Science, Engineering and Technology and the UK's Ethnic Minority Population

A Report for the Royal Society
April 2005

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Information about this publication

Project responsibilities
This report was commissioned by the Royal Society to provide a more detailed picture of the level of participation in science, engineering and technology (SET) education and employment by age, sex and race. The aim was to address gaps that had been evident in earlier reports and support a separate project looking more broadly at the use of SET role models to inspire young people, particularly girls and ethnic minority communities. Both projects were supported by the National Endowment for Science, Technology and the Arts (NESTA) and funded by the Department for Education and Skills (DfES). The Role Model Good Practice Guide is available on the Royal Society's website (www.royalsoc.ac.uk/rolemodels).

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The report can be found at www.warwick.ac.uk/go/rsreport2005 and www.royalsoc.ac.uk/diversity

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Labour Force Survey data are used with the permission of the Office for National Statistics and have been made available for research purposes by the Economic and Social Data Service at the UK Data Archive, University of Essex.

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Abbreviations

DfES	Department for Education and Skills
EPSRC	Engineering and Physical Sciences Research Council
GCSE	General Certificate in Secondary Education
HESA	Higher Education Statistics Agency
ICT	Information and communication technology
LFS	Labour Force Survey
NESTA	National Endowment for Science, Technology and the Arts
ONS	Office for National Statistics
SEMTA	Science, Engineering and Manufacturing Technologies Alliance
SET	Science, engineering and technology
SOC	Standard Occupational Classification
YCS	Youth Cohort Study of England and Wales

Executive Summary

This report was commissioned by the Royal Society as part of its agenda to address diversity issues in science, engineering and technology (SET).

The aim of the study is to present a picture of ethnic group participation in SET in terms of occupations held and participation in post-compulsory education. This has been achieved by consolidating information from a variety of sources, in particular the Labour Force Survey (LFS) and Youth Cohort Study of England and Wales (YCS), with data from the Higher Education Statistics Agency.

The findings reveal a very mixed picture of participation in SET among ethnic minority groups. In particular, there are sharp divides within the broad ethnic groups so that a broad differentiation along the lines of White, Black, or Asian will not suffice. In general, among Asian groups, the Indian population is over-represented in SET compared to the White population, while the opposite is true for the Bangladeshi population. Similarly, among the Black ethnic minority groups, the Black African population is very well represented in SET, whereas the Black Caribbean population is not. The Chinese population is also well represented in SET compared to the White population.

The two main disadvantaged groups in terms of participation in SET are the Bangladeshi population, where the problem appears to be most apparent among women, and the Black Caribbean population, where the problem of under-representation is greatest among males. Members of these ethnic groups are significantly less likely to work in a SET occupation than their White counterparts, and are significantly less likely to undertake a post-compulsory SET-based education. This conclusion broadly supports the findings of earlier work, notably the report 'SET for equality on ethnic minorities in science, engineering and technology' published by the Science, Engineering and Manufacturing Technologies Alliance (SEMTA) in the spring of 2004. The causes of this under-representation are not yet fully understood and deserve further research as the available literature in this area is limited.

The findings also highlight a clear gender divide in terms of participation in SET, with men being approximately four times more likely to work in a SET occupation than women. This ratio is broadly consistent across all ethnic groups. There is also a small bias towards younger people working in SET occupations.

Part of the exercise was to identify the numbers of role models, by ethnic group and gender, available to inspire the next generation of young people to work in SET. Estimates of these numbers based on the LFS from 2002–3 are provided in the table below.

Role models: Estimated numbers employed in SET by ethnic group and gender

Ethnicity	Male	Female	Total
White	1,059,900	189,000	1,248,900
Black – Caribbean	4,700	700	5,400
Black – African	5,400	1,900	7,300
Indian	22,400	7,700	30,100
Pakistani	5,700	1,600	7,300
Bangladeshi	700	200	900
Chinese	5,200	1,600	6,800
Other	18,800	4,400	23,200
Total	**1,122,800**	**207,100**	**1,329,900**

Note: Estimates for the UK are based on weighted LFS data for 2002–3. Figures presented to the nearest 100

1. Introduction

The size of the minority ethnic population in the UK has increased significantly over recent years, from only 1 million three decades ago to 4.6 million today, representing 7.9% of the total population of the UK. This population is diverse: half of the ethnic minority population is Asian, chiefly Indian, Pakistani or Bangladeshi, and a quarter describe themselves as Black, either African or Caribbean[1].

Despite such large numbers, relatively little is known about the extent of participation by ethnic minorities in science, engineering and technology (SET). There is a concern backed by recent research that particular ethnic minority groups may be under-achieving in science. This is the conclusion of Harrison *et al*. (2003)[2] in a report to the Royal Society, which highlights under-achievement in science and mathematics education at secondary school by African-Caribbean, Bangladeshi and Pakistani pupils, based on a review of existing data and case studies in schools in Sheffield, Birmingham and Manchester.

Other studies have also identified under-achievement among black, Pakistani and Bangladeshi pupils (boys in particular) throughout school, and in particular at key stage levels[3]; these studies include SEMTA (2004), Roberts (2002), Demack et al. (2000) and Gillborn and Mirza (2000) and are complemented by data on achievement at Key Stage 3 provided by the Department for Education and Skills (DfES)/Office for National Statistics (ONS). A study by Connor *et al*. (2003) for the DfES has extended this picture, presenting a very thorough account of ethnic minorities in higher education. However, up to this point there are little or no data relating specifically to achievement in SET.

1 2001 figures. Source: Office for National Statistics.
2 Appendix 1
3 Appendix 2. Key stage levels describe particular stages within the period of compulsory schooling for every child. Primary education is covered by two key stages, as is secondary schooling.

This report defines SET both in terms of economic activity, using the Standard Occupational Classification (SOC) of occupations, and educational achievement based on qualifications obtained at higher degree, degree or advanced level. Definitions used are detailed in the report. Using this basis, the report presents a statistical overview of ethnic groups' participation in SET, by consolidating information from a variety of sources. In particular, the following data sources are utilised: the Labour Force Survey (LFS), which provides information on occupations and highest qualifications; Higher Education Statistics Agency (HESA) data, which presents a comprehensive picture of participation and attainment in higher education; and the Youth Cohort Study of England and Wales (YCS), which surveys young people's educational achievement between the ages of 16 and 19.

The results suggest a very mixed picture of participation in SET among ethnic minority groups. Among Asian groups, Indian and Chinese people are over-represented compared to the White UK population. In contrast, Bangladeshi people are under-represented in SET, both in terms of occupations and educational attainment. Moreover, the problem is more acute among Bangladeshi women. Among the Black ethnic minority population there is a sharp contrast. While Black African people are over-represented in SET compared to the White UK population, this is not the case among Black Caribbean people. In this instance the problem of under-representation is worse among males.

The presentation of the findings begins with SET occupations by ethnic group, then proceeds to participation in SET in higher education, and finally considers participation in SET at A level. In each case participation among the ethnic minority groups is compared with the majority White population. Section 2 provides detail on sources of data and Section 3 discusses the classification of ethnic groups, based on ONS census definitions. The results are presented in four further sections. Section 4 details workforce participation in SET occupations by ethnic minority group, based on evidence from the LFS. Section 5 details participation in SET in higher education by ethnic group, including numbers of postgraduates and staff, based primarily on data from HESA. Section 6 extends this analysis by analysing research funding in SET by ethnic group. Finally, Section 7 illustrates the achievement of SET subject qualifications at A level by ethnic minority group, using data from the YCS. Section 8 draws conclusions. In addition the numerous appendices present technical information supporting the information contained in the report.

2. Data Sources

This report bases its findings primarily on an analysis of secondary data sources. The three sources of data utilised in the study are briefly described in turn. Further data have also been obtained from Department for Education and Skills (DfES) and the Engineering and Physical Sciences Research Council (EPSRC).

2.1 Labour Force Survey

The Labour Force Survey (LFS) is a sample survey of households living at private addresses in the UK. The surveys are conducted on a quarterly basis and provide data on approximately 65,000 employed persons per quarter. Information is collected from one household member (face to face initially, then subsequently by telephone interviews) about the education, training and employment of all household members. Each household in the sample is surveyed for five successive quarters subsequent to initial contact.

In order to obtain reliable estimates of employment and education, quarterly LFS data sets are pooled as appropriate in order to ensure sufficiently large sample sizes for ethnic minority groups. Further, since one of the aims of this study is to look at how ethnic minority participation in science, engineering and technology (SET) has changed over time, pooling of LFS data sets is done for three separate time periods over the past decade[4]. These are:

2002–2003. Based on quarterly LFS samples for March–May 2002 and June–August 2003 (the last available at time of writing).

1997–2001. Based on quarterly LFS samples for March–May 1997, June–August 1998, September–November 1999 and December 2000–February 2001.

1992–1996. Based on quarterly LFS samples for March–May 1992, June–August 1993, September–November 1994 and December 1995–February 1996.

Note that there is a structural break in the LFS data in the spring of 2001. Subsequent to this time, different definitions of ethnicity are applied (as outlined in Section 3). Additionally, a new Standard Occupational Classification (SOC) system has been introduced for occupations (i.e. SOC 2000) replacing the old SOC 1990 definitions. Therefore caveats must be applied when making comparisons between the final period and earlier periods.

Finally, the merging of the data takes into account the sample rotation[5] of households in the LFS on a five-quarter basis in order to ensure that no 'double counting' takes place. The chart in Appendix 3 illustrates the wave structure of the LFS and the selection of data sets.

4 LFS data are available from spring 1992 onwards. This gives us a natural starting point for the analysis.

5 Approximately 13,000 new people are added to the sample each quarter and approximately the same number leave the survey. Therefore, in any one quarter, one wave will be receiving their first interview, another wave their second, and so on, with one wave receiving their fifth and final interview.

2.2 Higher Education Statistics Agency data

The Higher Education Statistics Agency (HESA) is the central source for higher education statistics for the UK. HESA collects data on students and staff in all higher education establishments on an annual basis. The relevant data sets used in this study are:

(i) The student data set, an annual census of students undertaking studies of British universities at the time of survey. Information is provided on numbers of students by institution, gender, ethnicity, subjects being taken, qualification aim and level of study, etc.

(ii) The first destination data set: a survey of students completing their courses and leaving higher education. This reports grades achieved by subject and the whereabouts of students (in terms of job, etc) in the January and February six months after they complete their studies[6].

(iii) Records the ethnicity of members of staff in higher education institution.

In order to make a comparison of ethnic minority participation and achievement over time, data sets used in this study relate to two separate points in time, namely 1996–7 and 2001–2[7].

2.3 Youth Cohort Study of England and Wales

The Youth Cohort Study (YCS) is a postal survey of approximately 18,000 school leavers, with new cohorts introduced on a bi-annual basis. The study collects data from a representative sample of young people, where individuals are initially sampled in the spring after completing their compulsory education (at this time they are aged either 16 or 17), and revisited two years later (at which time they are 18 or 19). The study records information on educational achievement, training and labour market participation. In this study the YCS data are used to report the achievement of A levels in SET-related subjects. In order to do this, the last two available data sets, which relate to Cohort 9 (2000) and Cohort 10 (2002) respectively, were merged. In this instance trends over time are not analysed.

6 Downloadable summary data sets are available at www.hesa.ac.uk/holisdocs/home.htm
7 HESA cannot accept responsibility for any inferences or conclusions derived from the data by third parties.

3. Classification of Ethnic Groups

The information collected on ethnicity in each of the three data sources – the Labour Force Survey (LFS), Higher Education Statistics Agency (HESA) and Youth Cohort Study of England and Wales (YCS) – is based on a question (in the respective survey) that asks for respondents' assessment of the ethnic group to which they belong.

The response options available to the individual are based on the 1991 census classification (applicable before spring 2001) or the 2001 census classification (subsequently) as defined by the Office for National Statistics (ONS).

For practical purposes, since the data used here straddle both the periods before and after the introduction of new definitions (spring 2001), a classification of ethnicity that reconciles both definitions is used. This is summarised in Table 1. The left-hand column shows the categories used in this study; the other columns show how the categories relate to ONS definitions. It is worth noting in particular that the 2001 definitions replace the old definitions with a two-level classification system. Level 1 is a coarse classification into five main ethnic groups. Level 2 nests within Level 1, and provides a finer classification[8]. For convenience, the White group is used as the comparison group throughout the study. Note that the group 'Other (including Mixed)' is intended as a residual group, and therefore contains an eclectic mix of ethnicity.

Table 2 shows the (estimated) ethnic breakdown of the UK working population (those either in employment or seeking work) by ethnic group. Numbers and percentages are shown based on a re-grossing of LFS data from March 2002 to August 2003 (the last available at the time of writing)[9]. The largest ethnic group is White, accounting for 93.1% of the working population. Of the minority groups, the largest ethnic minority group is Indian (1.7%). The smallest ethnic group is Bangladeshi, which is less than 0.3% of the working population. The final column of the table indicates the percentage of each group that respond as being British nationality in the LFS. It is noteworthy that while large numbers of the non-White population are not British, everybody is resident in the UK at the time of being surveyed.

8 The change in definitions in spring 2001 should be treated as structural break when interpreting the data. For example 'Black – Caribbean' (1991 definition) and 'Black or Black British' and 'Caribbean' (2001 definition) should not be treated as being identical, and the ONS warns against such comparisons.

9 The re-grossing exercise applies weights to each of the responses in the LFS so that the survey sample is extrapolated to the population of the UK.

Table 1: Classification of ethnic group using census definitions

Categories	1991 Census Definition Ethnic Origin	2001 Census Definition Level 1	 Level 2
White	White	White	—
Black – Caribbean	Black – Caribbean	Black or Black British	Caribbean
Black – African	Black – African	Black or Black British	African
Indian	Indian	Asian or Asian British	Indian
Pakistani	Pakistani	Asian or Asian British	Pakistani
Bangladeshi	Bangladeshi	Asian or Asian British	Bangladeshi
Chinese	Chinese	Chinese	—
Other (including Mixed)	Black – Other	Other	
	Black – Mixed	Mixed	—
	Other – Asian	White	Other White
	Other – Other	Black or Black British	Other Black
	Other – Mixed	Asian or Asian British	Other Asian

Source: ONS.

Table 2: UK working population by ethnic group

Ethnicity	UK Working Population	% Working Population	% British
White	28,136,200	93.1	95.1
Black – Caribbean	290,200	1.0	86.4
Black – African	232,300	0.8	42.1
Indian	518,700	1.7	81.3
Pakistani	238,600	0.8	84.3
Bangladeshi	82,600	0.3	76.2
Chinese	99,000	0.3	52.8
Other (including Mixed)	621,300	2.1	57.4
Total	**30,218,900**	**100.0**	**91.8**

Source: Pooled LFS, March 2002 to August 2003.
Note: The UK working population is calculated as both those in work or available for work. Figures presented to the nearest 100.

