Institutional diversity in the contemporary further education sector in England

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Contents

Tables and figures

List of tables

List of figures

10.12	Percentage of aims at each level of study by mode of study
10.13	Percentage of aims in each age group of student by level of study
10.14	Percentage of aims at each level of study by age group of student
10.15	Percentage of aims for each ethnicity of student by subject of study
10.16	Percentage of aims in each subject of study by ethnicity of student
10.17	Percentage of aims in each mode of study by gender of student
Chapter 11	
11.1	Group six subject characteristics
11.2	Group seven subject characteristics
11.3	Group eight subject characteristics
Chapter 14	
14.1	Distribution of size by headcount
14.2	Distribution of full-time student percentage for general FE colleges
14.3	Distribution of full-time student percentage for sixth form colleges
14.4	Percentage of students at each level of study over the college system
14.5	Distribution of level of study in general FE colleges
14.6	Distribution of level of study in sixth form colleges
14.7	Subject of study by percentage of aims of each subject
14.8	Distribution of Science and Mathematics percentage for general FE colleges
14.9	Distribution of Science and Mathematics percentage for sixth form colleges
14.10	Distribution of Engineering and Manufacturing Technologies percentage for general FE colleges
14.11	Distribution of Engineering and Manufacturing Technologies percentage for sixth form colleges
14.12	Distribution of Business, Administration and Law percentage for general FE colleges
14.13	Distribution of Business, Administration and Law percentage for sixth form colleges
14.14	Distribution of average age of students at each general FE college
14.15	Distribution of average age of students at each sixth form college
14.16	Distribution of male student percentage for general FE colleges
14.17	Distribution of male student percentage for sixth form colleges
14.18	Distribution of female student percentage for general FE colleges
14.19	Distribution of female student percentage for sixth form colleges
14.20	Ethnicity demographics of student population
14.21	Distribution of colleges by percentage of students from minority ethnic backgrounds
Annex Two	
A2.1	Percentage of students at each level of study at special colleges
A2.2	Percentage of students at each level of study at special colleges - agriculture and horticulture
A2.3	Percentage of students at each level of study at specialist designated colleges
A2.4	Percentage of students at each level of study at special colleges - art, design and performing arts
Annex Four	
A4.1	Percentage of aims in each age group of student by gender of student
A4.2	Percentage of aims for each gender of student by age group of student
A4.3	Percentage of aims at each level of study by gender of student
A4.4	Percentage of aims for each ethnic group of student by level of study
A4.5	Percentage of aims at each level of study by ethnic group of student
A4.6	Percentage of aims for each ethnicity of student by age group of student
A4.7	Percentage of aims in each age group of student by ethnicity of student

A4.8	Percentage of aims for each ethnic group of student by mode of study
A4.9	Percentage of aims in each mode of study by ethnic group of student
A4.10	Percentage of aims for each ethnicity of student by gender of student
A4.11	Percentage of aims for each gender of student by ethnicity of student

GLOSSARY

AFE	Advanced Further Education
AHAC	Agriculture, Horticulture and Animal Care
AMP	Arts, Media and Publishing
AoC	Association of Colleges
ASAS	Applied Subjects and Skills
BAL	Business, Administration and Law
BIS	Department for Business, Innovation and Skills
CC	Carnegie Classification
CoVE	Centre of Vocational Excellence
CPBE	Construction, Planning and the Built Environment
DLE	Demand Led Element
DIUS	Department for Innovation, Universities and Skills
DS	Data Service
EFA	Education Funding Agency
EMT	Engineering and Manufacturing Technologies
ESL	English as a Second Language
ET	Education and Training
FE	Further Education
FEFC	Further Education Funding Council
FHEQ	Framework for Higher Education Qualifications
GFEC	General Further Education College
GSEP	General Studies and Enrichment Programmes
HE	Higher Education
HEFCE	Higher Education Funding Council for England (The)
HEIF	Higher Education Innovation Fund
HPSC	Health, Public Services and Care
HPT	History, Philosophy and Theology
IA	Information Authority
ICT	Information and Communication Technology
ILA	Individualised Learning Accounts
ILR	Individualised Learner Record
IT	Information Technology
ITB	Industrial Training Boards
KBS	Key and Basic Skills
LA	Local Authority
LAS	Liberal Arts and Sciences
LEA	Local Education Authorities
LSC	Learning and Skills Council
LLC	Languages, Literature and Culture
LTT	Leisure, Travel and Tourism
NSA	National Skills Academy
NAPAG	National Academies' Policy Advisory Group

