

Provision of GCSE Subjects

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Introduction

In this report, the provision of GCSE subjects in English schools is considered. This is the second report in the Cambridge Assessment's research division's statistics report series. The first report considered the provision of GCE A-level subjects. These reports will include a rolling programme of analyses of the large databases of examination results. Earlier analyses of this type of data have been presented in a variety of conferences, journal papers and reports (e.g. Bell, 2002; Bell, Malacova and Shannon, 2005; Vidal Rodeiro, 2005).

One of the major influences on provision of GCSE is the National Curriculum. The curriculum is in the process of change with the study of design and technology and a modern foreign language ceasing to be compulsory at Key Stage 4. However, there is a new category of entitlement curriculum areas which will comprise the arts, design and technology, the humanities and modern foreign languages. This means that state-maintained schools must make these areas of the curriculum available to all students who wish to study courses in them. Under the new arrangements the following will be compulsory at key stage 4:

- English;
- Mathematics;
- Science;
- Information and communications technology;
- Physical Education;
- Citizenship;
- Religious education;
- Sex education;
- Careers education;
- Work-related learning.

However, students do not have to follow a GCSE course take or take an examination in these subjects.

Analyses were carried out using the data for the entire GCSE-level entry in 2004 in England. Only data for GCSE examination results is used and the courses leading to other qualifications are not included.

In the next section the classification of schools used in this report will be described. This is followed by the provision of individual subjects. In later sections the provision of modern languages and Design & Technology subjects, as well as the way that Science is provided, are analysed further.

Classification of Schools

Schools were classified using the data from the National Centre Databases used by the awarding bodies for maintaining contact with examination centres (in this study, examination centres are schools but there are other kinds of institutions where candidates sit examinations, e.g. prisons, mental hospitals). Centres with fewer than 50 exam entries were excluded. Table 1 shows the number of school centres of each type.

Table 1: School type

School Type	Number of Schools	Percentage
Comprehensive	2765	70.0
Independent	728	18.4
Grammar	165	4.2
Secondary Modern	159	4.0
Sixth Form College	4	0.1
FE College	2	0.1
Other	130	3.3

Because of the small number of schools in these categories, Sixth Form Colleges and FE Colleges will not figure in this report. Neither will the category 'Other'. As some candidates sit additional exams in centres other than their main school, for the purpose of this study a candidate's centre is defined as the one where they sit the majority of their exams.

School attainment

The attainment group of a school is computed as the mean of the attainment of the pupils attending the school. The attainment of the pupils is based on the mean GCSE score: The GCSE-level grades for candidates are converted into scores using

Table 2 (grades denoting compilation errors, absences and queried results are not in the table and are treated as missing values) and the average of the scores is computed for each candidate. The mean GCSE-level score for candidates and schools could therefore range from 0 to 8.

Table 2: GCSE-level grades and corresponding marks

Grade	Mark
A*	8
A	7
B	6
C	5
D	4
E	3
F	2
G	1
U	0

A frequency distribution of these scores was obtained and used to divide the schools into attainment quintiles. The cut-off points are shown in Table 3. Quintile 1 contains schools with the lowest mean GCSE score, and quintile 5 those with the highest mean score. (The groups are not of equal size because the quintiles are based on *all* schools, whereas Table 3 only contains Comprehensive, Independent, Grammar and Secondary Modern schools.) Note that although a similar definition was used in the first report of the series (Vidal Rodeiro, 2005) the definition of the groups is different and the notation is different to emphasise this fact.

Table 3: School attainment groups

School Ability Group	Number of schools	Minimum	Maximum
Quintile 1	693	1.98	3.90
Quintile 2	781	3.90	4.40
Quintile 3	785	4.40	4.90
Quintile 4	775	4.90	5.63
Quintile 5	783	5.63	7.71

School size

One potentially important school characteristic is its size. It is obviously easier for a large school to create viably sized teaching groups. In the following table we categorise schools into five groups according to their size (based on the number of students).