4. Ethnic Minorities in SET Occupations

Using the Labour Force Survey (LFS) data, and restricting the analysis only to those who were employed at the time when they were surveyed, the representation of ethnic minority groups in science, engineering and technology (SET) occupations may be examined.

SET occupations are classified by minor Standard Occupational Classification (SOC) 1990 and SOC 2000 occupational groups, and definitions are shown in Appendix 4. Using these definitions, Table 3 shows estimated numbers working in SET by ethnic group and gender, based on pooled LFS data for March 2002 to August 2003.

Of the 1.33 million people employed in SET, the vast majority are White (1.25 million) and/or male (1.12 million). Due to the small size of some of the ethnic minority populations, the number working in SET and, therefore, the number of potential role models for young people is very small. Taking the Bangladeshi group, for example, it is estimated that there are only 725 males and 177 women working in SET occupations in the UK.

It is also informative to look at the numbers working in SET as a percentage of all occupations[10]. This information is presented in Figure 1. The chart shows comparisons of SET occupations by ethnic minority group using both the old (SOC 1990) and new (SOC 2000) definitions of a SET occupation. The upper frame (SOC 1990 definitions) allows comparison of trends over time. This is not possible after spring 2001 due to the structural break in the data. Based on this evidence, it can be seen that participation in SET, in terms of occupation, increased significantly throughout the 1990s for all groups, but especially among the non-White ethnic minority populations.

In terms of cross- sectional comparisons, patterns remain fairly constant over all three time periods. The highest level of employment in SET occupations is among the Chinese population (8.9% of all those employed in 2002-3) and the Indian population (7.2%). The percentage of the White ethnic population in SET occupations is fairly constant at just over 5%. The Black African population (4.0%) and the Pakistani population (4.7%) also have participation rates lower than that of the White population, but the most notably under-represented groups in SET occupations are the Bangladeshi population (1.6%) and the Black Caribbean population (2.3%).

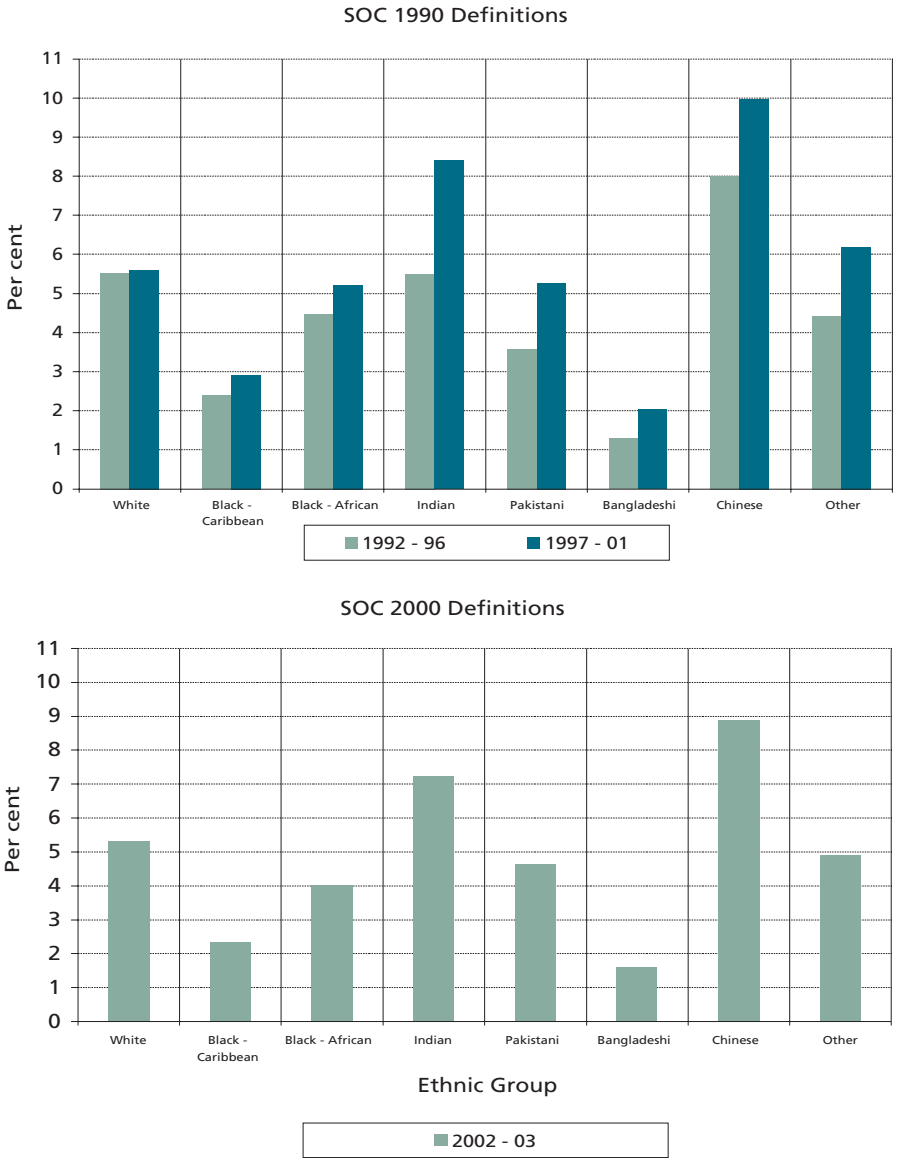
Table 3: Employment in SET in the UK by ethnic group and gender

Ethnicity	Male	Female	Total
White	1,059,900	189,000	1,248,900
Black – Caribbean	4,700	700	5,400
Black – African	5,400	1,900	7,300
Indian	22,400	7,700	30,100
Pakistani	5,700	1,600	7,300
Bangladeshi	700	200	900
Chinese	5,200	1,600	6,800
Other	18,800	4,400	23,200
Total	**1,122,800**	**207,100**	**1,329,900**

Source: Pooled LFS, March 2002 to August 2003.
Note: Figures presented to the nearest 100.

10 These percentages are calculated using weighted observations (i.e. using LFS weights) rather than raw sample numbers. This is applied throughout, as prescribed by the ONS. Sample sizes are reported where relevant. Note that standard errors on these participation rates are quite large for the smallest groups – Bangladeshi, Black African and Chinese – see Appendix 5 for details. In subsequent analyses when the numbers are further subdivided (for example by gender, age or detailed SET occupation), the figures are presented pooled for all periods.

Figure 1: Employment in SET occupations, by ethnic group



Source: LFS.

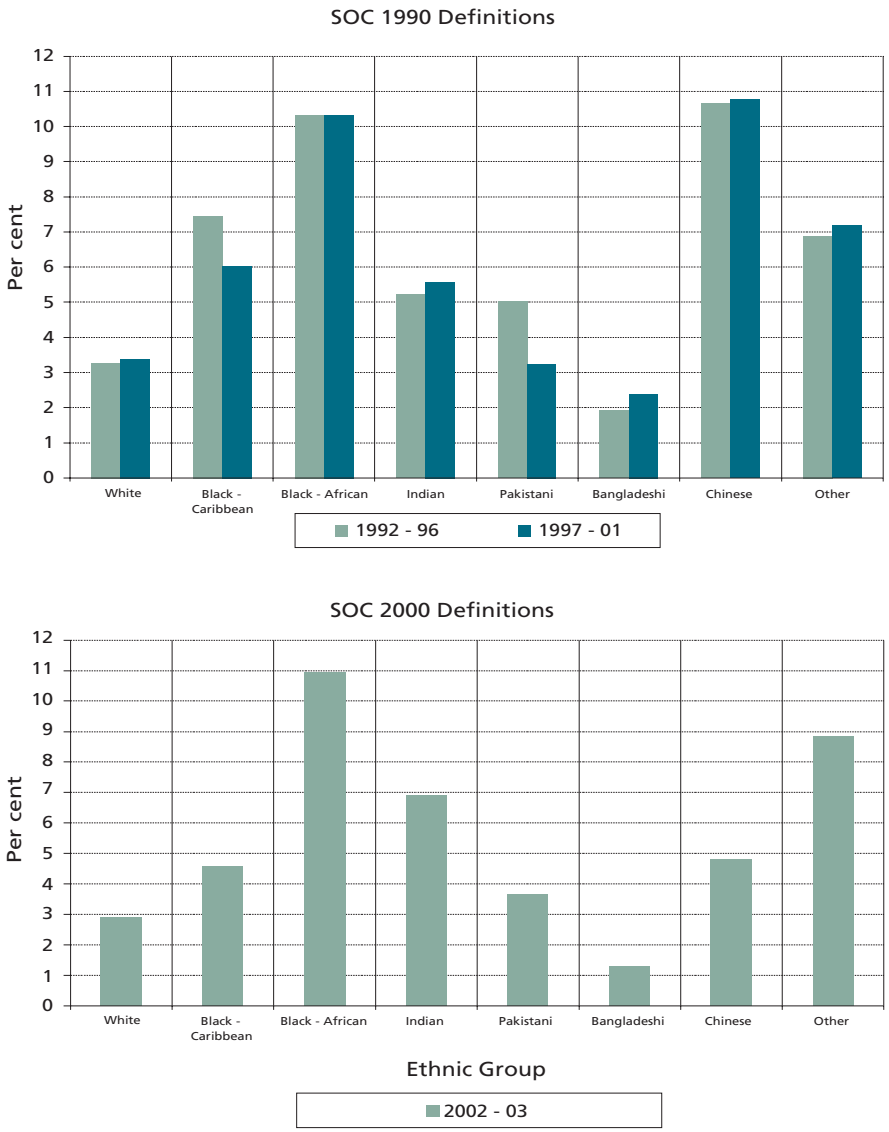
It is interesting to make a comparison at this point with numbers in health-related occupations[11] (medical practitioners, pharmacists/pharmacologists, opticians, etc.), since these may be regarded as close substitutes for a career in SET, and may be seen as particularly appealing for some ethnic groups. Figure 2 shows comparisons by ethnic minority group using both the old (SOC 1990) and new (SOC 2000) definitions of a SET occupation.

Although there are apparently no strong trends over time (upper frame), there are clear differences between ethnic groups. In this case the Black African population is particularly over-represented (10.9% of all those employed, based on 2002–3 figures), as is the Indian population (6.9%), the Chinese population (4.8%) and the Black Caribbean population (4.6%), compared with the ethnic White population. In fact only the Bangladeshi population has a smaller proportion employed in health-related occupations (2.9%) than the White population.

The analysis may now be extended to look at the effect of gender and age (by ethnic group) on the likelihood of working in a SET occupation. The results of this analysis are presented in Figure 3. The figures relate to the percentage of those employed (belonging to a particular ethnic group) who work in a SET occupation, and are based on pooled LFS data for all periods, so may be regarded as 'average' rates of employment for 1992–2003.

11 As with SET occupations, both those in professional and associate professional roles are chosen to be included. Definitions are shown in Appendix 4.

Figure 2: Employment in health-related occupations, by ethnic group



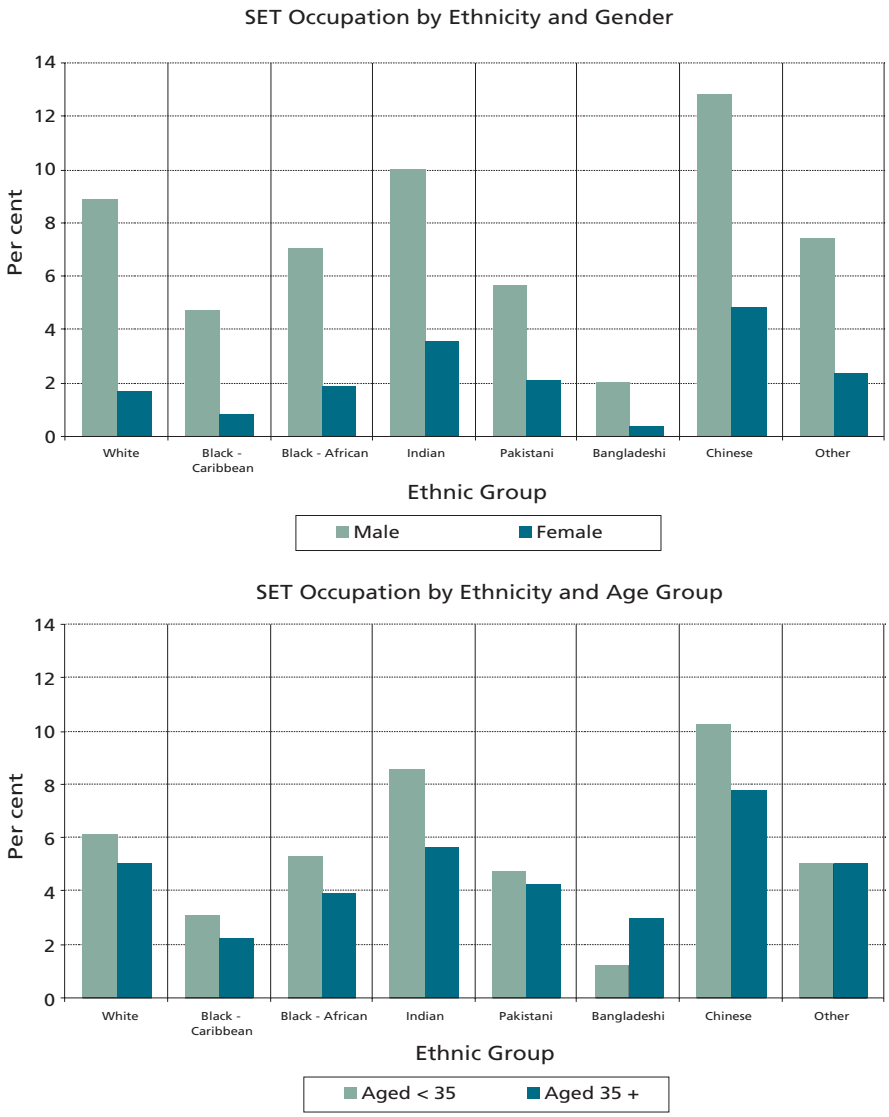
Source: LFS.

The analysis reveals two important patterns. First, with regard to gender, men are much more likely to work in SET occupations than women. For example, among the White population, 8.9% of males work in SET occupations compared to 1.8% of women. This ratio of men to women in SET occupations of approximately 5 to 1 is broadly maintained for all the ethnic groups. The highest rates of participation for women are among the Chinese population (4.9%) and the Indian population (3.6%), although Pakistani women's participation rate is relatively high compared to Pakistani men. The lowest rate of employment in SET occupations is among Bangladeshi women, at 0.4% of all those employed.