NAFE	Non-Advanced Further Education
NQF	National Qualifications Framework
NVQ	National Vocational Qualification
OECD	Organisation for Economic Co-operation and Development
OfQUAL	Office of Qualifications and Examinations Regulation
OfSTED	Office for Standards in Education, Children's Services and Skills
PACEC	Public and Corporate Economic Consultants
PLW	Preparation for Life and Work
QCA	Qualifications and Curriculum Authority
QCF	Qualifications and Credit Framework
RAE	Research Assessment Exercise
RCE	Retail and Commercial Enterprise
RSC	Royal Society of Chemistry
SAR	Strategic Area Review
SC	Specialist College
SD	Standard Deviation
SFA	Skills Funding Agency
SFC	Sixth Form College
SM	Science and Mathematics
SPSS	Statistical Package for the Social Sciences
SS	Social Sciences
SSAC	Sector Subject Area Classification
TEC	Training and Enterprise Councils
UAS	University of Applied Sciences
UGC	University Grants Commission
UCU	University and College Union
WBL	Work Based Learning
YPLA	Young People's Learning Agency

Note: Abbreviations for various qualifications and very commonly used acronyms are deliberately omitted from this list.

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Abstract

The thesis is a study of the nature and extent of institutional diversity in the further education sector in England. Unlike for institutions in the higher education sector, the pattern of further education colleges has been less systematically investigated and the standard classification of colleges adopted by the central authorities has remained largely the same since the 1990s. Analysis of administrative data on course and student characteristics for the academic year 2011/2012, the dimensions and patterns of institutional diversity are reported using descriptive statistics and cluster analysis. The findings demonstrate a greater level of diversity among and between colleges than is captured by the standard classification. This is substantially so within the category of general further education colleges which accounts for the majority of colleges, courses and students in the sector. Even within the specific categories of sixth form colleges and specialist colleges there are notable variations in their course profiles and student populations. Based on these findings, an argument is made for a review and overhaul of official categorisations in order both to better inform policymaking in England and to underpin current and future research on tertiary education.

Chapter 1: Introduction

1.1: Aim, scope and background

The research for the thesis investigates the nature and extent of institutional diversity among colleges in the further education (FE) sector in England. Further education is one of three main sectors of education and training in England. Higher education (HE) is concerned with courses above A-level or equivalent qualifications and is provided mainly but not exclusively in universities. School education is essentially concerned with primary and secondary education, including upper secondary education beyond the age of 16. Further education is located between these two sectors, with some overlap with each of them. Further education is mostly aimed at adults and young people over 16 years of age. Its academic, vocational and general courses are taught at a variety of levels, from basic skills through to postgraduate education.

Further education colleges are officially classified into six types. The largest group is styled general further education colleges and their courses cover a wide range of subjects and levels. Typically, their students span a variety of ages and backgrounds. The second group comprises sixth form colleges. Before 1992, these colleges were under schools regulations. Their students are mainly aged between 16 and 19 and they mainly study for A-level qualifications. The remaining four types are commonly grouped together as specialist colleges and include those where students study in specific subject areas (such as art and design and land-based studies), where courses are targeted at the adult population and where education is provided for students with special educational needs. It is made clear in the thesis when the full or the three-type classification is used. Together, these six types of institution constitute the further education sector (or the college sector as it is sometimes termed). This is the largest and most important part of the further education system in England. The further education that is publicly funded outside the college sector is undertaken by a wide variety of other organisations, often small in scale and including community education and private training providers.

Today, the colleges in the further education sector are publicly funded through two main bodies: a funding body for the education of 16 to 19 year olds (the Education Funding Agency, (EFA)), and another funding body for the education of adults (the Skills Funding Agency, (SFA)). Except for the HE taught in some colleges, the quality of the education is assessed by a single inspectorate (the Office for Standards in Education, Children's Services and Skills, (OfSTED)). Data collection is the responsibility of the Skills Funding Agency and, up to recently, was undertaken by the Data Service and overseen by the Information Authority.

In the 2011/2012 academic year, the base year for this research, some 3,035,274 students were studying in the 358 colleges in the FE sector. The range of subjects, modes and levels taught in further education colleges is greater than in the school and HE sectors. However, the pattern and extent of this diversity among and between individual colleges is not well understood, partly because the standard categories of general, sixth form and specialist colleges have been the main way that differences of function, provision and participation have been signalled. The research for the thesis is designed to explore behind these categories and so present a fuller picture of the extent to which colleges are similar or different in their course profiles and student populations.

1.2: Core and supplementary research questions

The thesis is a study of the nature and extent of institutional diversity in the FE sector in England.

Hence, the primary research question is: *What is the nature and extent of institutional diversity among colleges in the FE sector in England*?