Table 4: School size

School Size	No. of schools	Percentage
Less than 60	461	12.1
60 – 119	638	16.7
120 – 179	1209	31.7
180 – 239	1043	27.3
240 or more	466	12.2

Relationship between school type and attainment group

Table 5 shows the relationship between school type and school attainment group. The figures in the table are row percentages (*i.e.*, 2.6% of Comprehensive and 75.3% of Independent schools are in the highest performing group). Obviously this pattern is determined by selection procedures and catchment areas. Some anomalies might exist because some schools might not use GCSE examinations.

Table 5: Percentage of schools falling into each attainment group

School type	School attainment group					Number of schools
	I	II	III	IV	V	
Comprehensive	22.4	25.7	26.3	23.0	2.6	2765
Independent	1.1	2.2	4.1	17.3	75.3	728
Grammar	0.6	0.6	0	1.2	97.6	165
Secondary Modern	40.3	34.0	17.6	7.6	0.6	159

Provision of individual subjects

The first issue that will be considered is the proportion of schools that offer individual GCSE subjects. These are displayed as percentages by school type, following the classification shown in Table 1. (In Tables 6 and 7 an empty cell means that no school offered this subject.) The provision of certain traditional GCSE-levels, such as Mathematics and English Literature, is compulsory for schools that are bound by the National Curriculum (all schools other than Independent schools) and therefore stands at 100%.

Provision of individual subjects by school type

Table 6: Provision of GCSE subjects by school type (percentages of schools)

Subject	Compr.	Ind.	Grammar	Sec. Modern
Accounting / Finance	0.3	0.8		
Arabic	7.2	5.1	1.8	2.5
Archaeology	0.4		0.6	
Art & Des - Fine Art	30.3	37.2	43.6	27.0
Art & Des (3D Stds)	7.1	5.9	1.8	8.2
Art & Des (Graphics)	6.4	2.1	3.6	6.9
Art & Des (Photo.)	4.1	5.8	1.8	4.4
Art & Des (Textiles)	8.6	7.4	4.8	10.1
Art & Design	76.3	63.5	63.0	79.2
Bengali	4.9	1.0		1.9
Biology	26.8	60.7	66.1	6.9
Biology: Human	0.6	1.8	1.8	1.3
Bus. Stds & Economics	2.8	2.1	6.1	
Bus. Stds: Single	51.8	24.3	47.3	42.1
Chemistry	25.5	60.4	66.7	6.3
Chinese	7.3	30.1	15.2	2.5
Class. Civilisation	2.5	20.7	7.9	
Classical Greek	0.2	16.9	4.8	
D & T Electronic Prods	23.8	4.5	20.0	11.9
D & T Food Technology	86.0	12.0	47.3	82.4
D & T Graphic Prods	83.2	15.2	64.2	73.6
D & T Product Design	9.0	4.8	12.7	11.9
D & T Resist. Matrls	89.0	44.2	69.1	86.2
D & T Systems & Cont	17.1	6.2	18.8	7.5
D & T Textiles Tech.	61.4	11.4	35.8	45.3
Drama & Theatre Stds	84.6	58.2	52.7	74.2
Dutch	2.1	0.8	0.6	1.3
Economics	3.2	2.7	11.5	
English	100.0	99.2	99.4	100.0
English Literature	99.9	94.5	100.0	100.0
French	96.8	92.4	99.4	94.3
General Studies	1.4	0.1	2.4	1.3
Geography	98.0	91.6	100.0	96.2
German	66.8	70.6	94.5	30.2
Gujarati	2.9	1.4	1.8	1.3
HE: Child Devt	34.3	4.0	2.4	34.6
HE: Food	4.2	21.2	1.2	3.1
HE: Textiles	0.3	2.7		0.6
History	98.2	93.3	100.0	96.9
Humanities: Single	6.0	0.7		4.4
Inform Comm Tech	42.4	44.5	56.4	43.4
Italian	6.6	9.2	9.1	4.4
Japanese	1.7	7.3	6.1	0.6
Latin	5.6	50.3	50.9	0.6
Law	1.3	1.0	0.6	0.6
Mathematics	100.0	99.6	100.0	100.0
Media / Film / TV Stds	28.4	4.0	9.1	24.5
Modern Greek	1.4	0.7		
Modern Hebrew	0.4	1.1		0.6
Music	91.1	78.3	100.0	84.9
Office Technology	16.3	8.1	3.0	22.6
Panjabi	3.8	0.7	4.2	5.0
Performance Stds	29.7	5.4	11.5	34.0
Persian	3.9	1.0	0.6	1.9
Physics	25.5	60.4	66.7	7.5
Polish	1.2	0.7	1.2	3.8
Portuguese	5.9	1.8	1.2	5.7
Psychology	1.9	0.4	2.4	1.9
Religious Studies	61.8	62.0	77.0	49.1
Russian	4.9	9.8	7.3	1.3
Sci: Double Awd	99.0	80.1	94.5	98.7
Sci: Environmental	0.4	0.1		1.9

