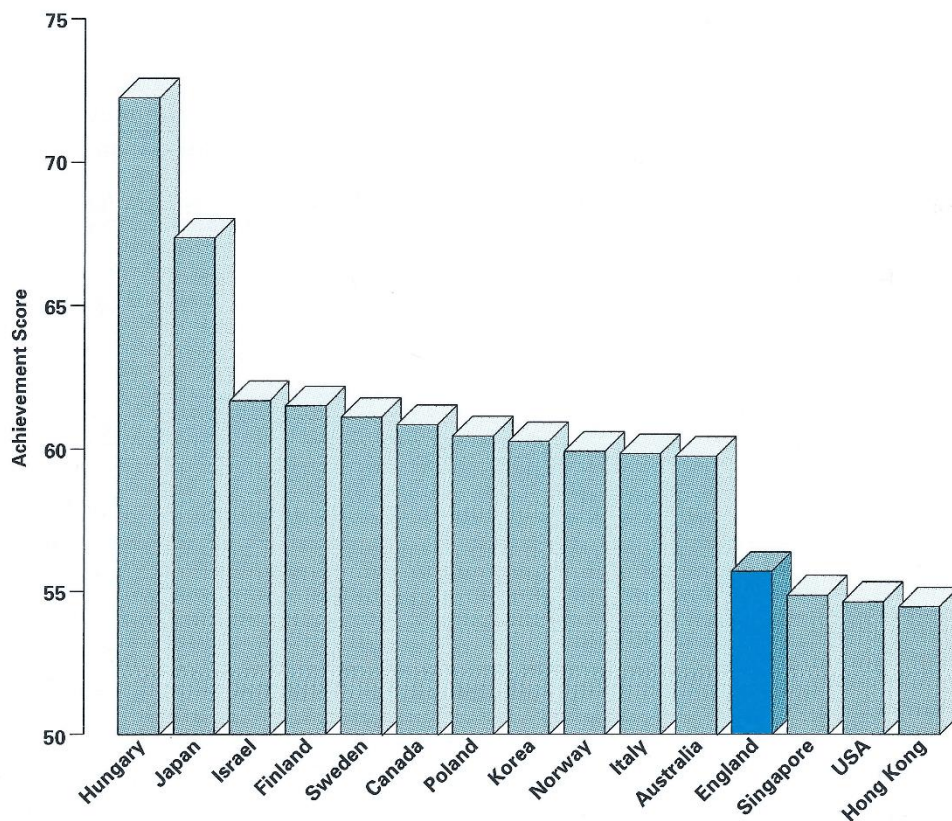
<sup>§</sup> Four years in Scotland, and some courses.

**Source:** International Comparisons of Higher Education, Working Report (1991), London DES.

3.7 But perhaps the worst feature of the English system is the way it treats the ordinarily-intelligent child. If We look at 14-year-olds' achievements, as in Chart 3.4, We can see that at this age young people in England together with those in Singapore and Hong Kong are at the bottom of the international league. So when the whole age group is sampled at age 14 England does badly and with ten-year-olds the result is much the same. The system which is effective and efficient for the (few) most academically able gives a poor deal to the rest.

3.8 This is also suggested by the detailed studies made by the National Institute of Economic and Social Research<sup>8</sup> of syllabuses in mathematics in England and Europe. Prais of NIESR found that pupils in Dutch schools from the bottom third of the ability range were able to solve algebraic problems usually tackled only in first-year A-level work in England. He also found that parts of the syllabus specified in the national curriculum in England for the top quarter of 16-year-olds were being successfully taught to 14-year-olds in the lower half of the ability range in Germany.

**Chart 3.4: Science Achievement at Age 14 by Country**



**Source:** Postlethwaite and Wiley (1991). *Science Achievement in Twenty Three Countries*, Oxford: Pergamon.

3.9 Prais has tried interchanging exam papers between Germany and England which was difficult because German pupils generally found those from England too easy, and pupils in England those from Germany too hard. But in detailed comparisons of answers to particular questions striking results were obtained (see Box B). Prais has also taken teachers from English schools to Germany where they were surprised at what was being achieved.

3.10 Prais attributes the superior educational achievement in secondary schools in Germany and Holland, particularly by children in the bottom third, to at least three factors:

- a school-leaving award closely tied in with future job opportunities – in Dutch biscuit-making for example a ‘B’ is required to train as a maintenance mechanic; and a ‘C’ to work on an oven line; but to those without a diploma only jobs like those in the packing department are open;
- the final mark is averaged across subjects so that the pupils cannot give up on a subject (e.g. mathematics) simply because they do not like it;
- teaching groups are more homogeneous and the teacher retains the sanction of moving the pupil between streams or asking for a year to be repeated.

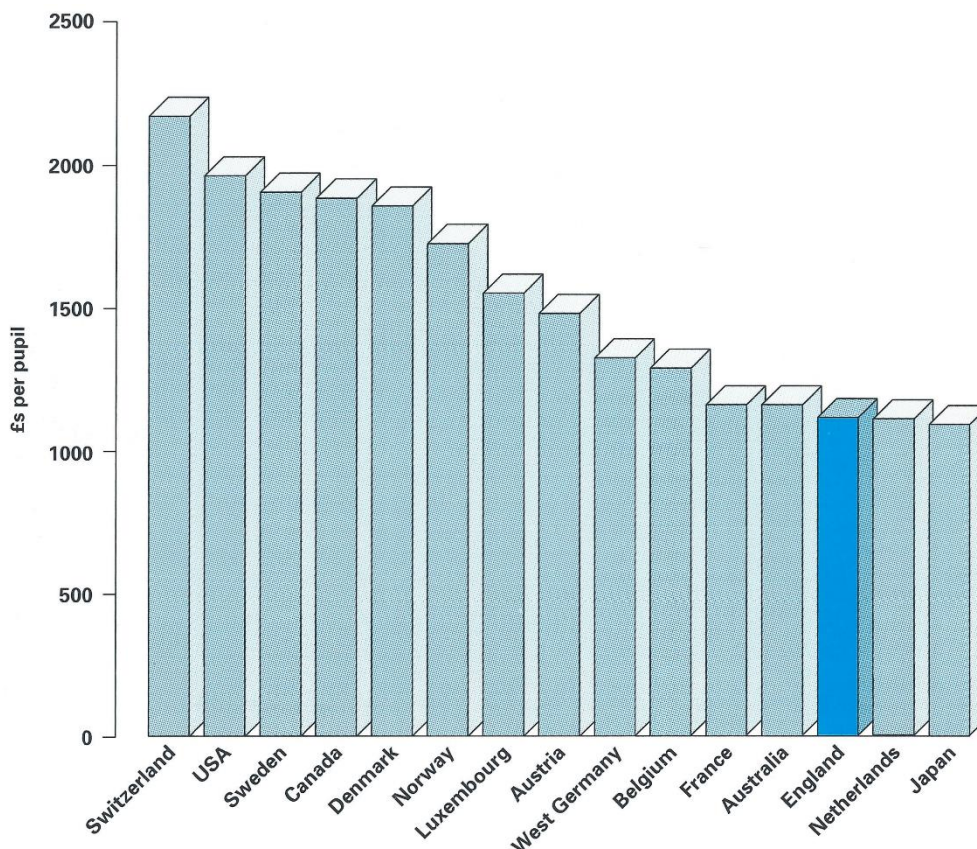
There may be important lessons here for improving performance in England.

### Box B: Attainment in Arithmetic in Germany and England

Prais and Wagner<sup>8</sup> have made detailed comparisons of the answers to arithmetic questions of 15-year-old pupils in the lower half of the ability range in Germany and England:

- (a) 66 per cent of German pupils were able to correctly solve:  
 $389.59 - 83.64 + 529.5 - 712 =$   
 but only four per cent of pupils in England got the right answer to  
 $2.6 - 4.12 + 6.3 - 0.44 =$
- (b) 69 per cent of German pupils answered correctly the question:  
 $18 \frac{3}{5} \div 7 \frac{3}{4} =$   
 but only 13 per cent of pupils in England could do  
 $1 \frac{1}{3} \div \frac{8}{9} =$
- (c) 59 per cent of German pupils solved:  
 $543.75 \div 12.5 =$   
 but only ten per cent of pupils in England correctly answered:  
 $40 \div 0.8 =$

Chart 3.5: Educational Spending\* by Country



\* Adjusted for purchasing power.

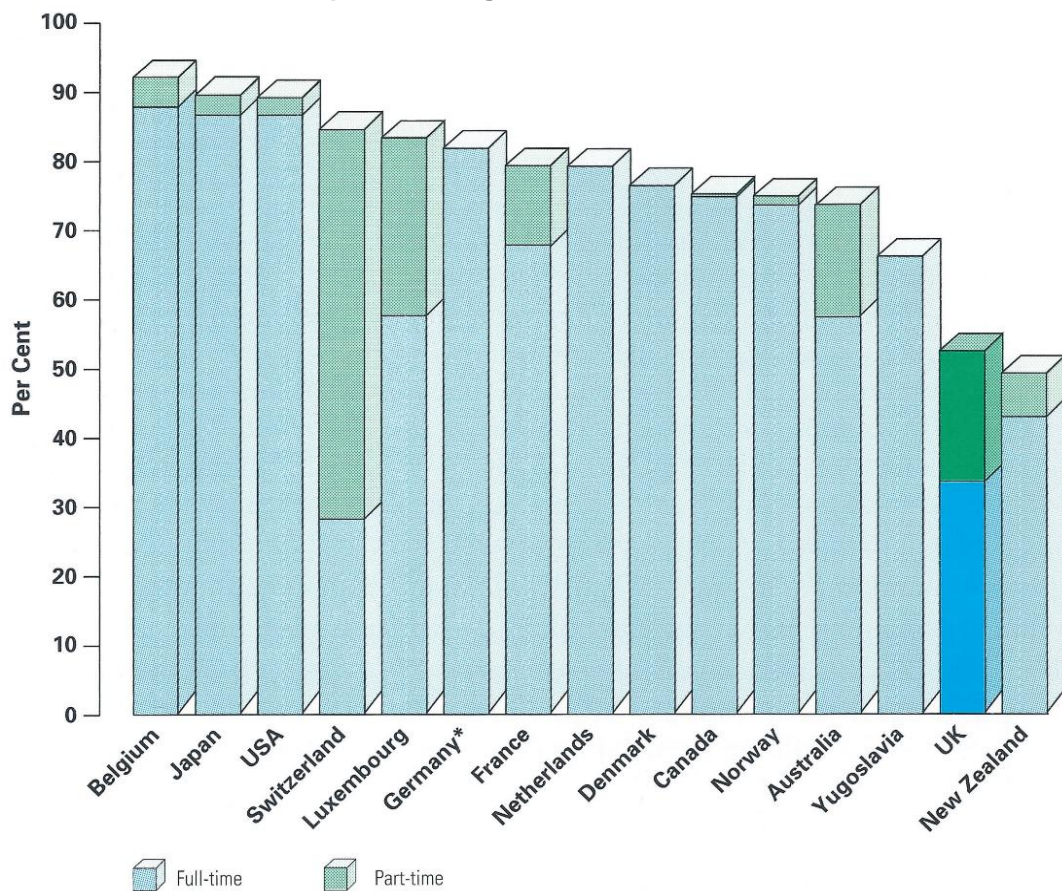
Source: OECD and UNESCO statistics, adapted from Walberg (1991).

- 3.11 As well as the distinctive character of English education, Charts 3.1 and 3.4 bring out the poor showing of the United States. This is very surprising not only because the United States has one of the highest participation levels in the world to age 18, but also because of its high spending on education.
- 3.12 Chart 3.5, based on information collected by OECD and UNESCO9, shows, in the same format as for science achievement, the educational spending of a number of countries adjusted for purchasing power. It is remarkable how the positions of Japan and the United States are reversed. While for achievement among 14-year-olds Japan is near the top and the United States the bottom, for spending they have swapped places. In relation to pounds spent Japan is thus doing very much better than the United States. England comes out of such an exercise not too badly - behind Japan and Australia, but above Norway, Canada, Sweden and, of course, the United States.
- 3.13 Calculations of this kind are contentious, but they do show that, as important as resources are, high attainment cannot just be bought. They also underline that participation is not attainment; having people in the education and training system, although a first step, does not necessarily lead to high achievement. That is why we have focused first on attainment. But it is also true that England's participation levels do not look very encouraging.

## 4. Participation

4.1 The fact that so few young people seem to continue in education and training beyond compulsory schooling is often cited as evidence that Britain's arrangements are not functioning properly. The UK does not come out well on international comparisons (see the OECD statistics in Chart 4.1). Of 18-year-olds (as we defined them) only just over half are recorded as being in education or training (33.7 per cent full-time and 18.4 per cent part-time). That proportion puts the UK next to bottom among the 15 nations compared.

Chart 4.1: Participation at Age 18 in OECD Countries, 1988



\* Germany classifies dual system as full-time.

Source: Education in OECD Countries 1987-88 (1990), Paris: OECD.

4.2 But these statistics tell only part of the story (see Box C). The proportion of 17 and 18-year-olds engaged in some form of education or training is much higher. Some 86 per cent of 17-year-olds and 69 per cent of 18-year-olds are either staying on at school, or studying full or part-time in Further Education or on Youth Training (Chart 4.2 shows that some 12 per cent of the age group, about one-third of the sixth form, leave after spending only one non-compulsory year at school).

- 4.3 On average for the two years over 77 per cent of young people are engaged in education and training of some sort. The figure may realistically be rounded up to 80 per cent by including those attending private colleges (see Box D).