The supplementary research questions are:

1. *What patterns can be identified?*
2. *Do official categorisations capture existing diversity?*
3. *Should these categorisations be reviewed and revised?*

1.3: Rationale for the study

Over many decades, institutional diversity has been considered an essential ingredient of a successful post-secondary system of education for mass engagement by students (Van Vught, 2008; Huisman, 1995; Clark, 1983; Birnbaum, 1983; Reisman, 1956). Although many of these studies focus on the American system where all post-secondary education is considered HE, the similarities of purpose between the English and American tertiary systems give these works a special importance. Thus, a systematic examination of institutional diversity in the HE and FE systems in England would bring a theoretical lens to bear on policy and professional debates as well as offer tools and approaches to improve its quality, efficiency and effectiveness. In the HE sector in England, such studies have been frequently conducted by authors such as Tight (2007, 1996 and 1988), Dolton and Makepeace (1982) and King (1970) using statistical methodologies.

In contrast to the field of HE, there are few empirical or statistical studies of further education in England that examine the pattern of diversity within and among colleges. Similarly, organisational studies in further education have not been informed to any major extent by theoretical and typological debates about the nature of institutional differentiation and diversification. While policy-related research on the FE sector has grown in recent years, much of the work on the nature of colleges as organisations has been concerned with their performance as institutions, rather than a systematic examination of the size, shape and scope of their course and student profiles.

Furthermore, the FE sector has used essentially the same standard (official) classification of colleges since it was adopted in the early 1990s. Although originally devised for administrative and data collection purposes, it has been widely used (as a short-hand) by policy makers, researchers and commentators. There are several possible reasons why the official classification has remained largely unchanged. One is a result of the major structural reforms applied to English further education over the last 25 years. These have involved a succession of new bodies concerned with funding and quality assurance, including new agencies and shifting purposes for data collection. Where previously data collection served the needs of sound administration and system planning, it now also had to accommodate new and complex funding arrangements as well as generate data for the measurement and assessment of institutional performance (Hodgson, 2015; Gravatt, 2007). One of the consequences of using the student record as a basis for funding allocations and other policy purposes was to make it

difficult to produce a consistent and reliable time series for the further education system in England. This was a major reason why the research for the thesis is focused on a single year. These same reservations were echoed by Perry and Davies (2015) in their discussion of how student numbers in further education were counted from year to year:

> Linking student information with budgets may have brought a sense of priority – and audit – to individual institutional data collection, but actually did little to create a clear national view of learner numbers. It is striking that a national picture of enrolment information is difficult to find, even in the age of Google (Perry and Davies, 2015, p.55).

These pressures were unlikely to favour or find time for a review of the standard classification of colleges. On the other hand, many of the government policies aimed at the college sector over this period have been concerned with influencing the shape and configuration of further education institutions. Successive attempts have been made to encourage colleges, especially general further education colleges, to focus their mission on a vocational specialism (Foster, 2005). Contemporaneously, there have been regular government attempts to foster market-like conditions to encourage competition between colleges, whilst also pushing the benefits of cooperation (Smith, 2007; Further and Higher Education Act, 1992). This has also been a period in which the number of colleges has decreased as a result of institutional mergers. Between 1993 and 2016, there have been no less than 131 mergers in the college sector (AoC, 2016a). In other words, changes in the purpose, size and profile of individual colleges were a direct or indirect consequence of government actions, yet this was not sufficient to stimulate another look at how it categorised these institutions.

In the higher education sector, where the number and character of institutions have been more stable, the similarities and differences between higher education establishments are a major concern for institutional leaders, for policymakers and for academic researchers. In part, this is because higher education – unlike further education – is an international as well as a national and local activity where research and scholarship as well as teaching are important markers of reputational status. In contrast to the succession of reform measures applied to the English further education sector, the same funding council, Quality Assurance Agency (QAA) and statistics body for higher education has operated since the 1990s. Much more than their counterparts in further education, these organisations regularly undertook their own analytical studies of changes in the landscape of higher education, including its institutions. These studies were published alongside the reports and commentaries they commissioned from the academic research community.

In short, research and intelligence on English further education and its large number of institutions is much less developed and supported than in the higher education sector. Furthermore, research on institutional patterns of provision and participation in higher education played into larger policy and political debates about the accessibility of higher education and the tendency for universities to pursue similar missions. Although concerned with a larger population of students, courses and qualifications, research into the further education sector is a smaller and narrower enterprise than in higher education, with less opportunity for researchers to exert an influence on the kinds of data collected and analysed for policy purposes.