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Subject	Compr.	Ind.	Grammar	Sec. Modern
Sci: Single Award	48.1	29.7	20.0	55.3
Science: Astronomy	0.9	1.2	1.2	1.3
Science: Rural	1.7	0.4		3.8
Social Science	1.0	0.3	0.6	
Sociology	13.1	1.8	3.0	7.5
Spanish	41.5	59.1	51.5	29.6
Sport / P.E. Studies	94.0	47.5	63.6	96.2
Statistics	24.7	9.5	23.6	20.8
Tourism	2.3	0.3		5.0
Turkish	5.2	0.7	1.2	3.1
Urdu	12.1	5.9	4.2	8.8

Provision of individual subjects by school attainment

Table 7: Provision of GCSE subjects by school attainment group

Subject	Q1	Q2	Q3	Q4	Q5
Accounting / Finance	0.3%	0.1%	0.5%	0.6%	0.4%
Arabic	11.6%	6.7%	5.1%	4.8%	3.0%
Archaeology	0.4%	0.5%	0.3%	0.3%	0.1%
Art & Des - Fine Art	24.1%	27.2%	32.6%	33.4%	40.3%
Art & Des (3D Stds)	6.8%	5.6%	7.6%	7.1%	5.2%
Art & Des (Graphics)	6.7%	5.8%	5.9%	5.2%	3.0%
Art & Des (Photo.)	3.4%	3.9%	4.2%	4.9%	5.2%
Art & Des (Textiles)	8.1%	9.1%	8.7%	7.7%	6.8%
Art & Design	77.2%	77.6%	73.1%	72.3%	65.1%
Bengali	7.5%	5.6%	4.2%	1.0%	0.1%
Biology	12.5%	20.0%	30.1%	39.7%	65.3%
Biology: Human	1.0%	1.1%	0.3%	1.3%	1.5%
Bus. Stds & Economics	0.8%	1.8%	2.3%	4.8%	3.3%
Bus. Stds: Single	33.2%	46.0%	56.4%	58.4%	30.0%
Chemistry	10.5%	18.6%	28.4%	38.2%	65.3%
Chinese	6.3%	7.2%	6.8%	9.1%	27.5%
Class. Civilisation	0.8%	1.3%	1.4%	4.9%	21.5%
Classical Greek			0.1%	0.3%	16.8%
D & T Electronic Prods	12.7%	20.2%	26.8%	24.8%	9.5%
D & T Food Technology	71.6%	83.9%	85.0%	73.2%	25.7%
D & T Graphic Prods	68.4%	79.4%	82.0%	74.1%	30.5%
D & T Product Design	7.0%	10.4%	8.0%	8.7%	7.0%
D & T Resist. Matrls	79.6%	86.6%	88.0%	79.1%	54.6%
D & T Systems & Cont	8.6%	14.4%	18.5%	19.0%	10.4%
D & T Textiles Tech.	44.7%	56.8%	61.7%	57.9%	21.4%
Drama & Theatre Stds	68.6%	80.9%	84.5%	81.4%	63.2%
Dutch	3.4%	2.0%	1.0%	0.9%	1.0%
Economics	0.4%	1.9%	4.4%	4.2%	5.2%
English	100.0%	100.0%	99.9%	99.7%	99.2%
English Literature	95.1%	99.0%	99.0%	97.9%	98.1%
Envir. Stds. Single			0.1%		
French	81.5%	94.1%	97.2%	96.8%	98.5%
General Studies	2.3%	0.9%	1.9%	0.6%	0.5%
Geography	84.6%	96.1%	97.3%	97.3%	97.6%
German	33.5%	58.4%	72.4%	77.0%	84.7%
Gujarati	3.2%	2.9%	2.7%	2.1%	1.3%
HE: Child Devt	29.6%	31.7%	35.7%	32.1%	5.4%