**Box C: How Many Continue with Education and Training Post 16?**

There is confusion about the numbers involved in education and training. The latest policy documents of the two main political parties quote very different figures. In the recent White Paper the proportion continuing is given as 86 per cent, but in the Labour Party proposals published in April 1991 the figure presented is 69 per cent - obtained from DES Statistical Bulletin 1/90. Both differ sharply from the 52 per cent in the OECD comparisons.

The differences arise from (i) who is counted and (ii) what is treated as education and training.

*(i) Who is Counted?*

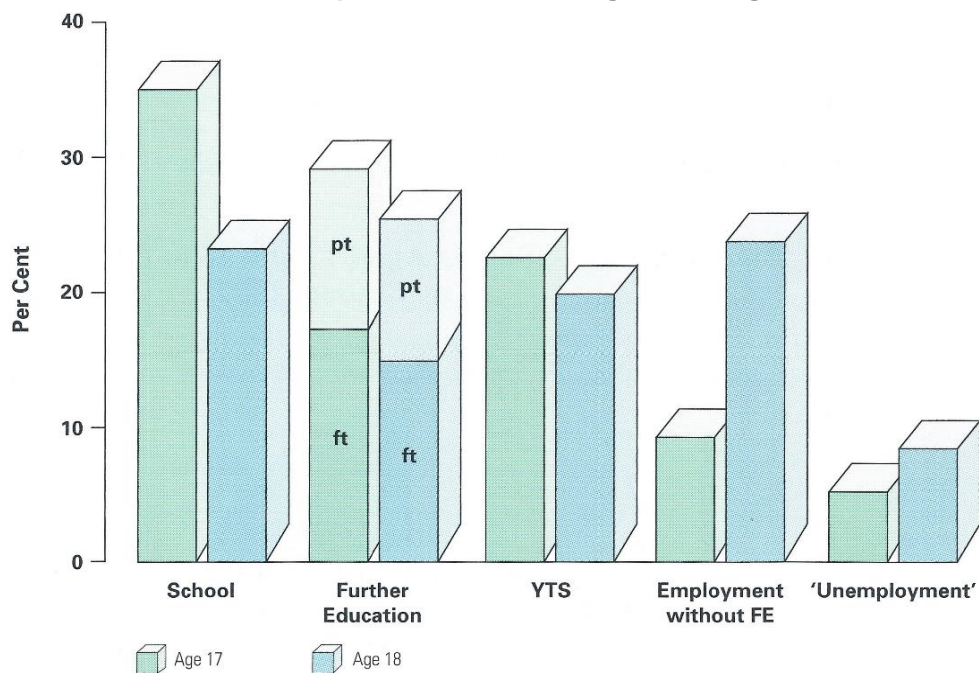
The two years after compulsory schooling have come to be described as education 16-18 or education 16-19 suggesting that three or even four years may be involved. The scope for confusion has been compounded by the practice of the DES in labelling the year group by the age of pupils at the beginning of the school year so that first year sixth formers are classed as 16-year-olds and second year sixth formers as 17-year-olds. In preparing statistics on education 16-18 the DES has therefore been led to cover three years, and include those it labels as 18-year-olds but who, in fact, are in their nineteenth year, and who typically have left school. This is the case in the figure given in the Labour Party document which thus under-states participation.

Many pupils, as we have seen in Chart 4.2, leave at 17 and not 16 so it also matters which year(s) beyond compulsory schooling is (are) being considered. The figure taken from the White Paper refers to the first year, the OECD figure the second, and the Labour Party's DES statistic the average of three years.

*(ii) What is Counted?*

Both the Government and Labour Party figures include Youth Training (see Chapter 8) which occupies about a fifth of the age group. The OECD figure does not and hence the much lower estimate.

**Chart 4.2: Participation Levels in England at Age 17 and 18, 1990**



Source: Statistical Bulletin 13/91, London: DES.

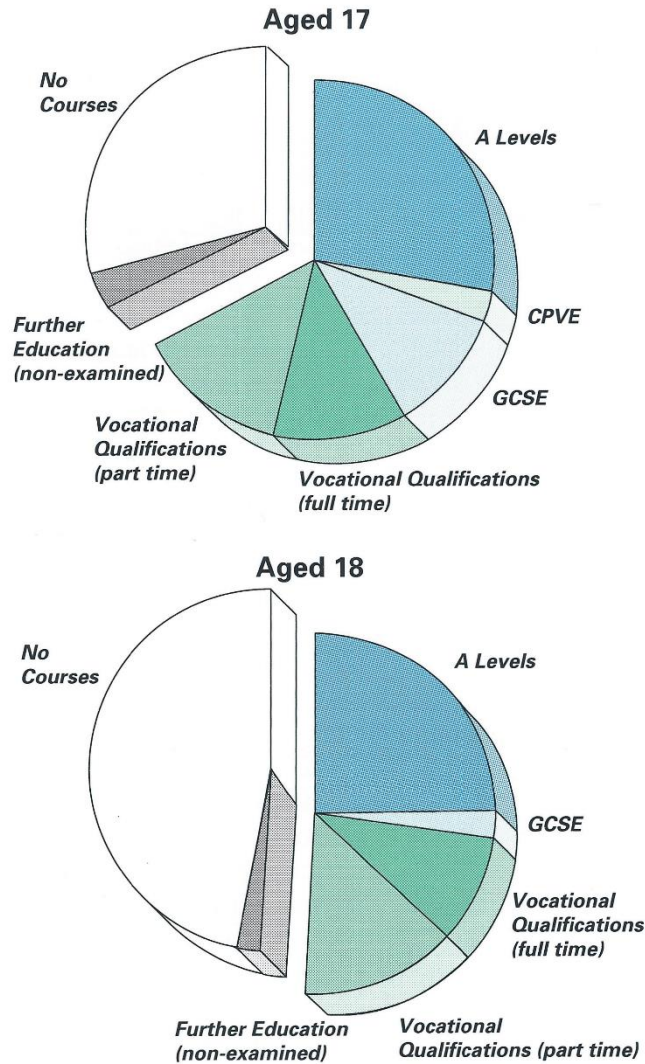
- 4.4 The picture seems quite rosy because Youth Training has been included, although it seems to yield few useful, and even fewer transferable, qualifications. Its intent has seemed ambiguous: when first introduced in 1978 it was seen more as a palliative for rising unemployment among the young than as a key plank in a national training strategy. Even now, when the Government has insisted on its serious training purpose, only 40 per cent of Youth Trainees gain any qualifications at all.

**Box D: Estimating Those Involved In Part-time Training**

Part-time FE poses a classification problem in that published statistics include those involved in leisure activities only, like badminton classes, but do not cover students at private colleges. Part-time FE also overlaps considerably with the employment and unemployment categories (which itself does not officially exist since to count as 'unemployed' a person must be a claimant, and those under 18 are not entitled to benefit). There have been few estimates of training in employment but a recent survey by the Association of County Councils<sup>10</sup> suggests that 42 per cent of school leavers received training in the first year of employment. Applying this to the employment category of Chart 8.1 (see page 33) gives a figure not very different from the proportion in part-time FE.

4.5 A review of the courses followed by 17 and 18-year-olds (Chart 4.3), and the qualifications sought, presents a different and less favourable picture. Only about two-thirds of 17-year-olds follow courses leading to qualifications with 28.4 per cent taking A-levels (about a sixth of them in further education, including tertiary colleges) and 26 per cent studying full-time or part-time for vocational qualifications. It is less clear that the others are moving forward: they are either repeating GCSEs (11.6 per cent) or taking the one-year course for the General Certificate of Pre-Vocational Education which does not seem to lead naturally to any further studies.

**Chart 4.3: Young People Aged 17 and 18 in England by Course, 1989**



**Source:** Statistics of Education, Schools 1989, Further and Higher Education 1988-89; Statistical Bulletins 1/91 and 13/91, London: DES.

4.6 A year later - among the 18-year-olds - the proportion studying for qualifications falls to about half. Not only have the GCSE and CPVE students mainly gone, but some have abandoned their A-level and vocational courses.

- 4.7 On the evidence of ‘participation levels’ alone it may be unnecessarily pessimistic to claim that England’s education system is failing. After all, as we have shown, four out of five 17 and 18-year-olds are in training or education of some kind. Real doubts arise, however, from the fact that only two-thirds of 17-year-olds and only half of the 18-year-olds are heading for qualifications. And only about one quarter of the 18-year-olds survive the A-level track where success is the door to higher education and a graduate job.
- 4.8 Our analysis of the two years after compulsory schooling, then, suggests that the educational system does quite well by the academically able, but is far less coherent for those of average, or below-average ability. A system built around an academic track, from which two-thirds of the age group are discarded by age 16 and three-quarters by age 18, has important strengths, but it also leads to much loss of talent and personal unhappiness. Before going on to consider possible improvements, we briefly consider how the English education system has evolved in this fashion.

## 5. A Brief History

- 5.1 English education has been shaped by its history. The favoured academic track, represented today by A-levels, is a direct descendant of the process of qualifying for university through matriculation; the organisation of schools has developed piecemeal through a series of partial reforms; and the curriculum reflects a particular response to the knowledge explosion of the nineteenth century.

### Schools

- 5.2 It is only 120 years since England began to educate all its children. Before the Forster Act of 1870 (see the chronology in Box E), there was a wide variety of schools ranging from the “aristocracies of talent and worth,”<sup>11</sup> such as that at Rugby, to establishments like Dickens’ Dotheboys Hall. The Newcastle Commission<sup>12</sup> of 1861 estimated (though the statistics are questionable) that at that time 97 per cent of the children of the poorer classes were in schools of some kind and that they generally stayed there for between four and six years. Most left at 11 but about one in twenty remained beyond the age of 13.

#### **Box E: Chronology of School Organisation**

Variety of fee-paying schools - public, endowed grammar, ‘Dame’, private-venture establishments, charity schools and Sunday schools (pre-1870)

Public elementary education (1870)

State secondary schools (1892)

Tri-partite system (1944)

Comprehensives (1965)

Diversity as basis for choice - CTCs, Grant Maintained, ‘magnet’ (1987)

- 5.3 Fears about the quality of education were already commonly expressed, as they are today. The Schools Inquiry Commission<sup>13</sup> (the Taunton Report) of 1868 commented:

Our deficiency is not merely a deficiency in technical education, but, . . . in general intelligence, and unless we remedy this want we shall gradually but surely find that our undeniable superiority in wealth and perhaps in energy will not save us from decline.

It recommended a well-designed national system of education but this was rejected as being “too Prussian”<sup>14</sup>. Instead the Acts of 1869 and 1870 contented themselves with handing out grants-in-aid to School Boards to supplement voluntary denominational schools. The extension of schooling to all between the ages of 5 and 10, made compulsory in 1876, came about not through root-and-branch reform but rather by bolting on something for the under-classes to what was already there. Even today the less academic elements of English education have that ‘bolt-on’ look.

- 5.4 Ambivalent feelings towards German technical education also have a long history. The Royal Commission on Technical Instruction<sup>15</sup> (the Samuelson Report), 1882-84 observed:

The one point in which Germany is overwhelmingly superior to England is in schools, and in the education of all classes of the people . . . the dense ignorance so common among workmen in England is unknown.

Ironically, our main European competitors responded to our early success in the Industrial Revolution by developing technical education through to the highest levels (the French created the *École Polytechnique* to train engineers in 1794), but we would not or could not see the sense in this.

5.5 In spite of regrets like those expressed by the Bryce Commission<sup>16</sup> (Royal Commission on Secondary Education), 1895, at “the discontinuous and incoherent growth of secondary education” the process of partial reform continued. The 1902 Act established state secondary schools on the base of existing grammar schools. The academic hand was further strengthened by the Free Place Regulations of 1907 which were framed to ensure that grammar schools recruited bright poor children. Developments in the technical field were hampered by a requirement that the schools should teach Latin or at least “the Board will require to be satisfied that the omission of Latin is to the advantage of the school.”<sup>17</sup>

5.6 The Spens Report<sup>18</sup> (1938) noted that:

The most salient defect in the new regulations for secondary schools issued in 1904 is that they failed to take note of the comparatively rich experience of secondary curricula of a practical or quasi-vocational type . . . the new regulations were based wholly on the tradition of the grammar schools and public schools.