Secondly, when looking at the effect of age, for convenience two broad age categories are used: under 35 (approximately 39% of the pooled sample of those in employment), and aged 35 and over (approximately 61%). This analysis reveals that employment in SET occupations is a little higher for younger workers, although differences between the two age groups are not very large. For example, for the White population, 6.1% of those aged under 35 and employed work in a SET occupation compared to 5.1% of those aged over 35. Comparisons across ethnic groups show broadly the same pattern. The only notable exception is among the Bangladeshi population where this age pattern is reversed. However, a possible cause of this observation is sampling error (given that the Bangladeshi population is the smallest ethnic minority group).

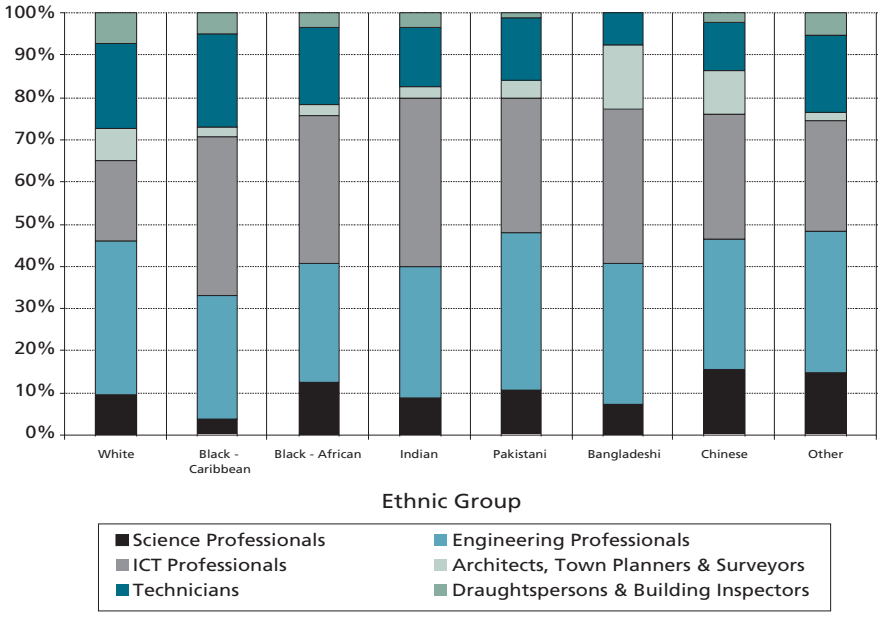
Within the working definition of SET occupations there are six different occupational groups, as defined in Appendix 4. Considering only those members of each ethnic group working in SET occupations, Figure 4 presents the breakdown of each ethnic group into different SET occupations based on pooled LFS data for 1992–2002. (Detailed figures are presented in Appendix 6.)

Figure 3: Employment in SET occupations, by (i) ethnic group and gender, and (ii) ethnic group and age group



Source: LFS.

Figure 4: Employment in SET occupations by ethnic group and detailed occupational category



Source: LFS.

The chart shows a great deal of variation in ethnic minority participation by the different SET occupational groups. Among the ethnic minority groups, of those employed in SET, higher proportions work in ICT professions compared with the White population. In contrast, a higher proportion of the White population works in engineering. It is notable that among ethnic minority groups, the Black Caribbean population is over-represented in associate professional occupations compared to professional occupations, i.e. among technicians and draughtspersons.

4.1 Nationality of Scientists

Finally, an interesting issue relating to occupations in SET is the number of non-British scientists working in the UK. This information is available in the LFS using the nationality marker. To keep the analysis simple, only whether or not those working SET in the UK are British will be considered (note, of course, 'British' spans the whole array of ethnicity, including British Black and British Asian). Table 4 presents estimates of the number of scientists in the UK who are non-British according to the LFS data, based on the most recent surveys (i.e. based on the period 2002–3). The data are presented overall for all SET occupations and also for individual SET occupations.

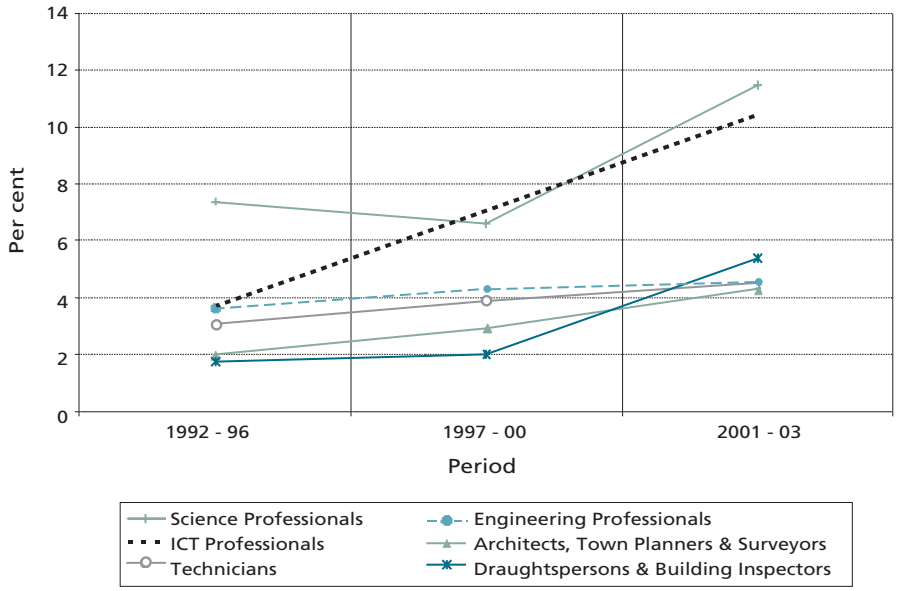
Table 4: Number of scientists in the UK who are non-British

Occupation	Estimated Employment
All British employed in SET occupations	1,239,400
All Non-British in SET occupations	90,500
Of which:	
Science Professionals	13,000
Engineering Professionals	17,200
ICT Professionals	39,400
Architects, Town Planners and Surveyors	5,200
Technicians	12,200
Draughtspersons and Building Inspectors	3,500

Source: Pooled LFS, March 2002 to August 2003.

Note: Figures presented to the nearest 100.

Figure 5: Trends in percentage of non-British scientists by detailed SET occupations



Source: LFS.

In addition to this, Figure 5 shows percentages of all those employed who are non-British nationals by detailed SET occupation. The percentages of non-British increase with time, particularly among science professionals and ICT professionals. These occupations also have the greatest percentages of non-British nationals (11.5% and 10.5% respectively).

5. SET and Ethnic Minorities in Higher Education

5.1 Degree Attainment

Training at degree level is important in entering most SET occupations. This is especially true for the professional occupations in SET. Table 5 shows the percentage of all those employed in SET occupations that hold degrees. Among science, engineering and ICT professionals, over a third hold degrees and a large proportion hold higher degrees. In science for example, 28.5% of all those employed hold degrees at master's or doctorate level. Holding a degree is less important at associate professional level.

Table 5: Employment in SET in the UK by degree-level qualification, per cent

Occupation	First Degree	Higher Degree	Either
Science Professionals	20.8	28.5	49.3
Engineering Professionals	22.4	6.5	28.9
ICT Professionals	24.1	9.4	33.5
Architects, Town Planners and Surveyors	7.7	1.0	8.6
Technicians	8.7	2.5	11.2
Draughtspersons and Building Inspectors	6.4	0.7	7.1

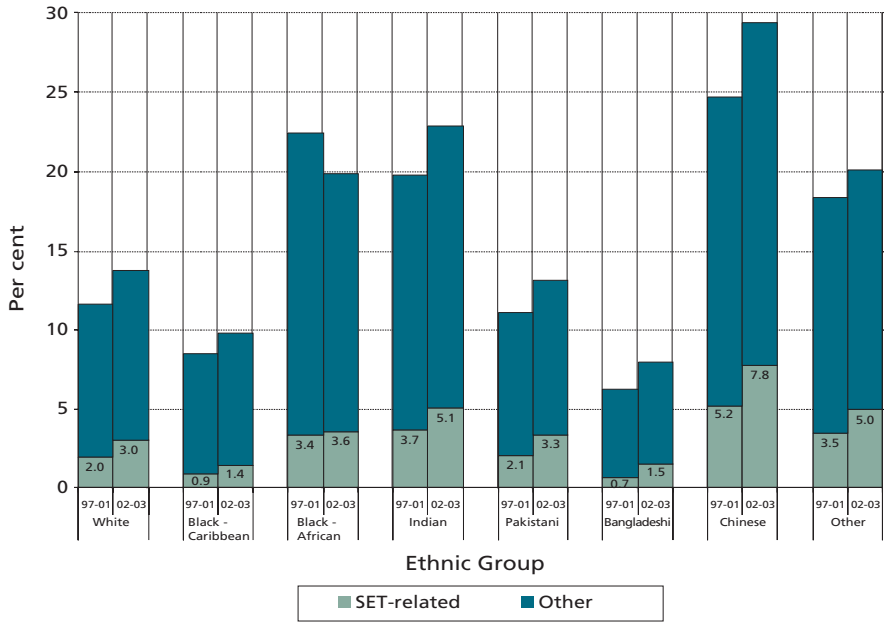
Source: Pooled LFS, March 2002 to August 2003.

Since obtaining a degree appears to be important in progressing in SET, it is interesting to consider the participation and achievement in SET at degree level among the ethnic groups. For this, the LFS data are used to analyse degree attainment in the overall ethnic population, and HESA data are used to provide more detail in terms of the make-up and achievement of (current) students.

Figure 6 shows the percentage of the population aged 21 and over who have completed either a SET-related degree or other degree, by ethnic group[12]. The information is shown both for pooled LFS data from 1996–2001 and 2002–3 (the earliest period is excluded as the subject definitions changed after 1996). Definitions used for SET-related qualifications are shown in Appendix 7.

12 In this instance first and higher degrees are combined.

Figure 6: Population aged 21+ holding degrees, by ethnic group



Source: LFS.

Figure 6 shows that a similar pattern of ethnic minority participation in SET emerges as previously. Compared to the White population, the Chinese and Indian populations have the highest proportions passing a degree in a SET-related subject. Based on figures from 2002–3, 7.8% of the Chinese population and 5.1% of the Indian population hold SET-related degrees (analysis is restricted to those aged 21 and over), compared to 3% of the White population. Again the lowest achievers are the Bangladeshi population (1.5%) and the Black Caribbean population (1.4%). These patterns are mirrored in the achievement of degree qualifications generally. Finally, a marked increase is observed with time in numbers holding SET-related degrees for all groups (excluding the Black African population). This probably reflects the expansion of the higher education sector[13].

Finally, the LFS data can also yield some information on the relationship between qualifications and occupations in SET. Table 6 shows the percentage of those who hold a SET-related degree who work in a SET occupation based on the pooled LFS data for March 2002 to August 2003. It is noticeable that the attrition from science after completing a degree varies little across ethnicity. (Note that about 66% of potential scientists, engineers and technologists have non-SET occupations.) The lack of scientists among some ethnic groups seems instead to be related to the lack of take-up for degrees generally (note the low figures for the Bangladeshi and Black Caribbean populations) combined with a slight preference for non-science subjects (compared to the White population) among some ethnic groups.

Table 6: Relationship between degree-level qualifications and SET occupation

Ethnicity	Degree	Of which: SET Degree	Of which: SET Occupation
White – British	11%	21%	31%
Black – Caribbean	7%	14%	27%
Black – African	20%	17%	29%
Indian	18%	22%	35%
Pakistani	10%	23%	33%
Bangladeshi	6%	17%	26%
Chinese	24%	26%	31%
Other	14%	19%	31%

Source: Pooled LFS, March 2002 to August 2003.
Note: %s refer to population aged 21 and over.

13 A detailed breakdown of first-degree subjects for 2001–2 graduates is shown in Appendix 8.

5.2 Student Data[14]

HESA data are from a census of all students in higher education establishments, which allows a more detailed look at the ethnicity of the students studying SET[15]. Table 7 compares ethnic make-up of the student body in 2001–2 with that of the population of young people in the UK (for convenience 18- to 25-year-olds are taken as a comparison group[16]). Students are classified by subjects taken where SET-related disciplines are paid particular attention, as is 'medicine' (which includes other medicine-related subjects), which provides a useful comparison given the relative popularity of medicine-related subjects among some ethnic groups[17]. (For the classification system of degree subjects see Appendix 7.) Table 7 shows that in fact most ethnic minority groups are over-represented in the SET student population relative to their numbers in the population. For example, Indian students make up 5.5% of the SET student population, but only 2.5% of young people, Pakistani students make up 3.3% of the SET student population, but only 2.1% of young people, etc. The only ethnic minority under-represented in science in higher education, by this measure, are Black Caribbean students. However, the proportion of Bangladeshi students in SET is just in line with the proportion in the population as a whole.

Table 7: Ethnic make-up of the student body, 2001–2

		% of Student Body			
Ethnicity	**Student Body 2001–2**	**SET**	**Medicine**	**Other**	**% of Population Aged 18–25 Years**
White	1,326,615	81.61	83.71	88.87	88.31
Black – Caribbean	17,500	0.91	1.44	1.15	1.07
Black – African	30,900	2.33	3.72	1.54	1.14
Indian	52,990	5.48	4.24	2.64	2.46
Pakistani	27,710	3.27	1.80	1.34	2.13
Bangladeshi	7,970	0.86	0.44	0.43	0.82
Chinese	13,960	1.50	0.79	0.75	0.73
Other	54,025	4.05	3.87	3.28	3.34
Total	**1,531,670**	**100.00**	**100.00**	**100.00**	**100.00**

Source: HESA student data 2001–2.
Note: UK domicile population; ethnicity 'Not known' excluded. HESA student numbers are rounded to the nearest 5.