HE: Food	5.2%	3.7%	3.8%	7.0%	16.5%
HE: Textiles	0.6%	0.1%	0.4%	0.5%	2.0%
History	85.2%	96.0%	97.9%	97.6%	98.5%
Humanities: Single	8.6%	5.7%	5.8%	2.9%	0.4%
Inform Comm Tech	35.3%	41.1%	44.4%	45.3%	46.1%
Italian	4.6%	4.6%	6.6%	8.6%	10.3%
Japanese	1.0%	0.5%	1.5%	3.2%	7.8%
Latin	0.9%	2.1%	4.0%	11.0%	59.0%
Law	1.1%	1.5%	1.8%	0.6%	0.8%
Mathematics	99.9%	100.0%	99.9%	100.0%	99.7%
Media / Film / TV Stds	28.0%	30.0%	27.8%	20.6%	4.3%
Modern Greek	1.0%	0.8%	2.1%	1.0%	0.8%
Modern Hebrew	0.3%	0.1%	0.1%	0.5%	1.5%
Music	68.9%	89.1%	91.4%	90.1%	91.0%
Office Technology	17.3%	16.2%	17.3%	13.0%	7.1%
Panjabi	5.1%	4.6%	2.5%	2.5%	1.3%
Performance Stds	29.9%	29.2%	29.6%	22.8%	7.2%
Persian	6.3%	3.7%	2.5%	1.9%	0.6%
Physics	11.0%	17.8%	29.2%	38.6%	65.3%
Polish	1.6%	1.1%	1.0%	0.9%	1.3%
Portuguese	9.4%	5.7%	4.4%	3.0%	1.3%
Psychology	1.8%	1.5%	2.7%	1.5%	0.9%
Religious Studies	41.9%	56.3%	61.8%	68.4%	72.7%
Russian	5.3%	5.3%	3.9%	3.3%	10.0%
Sci: Double Awd A	90.0%	97.5%	98.5%	95.3%	85.8%

(continued)

Subject	Q1	Q2	Q3	Q4	Q5
Sci: Double Awd B	90.0%	97.5%	98.5%	95.3%	85.8%
Sci: Environmental	0.9%	0.3%	0.3%	0.6%	0.1%
Sci: Single Award	54.7%	46.8%	49.9%	42.5%	27.1%
Science: Astronomy	0.6%	1.4%	0.8%	0.8%	1.4%
Science: Rural	0.6%	1.4%	3.0%	1.8%	0.3%
Social Science	0.6%	1.0%	0.8%	1.0%	0.5%
Sociology	10.0%	14.0%	11.9%	11.6%	2.7%
Spanish	32.4%	38.4%	40.6%	43.4%	63.2%
Sport / P.E. Studies	84.4%	92.4%	91.3%	86.1%	53.2%
Statistics	22.2%	23.8%	23.4%	21.4%	13.9%
Tourism	2.4%	2.5%	2.4%	1.5%	0.4%
Turkish	6.7%	5.4%	4.6%	1.6%	1.3%
Urdu	18.6%	14.0%	9.6%	5.8%	2.7%

Number of modern languages offered

Figure 1 shows the number of modern languages (excluding English) offered by centres, broken down by type of school. Figure 2 shows the same information, this time broken down by school attainment. From the mode and the distribution it can be seen that independent and grammar schools tend to offer a higher number of languages. The same holds for the highest attaining schools, compared to the four lowest attainment quintiles, as the vast majority of independent and grammar schools fall in the top quintile (see Table 5).