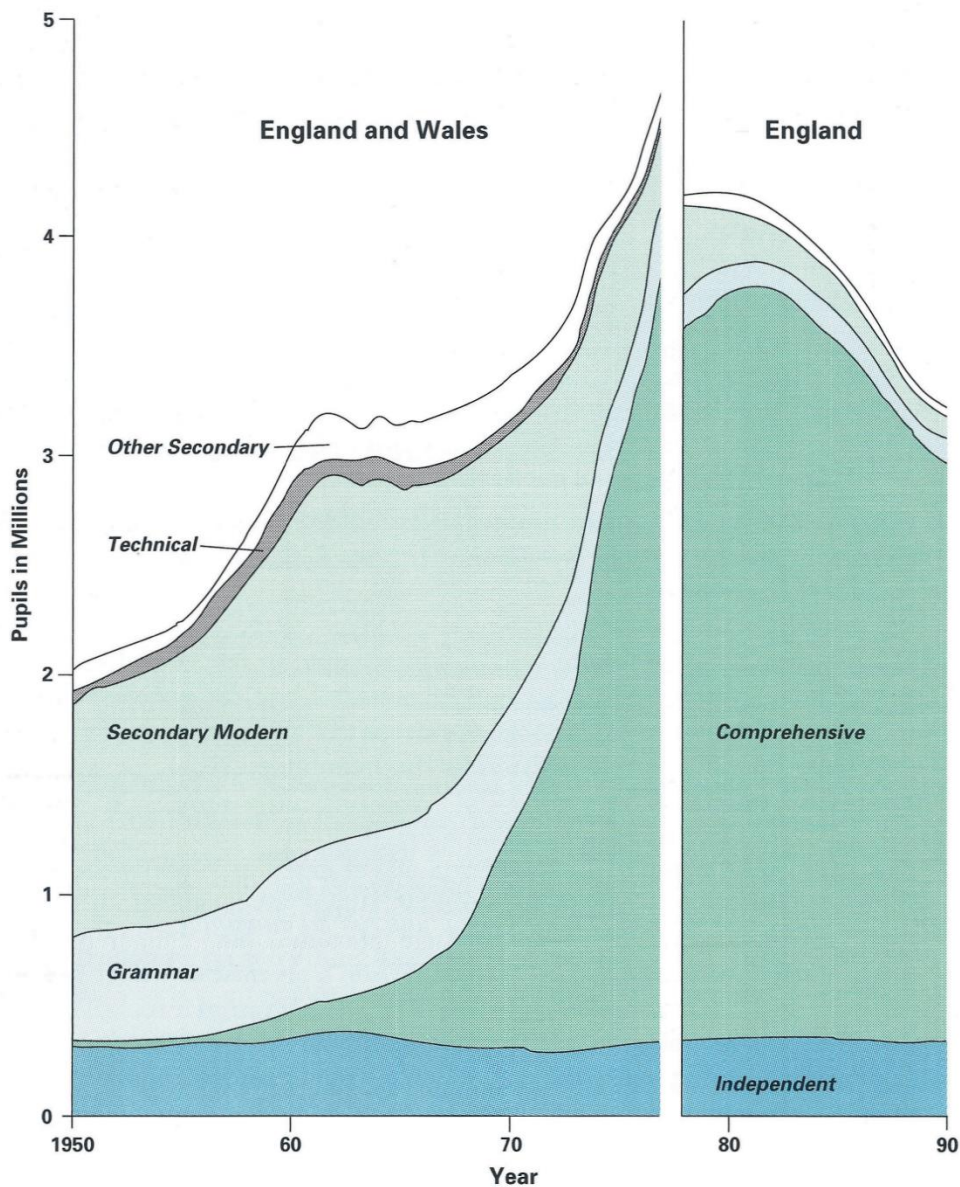
Spens proposed to remedy this through a differentiated system of secondary education in which there would be Modern Schools, Grammar Schools and Technical High Schools.

5.7 The proposal for a tri-partite system was adopted in the 1944 Educational Act, but technical schools never became fully established (at a maximum they took only four per cent of secondary-age pupils) so that the arrangements that emerged essentially set up a simple division in the maintained sector between grammar schools and others.

5.8 This sharp split linked to 11+ selection was rejected in 1965 by the Secretary of State, Anthony Crosland, in his circular 10/65<sup>19</sup> to local authorities directing them to implement ‘a comprehensive system’, but the purpose of this reorganisation was confused by Harold Wilson’s promise as leader of the Labour Party in 1963 that comprehensives would provide “grammar school education for all”. Their essential aim was further undermined by failure to rethink the qualifications along with the schools, so that once more practical/technical abilities were neglected.

5.9 Much of what was attempted was embarked upon for the best of motives. Because grammar school, academic, not to say classical, education led to so many of the best jobs (and was seen as the best general education), progressive thinkers were determined that no one should be deprived of it. The best should be open to all. It was strongly felt that working class youngsters should not be ‘fobbed off’ with ‘mere’ vocational education which would limit - for ever - the range of occupational choices open to them. But this conflicted with the aim of developing different kinds of excellence, and it is perhaps fair to suggest that comprehensive schools taken together have never been entirely clear about their purpose. As the Council for Industry and Higher Education has said in another context “sureness of purpose is the essential ingredient of high morale.”<sup>20</sup>

**Chart 5.1: Pupils in School**



**Source:** Ministry of Education Annual Reports 1950-1960, London: Ministry of Education; Statistics of Education, Schools 1961-1990, London: DES.

- 5.10 Crossland's Circular 10/65 did however promote a massive change in the organisation of secondary schooling as we can see in Chart 5.1. Grammar schools and secondary modern schools have largely been swept aside so that about 90 per cent of secondary-age pupils are in comprehensive schools. Independent schools, however, slightly increased their share so that the comprehensive system is far from being a system for all.
- 5.11 Since at least 1987 the Conservative government has been re-thinking education; its policy on school organisation seems to be to create more diversity to give parents choice. It is seeking to create a market so that standards will be levered up by competition. Whether this will lead to a system capable of developing all the available talent remains to be seen.

## Qualifications

- 5.12 Qualifications in schools underpin the academic bias. At first there were no national school-leaving awards, but each university set its own matriculation examination to qualify candidates for entry. These came to be used as a form of school-leaving certificate. Sensing an opportunity here London University (see Box F), for example, introduced awards for that purpose in 1902 and higher level awards in 1905.

### Box F: Chronology of Academic Qualifications

London Matriculation Examinations, Oxford Local Examinations, Cambridge Local Examinations (1858)

London University School Certificates (1902, 1905)

Secondary School Examinations Council, School and Higher School Certificates (1917)

O and A-level (1951)

CSE (1965)

GCSE (1988)

- 5.13 Individual enterprise prompted government action and in 1917 the Secondary School Examinations Council was set up to oversee a School Certificate and a Higher School Certificate. The School Certificate aimed at some breadth since it could be gained only through passes in a minimum number of subjects. The Higher Certificate, on the other hand, was based on “a more concentrated study of a connected group of subjects.”<sup>21</sup>
- 5.14 By early 1950 the fashion was for specialisation (for example, “It is the mark of the good and keen sixth former. He has looked forward to being a science specialist or a classic or a historian - his mind has been set this way by inclination and by the main school mechanisms”<sup>22</sup>). The School Certificate was thought unduly restrictive and O and A-levels were introduced to afford opportunities for choice and study in depth.
- 5.15 With the push towards comprehensive schools in 1965, the Certificate of Secondary Education for the less academic pupils was introduced. This was to some extent a diluted form of O level but it also offered some interesting practical options. Later, in 1988, O levels and CSE were brought together in the GCSE with the aim of covering the whole ability range but with some loss of the technical/practical alternatives.

## Curriculum

- 5.16 Until the Education Reform Act of 1988 no curriculum was specified for schools in England. What was taught was largely in the hands of the schools and teachers, responding to the influence of the examination system.
- 5.17 This reflected the implicit belief in specialisation which stemmed from a particular response to the great increase in knowledge in the nineteenth century. While the countries of continental Europe reacted by adding subjects to the classical curriculum of Latin, Greek and mathematics, England created ‘sides’, first ‘a modern side’, then ‘a science side’ as alternatives<sup>23</sup>. This separation persists even to the present day where A-levels

tend to be grouped as either science or arts/social science, though pupils are increasingly taking subjects from the two categories together.

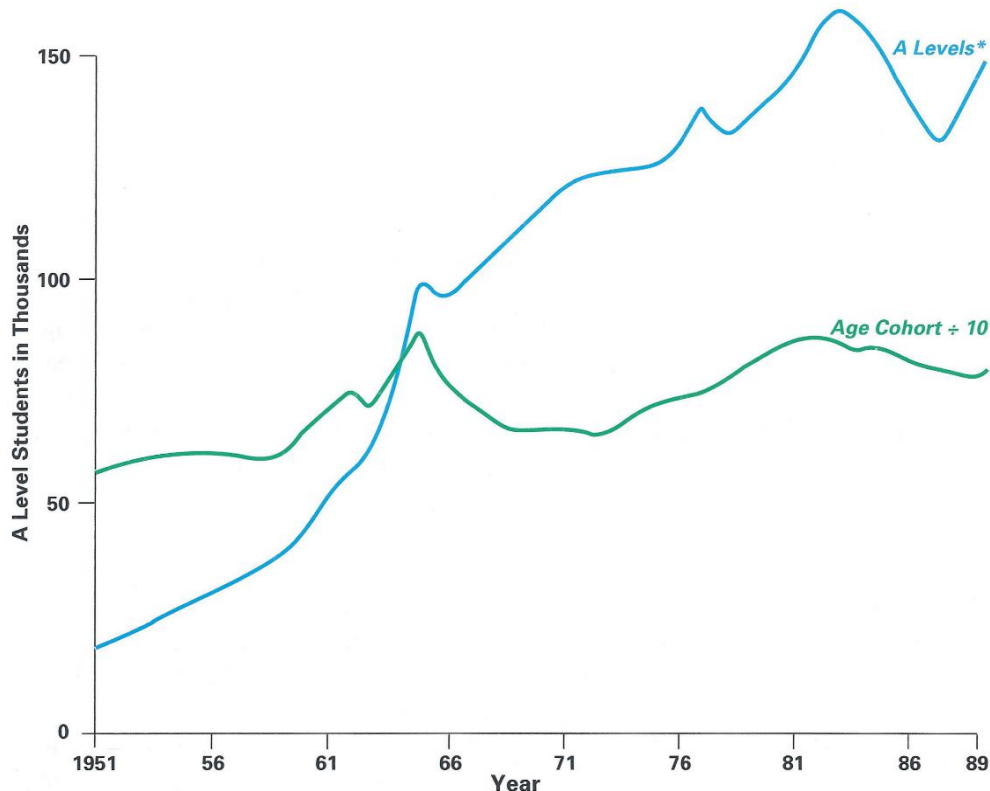
### **Conclusion**

- 5.18 We have seen then how it is that England comes to have an education system which is firmly academic, geared to university entrance and with few subjects taken in the sixth form. Attempts to make changes must reckon with the strength of that tradition. Many efforts at providing more practical/technical education have foundered because of 'academic drift'. The prestige of academic study, for example, led institutions created for technical or technological advancement to become, or aspire to become, universities, first the Colleges of Advanced Technology and then the Polytechnics. Further education colleges are keen to demonstrate their worth by teaching A-levels. Technology, introduced as a subject to bring the practical/technical into the national curriculum, is already more about writing how to do things than actually doing them. The obstacles to change should not be underestimated.

## 6. Academic Expansion

- 6.1 Attempts to increase educational opportunity in the recent past have concentrated on encouraging more youngsters to go down the academic route. There has been a very considerable growth in the proportion of 18-year-olds taking A-levels since the introduction of the exams in 1951. Chart 6.1 shows the numbers on A-level courses compared to the age cohort. From 3.1 per cent in 1951 the proportion has increased six-fold to reach 18.8 per cent in 1989.

Chart 6.1: The Growth of A-Levels

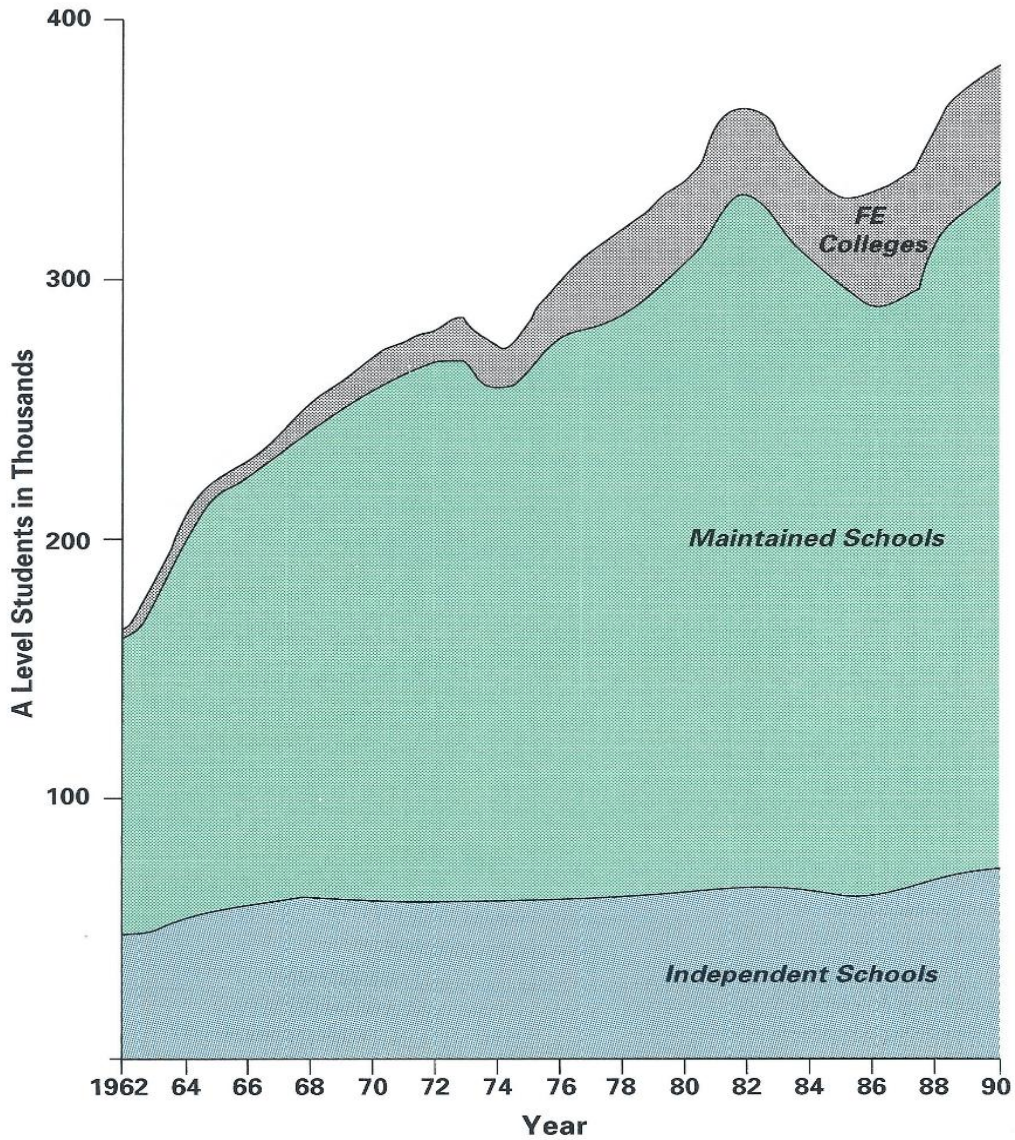


\* Students on second year A-levels, each student counted once whether doing one or more A-levels.  
**Source:** Ministry of Education Annual Reports 1950-1960, London: Ministry of Education; Statistics of Education, Schools 1961-1990, London: DES; Office of Population Censuses and Surveys.