The 1996–7 student data are now looked at in a similar way and in more detail by level of study (detailed analysis is shown in Appendix 10). Over or under-representation in SET, by ethnic group, is measured using the following ratio:

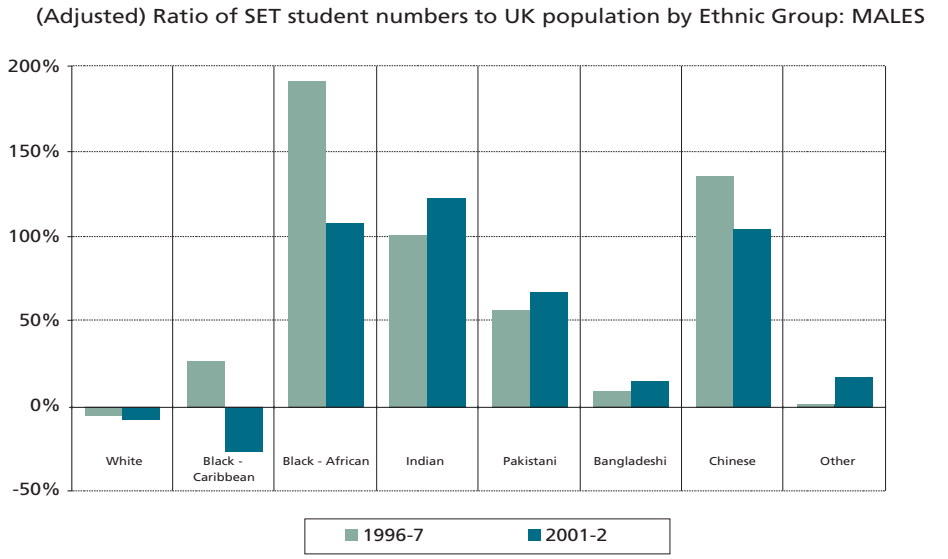
$$\frac{\text{proportion of ethnic group 'X' among all students doing SET degrees}}{\text{proportion of ethnic group 'X' among the population of 18- to 25-year-olds}}$$

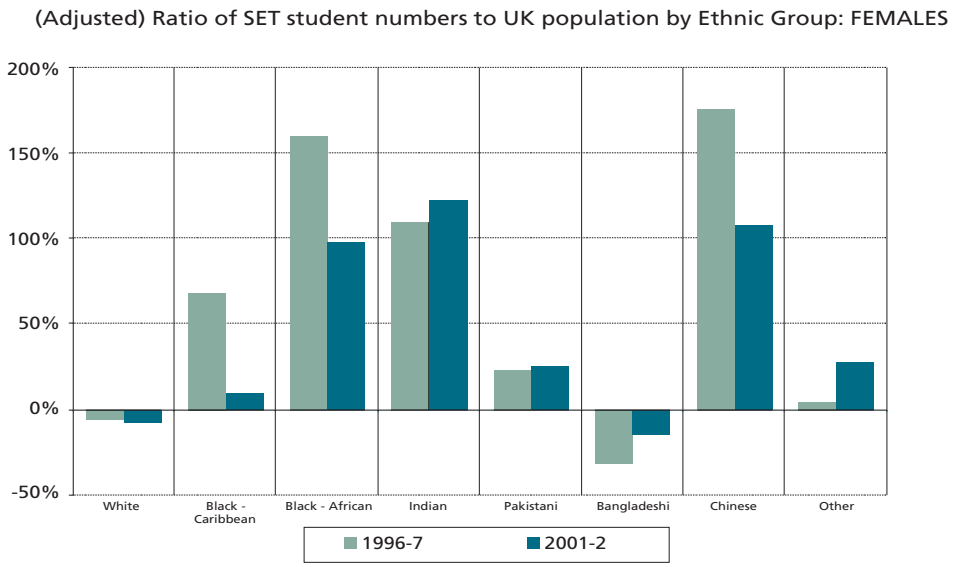
14 Analysis of the HESA data is restricted to UK domicile students in all cases.
15 Of course, there are some omissions from the data set due to non-response error. In addition, data with a missing ethnic marker are omitted in our study. Preliminary investigation suggested that such omissions were not systematic by ethnic group or institution.
16 Figures are taken from the LFS, pooled for 2002–3 or 1996–7, as appropriate. It is important to restrict the age range to 18–25 years in this case in order to capture the likely make-up of the student body. The age distribution of the population is quite different across ethnic groups. In general, the ethnic minority groups have a younger population profile that that of the White population. See Appendix 9 for a breakdown of population by ethnicity and gender.
17 The make-up of the student body by subject in 2001–2 was as follows: SET 320,967 (21% of students); Medicine 217,838 (14.2%) and Other 992,867 (64.8%).

To use a concrete example, consider the Indian students in Table 7: 5.5% of those taking SET degrees are Indian compared with 2.5% in the population as a whole. This gives a ratio of 2.23. Converted to a percentage this is an over-representation of Indian students in the SET student body of 123%. Figure 7 shows this ratio by ethnicity and gender for each period. Broadly the same picture emerges as has been discussed so far. Black African, Indian and Chinese students are over-represented in SET, whereas Black Caribbean (especially men) and Bangladeshi (especially women) students are under-represented. No particular trends with time are noted, and on the whole gender differences are minor. However, when old universities are focused on (i.e. before the 1992 legislation) the patterns of under- and over-representation are, although qualitatively similar, much more pronounced. The chart for pre-1992 universities only can be found in Appendix 11.

Figure 8 presents the results of the same analysis for postgraduate courses[18] (detailed figures are shown in Appendix 10). While the participation in SET at master's level mirrors the patterns already discussed, a different picture emerges at doctorate level. Numbers of Black Caribbean and Bangladeshi students, and also Pakistani students, studying at this level are around 50% less than would be expected based on population data. Moreover, the majority White population is over-represented in SET at doctoral level, which is not the case at all other levels of education. Of the ethnic minority groups, only the Chinese population is over-represented at doctorate level. These figures raise an important point, since a doctorate may be a prerequisite to accessing some of the top positions in SET, especially in the field of natural science.

Figure 7: Over- and under-representation in SET degrees, by ethnic group





Source: HESA student data 1996–7 and 2001–2.

18 Analysis of master's degrees is restricted to degrees not by research. Doctorates are by research only.

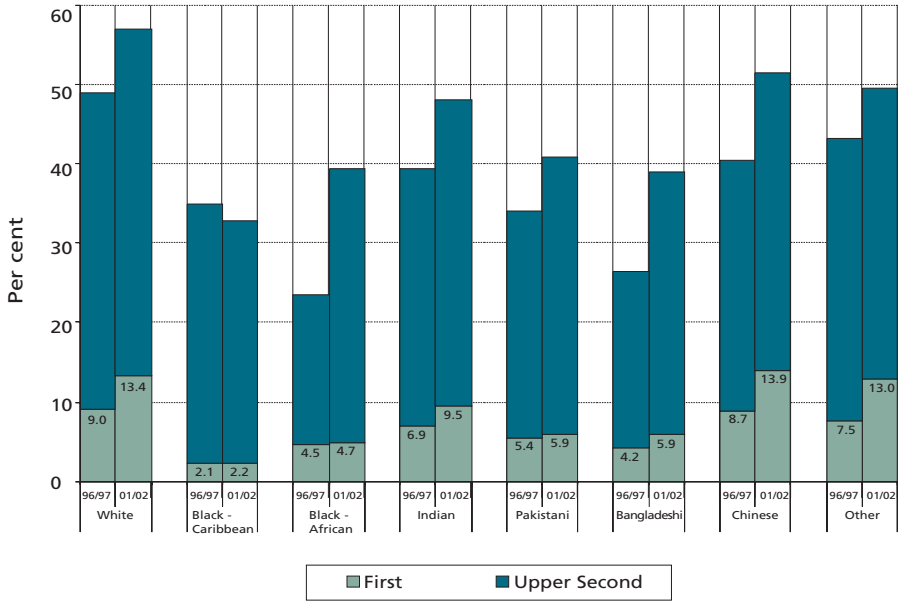
Figure 8: Over- and under-representation in SET postgraduate education, by ethnic group

Source: HESA student data 1996–7 and 2001–2

Achievement in higher education in terms of degree classification by ethnic group can be examined using the HESA first destination data. Figure 9 shows the percentage of students graduating in a SET subject who obtained either a first or upper second class degree, by ethnic group[19]. The chart shows that White students are out-performing all ethnic minority students in this respect. Based on 2001–2 figures, 57% of White students graduating in a SET subject obtained a first or upper second class degree. This is almost double the rate for Black Caribbean students, only 32% of whom achieved a first or upper second class degree, and is well above the proportion of Black African, Pakistani and Bangladeshi students. However, the picture has improved for most ethnic minority groups since 1996–7, and this is especially the case for Black African students (up from 24% to 39%) and Bangladeshi students (up from 27% to 39%). If only the proportions obtaining first class degrees in SET subjects are examined, the differences in degree classification for White versus non-White students becomes more pronounced. Based on 2001–2 figures, 13.4% of White students achieved first class degrees in SET subjects, compared to only 2.2% of Black Caribbean students, 4.7% of Black African students, 5.9% of Pakistani and Bangladeshi students and 9.5% of Indian students. Only Chinese students compare favourably (13.9%) with White students. This analysis raises some important issues in terms of systematic biases against ethnic minority groups in respect of achievement in SET. The reasons behind these differences deserve further research.

19 Tables are shown in Appendix 12, with additional detail provided for 'all subjects'.

Figure 9: Students graduating in a SET subject obtaining a first or upper second, by ethnic group



Source: HESA first destination data 1996–7 and 2001–2.

5.3 Staff Data

It is also interesting to examine the ethnic diversity of academic staff using the HESA staff data. Table 8 presents the summary academic staff data. The analysis is restricted to professors, senior lecturers and lecturers in UK universities, and information is presented by teaching area (SET, medicine or other). In this case the normalisation of the percentages in each ethnic group is done with respect to the working population without age restriction. In addition, Figure 10 summarises the under- and over-representation using the same ratio as previously defined.

There are stark differences between ethnic minority representation in SET. The White population is represented among academics in SET more or less in line with population numbers. The fact that stands out, however, is that Chinese people are *seven times* more prevalent among SET academic staff than would be expected based on the working population data. In contrast, all other ethnic minority groups are under-represented (based on 2001–2 figures). This is especially the case for the Bangladeshi, Black Caribbean and Pakistani people.

Table 8: Ethnic composition of the academic staff, 2001–2[20]

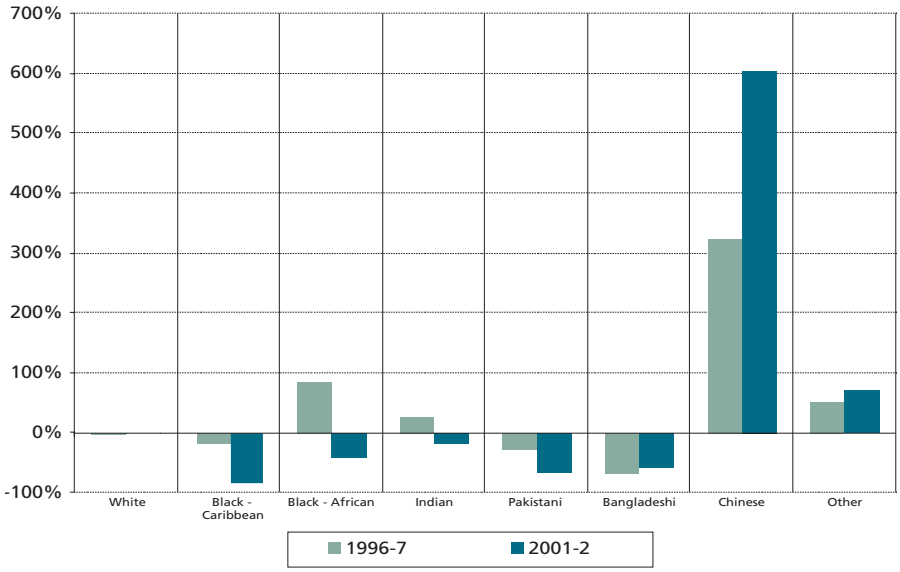
		% of Academic Staff			
Ethnicity	**Staff in all subject areas**	**SET**	**Medicine**	**Other**	**% of Working Population**
White	69,645	91.87	90.22	94.22	93.10
Black – Caribbean	300	0.16	0.83	0.35	1.00
Black – African	445	0.46	0.89	0.53	0.80
Indian	1,125	1.39	2.59	1.05	1.70
Pakistani	215	0.27	0.47	0.22	0.80
Bangladeshi	65	0.13	0.08	0.06	0.30
Chinese	940	2.12	1.31	0.65	0.30
Other	2,470	3.60	3.62	2.92	2.10
Total	75,205	100.00	100.00	100.00	100.00

Source: HESA staff data set 2001–2.
Note: Ethnicity 'Not known' excluded. HESA staff numbers are rounded to the nearest 5.

20 The detailed analysis for 1996–7 is shown in Appendix 10. Appendix 10 (ii) repeats Table 8 for 1996-7, for the sake of completeness.

This analysis can be extended to consideration of staff seniority. A broad breakdown of staff grade is available in the HESA data by researcher / lecturer / senior lecturer / professor and 'other' grades. Figure 11 presents this breakdown for SET subject academic staff in 2001–2 by ethnic group and separately by gender, since this is clearly another important factor. Note that gender breakdowns within ethnic groups were not appropriate here because sample sizes (based on staff numbers) were very small for most non-White groups.

Figure 10: Over- and under-representation of academic staff in SET by ethnic group



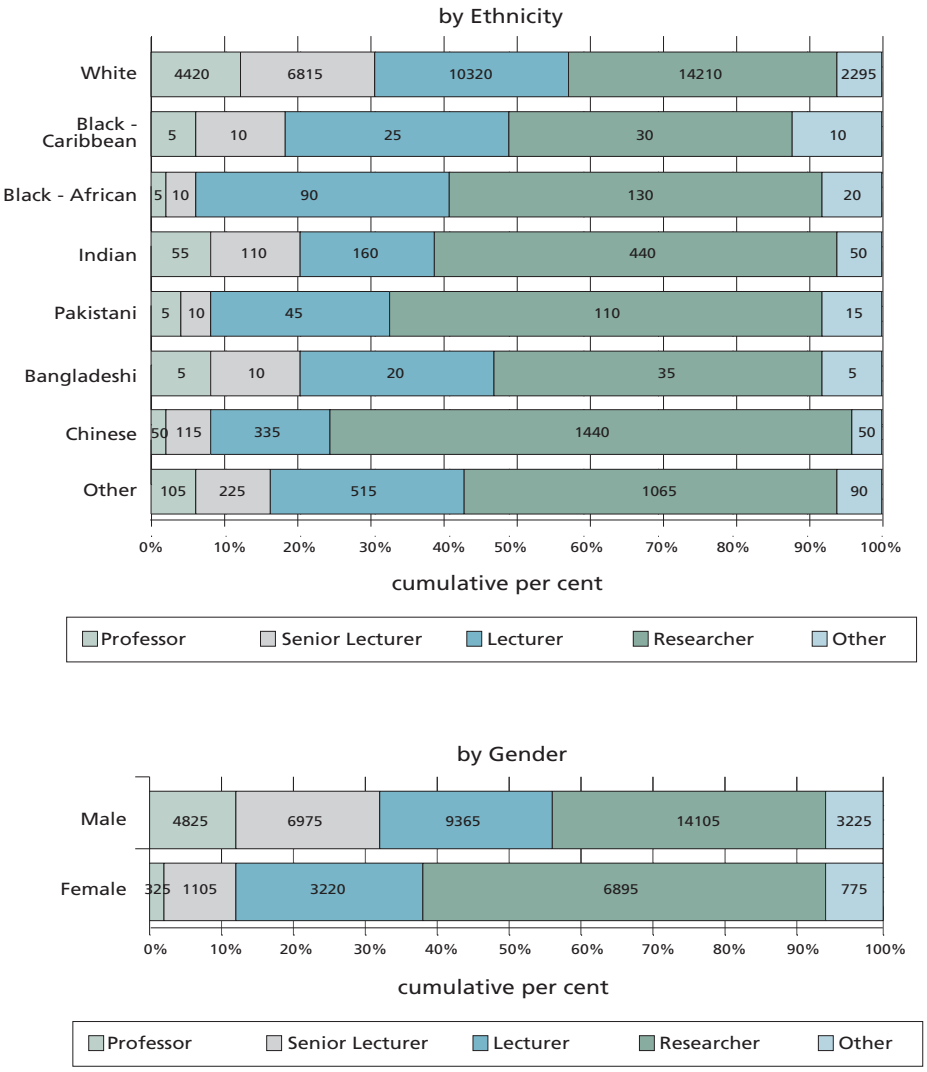
Source: HESA staff data set 1996-7 and 2001-2.