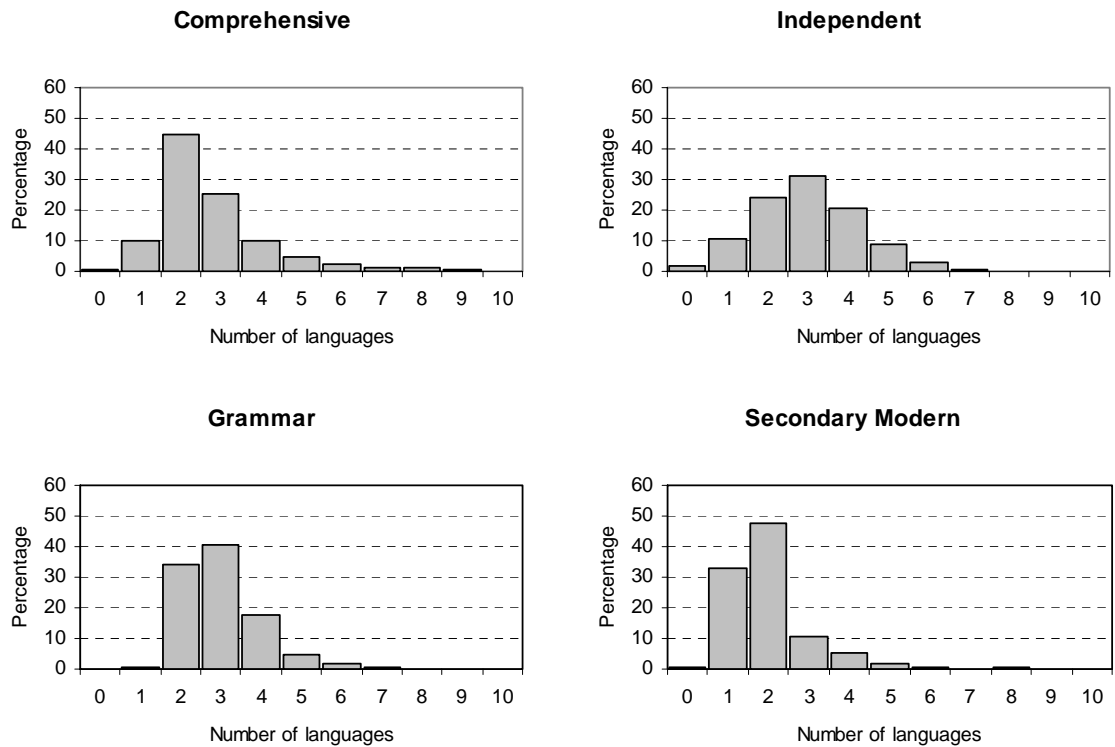


Figure 1: Number of modern languages offered by school type

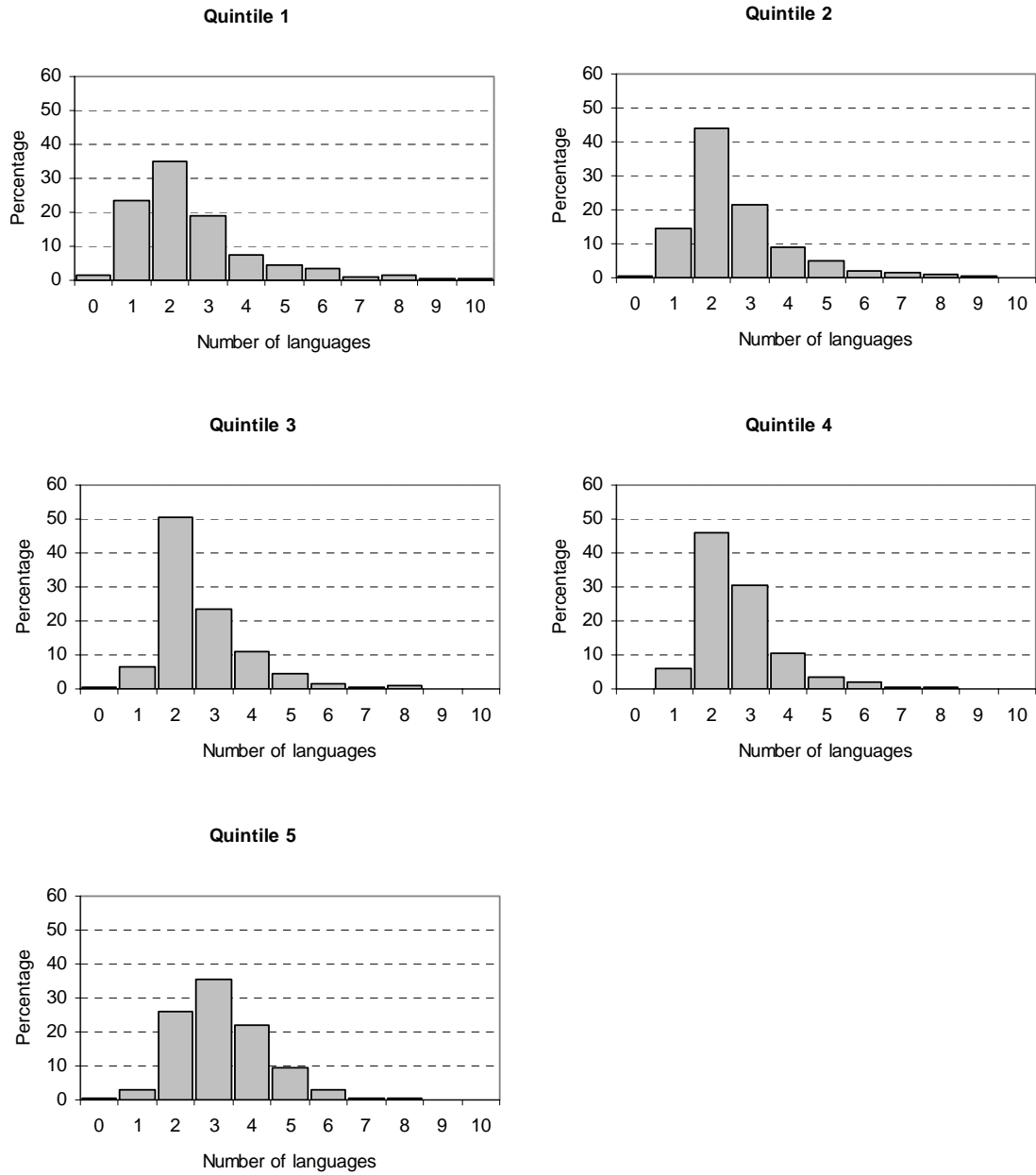


Figure 2: Number of modern languages offered by school attainment

Number of Design & Technology subjects offered

Figure 3 shows the number of D&T subjects offered by centres, broken down by type of school. Figure 4 shows the same information, this time broken down by school attainment. It can be seen that independent schools tend to offer very few of these subjects, if any at all. The vast majority of schools of the other types tend to offer at least one subject, with comprehensives offering the most. As was the case for modern languages, the top quintile follows a different pattern from the bottom four quintiles.