- 6.2 Chart 6.2 indicates that this expansion occurred mainly in the state sector. While there was an increase of 42 per cent in independent schools, take-up more than doubled in maintained schools. From 29.3 per cent in 1962 the independent sector's 'share' decreased to 18.8 per cent in 1989. As well as growth in A-level studies in state schools, there has been a considerable increase in FE (which includes tertiary colleges) - from 3,692 enrolments in 1962 to 46,996 in 1989.
- 6.3 This may appear at first sight a triumph for comprehensive schools in encouraging more young people to stay on in full-time education and progress to A-levels. But a quite different picture emerges if, as in Chart 6.3, we look at the proportion of pupils obtaining three A-level passes, the normal passport to higher education. While nearly half those in the fifth forms of independent schools and the remaining grammar schools go on to pass three A-levels, less than ten per cent of those in the comprehensives do. Only a quarter in

comprehensive schools were able to obtain five GCSEs at grades A-C compared to over 80 per cent in the independents and grammars.

**Chart 6.2: Cumulative Trends in Students\*on A-level Courses**



\* All students taking A-levels, each counted once whether taking one A-level or more.

Source: Statistics of Education, Schools 1962-90, and Further and Higher Education 1962 to 1988-89, London: DES.

6.4 In other words over 40 per cent of 16-year-olds at independent and grammar schools go on to get three A-levels, Whereas the proportion is only eight per cent for all other schools. To put it another way, 40 per cent of the three A-level pupils come from the independent and grammar schools which have only 11 per cent of the 16-year-old population. If one remembers that the comprehensives include a number of first class, quite academic ex-grammar schools which do well with A-levels, there are very few A-level pupils (relatively speaking) spread among all the others. For many of the school population therefore, A-levels is very much a minority sport and for them - with the vocational area looking so messy - there is **virtually no mainstream** post-16 education.

**Chart 6.3: Exam Performance and Type of School, 1988**

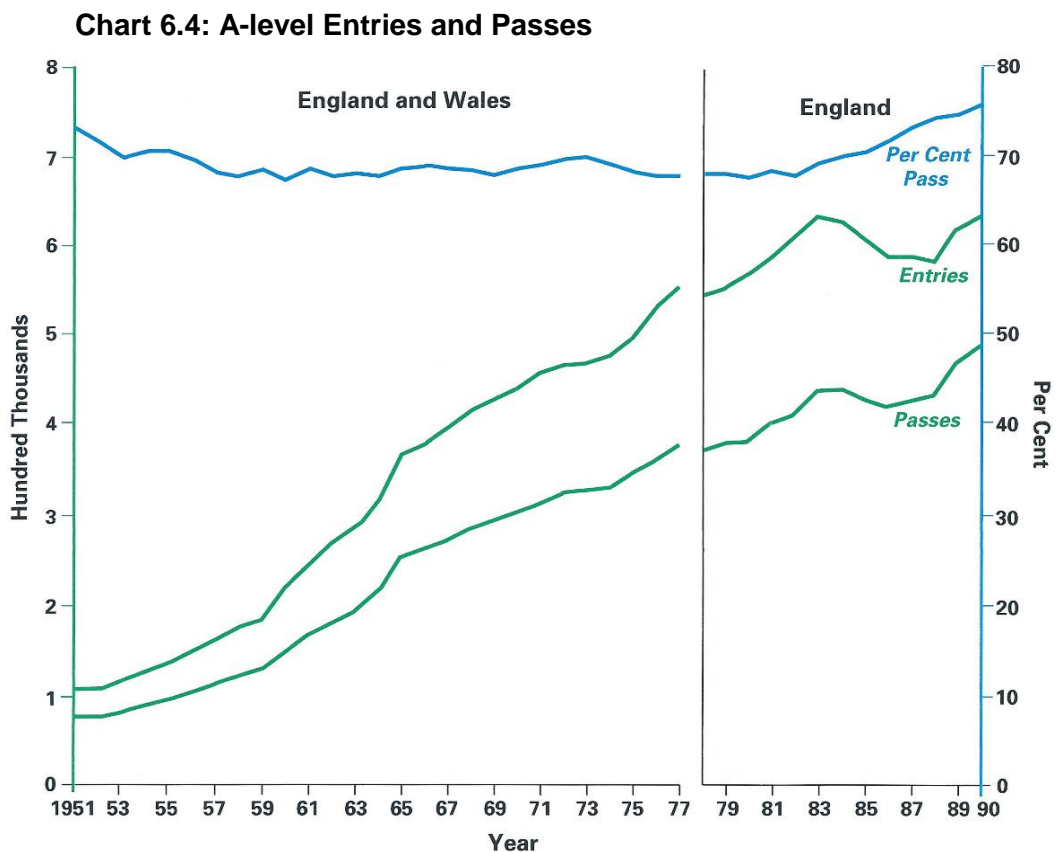
Exam Passes	Ind*	Gr	C18	VIFC	C16	Other
<b>3 A-levels</b>						
Numbers	21,690	7,770	31,820	11,760	-	840
% Entrants	70.7	61.9	48.0	53.6	-	40.2
% Fifth Form	44.6	47.7	9.4	6.3 <sup>†</sup>	-	2.9
<b>5 GCSE A-C</b>						
Numbers	39,785	16,686	94,077	-	47,275	5,239
% Entrants	80.7	84.7	28.7	-	25.2	14.8
All 16-year-olds	49,300	19,700	327,800	-	187,600	35,400

\* Ind = independent, Gr = grammar, C18 = comprehensive to age 18, VIFC = sixth form college, C16 = comprehensive to age 16.

<sup>†</sup> Of those in C16 fifth form.

**Source:** Statistics of Education, School Leavers (1988); Statistical Bulletin 1/91, London: DES.

6.5 The narrow gate of A-levels has however been widening. As Chart 6.4 shows, not only have entries tended to increase, but during the eighties the pass rate has risen from 70 per cent (where it had been steady for much of the previous three decades) to 77 per cent in 1990.



**Source:** Ministry of Education Annual Reports and Statistics of Education; School leavers 1961-86, London: DES; Inter-Board Statistics 1987-90, University of London School Examinations Board.

**Chart 6.5: O Level/GCSE Results**

*per cent*

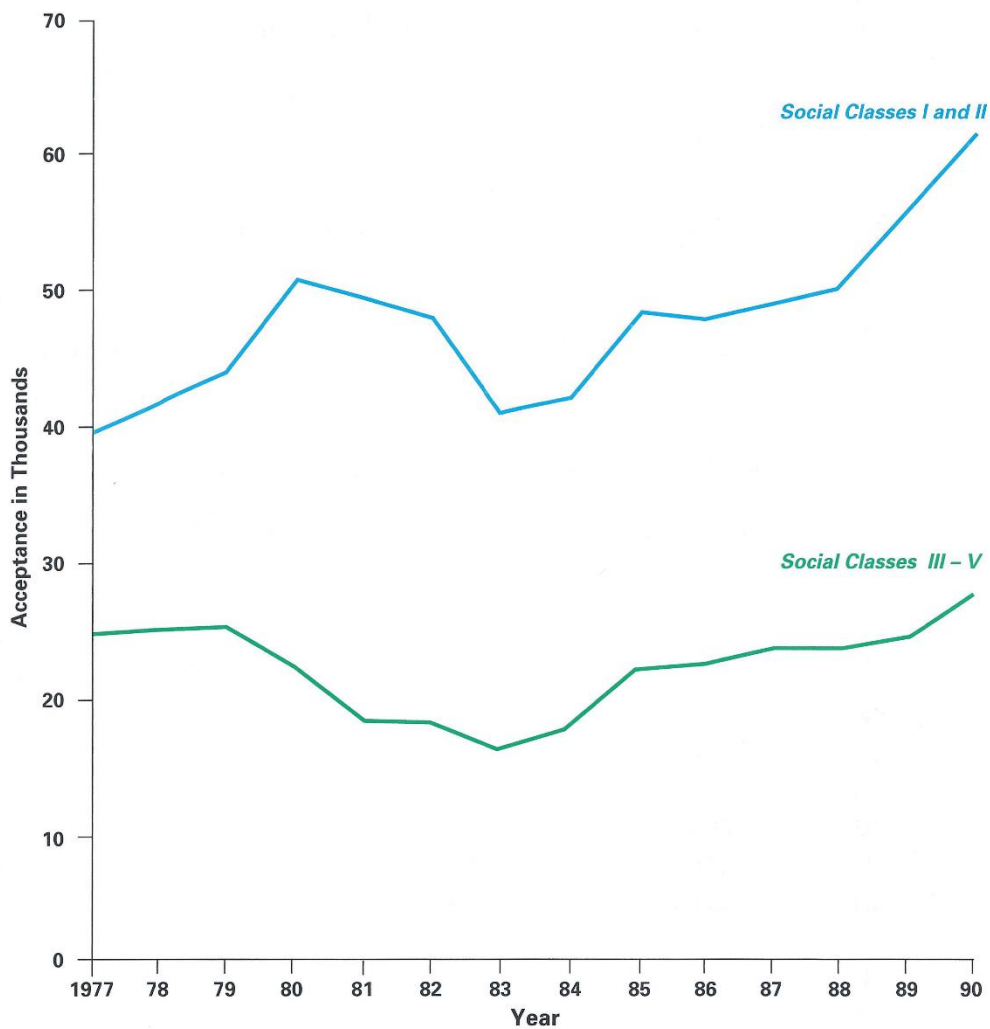
Grades (N*)	1979 (737.4)	1984 (752.8)	1985 (736.2)	1986 (718.2)	1987 (716.0)	1988 (656.0)	1989 (617.7)
5 or more A-C	23.6	26.7	26.8	26.7	26.4	29.9	31.9
5 or more A-G	68.8	74.2	74.3	73.6	73.5	74.7	76.9
No graded result	13.0	9.8	9.7	10.0	9.8	10.1	9.1

\* Thousands

Source: Statistical Bulletin 1/91, London. DES.

- 6.6 The proportion of good passes in the examinations at 16 has also been rising. Chart 6.5 shows that from the last year of O level, when 26.4 per cent received five or more passes at A-C, it has gone up to 29.9 per cent in 1988 and 31.9 per cent in 1989.

**Chart 6.6: University Acceptances by Social Class**



Source: Statistical Supplements to Annual Reports, Cheltenham: UCCA.

- 6.7 Whether these improved pass rates represent a real improvement in achievement or a change in examiners' judgements is not clear. Whatever is claimed about criterion-referencing, neither A-level nor GCSE is clearly tied to external standards. The grades that emerge are essentially arrived at through comparisons of what the candidates can do (norm-referencing), and it is at least plausible that since examiners are now seeing a wider cross section of the ability range their notions of what constitutes a good pass have changed.

**Chart 6.7: University Admissions and Acceptances, Social Classes I and II**

Year	Number of 18-yr olds	Per Cent Applicants	Per Cent Admissions	Ratio of Appl to Adm
1977	230.3	30.4	17.3	1.76
1978	240.8	30.0	17.3	1.73
1979	249.8	31.2	17.8	1.75
1980	259.2	35.0	19.5	1.79
1981	266.1	35.5	18.5	1.92
1982	276.7	34.9	17.3	2.01
1983	277.2	30.0	14.7	2.04
1984	278.7	29.3	14.9	1.96
1985	278.6	33.5	17.3	1.93
1986	282.9	31.6	16.9	1.87
1987	282.5	31.5	17.3	1.82
1988	285.2	32.4	17.7	1.83
1989	294.9	34.7	18.7	1.86
1990	283.8	40.0	21.9	1.82

**Source:** Statistical Supplement to Annual Reports, Cheltenham: UCCA; Working Paper, The Royal Society (1983).

**Chart 6.8: University Admissions and Acceptances, Social Classes III – V**

Year	Number of 18-yr-olds	Per Cent Applicants	Per Cent Admissions	Ratio of Appl to Adm
1977	622.2	7.5	3.9	1.92
1978	649.6	7.0	3.7	1.89
1979	666.4	7.2	3.7	1.95
1980	687.2	6.2	3.1	2.00
1981	694.4	7.5	2.6	2.88
1982	707.4	6.0	2.5	2.40
1983	690.1	5.3	2.2	2.40
1984	671.6	5.8	2.5	2.32
1985	654.5	7.4	3.3	2.24
1986	635.8	7.3	3.4	2.15
1987	609.8	7.7	3.7	2.08
1988	591.6	7.9	3.8	2.08
1989	579.7	8.7	4.1	2.12
1990	525.1	10.8	5.1	2.11

**Source:** Statistical Supplement to Annual Reports, Cheltenham: UCCA; Working Paper, The Royal Society (1983).

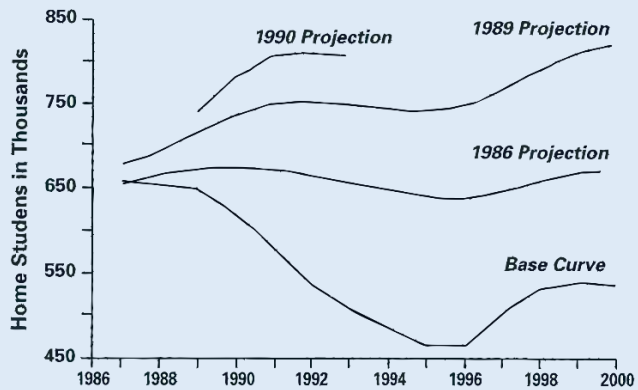
### Box G: DES's Projections of Demand for Higher Education

DES's attempts to forecast the numbers of home students likely to want higher education to the end of the century are shown in Charts G.1 and G.2. During the early eighties there were fears that the demographic downturn would lead to empty places (and possibly cost-savings in consequence). However, as Figure G.1 clearly brings out, demand has not fallen but gone up dramatically.