Figure 11 also shows the breakdown of staff grade in SET by percentages and actual numbers employed in higher education in the UK. Results reveal much greater proportions of professors primarily for White staff (21%) but also for Indian staff (17%). In contrast, most Black academic staff in SET remain at lecturer grade, and the same appears to be true for Bangladeshi and Pakistani staff, although sample sizes are small. In addition, it is apparent that men still very much dominate professorial positions in SET compared to women.

Note that the numbers for staff ethnicity presented in Figure 11 (and amplified slightly in Appendix 13) should be treated with some degree of caution. In 6,455 cases the ethnicity of the member of staff (as broadly defined above) was not returned and is classified as 'unknown'. This represents approximately 13% of the total staff numbers of 49,917 in the 2001–2 data. Further information is not available on those unlikely to declare ethnicity. However, if the propensity to not declare ethnicity is systematic *vis-à-vis* ethnicity, then the results may contain some systematic bias (e.g. under-reporting by some ethnic groups).

As a further note of caution in interpreting these data, the staff breakdown by grade may reflect historical rather than current patterns of career progression. For example, since in most cases it takes many years to gain a professorship, the number of professors (by ethnicity or gender) will reflect the propensity to have gained promotion in the past. Current rates of career progress may in fact be quite different, for example reflecting achievement of second- or third- rather than first-generation immigrants.

Figure 11: Staff grade in SET by ethnicity and gender



Source: HESA staff data set 2001–2.

6. Research Funding in SET

Research funding is an important area, not only for the advancement of science, but also for access to opportunities and career progression for individuals. It is therefore informative in enhancing our picture of ethnicity in SET to look at research funding by ethnic group.

This section utilises a data set on research funding provided by the Engineering and Physical Sciences Research Council (EPSRC)[21]. The EPSRC is the main UK government agency for funding research and training in engineering and the physical sciences, providing around £500 million a year for research funding in a broad range of SET subjects. The data set relates to a breakdown of the number of research grants awarded during the period 1997–2003 by broad ethnic group[22] and by area of funding (science, engineering and technology). These awards are restricted to people working or studying in UK higher education establishments.

Table 9 shows the total number of research grants awarded between 1997 and 2003 by ethnic group. Although the percentages are not in line with UK population figures (as shown in Table 2), they do in fact relate fairly closely to the ethnic composition of academic staff, shown in Table 8, and also the ethnic composition of doctoral students, shown in Appendix 10. This is not altogether surprising as these are likely to be the relevant populations seeking research funding. In general we therefore do not detect strong evidence of bias in funding opportunities.

However, two data artifacts are notable. First, the dominance of the Chinese population, relative to both their population size (they make up only 0.3% of the working population) and relative to their numbers in UK higher education (they make up 2.1% of UK academic staff based on 2001–2 Higher Education Statistics Agency (HESA) data). Their success in winning research funding in all areas, but particularly in engineering and technology, is remarkable. The second observation is regarding the bias of most ethnic minority groups away from pure science and towards engineering and technology. Based on this evidence, this bias appears to be true among the non-White population in general.

Table 9: EPSRC research funding: number of awards by ethnic group, 1997–2003

Ethnicity	Science	%	Engineering	%	Technology	%	All SET	%
White	3,080	90.6	3,510	82.9	3,265	86.2	9,850	86.3
Black and Black British	less than 5	0.1	40	0.9	15	0.4	60	0.5
Asian and Asian British	40	1.1	110	2.6	95	2.5	251	2.1
Chinese	85	2.5	300	7.1	195	5.1	601	5.1
Mixed	less than 5	0.1	5	0.1	5	0.2	15	0.1
Unknown	190	5.6	265	6.3	210	5.5	665	5.8
All	**3,395**	**100**	**4,230**	**100**	**3,785**	**100**	**11,412**	**100**

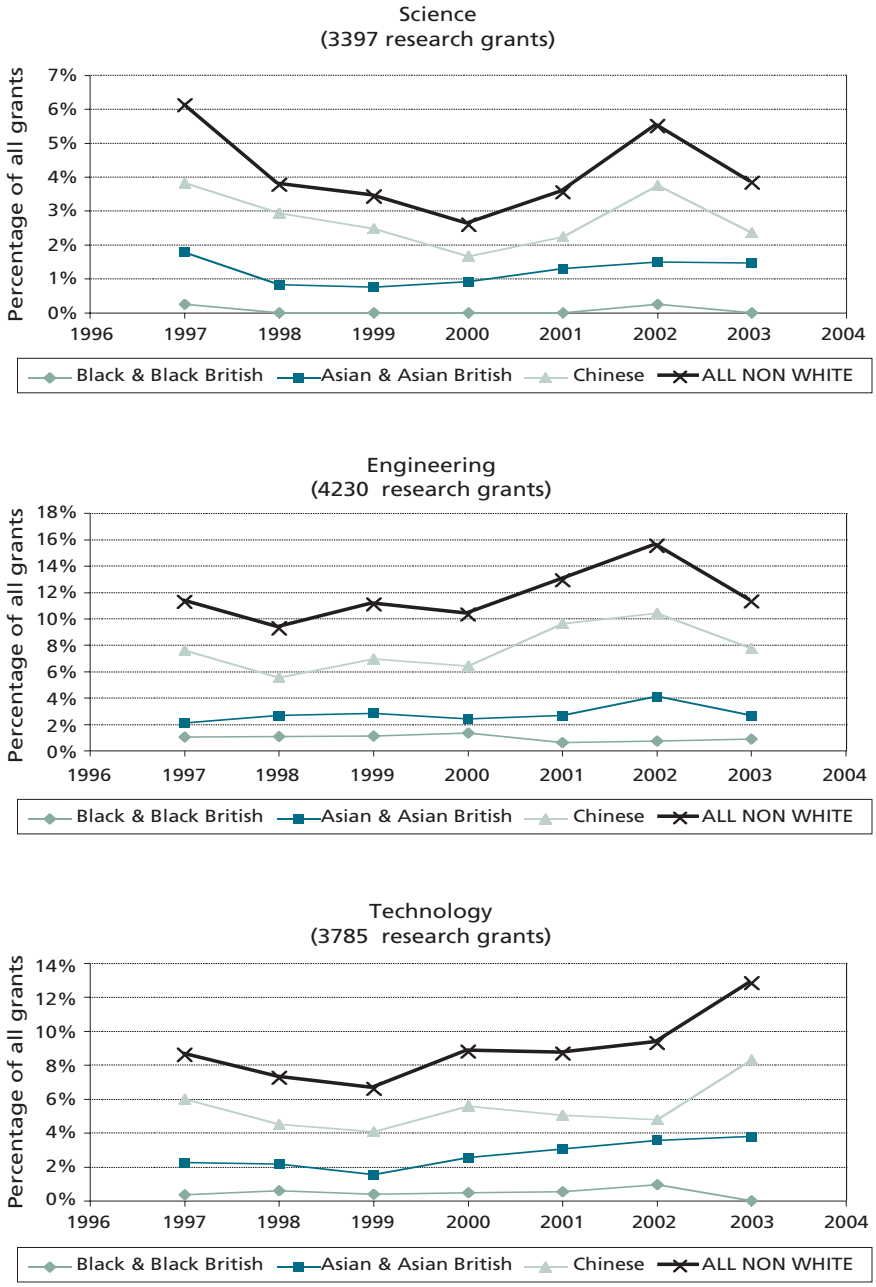
Source: EPSRC. Figures are rounded to the nearest 5.

21 We would like to thank Clare Brooks at the EPSRC for kindly providing the data.

22 The ethnic groups in the EPSRC data set are broader than those used elsewhere in this study. They are based on the first tier of the two-tier ethnic group classification system introduced by the Office for National Statistics (ONS) in 2001.

Finally, Figure 12 shows trends in funding by broad ethnic group over time. The percentage of grants awarded, by ethnic group, is tracked from 1997 to 2003. (The percentage funding to the White population is excluded from the graph for convenience, but is the residual percentage out of 100.) No strong trends are apparent from these figures. However, the possible exception is the proportion of research grants in technology. Here funding awarded to applicants from an ethnic minority background has doubled over the past four years.

Figure 12: Trends in EPSRC research funding by ethnic minority



Source: EPSRC; percentages exclude those of unknown ethnic origin.

7. Ethnic Minorities and SET at A level

Finally, the analysis of post-compulsory education is completed by examining ethnic minority representation in SET at A level.

This is done by analysing qualifications achieved at age 18/19 in the second, follow-up, survey of the Youth Cohort Study (YCS). The survey records information on the A levels each student has obtained at the time of contact[23], including the subjects taken and grades obtained. The analysis is based on pooled data for spring 2000 (Cohort 9) and spring 2002 (Cohort 10), giving a combined sample of 13,542 responses.

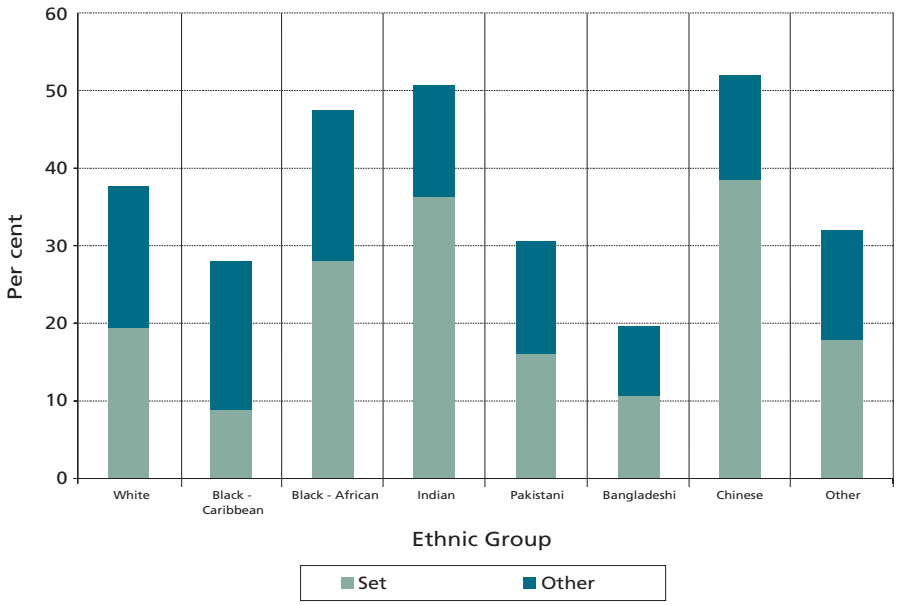
The starting point for the analysis is to consider the award of *one or more* A levels in a SET-related subject. For the purposes of this analysis, A levels are divided into SET and non-SET subjects. The subjects defined as being broadly SET based are science (including for the main part biology, physics and chemistry), mathematics (including statistics and further mathematics) and information and communication technology (ICT). Details of the definitions are shown in Appendix 7. Figure 13 shows the percentage of students awarded one or more A level and, as a subset of this, one or more A levels in a SET-related discipline.

Among the White population, 38% are awarded an A level of some kind and 19% a SET-related A level. The patterns of under- or over-representation at A level are similar to those found at degree level. Compared to White students, Black African students (28% with a SET-related A level), Indian students (37%) and Chinese students (39%) are over- represented. Note also that the vast majority of Indian and Chinese students who obtain A levels take at least one SET-related subject. In contrast, Black Caribbean students (9% with a SET-related A level) and Bangladeshi students (11%), along with Pakistani students (16%), are under-represented in terms of SET-related A levels.

Extending this analysis, the success at A level in specific SET subjects can be examined, i.e. science, mathematics and ICT. Figure 14 shows the percentage of students achieving an A level in each of these areas, by ethnic group. (Note that a student may be awarded an A level in more than one of these areas, so percentages do not reconcile exactly to Figure 13). The analysis shows similar patterns of under- or over-representation across ethnic groups as discussed above. Again Black African, Indian and Chinese students are very well represented, while Black Caribbean and Bangladeshi students are poorly represented.

23 The estimates (e.g. percentage obtaining A level) can be regarded as a lower bound estimate since they are based on pass rates at 18/19 years of age. A minority of students will complete A levels later. For example, some students may take a further year to re-sit GCSEs, etc. and so have not achieved A levels by this point. Others may achieve A levels later in life.

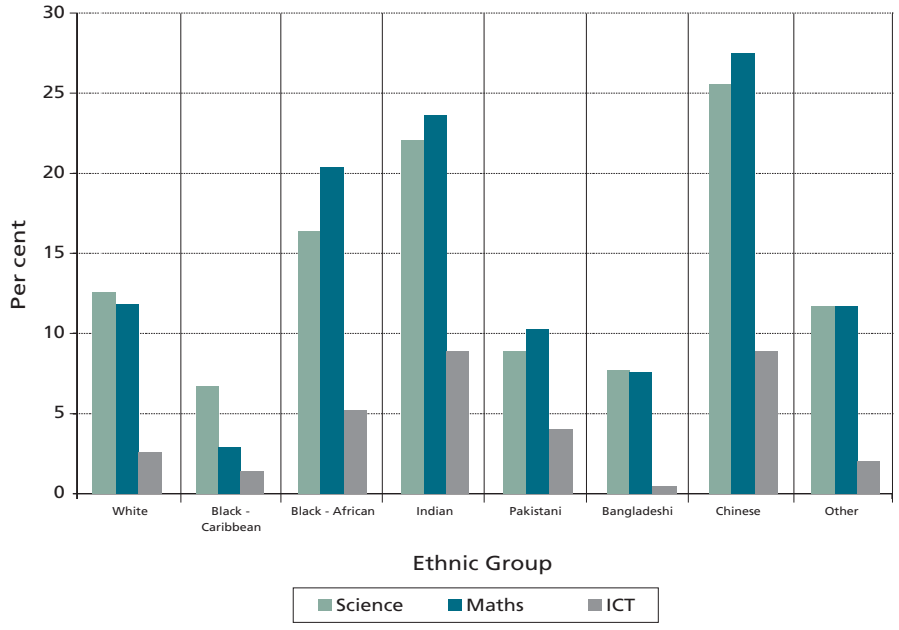
Figure 13: Young people awarded at least one A level at age 18/19 years, by subject area and ethnic group



Source: Pooled YCS, spring 2000 and spring 2002.