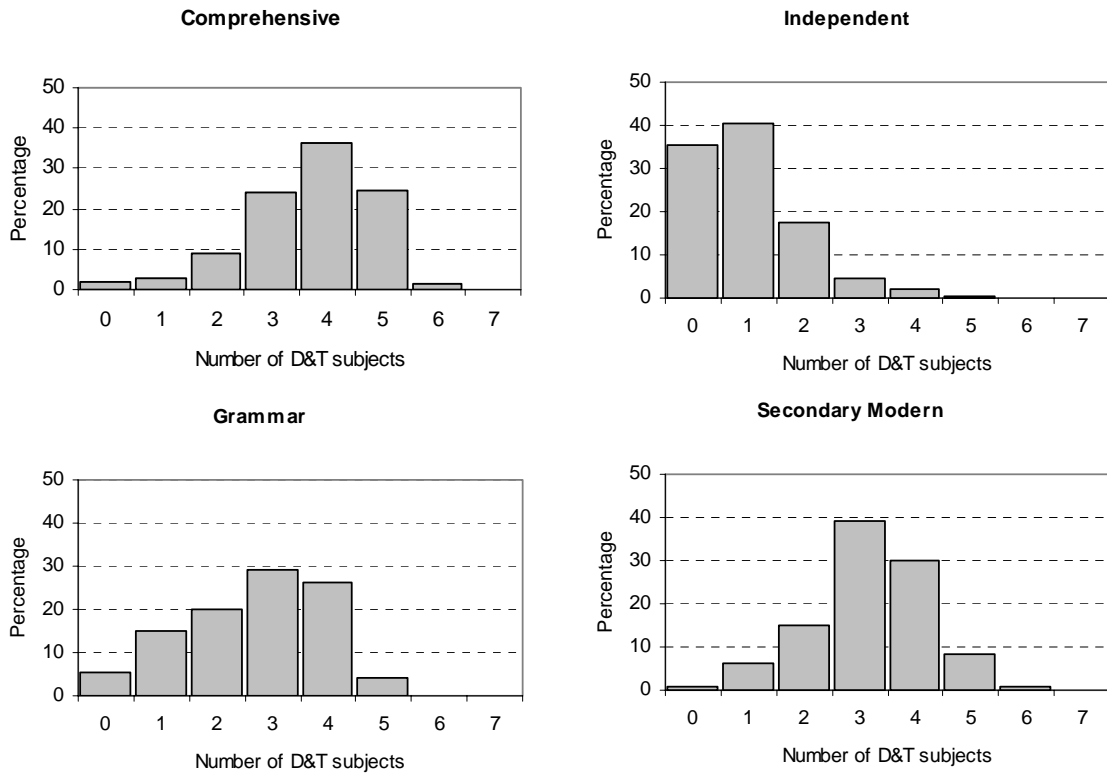


Figure 3: Number of D&T subjects offered by school type

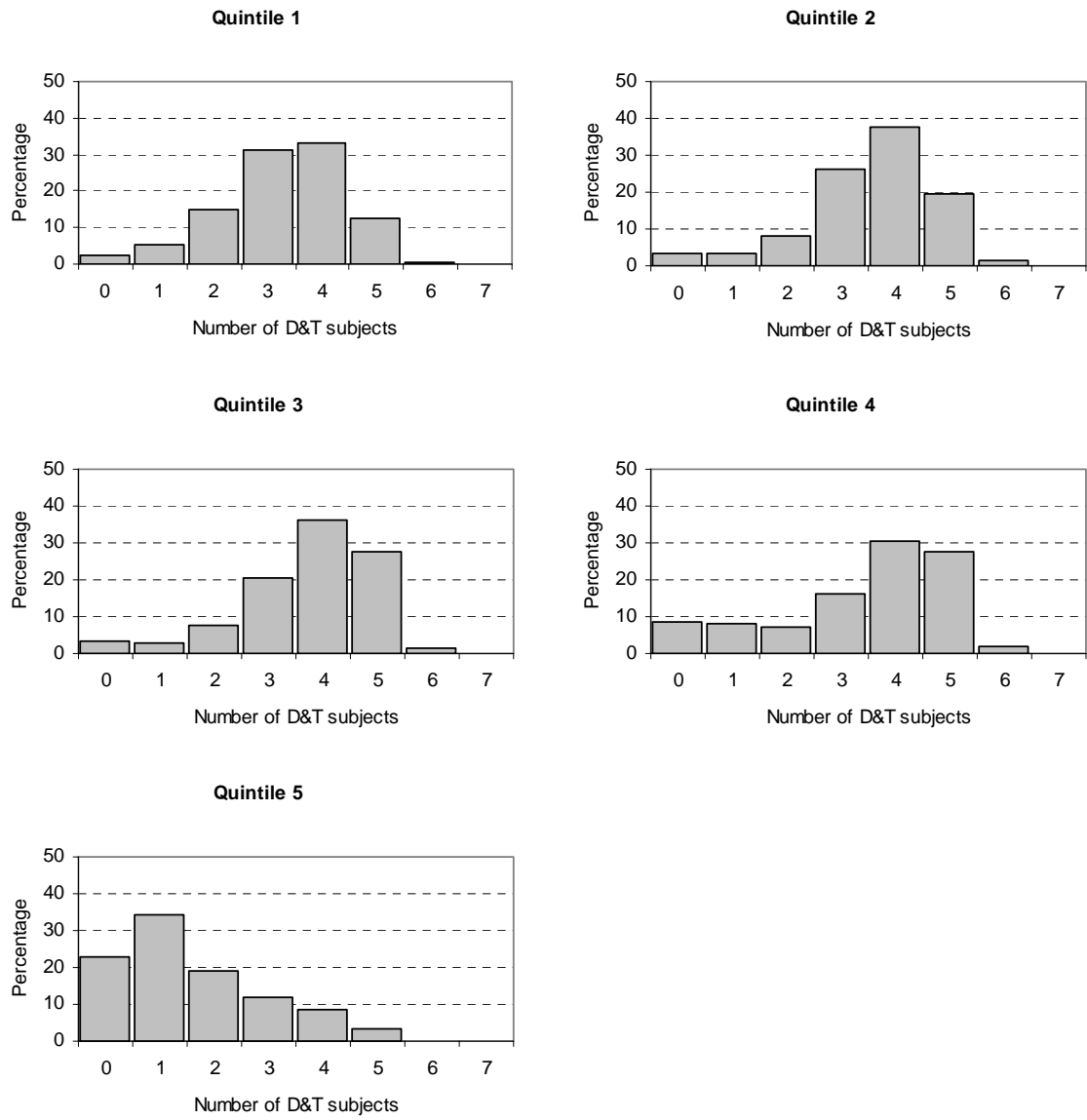


Figure 4: Number of D&T subjects offered by school attainment

The provision of Science

Science GCSE can be offered in a number of ways: the single award, the double award, and as individual subjects (Physics, Chemistry and Biology), which we will call a triple award for convenience. There are seven possible combinations of Science subjects a school can offer:

1. single award only
2. double award only
3. triple award only
4. single as well as double award
5. single as well as triple award
6. double as well as triple award
7. single, double and triple award

Table 8 shows the proportion of schools, as a percentage, that offer these combinations. (In addition, 0.65% of schools offered only one or two individual Science subjects, e.g., physics and biology).

Table 8: Percentage of schools offering combinations of science awards

	Percentage
single award only	0.7
double award only*	36.3
triple award only*	2.7
double as well as single award*	16.7
double as well as triple award*	30.0
triple as well single award	0.8
single, double and triple award*	12.2

Since very few schools offer only the single award or the single award in combination with the triple award, the tables that follow will only show results for the five combinations indicated in Table 8 with an asterisk.

Finally, Table 9 and Table 10 show the percentages of schools offering different science combinations, broken down by school type and school attainment.

Table 9: Percentage of schools offering combinations of science awards by school type

	Compr.	Ind.	Grammar	Sec. Mod.
Triple only	0.1	12.9	4.2	0.0
Double only	39.8	24.2	27.3	40.9
Double & Single	34.5	13.3	6.7	51.6
Double & Triple	11.8	31.4	48.5	3.1
All	12.9	11.5	12.1	3.1

Table 10: Percentage of schools offering combinations of science awards by attainment

	Q1	Q2	Q3	Q4	Q5
Triple only	0.1	0.1	0.5	2.6	9.8
Double only	41.9	43.4	36.6	36.0	24.3
Double & Single	44.6	37.1	34.4	25.7	9.7
Double & Triple	4.9	9.0	12.6	17.9	37.8
All	5.5	8.7	15.2	16.7	14.3

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