The DES's 1986 projection was soon outstripped. The 1989 projection, by the same method, took account of the new baseline in 1989, but was again overtaken by enrolments. In 1990 another attempt was made to project demand, again using the same method, but seemed to lose its nerve in 1993, presumably because of the large numbers that were emerging.

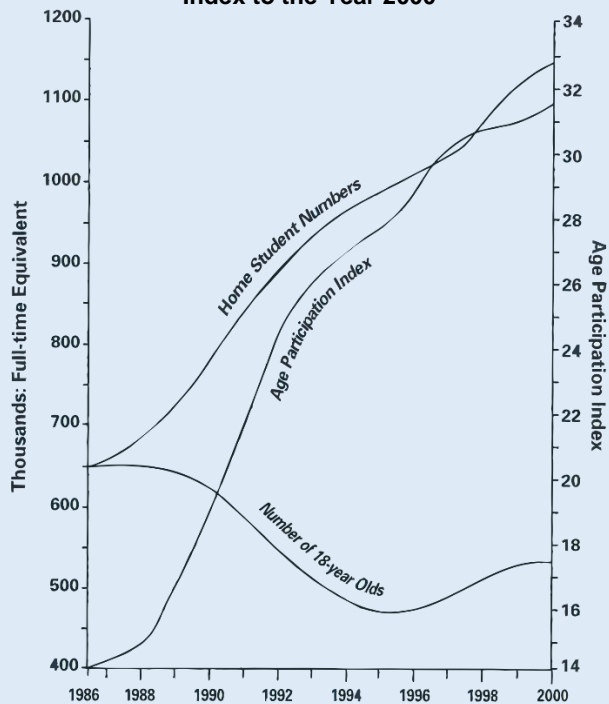
However, by the time of the White Paper in 1991, We can see in Figure G.2 that the government was prepared to bite the bullet and has even adopted the increase as policy, so that participation in higher education is envisaged as rising from 14 per cent in 1987 to 32 per cent by the end of the century. Mature students are seen as comprising about 30 per cent of the intake throughout this period.

**Chart G.1: Projections of Full-Time Home Student Numbers**



Source: Highly Qualified People: Supply and Demand (1990), London: HMSO.

**Chart G.2: Projected Age Participation Index to the Year 2000**



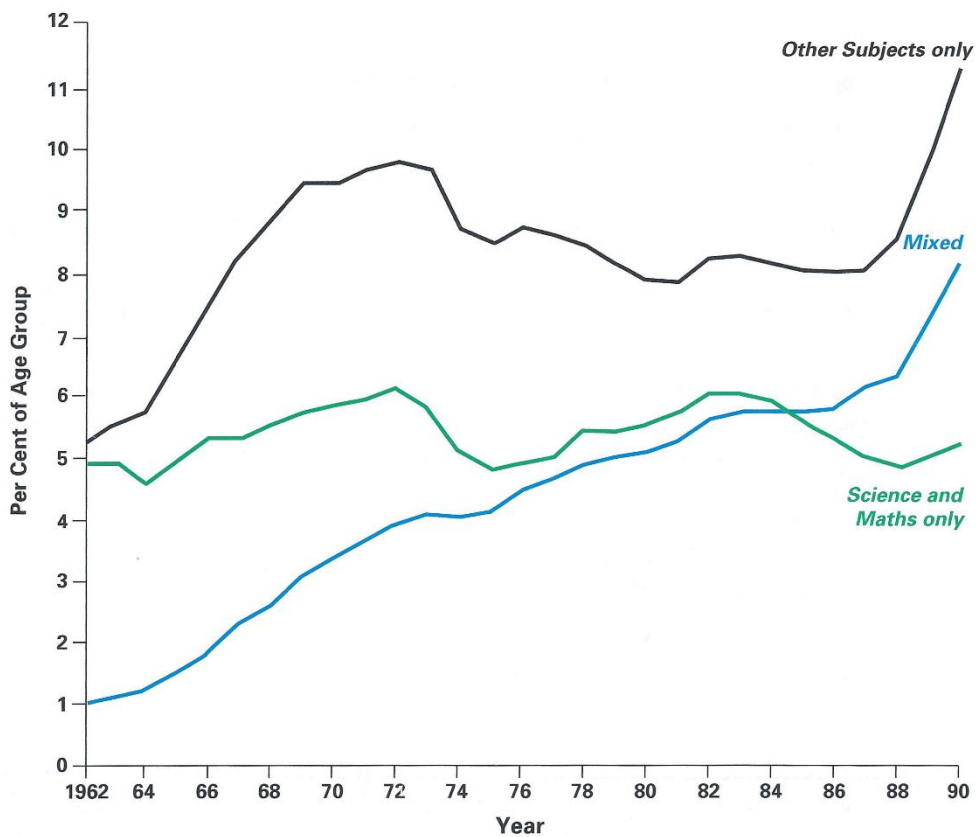
Source: Higher Education: A New Framework (1991), London: HMSO.

- 6.8 The increase in the number of pupils taking A-levels and the higher pass rates has confounded forecasts of demand for higher education (see Box G). The much greater interest in higher education seems to have come about for a number of reasons:
- we have already discussed the improved examination results at 16 and 18;
  - social classes I and II from which most higher education applicants come have not been so much affected by demographic downturn as the others,<sup>24</sup>
  - more young people are themselves the offspring of graduates and are more likely to go onto HE,<sup>25</sup>
  - self-selection occurs and with fewer 18-year-olds young people may think they have more chance and therefore be more likely to put themselves forward.<sup>26</sup>
- 6.9 Social classes I and II have, if anything, strengthened their grip on university education (unfortunately no data are available for the polytechnics). Chart 6.6 shows that an increasing proportion of university entrants are from those classes. When the data are examined in more detail, as in Chart 6.7, we can see this is partly because more of the 18-year-olds now come from classes I and II. Not only has the birth rate fallen less in those classes but social mobility has played a part: many parents from working class backgrounds themselves have obtained degrees and moved into the ‘professional’ or ‘managerial’ groups (see Chart 2.5 on page 6).
- 6.10 Comparing social classes I and II (Chart 6.7) with III, IV and V (Chart 6.8), we can see that children of the former were about four times more likely to apply to university and, although applicants have risen in both groups, that ratio has been maintained. Not only were children from the higher social classes more likely to apply, but they were more likely to get in. Over the years consistently fewer of the working class applicants have been admitted.
- 6.11 The system thus maintains its old heavy bias. England has been trying for 120 years to achieve universal education, but its approach has been dominated by the academic. Many more young people have thus been encouraged and enabled to gain A-levels, usually in a narrow range of subjects, and so qualify for higher education. Yet comprehensive schools with a common examination for 16-year-olds, which seem to offer an education for all, are even now very far from offering the variety of learning to suit all their pupils. The independent and grammar schools still provide the main route to three good A-levels, and it is the children of the professional and managerial classes who go on to universities.
- 6.12 Comprehensive schools seem never really to have resolved whether they are to offer ‘a grammar school education for all’ or ‘different kinds of excellence’ (see para. 5.8). No coherent complementary system of technical and vocational education has been developed. But before going on to explore this further in Chapter 8, it should be noted that not all subjects have shared in the growth of A-levels.

## 7. Flows into Science and Engineering

- 7.1 Although recent years have seen a marked increase in the numbers of young people continuing at school and going on to higher education, this has not been true of all subjects. In particular, the sciences *per se* have not shared in the growth in A-levels, and physical science and engineering departments in higher education have found recruitment difficult.
- 7.2 Chart 7.1 shows the changing pattern of A-level studies. The proportion of those studying exclusively science and maths has fluctuated at around five per cent (6.0 per cent in 1982, 4.8 per cent in 1988, 5.2 per cent in 1990) but there have been big increases elsewhere.

**Chart 7.1: Sixth Formers on A-level Courses\* as % Age Group**



\* In England and Wales, from 1978 data for England only.

**Source:** Statistics of Education, Schools (1990), London: DES; Smithers and Robinson (1988), *The Growth of Mixed A-levels*, Manchester: Carmichael Press.

- 7.3 In particular, the proportion of students studying *some* science and/or maths in combination with other subjects has grown from one per cent of the age group in 1962 to 8.2 per cent in 1990 so that many more now take a mixture than take sciences and maths alone. The arts and social sciences have also sharply increased their share - from 5.3 per cent in 1962 to 11.3 per cent in 1990. The effect is that the science/maths specialists, who made up 44 per cent of A-level candidates in 1963 were reduced to only 21 per cent by 1990. This represents a decline in actual numbers from 86,175 in 1985 to 68,358 in 1990.

7.4 Viewed optimistically, Chart 7.1 can be taken to indicate that while only 5.9 per cent of the age group studied any science in the sixth form in 1962, the proportion is now 13.4 per cent. However, relatively few of those taking mixed A-level courses (21.5 per cent of the boys and 14.7 per cent of the girls) were looking towards degree studies in science and technology so more than four-fifths were moving out of, rather than into, the sciences.<sup>27</sup> Given the emphasis on ‘business’ and ‘commercial values’ in the last decade, it is perhaps not surprising that young people with numerical ability should increasingly be choosing to use it in these areas.

**Chart 7.2: University Admissions\*, 1988**

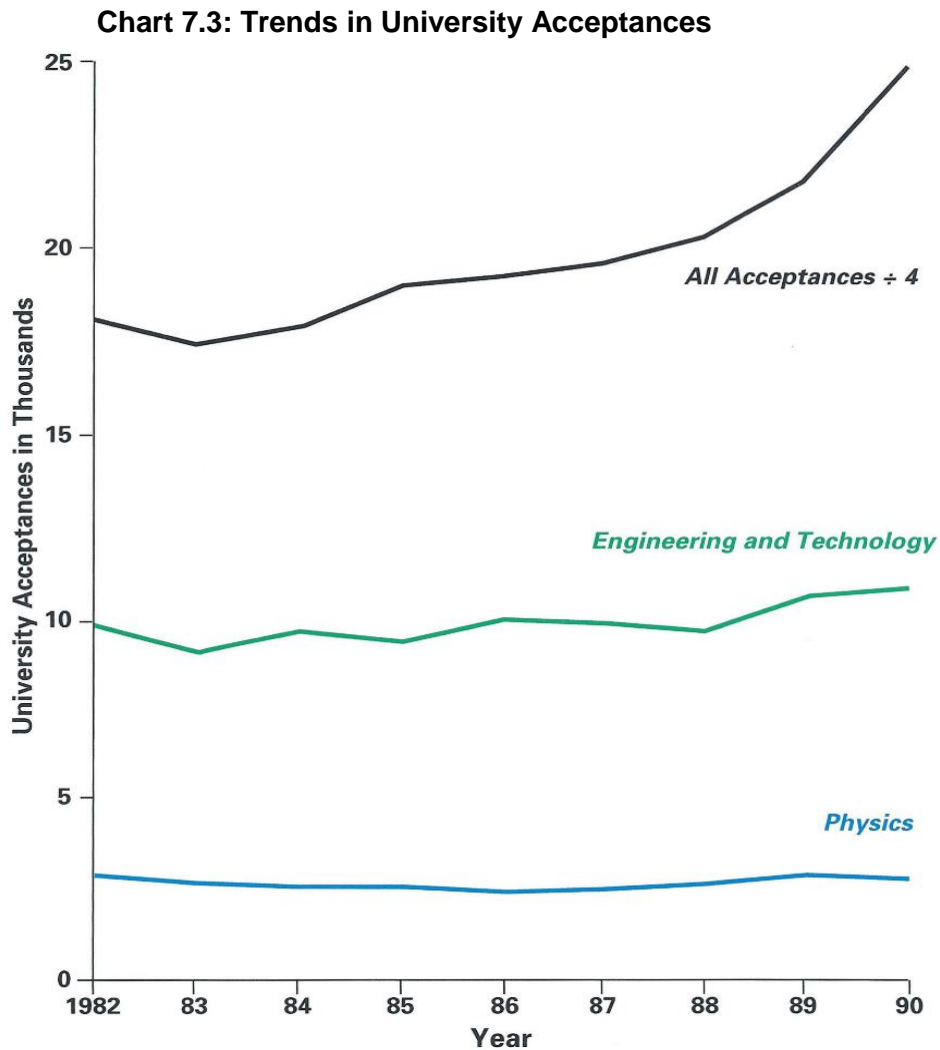
Subject	Applications	Acceptances	Ratio of Acceptances to Applications	Per Cent Change in Applications 1985-88
Biological Sciences	9727	5877	1.7	0.3
Physical Sciences	9118	7153	1.3	-7.8
Mathematical Sciences	8218	5694	1.4	-2.6
Engineering and Technology	14274	9466	1.5	-18.5
Business and Administration	13741	3922	3.5	18.1
Social Sciences	27952	11705	2.4	11.9
All Subjects	156981	80496	2.0	-0.1

\* Home Students only.

Source: Twenty-Sixth Report (1987-88), Cheltenham: UCCA.