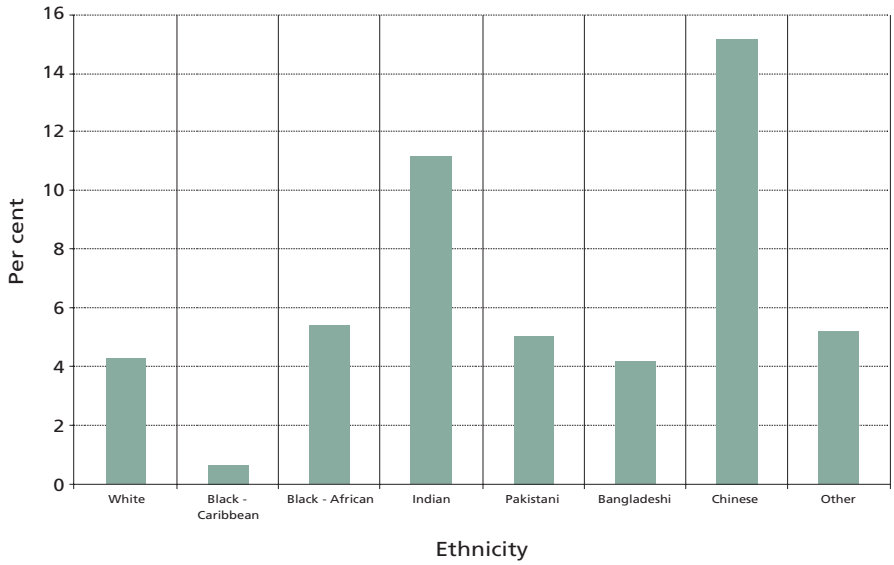
Finally, since students can take A levels in a variety of subjects, one, two, three or more SET-related A levels might be taken by an individual. For example, some students might have taken a science A level as part of a broad mix with other non-science subjects, while others may specialise, for example choosing three science-based subjects. It is therefore interesting to consider the percentage of those surveyed awarded three or more SET subject A levels. This is shown in Figure 15. The chart reveals an even more dramatic picture of over-representation in SET-related A levels among Chinese and Indian ethnic minorities. 15% of Chinese students and 11% of Indian students are awarded three or more SET-related A levels at age 18/19, based on the data, compared to just over 4% of White students. Equally dramatic is the under-representation of young Black Caribbean students in SET using this measure. Less than 1% of this group were awarded three or more SET A levels at age 18/19.

Figure 14: Young people achieving a SET A level at age 18/19 years by subject and ethnic group



Source: Pooled YCS, spring 2000 and spring 2002.

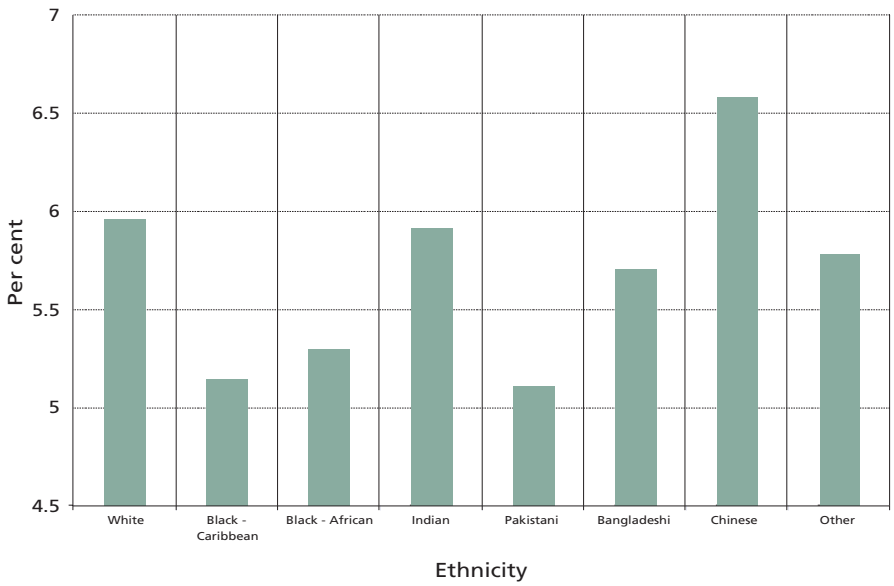
Figure 15: Young people achieving three or more SET A levels at age 18/19 years by ethnic group



Source: Pooled YCS, spring 2000 and spring 2002.

To complete the analysis, A level grades awarded in SET-related subjects can be examined. This can be done by taking the mean grade score achieved in SET-related A levels, using the following scoring system: grade A = 10 pts, B = 8 pts, C = 6 pts, etc. The mean grades are calculated based on all SET-related subjects since sample numbers in individual subject areas are quite small. The results are shown in Figure 16. Interestingly, as well as taking more SET-related A levels (previous figures), Chinese students also score higher mean grades. In contrast, Black Caribbean students again achieve relatively poorly. However, it is interesting that White students score quite highly (mean = 6.0) and so do Bangladeshi students (mean = 5.7), even though for these groups the proportions taking SET-related A levels is relatively low[24].

Figure 16: Mean grade score for all SET A levels by ethnic group



Source: Pooled YCS, spring 2000 and spring 2002.

24 Comparative figures for non-SET A levels are shown in Appendix 14.

8. Conclusions

This report has examined the participation and success of ethnic minority groups in science, engineering and technology (SET) in terms of occupations and participation in SET in post compulsory and higher education. It concludes that ethnic minority groups are not necessarily disadvantaged compared to the White population but advises that the picture is complicated.

Various aspects of participation have been analysed using a variety of data sources, and a consistent pattern has emerged. The Chinese and Indian populations are the highest participators in SET. These groups are much more likely than other ethnic groups, including Whites, to take three SET-based A levels; they are over-represented relative to their population size at all levels of higher education, through to academic staff grades; and they are more likely to have a SET occupation than other ethnic groups.

At the other end of the spectrum, Black Caribbean and Bangladeshi populations have low participation rates. These groups are under-represented in SET at degree and A level and under-achieve in terms of grades awarded. They are also less likely to work in a SET occupation. This finding, reiterated throughout this study, gives direction for future research both in terms of discovering why these groups might choose not to enter SET, and in formulating future policy in helping these groups to bridge barriers to access.

The report concludes that ethnic minority groups are not necessarily disadvantaged, compared to the White population, in terms of access to and participation in SET. The picture is more complicated than this, and the White population is itself under-represented compared with its population size in the UK in some respects, including, notably, numbers of White students in SET at undergraduate level. However, areas of White (and often White male) domination remain and should be highlighted. This seems to be particularly the case with regards to high achievement in academic SET[25]. White students have, on the whole, better A level grades than other ethnic groups; are much more likely to achieve a first or upper second degree in SET; are more prevalent in SET in pre-1992 rather than new universities; are more prevalent in SET at doctorate level; and (among academic staff) are much more likely to become professors than ethnic minority groups.

25 These patterns do not show up particularly in the occupational data.

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10. Appendices

Appendix 1:

Attainment of Five or more GCSE Grades A*–C by Ethnic Group, based on YCS Cohorts 4–10

Year	**1989**	**1991**	**1992**	**1994**	**1996**	**1998**	**2000**
Sample	14,116	14,511	24,922	18,020	15,899	14,662	13,698
For 16-year-olds, % of group defined at each row	%	%	%	%	%	%	%
Ethnic origin							
White	30	35	37	43	45	47	50
Black	18	19	23	21	23	29	39
Indian	n/a	n/a	38	45	48	54	60
Bangladeshi	n/a	n/a	14	20	25	33	29
Pakistani	n/a	n/a	26	24	23	29	29

Source: Harrison et al. (2003).

Appendix 2:

Achievement at Key Stages 1–3[26]

Table 17: Achievements at Key Stage 1 Level 2 and above in 2002, by ethnicity and gender

Reading						
Key Stage 1	**Eligible Pupils**			**% Achieving**		
	Boys	**Girls**	**Total**	**Boys**	**Girls**	**Total**
White	242,941	230,893	**473,834**	81	89	**85**
Black Caribbean	4,291	4,093	**8,384**	75	85	**80**
Black African	5,111	4,997	**10,108**	75	82	**79**
Black Other	2,791	2,651	**5,442**	77	86	**82**
Indian	6,517	6,217	**12,734**	86	90	**88**
Pakistani	8,522	7,889	**16,411**	72	79	**75**
Bangladeshi	3,358	3,339	**6,697**	70	76	**73**
Chinese	922	892	**1,814**	87	92	**89**
Other	7,694	7,317	**15,011**	77	83	**80**
Unclassified[1]	15,183	14,364	**29,547**	78	86	**82**
All pupils	**297,330**	**282,652**	**579,982**	**80**	**88**	**84**

Writing						
Key Stage 1	**Eligible Pupils**			**% Achieving**		
	Boys	**Girls**	**Total**	**Boys**	**Girls**	**Total**
White	242,941	230,896	473,837	83	91	87
Black Caribbean	4,291	4,093	8,384	75	86	80
Black African	5,111	4,997	10,108	76	84	80
Black Other	2,791	2,651	5,442	77	88	82
Indian	6,517	6,217	12,734	87	93	90
Pakistani	8,522	7,889	16,411	74	83	78
Bangladeshi	3,358	3,339	6,697	73	81	77
Chinese	922	892	1,814	88	94	91
Other	7,694	7,317	15,011	79	87	83
Unclassified[1]	15,183	14,364	29,547	80	88	84
All pupils	**297,330**	**282,655**	**579,985**	**82**	**90**	**86**

[1] Includes information refused or not obtained and pupils categorised using the new ethnic group classifications.

Source: Extracts from national curriculum assessment, first statistical release DfES/ONS (February 2004)

26 Key Stage 1= School years 1-2; Key Stage 2 = school years 3-6; Key Stage 3 = school years 7- 9

Spelling						
Key Stage 1	**Eligible Pupils**			**% Achieving**		
	Boys	**Girls**	**Total**	**Boys**	**Girls**	**Total**
White	242,941	230,896	**473,837**	74	83	**78**
Black Caribbean	4,291	4,093	**8,384**	65	76	**70**
Black African	5,111	4,996	**10,107**	68	75	**72**
Black Other	2,790	2,651	**5,441**	68	79	**73**
Indian	6,517	6,217	**12,734**	80	87	**84**
Pakistani	8,522	7,889	**16,411**	68	76	**72**
Bangladeshi	3,358	3,339	**6,697**	66	73	**69**
Chinese	922	892	**1,814**	80	88	**84**
Other	7,694	7,317	**15,011**	70	78	**74**
Unclassified[1]	15,183	14,364	**29,547**	71	80	**75**
All pupils	**297,329**	**282,654**	**579,983**	**73**	**83**	**78**

Mathematics						
Key Stage 1	**Eligible Pupils**			**% Achieving**		
	Boys	**Girls**	**Total**	**Boys**	**Girls**	**Total**
White	242,941	230,896	**473,837**	90	92	**91**
Black Caribbean	4,291	4,092	**8,383**	83	88	**85**
Black African	5,111	4,997	**10,108**	82	86	**84**
Black Other	2,791	2,651	**5,442**	86	88	**87**
Indian	6,517	6,217	**12,734**	91	93	**92**
Pakistani	8,522	7,889	**16,411**	80	83	**82**
Bangladeshi	3,358	3,339	**6,697**	81	83	**82**
Chinese	922	892	**1,814**	94	97	**96**
Other	7,694	7,317	**15,011**	87	89	**88**
Unclassified[1]	15,183	14,364	**29,547**	87	90	**88**
All pupils	**297,330**	**282,654**	**579,984**	**89**	**91**	**90**

[1] Includes information refused or not obtained and pupils categorised using the new ethnic group classifications.

Source: Extracts from national curriculum assessment, first statistical release DfES/ONS (February 2004)

Table 18: Achievements at Key Stage 2 Level 4 and above in 2002, by ethnicity and gender

English						
Key Stage 2	**Eligible Pupils**			**% Achieving**		
	Boys	**Girls**	**Total**	**Boys**	**Girls**	**Total**
White	261,833	251,079	**513,478**	70	79	**75**
Black Caribbean	4,562	4,615	**9,184**	58	73	**66**
Black African	4,287	4,121	**8,418**	62	72	**67**
Black Other	2,606	2,529	**5,141**	62	75	**69**
Indian	6,635	6,713	**13,354**	74	82	**78**
Pakistani	7,764	7,257	**15,031**	55	64	**59**
Bangladeshi	2,869	2,807	**5,684**	60	70	**65**
Chinese	920	906	**1,828**	78	87	**83**
Other	7,196	6,934	**14,147**	66	76	**71**
Unclassified[1]	16,278	15,388	**32,085**	69	78	**73**
All pupils	**314,950**	**302,349**	**618,350**	**70**	**79**	**74**

Mathematics						
Key Stage 2	**Eligible Pupils**			**% Achieving**		
	Boys	**Girls**	**Total**	**Boys**	**Girls**	**Total**
White	261,712	250,933	**513,208**	73	74	**73**
Black Caribbean	4,565	4,613	**9,185**	59	63	**61**
Black African	4,288	4,121	**8,419**	64	66	**65**
Black Other	2,604	2,529	**5,139**	64	67	**65**
Indian	6,637	6,713	**13,356**	79	79	**79**
Pakistani	7,764	7,256	**15,030**	61	58	**59**
Bangladeshi	2,859	2,799	**5,665**	63	63	**63**
Chinese	920	907	**1,829**	89	90	**90**
Other	7,200	6,933	**14,150**	71	73	**72**
Unclassified[1]	16,281	15,388	**32,081**	71	72	**71**
All pupils	**314,830**	**302,192**	**618,062**	**73**	**73**	**73**

[1] Includes information refused or not obtained and pupils categorised using the new ethnic group classifications.

Source: Extracts from national curriculum assessment, first statistical release DfES/ONS (February 2004)

Science						
Key Stage 2	**Eligible Pupils**			**% Achieving**		
	Boys	**Girls**	**Total**	**Boys**	**Girls**	**Total**
White	261,887	251,130	**513,581**	87	87	**87**
Black Caribbean	4,565	4,615	**9,187**	78	82	**80**
Black African	4,287	4,120	**8,417**	76	78	**77**
Black Other	2,607	2,529	**5,142**	82	84	**83**
Indian	6,639	6,713	**13,358**	87	88	**88**
Pakistani	7,765	7,257	**15,032**	71	72	**72**
Bangladeshi	2,869	2,807	**5,684**	76	77	**77**
Chinese	920	907	**1,829**	91	94	**92**
Other	7,198	6,935	**14,150**	83	84	**83**
Unclassified[1]	16,283	15,391	**32,090**	85	85	**84**
All pupils	**315,020**	**302,404**	**618,470**	**86**	**86**	**86**

Table 19: Achievements at Key Stage 3 Level 5 and above in 2002, by ethnicity and gender

English						
Key Stage 3	**Eligible Pupils**			**% Achieving**		
	Boys	**Girls**	**Total**	**Boys**	**Girls**	**Total**
White	252,130	245,203	**497,333**	59	76	**68**
Black Caribbean	4,127	3,914	**8,041**	41	64	**52**
Black African	3,555	3,456	**7,011**	49	66	**57**
Black Other	2,554	2,462	**5,016**	48	69	**58**
Indian	7,121	6,821	**13,942**	70	83	**77**
Pakistani	7,158	6,546	**13,704**	47	64	**55**
Bangladeshi	2,481	2,664	**5,145**	47	67	**58**
Chinese	1,022	941	**1,963**	73	86	**80**
Other	6,061	5,646	**11,707**	54	72	**63**
Unclassified[1]	18,040	16,666	**34,706**	57	73	**64**
All pupils	**304,249**	**294,319**	**598,568**	**59**	**75**	**67**

[1] Includes information refused or not obtained and pupils categorised using the new ethnic group classifications.

Source: Extracts from national curriculum assessment, first statistical release DfES/ONS (February 2004)

Mathematics						
Key Stage 3	Eligible Pupils			% Achieving		
	Boys	Girls	Total	Boys	Girls	Total
White	253,081	245,533	**498,614**	68	69	**68**
Black Caribbean	4,126	3,914	**8,040**	45	50	**48**
Black African	3,538	3,465	**7,003**	50	53	**51**
Black Other	2,559	2,465	**5,024**	52	55	**54**
Indian	7,125	6,824	**13,949**	74	74	**74**
Pakistani	7,175	6,538	**13,713**	50	49	**50**
Bangladeshi	2,487	2,654	**5,141**	53	51	**52**
Chinese	1,020	942	**1,962**	87	88	**87**
Other	6,072	5,658	**11,730**	62	64	**63**
Unclassified[1]	18,363	16,859	**35,222**	64	65	**65**
All pupils	**305,546**	**294,852**	**600,398**	**67**	**68**	**67**

Science						
Key Stage 3	Eligible Pupils			% Achieving		
	Boys	Girls	Total	Boys	Girls	Total
White	253,396	245,735	**499,131**	69	68	**68**
Black Caribbean	4,134	3,926	**8,060**	43	51	**47**
Black African	3,572	3,467	**7,039**	47	52	**49**
Black Other	2,565	2,472	**5,037**	48	56	**52**
Indian	7,137	6,828	**13,965**	69	70	**70**
Pakistani	7,192	6,557	**13,749**	43	44	**43**
Bangladeshi	2,493	2,668	**5,161**	45	44	**44**
Chinese	1,021	944	**1,965**	79	81	**80**
Other	6,087	5,675	**11,762**	59	62	**60**
Unclassified[1]	18,370	16,870	**35,240**	64	65	**64**
All pupils	**305,967**	**295,142**	**601,109**	**67**	**67**	**67**

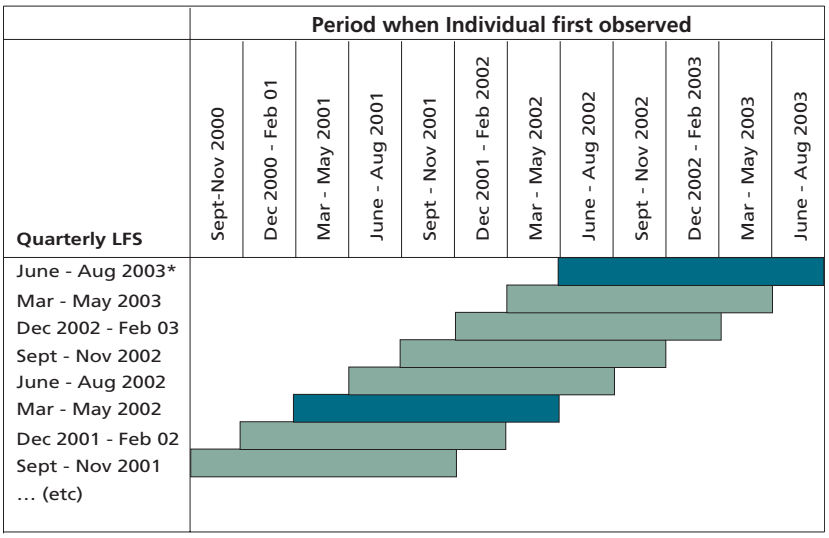
[1] Includes information refused or not obtained and pupils categorised using the new ethnic group classifications.

Source: Extracts from national curriculum assessment, first statistical release DfES/ONS (February 2004)

Appendix 3: Wave Structure of LFS

The wave structure presents an important issue in pooling Labour Force Survey (LFS) quarterly data sets. Since the same individual will appear in five consecutive surveys (i.e. subsequent to an initial interview, each household is tracked for four quarters), care must be taken not to double-count individuals. To avoid this 'overlap' issue, every fifth quarterly LFS survey is used. This is illustrated below.

Illustrating the Wave Structure of the Labour Force Survey



*This is the latest dataset available at time of writing

Appendix 4: Classification of SET- and Health-Related Occupations

Science Engineering and Technology

SOC 1990 Minor Groups	SOC 2000 Minor Groups
20 Natural Scientists	**211 Science Professionals**
200 Chemists	2111 Chemists
201 Biological scientists and biochemists	2112 Biological scientists and biochemists
202 Physicists, geologists and meteorologists	2113 Physicists, geologists and meteorologists
209 Other natural scientists n.e.s[27].	
21 Engineers and Technologists	**212 Engineering Professionals**
210 Civil, structural, municipal, mining and quarry engineers	2121 Civil engineers
211 Mechanical engineers	2122 Mechanical engineers
212 Electrical engineers	2123 Electrical engineers
213 Electronic engineers	2124 Electronics engineers
214 Software engineers	2125 Chemical engineers
215 Chemical engineers	2126 Design and development engineers
216 Design and development engineers	2127 Production and process engineers
217 Process and production engineers	2128 Planning and quality control engineers
218 Planning and quality control engineers	2129 Engineering professionals n.e.c.[28]
219 Other engineers and technologists n.e.s.	
32 Computer Analysts/Programmers	**213 Information And Communication Technology Professionals**
320 Computer analysts/programmers	2131 IT strategy and planning professionals
	2132 Software professionals
26 Architects, Town Planners and Surveyors	**243 Architects, Town Planners, Surveyors**
260 Architects	2431 Architects
261 Town Planners	2432 Town planners
262 Building, land, mining and general practice surveyors	2433 Quantity surveyors
	2434 Chartered surveyors (not quantity surveyors)
30 Scientific Technicians	**311 Science and Engineering Technicians**
300 Laboratory technicians	3111 Laboratory technicians
301 Engineering technicians	3112 Electrical/electronics technicians
302 Electrical/electronic technicians	3113 Engineering technicians
303 Architectural and town planning technicians	3114 Building and civil engineering technicians
304 Building and civil engineering technicians	3115 Quality assurance technicians
309 Other scientific technicians n.e.s.	3119 Science and engineering technicians n.e.c.
31 Draughtspersons, Quantity and Other Surveyors	**312 Draughtspersons and Building Inspectors**
310 Draughtspersons	3121 Architectural technologists and town planning technicians
311 Building inspectors	3122 Draughtspersons
312 Quantity surveyors	3123 Building inspectors
313 Marine, insurance and other surveyors	

27 n.e.s. : not elsewhere specified
28 n.e.c. : not elsewhere classified

Health Related

SOC 1990 Minor Groups	SOC 2000 Minor Groups
22 Health Professionals	**221 Health Professionals**
220 Medical practitioners	2211 Medical practitioners
221 Pharmacists/pharmacologists	2212 Psychologists
222 Ophthalmic opticians	2213 Pharmacists/pharmacologists
223 Dental practitioners	2214 Ophthalmic opticians
224 Veterinarians	2215 Dental practitioners
	2216 Veterinarians
34 Health Associate Professionals	**321 Health Associate Professionals**
340 Nurses	3211 Nurses
341 Midwives	3212 Midwives
342 Medical radiographers	3213 Paramedics
343 Physiotherapists	3214 Medical radiographers
344 Chiropodists	3215 Chiropodists
345 Dispensing opticians	3216 Dispensing opticians
346 Medical technicians, dental auxiliaries	3217 Pharmaceutical dispensers
347 Occupational and speech therapists, psychotherapists, therapists n.e.s	3218 Medical and dental technicians
348 Environmental health officers	
349 Other health associate professionals n.e.s	

Source: Data Archive.

Note: New definitions (based on SOC 2000) apply from spring 2001 onwards.

Appendix 5: Ethnic Minorities in SET Occupations

	% SET Occupation			LFS Sample (Employees)		
Ethnicity	**1992–6**	**1997–2001**	**2002–3**	**1992–6**	**1997–2001**	**2002–3**
White	5.52	5.59	5.32	216,640	214,313	100,445
Black – Caribbean	2.39	2.91	2.34	1,785	1,753	887
Black – African	4.47	5.21	4.01	694	1,032	678
Indian	5.5	8.4	7.24	3,054	3,124	1,647
Pakistani	3.57	5.26	4.65	760	1,024	609
Bangladeshi	1.28	2.03	1.61	230	344	208
Chinese	8	9.97	8.88	450	504	289
Other	4.42	6.18	4.9	7,212	2,283	1,782

Standard Error for % SET Occupation by Ethnic Minority

Ethnicity	**1992–96**	**1997–2001**	**2002–3**
White	0.07%	0.07%	0.11%
Black – Caribbean	0.54%	0.60%	0.76%
Black – African	1.18%	1.04%	1.13%
Indian	0.62%	0.74%	0.96%
Pakistani	1.01%	1.05%	1.28%
Bangladeshi	1.11%	1.14%	1.31%
Chinese	1.92%	2.00%	2.51%
Other	0.36%	0.76%	0.77%

Source: LFS.
Note: A design effect on sampling of 1.5 is used for ethnicity data in line with ONS guidance.

Appendix 6: Detailed Breakdown by SET Occupation

ETHNICITY	Science Professionals		Engineering Professionals		ICT Professionals		Architects, Town Planners and Surveyors		Technicians		Draughts-persons and Building Inspectors		Total
	% of All *	% of SET	% of All *	% of SET	% of All *	% of SET	% of All *	% of SET	% of All *	% of SET	% of All *	% of SET	**% of All**
White	0.53	9.6	2.02	36.7	1.05	19.1	0.41	7.4	1.1	20.0	0.4	7.3	**5.51**
Black – Caribbean	0.11	4.2	0.76	29.2	0.97	37.3	0.06	2.3	0.58	22.3	0.12	4.6	**2.60**
Black – African	0.59	12.7	1.31	28.2	1.62	34.8	0.13	2.8	0.84	18.1	0.16	3.4	**4.65**
Indian	0.65	9.2	2.2	31.0	2.83	39.9	0.19	2.7	1.01	14.2	0.22	3.1	**7.10**
Pakistani	0.5	10.8	1.72	37.3	1.47	31.9	0.19	4.1	0.69	15.0	0.04	0.9	**4.61**
Bangladeshi	0.13	7.6	0.57	33.3	0.62	36.3	0.26	15.2	0.13	7.6	0	0.0	**1.71**
Chinese	1.43	15.8	2.77	30.6	2.68	29.6	0.92	10.2	1.05	11.6	0.19	2.1	**9.04**
Other	0.75	8.3	1.69	18.7	1.33	14.7	0.09	1.0	0.91	10.1	0.27	3.0	**5.04**

Source: LFS.

*Note: *This refers to % of all those employed (by ethnic group).*

Appendix 7: Classification of SET-related Degree and A Level Qualifications

In the Labour Force Survey (1996 to date) the following degree subjects are classed as being SET related:

3 Biological Sciences
5 Physical/Environmental Sciences
6 Mathematical Sciences and Computing
7 Engineering
8 Technology

In the Higher Education Statistics Agency (HESA) data, the following degree subjects are classed as being SET related or medicine related:

Science, Engineering and Technology (SET)

Aeronautical Engineering
Archaeology as a Physical Science
Astronomy
Balanced Combination within Physical Science
Balanced Combination within Biological Science
Balanced Combination within Engineering
Balanced Combination within Mathematical Science
Biochemistry
Biology
Biotechnology
Botany
Ceramics and Glasses
Chemical Engineering
Chemistry
Civil Engineering
Computing Science
Electrical Engineering
Electronic Engineering
Environmental Science and Other Physical Science
General Engineering
Genetics
Geography Studies as a Science
Geology
Maritime Technology
Materials Science
Mathematics
Mechanical Engineering
Metallurgy
Microbiology
Minerals Technology
Molecular Biology and Biophysics
Oceanography
Other Biological Sciences
Other Engineering
Other Mathematical Sciences
Other Technologies
Others Materials Technology
Physics
Polymers and Textiles
Production Engineering
Psychology (not solely as Social Science)
Statistics
Zoology

Medicine

Anatomy and Physiology
Audiology
Balanced Combination within Medicine
Balanced Combination within Subjects Allied to Medicine
Clinical Dentistry
Clinical Medicine
Medical Technology
Nursing
Nutrition
Ophthalmics
Other Medical Subjects
Pharmacology
Pharmacy
Pre-clinical Dentistry
Pre-clinical Medicine

In the Youth Cohort Study (YCS) data the following A level subjects are classed as being SET related:

Science A Levels (based on YCS coding)

101 Biology
103 Biology: Human
105 Biology: Social
106 Biology: Human and Social
111 Chemistry
121 Physics
131 Science: Single Award
133 Science: Dual Award (1st Grade)
135 Science: Dual Award (2nd Grade)
137 Science: Double Award (1st Grade)
139 Science: Double Award (2nd Grade)
141 Science: Biology and Chemistry
145 Science: Biology and Physics
147 Science: Chemistry and Physics
163 Aeronautics
165 Science: Agriculture
167 Science: Applied
169 Science: Astonomy
171 Botany
173 Science: Electronics
175 Science: Environmental
177 Science: Geology
179 Science: Horticulture
181 Science: Physical