7.5 This is reflected in applications to universities (Chart 7.2) which fell by nearly 20 per cent in engineering and eight per cent in the physical sciences in the period 1985-88 (the most convenient recent period over which like can be compared with like). During that time engineering applications fell as far as business applications rose and in terms of the ratio of applications to acceptances business is more than twice as popular. This has had an effect on the quality of the entrants. Whereas in 1985 the average A-level points total of those admitted to engineering was 11.2 (on a scale of 5 for an A through to 1 for an E) and business 10.8, by 1988 the scores had reversed with that for engineering down to 10.6 and that for business up to 11.3. Since 1988 the trend has continued.

7.6 Chart 7.3 presents the changing pattern of university acceptances in a different way. While entries for all subjects are going up rapidly, those in physics and engineering and technology, have remained on a plateau.



7.7 Shortages in the physical sciences are feeding back into the schools through difficulty in teacher recruitment<sup>28</sup> which could itself be affecting the flows into these subjects. This raises the question of whether there should be some intervention in favour of the physical sciences and engineering. Since it is likely that people learn best what they have freely chosen to study this suggests that attempts to improve the flows into the sciences and engineering should first be directed at what makes them attractive and useful in themselves.

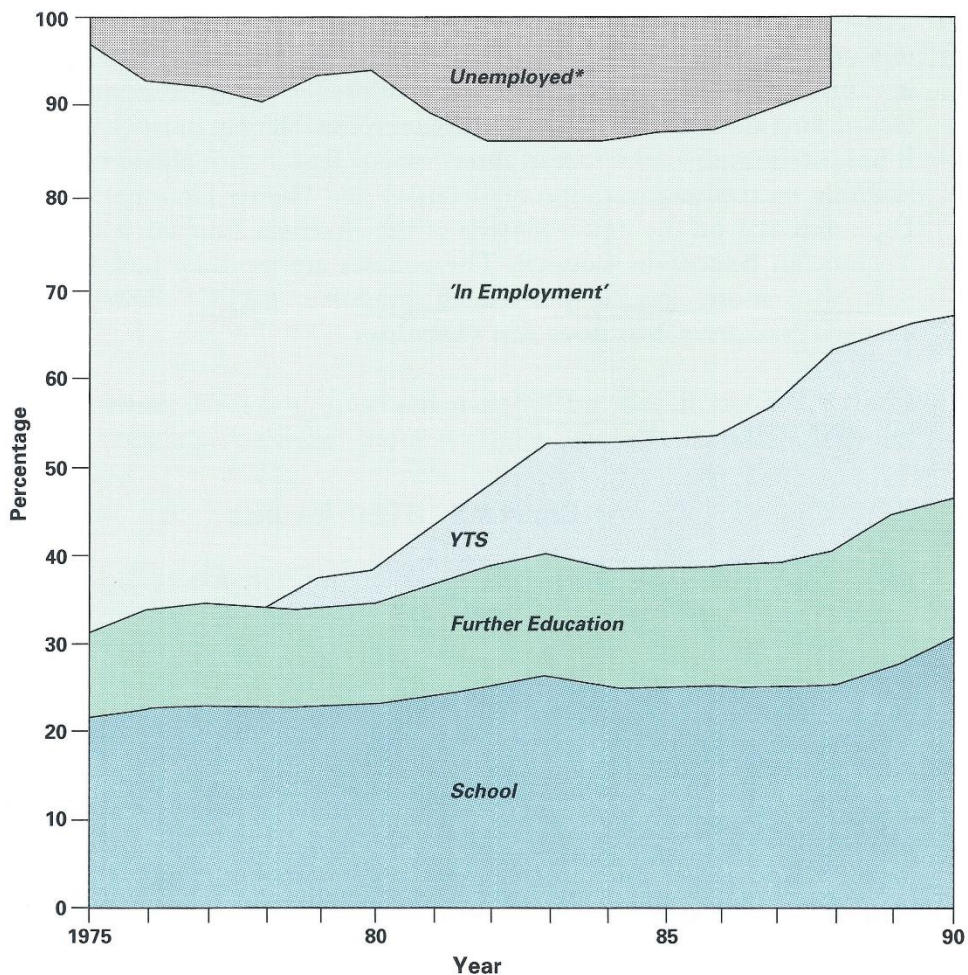
## 8. Technical and Vocational Education

8.1 England has never had a clear ladder of practical or vocational qualifications to complement the academic/theoretical ladder represented by good GCSEs, rising to A-levels, rising to grant-supported higher education. Indeed, as we saw in Chart 2.2 (page 4), the main qualification for getting into training or work at 16 appears to be failing to get five GCSEs at grades A-C. Those with no grades A-C tended to go on to youth training, work without training, or unemployment (although this is no longer officially recorded).

### Youth Training

8.2 A major development since 1978 has been the introduction of Youth Training. It now occupies about a fifth of the age group (Chart 8.1). The early scheme, the Youth Opportunities Programme, Was mainly a response to youth unemployment, offering Work experience of up to six months for unemployed 16 to 18-year-olds. But it gradually developed into an important part of the Government's training strategy.

**Chart 8.1: Education and Employment at Age 17 and 18**



\* To be classed as unemployed one has to be claiming benefit and since this is no longer available to 17 and 18 years (in our terms) there is no official figure for unemployment.

Source: Statistical Bulletins 2/87, 14/88, 13/91, London: DES.

- 8.3 In 1983, the Youth Training Scheme was introduced to provide a year's employment experience with at least 13 weeks off-the-job training for all 16-year-old school leavers and unemployed 17-year-olds. This was extended in 1986 to a two-year scheme with at least 20 weeks off-the-job training available to all 16 and 17-year-olds (in government terms; in fact our 17 and 18-year-olds). The schemes were first administered by the Manpower Services Commission and its successor bodies, but responsibility has now passed to the Training and Enterprise Councils, 82 regional organisations (in England and Wales) led by local business people.
- 8.4 The proportion of young people engaged in training is much larger if those on Youth Training are included (see Chapter 4). Against including them, however, is the fact that, on government figures, only about two in five placements lead to a qualification of any kind and most of those have little or no general currency in the labour market. Youth Trainees usually gain advantage from their training only in the firm to which they are assigned. Youth Training may be improving but it is still very patchy and it still lacks a clear sense of purpose.

### Business and Technician Education Council

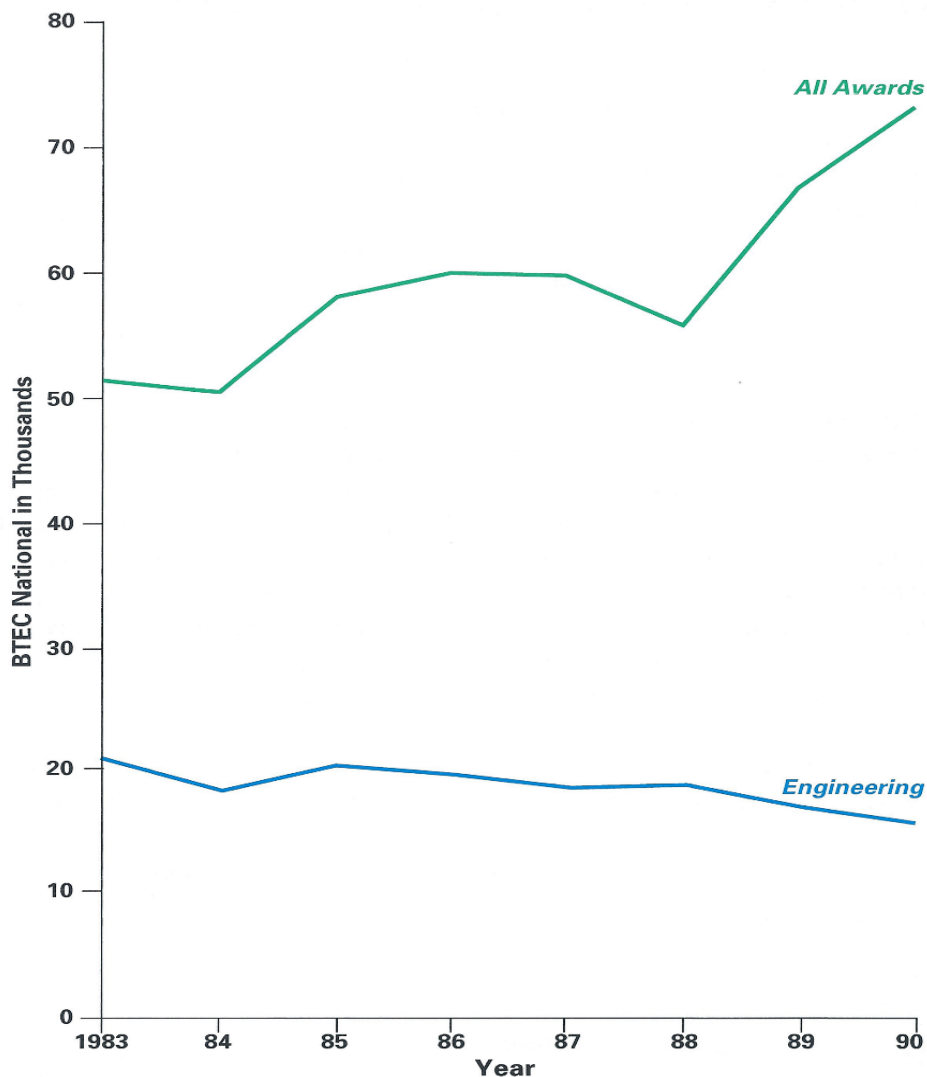
- 8.5 There are pointers to what a vocational ladder might look like in the three levels of award of the Business and Technician Education Council. BTEC was set up in 1983 to create a framework of nationally recognised qualifications for technicians and for those of comparable responsibility in business and commerce. It has established a structure at three levels - first, national and higher national - building on the long tradition of Ordinary and Higher National Certificates and Diplomas and on the newer awards of the Business Education Council and the Technician Education Council. The courses are modular based on a common core with more specific job-related modules. BTEC checks expertise and moderates courses, but does not examine.
- 8.6 Chart 8.2 shows that since 1983 there has been substantial growth in the two-year full-time National Diploma which is often taken straight after school. In one study<sup>29</sup>, 40 per cent of students on BTEC National courses expressed a wish to go on to higher education, so this could be seen as an emerging practically-based alternative to A-levels. Interestingly, as we can see in Chart 8.3, redolent of the 'swing against science', engineering has not shared in this growth.

**Chart 8.2: BTEC Awards**

Year	National Diploma	National Certificate	Higher Nat Certificate	Higher Nat Diploma
1983	17.7	33.0	16.7	6.1
1984	20.2	30.0	17.8	9.2
1985	24.1	33.6	19.0	12.8
1986	26.2	33.6	18.7	14.5
1987	26.6	32.8	18.9	15.2
1988	26.2	28.9	18.2	13.8
1989	34.5	31.7	17.7	14.4
1990	41.5	31.2	23.5	20.4

Source: Annual Reports 1983-4 to 1989-90, London BTEC.

Chart 8.3: Trends in BTEC National Awards



Source: Annual Reports 1983-4 to 1989-90, London: BTEC.

- 8.7 BTEC, however, is still in essence a route for people who have failed something. As we saw in Chart 2.2 (page 4) those entering vocational courses usually did not attain five GCSEs at A-C. Inevitably, it is seen as second best and lacks esteem not surprisingly BTEC holders are less acceptable to higher education and do less well there.

### Initiatives in Schools

- 8.8 A number of initiatives have been introduced to improve the development of practical-technical abilities in schools, but none has become established as a clear alternative to academic studies.
- 8.9 The Technical and Vocational Education Initiative was launched in 1983 in an attempt to apply some of the German experience of vocational courses to English education. But its impact has been lost in its diffuseness. Many money-hungry schools have been able to modify their courses in (say) chemistry or theatre studies to qualify for the payments. TVEI does not lead to particular qualifications, and it is hard to be sure of its impact.

- 8.10 Some schools offer the Certificate of Pre-Vocational Education as a one-year sixth-form course. It is usually organised with some participation by employers, but has never achieved national recognition and does not lead anywhere. It is held to be of equivalent standard to the BTEC First award and, to give it a chance to establish itself, schools until this year were not allowed to offer BTEC Firsts. However, in 1988-89 there were only 18,900 CPVE registrations.
- 8.11 As part of its policy of introducing vocational qualifications into schools, the government has changed the regulations regarding BTEC and 630 schools applied to run courses from September 1991 of which 118 were successful. Unlike A-levels, BTEC Firsts are diplomas specifying a complete programme of study. Although these are taken in the sixth form, BTEC Firsts are really the equivalent of GCSE and would be more appropriately taught pre-16. BTEC is considering developing a new 'first' award for 14 to 16-year olds. The recent White Paper envisages the introduction of general national vocational qualifications in schools in broad areas such as leisure, tourism and catering, but their precise shape has still to be determined.
- 8.12 Technology is part of the national curriculum but it has yet to establish a clear identity. Fears are being expressed that it is becoming another *academic* subject, being more about writing about doing things than actually doing them.

### **Initiatives from Industry**

- 8.13 There have been a number of initiatives too from the industry-side aimed at improving the quality of vocational education. Particularly since Industry Year (1986) companies have been encouraged in a number of ways to involve themselves with schools and colleges. However, although many of the schemes are national they have not yet settled into a coherent framework.
- 8.14 The 'Compact' initiative, started in East London in March 1987 but subsequently absorbed into a Department of Employment programme, seeks to raise the achievement of 15 to 16-year-olds by offering job and/or training guarantees. The pupils are set targets for school attendance, punctuality, and satisfactory completion of courses and given two weeks work experience. These goals seem modest but a study of Inner London Compacts<sup>30</sup>) shows that only about two students in five achieved them. Rather to the surprise of employers, however, the main effect of Compacts seems to have been to raise staying-on rates. In the original six East London schools the proportion of Compact students staying-on in full-time education has risen over the three years since 1987 from 37 per cent to 57 per cent, which is above the national average.
- 8.15 The pressure on employers to work with education (implicit in the increasing emphasis on pupil work experience) Was strengthened by the decision of the Department of Employment in 1990 to devolve control over training programmes to 82 employer-led Training and Enterprise Councils in England and Wales. (These are based on counties and metropolitan authorities, and there is some congruence with the 116 Local Education Authorities, but they are not co-terminous; some TECs will find themselves liaising with several LEAs and some LEAs with several TECs.) In ten areas a pilot scheme is being conducted where school leavers are issued with vouchers to the value of between £1,400 and £2,500 to spend in further education colleges or on other training of their choice.

8.16 More recently, the Departments of Employment, of Education and Science, and of Trade and Industry have jointly announced the Education Business Partnership Initiative. Funds are provided (but self-financing is expected by the third year) to enable the TECs to establish partnerships to promote work placements for students and teachers, better exchange of information, and to encourage business to contribute resources to schools and colleges.

8.17 **There is thus much activity, but it lacks shape.** It has been aptly described as ‘a spaghetti soup’<sup>31</sup> of ideas, confusing to business and education alike. Although they are important elements in creating a climate, the initiatives badly need the focus that a well-defined ladder of practical and vocational qualifications would give them.

### **National Council for Vocational Qualifications**

8.18 There are many vocational qualifications post-16. As well as BTEC, bodies like City and Guilds, the Royal Society of Arts, Pitmans and the London Chamber of Commerce and Industry validate. Only BTEC makes its statistics freely available, but the scale of their activity can be gauged from the fact that in 1989-90 City and Guilds examined 639,161 candidates (all ages) and made 410,242 awards, and RSA had total entries of 909,884.

8.19 The National Council for Vocational Qualifications was established in 1986 to bring some order to the great diversity of vocational qualifications. It has sought to do this by establishing a framework of levels of achievement (initially four, extended to five) and occupational areas. It hopes in this way to:

- recognise competence at different levels so that the awards of bodies like BTEC, City and Guilds and RSA can be brought together on a common scale and new awards developed of appropriate standard;
- to establish some kind of equivalence between vocational and academic qualifications;
- facilitate transfer and progression to enable individuals to achieve their potential.

8.20 If this could be accomplished it would be an important step towards establishing a coherent vocational track, but NCVQ has adopted a distinctive approach which has led to fierce criticism. It is based on analysing desired capability into numerous job-specific skills, already a list of about eight hundred compared with about four hundred in all across Europe. Competence is assessed by the employer with no external validation of standards. The high degree of specificity without regard to general abilities raises questions about the transferability of qualifications. There are large and unresolved differences between BTEC and NCVQ over their approaches to vocational education. There must be doubts therefore on present plans Whether NCVQ can successfully deliver the rationalisation for which it was set up.

### **Conclusion**

8.21 There have been a number of initiatives in vocational and technical education in England, particularly recently, but they have been haphazard and do not lead clearly either into employment or on to the next stages of education. What is needed is:

- a range of recognised school qualifications in technical and vocational subjects up to age 18 and
- a matrix of varied vocational qualifications at various levels beyond school.

It is important, however, that the practical-vocational ladder(s) should be freely chosen and not just turned to after failing academic subjects.

## 9. Qualifications of Workforce

- 9.1 The character of the English education system emerges in the country's workforce. At the graduate level it compares favourably with other countries but, because schools, in effect, dismiss a large proportion of the population as unacademic rather than developing their talents for making things, designing things and working with people, Britain lacks the range and level of developed skills that other countries have at their disposal.
- 9.2 The workforce, as Chart 9.1 shows, seems seriously under-qualified. About two-thirds of the workers lack vocational qualifications compared to only about a quarter in Germany and just over a third in The Netherlands. Only a fifth have vocational qualifications of the level of BTEC National or City and Guilds.

**Chart 9.1: Vocational Qualifications of Workforce** *per cent*

Vocational Qualifications	France (1988)	Germany (1989)	Netherlands (1985)	UK (1988)
Degree and Higher Diplomas*	14	18	18	17
Intermediate VQ	33	56	44	20
None <sup>§</sup>	53	26	38	63

\* Degrees, HND, HNC, teaching, nursing and equivalent.

† BTEC National, City and Guilds and equivalent.

§ General education only (below HE).

**Source:** Mason, Prais and van Ark (1990), Discussion Paper No. 191, London: NIESR.

- 9.3 Detailed studies by the National Institute of Economic and Social Research<sup>32</sup> have demonstrated the consequences for productivity, earning power, workmanship and service; in short many of the things that contribute to the quality of life. In Germany, for example, the technology exists to make and distribute customised kitchen units; these are units tailored to fit the particular shape of a kitchen, an advance on standardised and mass-produced patterns. Attempts to import the technology into this country, however, have failed because workers lack the arithmetic skills required to operate the machinery.
- 9.4 In a study of biscuit-making in The Netherlands, NIESR found that differences in the skill-levels of the workforce had a notable effect on the efficiency of production, with Dutch labour-productivity being about 25 per cent higher. As significant as this is, it is less than the overall Dutch productivity advantages across industry estimated at 45 per cent, probably reflecting the greater scope for using unqualified employees (in loading and packing for example) in automated process industries like biscuit-making. This bears out what NIESR found in comparisons with Germany where Britain seemed at a particular disadvantage when operatives' craft skills were crucial such as in making motor vehicle components, clothes, and wood furniture.

- 9.5 Even the academic track to degree level apparently fails to bring enough people to mathematics, engineering and technology (though it is not clear why the market has not acted to correct this). An analysis of graduate output by country, as in Chart 9.2, suggests that this could, in part, be due to the way those with numerical ability are distributed between engineering and the sciences. While in the UK engineers were only 41 per cent of the aggregated total, in Japan they were 85 per cent and in West Germany 74 per cent.
- 9.6 Surprisingly, perhaps, the higher levels of graduate output in Japan and the United States are mainly in fields such as the social sciences, law and business studies. But it must be remembered that while the UK is struggling to fill the available engineering places, in Japan there are 4.7 applicants for every place and it is the disappointed candidates who turn to business studies. In Britain business studies are often the first choice.

**Chart 9.2: Graduate Output by Country**

Subject Area	Per 1000 of Age Cohort				
	UK (1985)	France (1981)	West Germany (1984)	Japan (1985)	USA (1985)
Engineering and Technology	18	20	28	45	25
Science, Maths and Computing	26	33	10	8	27
Medical and Health Related	7	5	13	12	15
Social Sciences, Law, Business Studies	37	58	45	91	87
Arts, Humanities, Education	36	77	37	55	43
Other*	14	9	6	18	33
<b>Total</b>	<b>138</b>	<b>202</b>	<b>139</b>	<b>229</b>	<b>230</b>

\* Mass communication and documentation, home economics, service trades, transport and communications, agriculture, forestry, fishing, and other not specified.

**Source:** Annual Statistical Yearbook (1989), Paris: UNESCO.

- 9.7 Nevertheless the differences are not as large as is sometimes imagined and it appears that the UK may be producing more science and engineering graduates than Germany. Prais of NIESR has argued that the root of our poor economic performance compared with our industrial competitors lies elsewhere.
- 9.8 Chart 9.3, adapted from Prais, shows output in engineering in terms of the categories 'doctorate' through to 'craftsman'. It suggests that only at the level of doctorate does the UK compare favourably with the other countries, and particularly in the support levels of technicians and craftsmen it falls seriously behind. This can lead to graduates being deflected to lower level tasks.

**Chart 9.3: Qualifications in Engineering and Technology, 1985\*** *thousands*

Level	UK	France	Germany	Japan	USA
Doctorate	0.7	0.3	1.0	0.3	0.5
Master's degree	2		-	5	4
Bachelor's degree	14	15	21	30	19
Technician	29	35	44	27	17
Craftsman	35	92	120	44	na

\* Raw numbers for Japan and USA reduced in proportion to UK population; populations of France and West Germany taken as sufficiently similar to UK not to require adjustment.

**Source:** Prais (1988), National Institute Economic Review, February 76-83.

- 9.9 There are reasons, therefore, as we have seen throughout this report, for questioning the efficacy of the present education and training arrangements in enhancing the country's competitiveness, companies' recruitment and individual mastery. It seems important to consider what improvements might be made, and we turn to the possibilities in our final chapter.

## 10.Improving the System

10.1 The numerical picture of the education/training undertaken by 17 and 18-year-olds suggests that there are two main areas of concern to which the Council may wish to direct attention:

- whether the present academic pathway based on A-levels is the most appropriate one;
- the lack of coherent technical and vocational tracks.

These may, in fact, be the same problem, since the prestige of A-levels and the opportunities they lead to make it difficult to establish desirable alternatives. But it is convenient for the moment to treat the two issues separately.

### A-levels

10.2 As we saw in Chapter 3, the present academic pathway has important strengths:

- those 18-year-olds who go on to do A-levels perform very well in international comparisons of educational achievement;
- advanced study in the sixth form makes possible a higher education system which produces good quality graduates in a short time with relatively little wastage.

But sixth form education is also distinctive in that:

- a low proportion is involved;
- students take few subjects;
- not enough come through in the sciences and mathematics.

We also have to recognise that A-levels are an intimidating gamble because it is easy to fail - and those who do have nothing to show for two years' work. Since about a quarter fail each A-level (this has come down from a third recently) and the normal entry requirement is at least a 'C' at GCSE, the failures plainly include some of those who showed real promise at 16.

10.3 There is therefore a case for modifying A-levels to build on their strengths while trying to reduce their disadvantages. Possible changes may be considered under four headings: **breadth, failure, flows into quantitative subjects and 'backwash'**.

### *Breadth*

10.4 English education for 17 and 18-year-olds is distinctively specialised. It is usual for young people to take only three subjects compared to nine or more in some countries. Historically this came about through creating arts and science alternatives rather than adding new subjects to the curriculum as they emerged. The extent of specialisation has nevertheless been often questioned and there have been many attempts to achieve more breadth.

10.5 The one that has operated for most of the life of A-levels is General Studies which tries to achieve more breadth by offering it as an extra subject. Although it has one of the

highest entries at A-level, schools differ considerably in the seriousness with which they treat it, and it is still regarded as not quite an A-level by university admission tutors<sup>33</sup>.

- 10.6 More recently the government has sought breadth through the introduction of AS courses which are intended to be of the same standard as A-levels but to contain half the material. However, although there has been some increase in AS entries in 1991, they still amount to only 7.3 per cent of A-level entries and they do not seem to be winning the acceptance the government had hoped.
- 10.7 Alternative approaches to broadening the sixth-form curriculum that have been widely canvassed are increasing the number of subjects normally taken from three to five as proposed in the Higginson Report<sup>34</sup>, or establishing some framework of studies to be taken at higher and subsidiary levels such as in the International Baccalaureate.
- 10.8 Although breadth is widely assumed to be ‘a good thing’ the rationale for it has never been made explicit. The current fashion in discussing breadth is to talk in terms of ‘core skills’ such as problem solving and communication. However, while this may be a useful device for analysing outcomes, it does not seem a good basis for prescribing a curriculum since skills cannot exist without content. And it is an open question whether problem solving in history is the same as in science or motor vehicle maintenance, for example. It seems better to go straight to the subjects themselves and decide which ones should be included.
- 10.9 This is not the place to work out a detailed argument for breadth but we can see it might be attempted through the ‘different forms of knowledge’, the ways we make sense of the world. Most of these are known to us by their subject names - maths, history and science, literature and the rest. It becomes a matter of judgement therefore whether it is desirable that at 17 and 18 years of age young people should specialise or engage in a range of subjects. Any decision will have to reckon with individual differences. While some people have particular strengths, others are all-rounders.
- 10.10 It also has to be considered whether the system should run on rational choices, as hopefully it does now, or whether there should be the imposition of some framework. Decisions of two sorts therefore have to be taken: what degree of breadth is desirable and whether it should be chosen or compulsory.
- 10.11 The justification for a prescribed core of studies is that some subjects are so important to one’s life-chances that they must be taken to a certain level. This would seem appropriate for the years of compulsory schooling and we can see advantages in a diploma at age 16 based on a core of English, maths and science with mark averaged across subjects (cf. Chapter 4). But beyond compulsory schooling it would seem logical to have a system running on choices. (Competence in English and maths should by now have been attained.) Bearing in mind the extent to which people differ, it would be desirable to have a system which permitted both specialisation and breadth. This perhaps could be achieved with a norm of five subjects as proposed by the Higginson Committee but rejected by the government. Already, as we saw in Chart 7.1 (page 30), about a third of A-level students choose to combine the arts and sciences, five subjects would create the opportunity for all students to think seriously about breadth.
- 10.12 The government in its recent consultative document<sup>35</sup> on qualifications at 16 and 18 appears to go some way towards a prescribed core at 16. It develops the proposals first

announced in the White Paper, Education and Training for the 21<sup>st</sup> Century (May 1991), for ordinary and advanced diplomas. These are not, however, to be new qualifications but “the overarching stamp of quality” on existing ones. The ordinary diploma provisionally set at four good GCSEs does nevertheless specify that English and mathematics should be included. The advanced diploma is envisaged as being for those with two A-levels at any grade, or a general, or occupationally specific national vocational qualification at level 3 (as accredited by NCVQ). It therefore adds little and would not seem to have much chance of redressing the great imbalance of the academic and the vocational. Neither does it get to grips with the issues of breadth and specialisation.