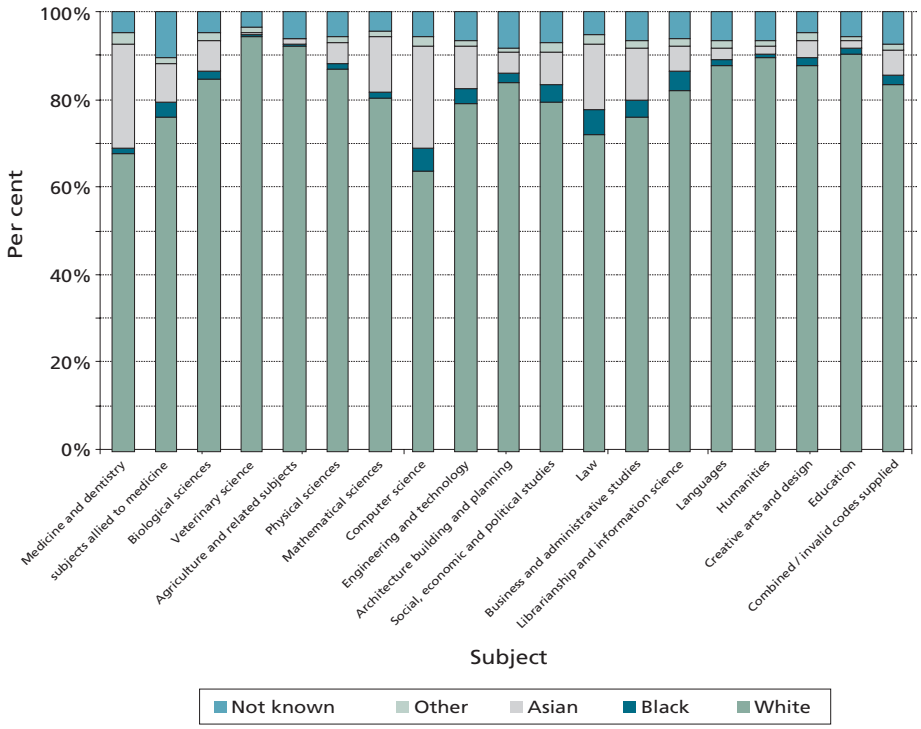
Mathematics A Levels (based on YCS coding)

221 Mathematics
223 Mathematics (Pure)
224 Decision/Discrete Mathematics
225 Mathematics (Applied)
227 Mathematics (Pure and Applied)
228 Pure and Decision Mathematics
229 Mathematics (Pure and Statistics)
230 Statistics and Decision Mathematics
231 Mathematics (Pure and Mechanics)
233 Mathematics (Further)
234 Additional Mathematics
235 Mathematical Studies
251 Statistics

ICT A Levels (based on YCS coding)

261 Computer Studies
263 Communication Technology
265 Information Technology
267 Information Studies

Appendix 8: Home First-degree Graduates in UK Higher Education Institutions 2001–2 by Subject



Source: HESA 2001–2.

Appendix 9: Age Profile of Population by Ethnicity and Gender

GENDER	Age Band (years)	White	Black – Caribbean	Black – African	Indian	Pakistani	Bangladeshi	Chinese	Other
Male	**16–24**	13.9	17.6	22.4	20.6	29.1	24.9	29.1	23.7
	25–34	17.6	15.5	28.3	23.4	27.2	36.0	24.3	28.1
	35–44	20.1	33.2	28.9	21.4	17.4	22.0	23.8	24.2
	45–59	24.9	14.4	14.1	23.0	17.6	7.1	16.9	15.8
	60+	23.5	19.3	6.4	11.6	8.7	10.1	5.9	8.3
	Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100**	**100.0**

GENDER	Age Band (years)	White	Black – Caribbean	Black – African	Indian	Pakistani	Bangladeshi	Chinese	Other
Female	**16–24**	12.9	16.2	21.4	20.3	28.2	34.2	24.3	20.0
	25–34	16.0	17.9	30.8	24.2	28.3	31.1	28.1	29.5
	35–44	18.7	32.6	28.8	21.3	18.8	14.7	18.8	23.3
	45–59	24.1	18.2	14.1	21.3	17.1	12.6	19.9	18.1
	60+	28.3	15.1	4.8	13.0	7.6	7.4	8.8	9.1
	Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Pooled LFS, March 2002 to August 2003.

Appendix 10: HESA Student and Staff Data by Ethnicity and Subject; Selected Analysis

(i) All students 1996–7

All Student Body		% of Student Body			
Ethnicity	Student Body 1996–7	SET	Medicine	Other	% of Population Aged 18–25
White	1,122,840	85.44	86.42	89.96	90.56
Black – Caribbean	16,135	1.03	1.79	1.27	0.74
Black – African	20,565	2.06	1.90	1.44	0.73
Indian	36,530	3.94	3.86	2.40	1.93
Pakistani	18,020	2.20	1.54	1.16	1.50
Bangladeshi	4,635	0.56	0.35	0.31	0.58
Chinese	10,000	1.24	0.84	0.64	0.50
Other	38,380	3.52	3.31	2.83	3.46
Total	**1,267,115**	**100.00**	**100.00**	**100.00**	**100.00**

Source: HESA student data set 1996-7.
Note: 'Not knowns' excluded. Student numbers are rounded to the nearest 5.

(ii) Staff 1996–7

		% of Academic Staff			
Ethnicity	Staff	SET	Medicine	Other	% of Working Population
White	65,270	91.62	95.96	93.69	93.97
Black – Caribbean	225	0.77	0.25	0.14	0.93
Black – African	350	0.80	0.44	0.42	0.43
Indian	800	1.99	0.74	1.28	1.55
Pakistani	155	0.39	0.15	0.23	0.54
Bangladeshi	35	0.05	0.04	0.06	0.16
Chinese	530	1.06	0.36	1.23	0.25
Other	1,775	3.31	2.05	2.93	2.18
Total	**69,140**	**100.00**	**100.00**	**100.00**	**100.00**

Source: HESA staff data set 2001–2.
Note: 'Not knowns' excluded. Student numbers are rounded to the nearest 5.

(ii) New versus pre-1992 universities

New Universities Only		% of Student Body			
Ethnicity	Student Body 2001–2	SET	Medicine	Other	% of Population Aged 18–25
White	647,100	76.97	85.46	85.46	88.31
Black – Caribbean	13,250	1.44	1.93	1.75	1.07
Black – African	22,070	3.38	4.76	2.23	1.14
Indian	31,510	6.93	2.58	3.51	2.46
Pakistani	17,730	4.44	1.10	1.88	2.13
Bangladeshi	5,260	1.11	0.32	0.63	0.82
Chinese	6,820	1.28	0.50	0.84	0.73
Other	29,315	4.45	3.35	3.70	3.34
Total	**773,055**	**100.00**	**100.00**	**100.00**	**100.00**

Pre-1992 Universities Only		% of Student Body			
Ethnicity	Student Body 2001–2	SET	Medicine	Other	% of Population Aged 18–25
White	679,520	86.20	81.64	92.26	88.31
Black – Caribbean	4,250	0.39	0.85	0.56	1.07
Black – African	8,830	1.28	2.49	0.86	1.14
Indian	21,480	4.03	6.21	1.76	2.46
Pakistani	9,980	2.10	2.62	0.80	2.13
Bangladeshi	2,710	0.60	0.58	0.23	0.82
Chinese	7,140	1.72	1.12	0.65	0.73
Other	24,705	3.68	4.49	2.88	3.34
Total	**758,615**	**100.00**	**100.00**	**100.00**	**100.00**

Source: HESA student data set 2001–2, UK domicile population.
Note: 'Not knowns' excluded. Student numbers are rounded to the nearest 5.

(iv) Postgraduate Study, 2001–2

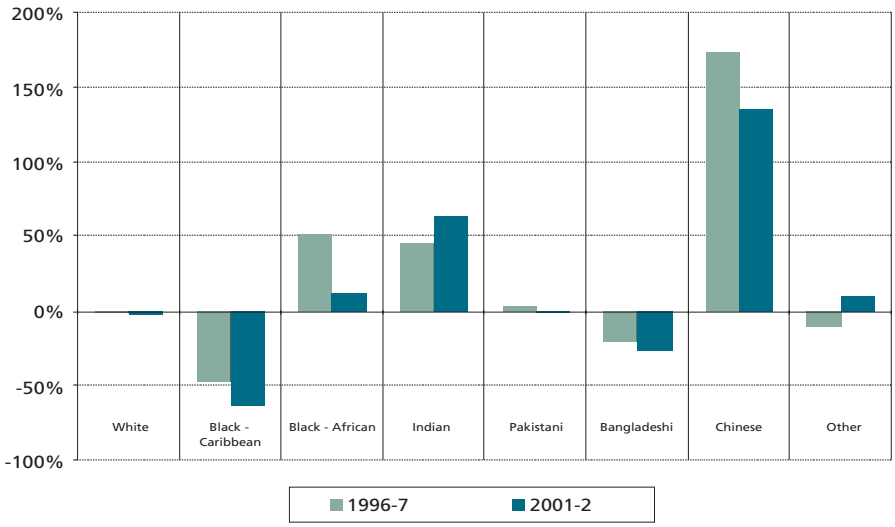
Master's Degree		% of Student Body			
Ethnicity	Student Body 2001–2	SET	Medicine	Other	% of Population Aged 18–25
White	91,260	79.11	85.05	86.95	88.31
Black – Caribbean	1,510	1.10	1.70	1.46	1.07
Black – African	3,310	4.66	3.15	2.58	1.14
Indian	3,440	4.62	3.69	2.68	2.46
Pakistani	1,575	2.77	1.33	1.08	2.13
Bangladeshi	395	0.66	0.24	0.30	0.82
Chinese	1,355	2.00	0.77	1.12	0.73
Other	4425	5.09	4.06	3.84	3.34
Total	107,270	100.00	100.00	100.00	100.00

Doctorate		% of Student Body			
Ethnicity	Student Body 2001–2	SET	Medicine	Other	% of Population Aged 18–25
White	35,285	90.50	85.57	91.00	88.31
Black – Caribbean	195	0.26	0.37	0.80	1.07
Black – African	445	0.87	1.35	1.35	1.14
Indian	775	1.97	3.79	1.32	2.46
Pakistani	330	0.94	1.58	0.48	2.13
Bangladeshi	80	0.23	0.37	0.13	0.82
Chinese	485	1.46	1.77	0.81	0.73
Other	1,610	3.76	5.21	4.10	3.34
Total	**39,205**	**100.00**	**100.00**	**100.00**	**100.00**

Source: HESA student data set 2001-2
Note: 'Not knowns' excluded. Student numbers are rounded to the nearest 5.
Appendix 11: Over- or Under-representation in SET Degrees, Pre-1992 Universities Only

Appendix 11: Over- or Under-representation in SET Degrees, Pre-1992 Universities Only

(Adjusted) Ratio of SET student numbers to UK population by Ethnic Group: Pre-1992 Universities



Source: HESA.

Appendix 12: Degree Classification by Ethnic Group Based on HESA First Destination Data

First degree, 2001–2 (UK domicile students)

Ethnicity	% of Ethnic Group			
	Set		All Subjects	
	First	Upper Second	First	Upper Second
White	13.4	43.6	9.0	48.4
Black – Caribbean	2.2	30.6	3.8	32.7
Black – African	4.7	34.8	4.2	32.7
Indian	9.5	38.7	6.0	36.7
Pakistani	5.9	35.0	5.0	34.9
Bangladeshi	5.9	33.1	3.1	31.0
Chinese	13.9	37.7	9.0	40.4
Other	13.0	36.8	8.0	41.5

Source: HESA.
Note: Graduate numbers 2001–2: All subjects 165,950, SET 35,630 (21.5% of graduates).

First degree, 1996–7 (UK domicile students)

Ethnicity	% of Ethnic Group			
	Set		All Subjects	
	First	Upper Second	First	Upper Second
White	9.0	40.0	6.1	45.2
Black – Caribbean	2.1	32.9	2.2	35.0
Black – African	4.5	19.1	2.5	25.9
Indian	6.9	32.6	5.0	31.7
Pakistani	5.4	28.8	2.6	29.1
Bangladeshi	4.2	22.2	2.8	25.7
Chinese	8.7	31.7	6.8	39.5
Other	7.5	35.8	5.0	41.0

Source: HESA.
Note: Graduate numbers 1996–7: All subjects 160,655, SET 39,765 (24.8% of graduates).

Appendix 13: Staff Grades in SET by Ethnicity, Numbers of Staff in UK, 2001-2

Ethnicity	Professor	Senior Lecturer	Lecturer	Researcher	Other Grade
White	4,420	6,815	10,320	14,210	2,295
Black – Caribbean	5	10	25	30	10
Black – African	5	10	90	130	20
Indian	55	110	160	440	50
Pakistani	6	10	45	110	15
Bangladeshi	fewer than 5	10	20	35	fewer than 5
Chinese	50	115	335	1,440	50
Other	105	225	515	1,065	90
Not known	505	780	1,075	3,540	555
Total	**5,150**	**8,080**	**12,590**	**21,000**	**3,100**

Gender	Professor	Senior Lecturer	Lecturer	Researcher	Other Grade
Female	325	1,105	3,220	6,895	775
Male	4,825	6,975	9,365	14,105	2,325
Total	**5,150**	**8,080**	**12,590**	**21,000**	**3,100**

Source: HESA.

Note: Figures are rounded to the nearest 5.

HESA staff grade definitions
Professor
Research grade IV (UAP scale)
Head of Department (PCEF scale)
Professor/Head of Department (CSCFC scale)
Clinical Professor
Locally determined scale – Professor
Professor (UAP minimum)

Senior Lecturer
Senior Lecturer (CSCFC scale)
Research grade III (UAP scale)
Clinical Senior Lecturer
Locally determined scale – Senior/Principal Lecturer
Principal Lecturer (PCEF scale).
Senior Lecturer (UAP scale)

Lecturer
Lecturer (CSCFC scale)
Clinical Lecturer
Locally determined scale – Lecturer
Lecturer A (UAP scale)
Lecturer (PCEF scale).
Lecturer B (UAP scale)
Senior Lecturer (PCEF scale).

Researcher
Researcher (CSCFC scale)
Researcher A (PCEF scale)
Researcher B (PCEF scale)
Research grade II (UAP scale)
Research grade IB (UAP scale)
Locally determined scale – Researcher
Research grade IA (UAP scale)

Other Grade
Other CSCFC
Other PCEF
Other UAP
Other

Appendix 14: Mean A Level Grades in Non-SET Subjects

Ethnicity	Mean Grade
White	6.6
Black – Caribbean	5.2
Black – African	4.9
Indian	6.0
Pakistani	5.3
Bangladeshi	5.1
Chinese	5.7
Other	5.9

Source: Pooled Youth Cohort Study, spring 2000 and spring 2002.
Note: Based on all other subjects, excluding those listed in Appendix 7.

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