### *Failure*

- 10.13 As presently constituted, A-levels are a risky investment of time. How can academic studies at age 17 and 18 be reorganised to preserve the present high standards but reduce the gamble? One possibility would be to modularise the courses and allow students to progress by performance. That is, they would move through A-levels chalking up success in ‘credits’ as they went along rather than facing a single high hurdle at the end of two years. (Graded music exams are a partial analogy.)
- 10.14 A scheme to teach maths in this way, Structured Sixth Form Mathematics<sup>36</sup>, has been devised by a group of mathematics teachers from independent and maintained schools. It consists of a number of modules, some of which are core and others optional, each equivalent to one term’s work. Three modules passed constitutes an AS, six an A-level, nine an A-level plus an AS in further maths, and twelve A-levels in maths and further maths. The modules are potentially combinable with those from other subjects so students would be able to move to something else if they were not making satisfactory progress in maths.
- 10.15 Such an arrangement has a number of advantages. Most students can achieve some success; they are able to progress as far as they are capable; it sets attainable goals; it is flexible; and it offers transferable credit. However, it does pose something of a dilemma in terms of assessment. If students are to be tested when they are ready this means that the formal testing will have to be delegated to the teachers. However, internal assessment can lack the comparability and fairness of external examinations. This is a square that would have to be circled, but one possibility is that examination boards could act as something like driving test centres and offer examinations at the end of every term (instead of twice a year as now) to which candidates could present themselves if they thought they were ready. However, this could be administratively difficult, and the perhaps incompatible advantages of progress by performance and a final external independent examination will have to be weighed carefully.

### *Flows into Quantitative Subjects*

- 10.16 The sciences and mathematics have not shared in the recent growth in A-levels and entries have been falling faster than the number of 18-year-olds. There seems a downward spiral in which diminishing numbers study these subjects at A-level, graduates are correspondingly few, teacher recruitment suffers, and poor teaching threatens to divert children to other subjects.
- 10.17 It is important to break into the spiral and it is possible that the Mathematics Scheme discussed above will, as hoped, substantially raise the proportion of the age group taking

A-level maths. If it is successful, a similar approach might be adopted in the physical sciences.

- 10.18 Science is now part of the core curriculum to age 16 and this is intended to bring more young people through into the sixth form to take the sciences. Mathematics, however, has always been treated as a ‘core’ subject but that has not halted its A-level decline.
- 10.19 So low has been the interest in the sciences that the possibility of a compulsory element of science/maths in the sixth form has been proposed. It is one of the arguments for compulsory breadth at that stage.
- 10.20 But it would seem preferable to rely on choices. How then are more young people to be persuaded to opt for the quantitative subjects? There is no easy answer. The subjects themselves and the careers they lead to must be made more attractive, but it may be necessary to intervene with incentives of some kind. Scholarships for sixth-form study in some subjects is one possibility.

### **‘Backwash’**

- 10.21 Another reason for contemplating some change to A-levels is what might be called the ‘backwash’ effect. Although the academic route may work well for the successful 15 per cent, the effects on the 85 per cent who are discarded along the way may be too high a price to pay. There are some<sup>37</sup> who would advocate abandoning A-levels for this reason. However, as we saw in Chapter 3, this could be to throw out the baby with the bathwater, and it would perhaps be preferable to concentrate on developing technical and vocational tracks of equivalent standing.

### **Technical and Vocational Tracks**

- 10.22 A widely recognised failing of the English education system is the absence of co-ordinated technical and vocational tracks from school into employment and higher education. A number of reforms have been attempted, as we saw in Chapter 8, but they have tended to be piecemeal and partial, and to have lacked coherence and credibility.
- 10.23 Some of the features<sup>38</sup> of such tracks might be:
- they should be freely chosen; not, as at present, entered after failing academic studies;
  - young people in the later years of compulsory schooling should be taught about employment opportunities (rather than just being sent on ‘work experience’) to help them choose;
  - schools and employers should work together so that occupational skills could be developed in occupational contexts;
  - education to age 18 should not be compulsory - it is difficult enough to keep some young people there till 16 - but only employers offering approved training should be allowed to recruit young people below the age of 18;
  - wage levels for young people should reflect the fact that they are trainees and not fully qualified.

- 10.24 The qualifications they led to would be paramount. They would be sought after only if they led clearly and naturally into employment and further stages of education/training.
- 10.25 The equivalence of the practical/technical track could be established by its too leading to A-levels at age 18. These could be among the say five to be studied. Practical/technical options could also comprise part of any diploma that was introduced at 16, or there could be practical/technical GCSEs. In creating GCSEs and A-levels in practical/technical subjects care would have to be taken to avoid the ‘academic drift’ that seems to be besetting technology. Practical/technical A-levels could be stepping stones to higher education where they should help with the considerable difficulties in recruitment that the technological subjects are experiencing. A vocational version of the practical track could be created by allowing young people of school age to experience and specialise in the work they might move into.
- 10.26 But what would really give impetus to the formation of technical and vocational tracks would be a registration scheme for skilled workers in the way that there is for some professions. If in order to practise as a registered plumber, for example, a person had to demonstrate competence and acquire certain qualifications, then the incentive would be there to acquire those qualifications. Registration schemes of this kind can be introduced only slowly to give current practitioners a chance to qualify, but they would seem worth considering.
- 10.27 It has not been within the scope of this study to make a detailed analysis of educational expenditure, but it looks as if the top part of the ability range receives a disproportionate share of resources. In view of the argument above which shows how the system at present ‘creams’, is this the distribution of resources we would want? The aim of technical and vocational tracks would be to establish **mainstream** education and training post 16 for all. This would not only have economic benefits but give dignity to many who now look upon themselves as failures.

### Higher Education

- 10.28 The UK also has a distinctive higher education system. It assumes that nearly everyone who enters will exit three (or four) years later with a degree, and there is a high entry hurdle. It therefore tends to be exclusive and there is a case for a more open system, as the Council for Industry and Higher Education has long recommended.
- 10.29 An example of a more open system, where quality is guaranteed at exit rather than entry, is America’s higher education which has the advantage of searching out talent and recognising achievement. It is a diverse and differentiated system, through which people are able to move according to what they have achieved.
- 10.30 The English system produces high quality graduates in a short period of time but is still aimed primarily at 18 to 21-year-olds. There are inadequate opportunities later in life. With an appropriate system of credit accumulation, study could be continuous or spaced, full-time or part-time, in one institution or several.
- 10.31 It would be important not to lose the coherence of a degree, but ways should be explored of making higher education more flexible so that anyone who was interested could progress as far as they were able, and there were opportunities throughout life. The aim should be a responsive and responsible system which seeks to maximise choice and opportunity.

## Conclusion

- 10.32 Our focus has been the two years beyond compulsory schooling. The phase has been difficult to talk about in some ways since it does not embody a clear concept nor have a label. At the moment the language is mostly of the academic route - sixth form, A-levels - reflecting its prestige and importance. When our thinking expands to encompass the idea of mainstream education/training of all 17 and 18-year olds then the language too will become available.
- 10.33 Our analysis suggests that the current arrangements have important strengths which can be built upon. The Council may wish to consider whether, in its view, the A-level route is satisfactory, needs fine-tuning or a major overhaul. The Council may also like to consider whether there is a case for equivalent technical and vocational tracks. All three tracks could be through a common system with many opportunities for moving between them. There would be consequences for the shape of higher education and funding implications.
- 10.34 The key criterion on which any proposed changes should be judged is attainment – of all young people. Participation is important but only as a starting point. It is what is learned that matters; learning in the service of a high quality of life.

## Notes

1. Ball, C. (1991). *Learning Pays*, Interim Report, London: RSA; Cassels, J (1990). *Britain's Real Skill Shortage*, London: Policy Studies Institute; Institute for Public Policy Research (1990). *A British 'Baccalauréat'*, Education and Training Paper No. 1, London: IPPR; McClure, J.S. (1991). *Missing Links*, London: Policy Studies Institute; Pilkington, P. (1991). *End Egalitarian Delusion*, Policy Study No. 124, London: Centre for Policy Studies; Secondary Heads Association (1991). *16-19 The Way Forward*, Leicester: SHA; The Royal Society (1991). *Beyond GCSE*, London: The Royal Society.
2. DES (1991). *Education and Training for the 21<sup>st</sup> Century*, London: HMSO.
3. Labour Party (April 1991). *Today's Education and Training: Tomorrow's Skills*; Liberal Democrats (1990). *Shaping Tomorrow - Starting Today*.
4. Courtney, G. (1989). *Youth Cohort Study, England and Wales, Report on Cohort 3, Sweep 1*, Research and Development No. 53 - Youth Cohort Series No. 3, Sheffield: Training Agency.
5. Smithers, A. and Robinson, P. (1989). *Increasing Participation in Higher Education*, para 4.3, London: BP.
6. Currently 40 per cent, see The Association of Graduate Recruiters (1990). *Graduate Employment Prospects 1990*, Manchester: Central Services Unit.
7. Postlethwaite, T.N. and Wiley, D.E. (1991). *Science Achievement in Twenty Three Countries*, Oxford: Pergamon.
8. Prais, S.J. and Wagner, K. (1986). Schooling standards in England and Germany: some summary comparisons bearing on economic performance. *Compare*, 16, 5-36; Prais, S.J. and Beadle, E. (1991). *Pre-Vocational Schooling in Europe Today*, Report Series No. 1, London: NIESR.
9. Walberg, H.J. (1991). *Assessing National Education Systems*, Unpublished paper, Chicago: University of Illinois.
10. Association of County Councils and Association of Metropolitan Authorities (1990). *School Leavers' Destinations 1989*, London: ACC.
11. Briggs, A. (1965). Thomas Hughes and the Public Schools, in *Victorian People*, Harmondsworth: Penguin Books.
12. Report of the Commissioners appointed to inquire into the State of Popular Education in England (The Newcastle Report), 1861. In Maclure J.S. (1973). *Educational Documents England and Wales: 1816 to the Present Day*, 70-78, London: Methuen.
13. Report of the Royal Commission known as the Schools Inquiry Commission (The Taunton Report), 1868. In Maclure, J.S. (*op. cit.*, ref 12) 89-97.
14. Barnett, C. (1986). *The Audit of War*, p 229, London: MacMillan.

15. Report of the Royal Commission on Technical Instruction (The Samuelson Report), 1882-84. In Maclure, J.S. (*op. cit.*, ref 12) 121-127.
16. Report of the Royal Commission on Secondary Education (The Bryce Report), 1895. In Maclure, J.S. (*op. cit.*, ref 12) 140-148.
17. Regulations for Secondary Schools, 1904. In Maclure, J.S. (*op. cit.*, ref 12) 156-159.
18. Report of the Consultative Committee of the Board of Education on Secondary Education with special reference to Grammar Schools and Technical High Schools (The Spens Report), 1938. In Maclure, J.S. (*op. cit.*, ref 12) 193-199.
19. Circular 10/65. *The Organisation of Secondary Education*, London: DES.
20. Council for Industry and Higher Education (1990). *Towards a Partnership: The Humanities for the Working World*, London: CIHE.
21. This is described in more detail in Edwards, A.D. (1970). *The Changing Sixth Form in the Twentieth Century*, London: Routledge and Kegan Paul.
22. Crowther Report (1959). 15-18. *A Report of the Central Advisory Council for Education (England)*, 1, London: HMSO.
23. Peterson, A.D.C. (1988). *Schools Across Frontiers*, La Salle, Illinois: Open Court.
24. Smithers, A. and Robinson, P. (1989). *Increasing Participation in Higher Education*, para 3.12, London: BP.
25. Burnhill, P., Garner, C., and McPherson, A. (1990). Parental education, social class and entry to higher education. *J. Royal Stat. Soc. A*, 153, (2), 233-248.
26. Ball, C. (1990). *More Means Different*, London: RSA.
27. Smithers, A. and Robinson, P. (1988). *The Growth of Mixed A-levels*, Manchester: Carmichael Press.
28. Smithers A. and Robinson, P. (1991). *Teacher Provision: Trends and Perceptions*, Manchester: School of Education.
29. Smithers, A. (1991). *The Vocational Route into Higher Education*, Manchester: School of Education.
30. Hailes, I. and Nuttall, D. (1991). *Pupil Goal Achievement in the Inner London Compacts 1989-90*, Centre for Educational Research, London: LSE.
31. Tytler, D. (1990). The training message decoded, *The Times*, May 21, 1990.
32. National Institute of Economic and Social Research (1990). *Productivity, Education and Training: Britain and Other Countries Compared*, Reprints of Studies published in the National Institute Economic Review, London: NIESR; Mason, G., Prais, S.J. and van Ark, B. (1990). *Vocational Education and Productivity in the Netherlands and Britain*, NIESR Discussion Paper, No. 191.

33. Robinson, P. and Smithers, A. (1991). *General Studies in the Sixth Form*, Report to the Leverhulme Trust, Manchester: School of Education.
34. Higginson Report (1988). *Advancing A-levels*, London: HMSO.
35. DES (1991). *Ordinary and Advanced Diplomas*, Consultative Document.
36. Clare, J. (1991). Making more sense of maths, *Daily Telegraph*, February 21, 1991.
37. Labour Party (July 1991). *Qualified Optimism: Post 16 Education and Training Reform in England and Wales*, London: Labour Party.
38. This argument is developed more fully in *Every Child in Britain*, the Report of the Channel 4 Commission on Education, 1991, London: Channel 4 Television.

**Additional copies**

Individual copies are available free of charge and requests should be addressed to:

The Council for Industry  
and Higher Education,  
100 Park Village East,  
London NW1 3SR

Telephone: 071 387 2171

**Bulk orders** (3 or more copies) will be charged at £2.50 per copy (inclusive of post and packing). Cheques should be made payable to: The Council for Industry and Higher Education and sent to the address shown.

*The Council gratefully acknowledges the assistance of  
The British Petroleum Company plc. in the design and printing of this paper.*

**ISBN 1 874223 00 9**

**The Council for Industry and Higher Education, 100 Park Village East, London NW1 3SR**