Thus, central to the rationale for this research is the paradox of a college sector that has been subject to major efforts by government to influence the nature and extent of institutional diversity but where systematic investigation of past and present patterns of diversity has been limited. In using and analysing administrative data to identify the scale and scope of institutional diversity, the research contributes to the base of knowledge and understanding in a strategically important sector of education policy and training. In so doing, the value of the standard classification of colleges is assessed and the need for a fundamental review and revision is considered. There is no attempt here to propose an alternative definitive typology or categorisation. Rather, the aim of the research is to highlight the many ways and levels at which institutional diversity might be captured, for administrative, policy and academic purposes.

1.4: Research design and methodology

Although the research is largely a statistical study based on institutional, course and student characteristics at one point in time, it is nevertheless informed by analytical and classificatory studies in the field of higher and post-secondary education. Following Huisman (1995) and Birnbaum (1983), the research examines both internal and external diversity (i.e. diversity within and between institutions). In addition, it considers the work of organisational theorists, such as Hannan and Freeman (1989, 1984, and 1977), DiMaggio and Powell (1983) and Pfeffer and Salancik (1978), for their understandings of the dynamics of differentiation and diversity and the resulting theoretical frameworks.

Inspiration for the methodology was drawn from the works of Malcolm Tight on institutional typologies in British higher education (2007, 1996 and 1988). In a review of the relevant literature, published studies using a similar design and methodology in the field of English further education were not in evidence. However, consideration was given to work commissioned or conducted by the national agencies responsible for FE in England investigating aspects of organisational diversity or closely related topics in the FE sector. These included a report by the Department for Innovation, Universities and Skills (DIUS, 2008), two reports commissioned by the Department for Education and Skills and authored by Edem, Spencer and Fyfield (2003a, 2003b) and an unpublished report by KPMG and Critical Thinking (Morland and Macleod, 2002).

The overall methodological approach is an exploratory analysis of administrative quantitative data on FE colleges collected by the then Data Service. The data used in this study is a subset of data from the Individualised Learner Record. This is the main administrative data set collected on the FE sector. For this study, seven variables were chosen for analysis: size by student headcount, mode, level and subject of study, together with age, gender and ethnicity of students. The selection of these variables was informed by a review of the empirical and theoretical literature on institutional diversity in tertiary education and similar studies to this one in the field of higher education.

The study is statistical in nature. Descriptive statistics were used to identify the extent of system and institutional diversity in the year under study based on seven variables. These descriptive statistics were first used to identify the diversity of the FE college sector as a whole and then to examine the patterns of distribution within and between individual colleges. Although colleges were studied as statistical constructs, without reference to their 'real world'

contexts, there are places in the thesis where it was appropriate to use the names of colleges for illustrative purposes. While this has increased the length and density of information presented in parts of the thesis, it offers a guide to the actual institutions that otherwise feature anonymously in statistical tables and charts. Additionally, statistical analysis was used to discover any associations between variables. These provided an examination of the links between the two sets of variables (course and student characteristics) and an insight into the profiles of colleges.

A key element in the research was the use of cluster analysis to identify possible institutional types based on the choice of variables. Two cluster analyses were undertaken and their results reported and discussed. In the first, clusters of similar institutions were identified using size combined with either course or student characteristics. The intention here was to pursue a fine-grained analysis, so generating a large number of institutional types. In the second (alternative) analysis, the variables were chosen with a view to producing a smaller set of clusters. The different pictures of institutional diversity presented in the two analyses, along with the findings based on the use of descriptive statistics, were set alongside the official classification (six-type or three-type where appropriate) of colleges in the further education sector. If, as argued in the thesis, there is a need for a more refined categorisation of colleges, there is still a balance to be struck: between the nature and extent of diversity which is able to be captured and, on the other side, the number and range of institutional types that make sense for policy development and public understanding.

1.5: Structure of the thesis

The thesis is presented in fifteen chapters. These include four literature review chapters, two chapters detailing the technical aspects of the thesis including the design and methodology, three chapters presenting descriptive statistics, three chapters presenting the results of cluster analyses and finally two chapters summarising the findings and discussing the overall conclusions of the study. These chapters are supported by a number of annexes and by additional data on a companion disk.

Chapter One is an introduction to the aims of the research, the questions and issues investigated, the approach and methods of analysis, and the value of the study. This is followed in Chapter Two by an account of the history and development of the FE sector in England with a focus on recent developments since the incorporation of colleges in 1992. It situates the FE sector in relation to the other education sectors in England and describes how the modern FE sector has evolved from its roots in vocational education and training. Chapter Three defines the scope of the investigation providing an overview of the institutions, programmes and qualifications found in the further education sector and represented in the statistical information collected by the Data Service and its classification of colleges.

The concepts of institutional diversity are introduced and examined in Chapter Four. It considers how key authors conceptualise diversity, both in its basic form and specifically in the context of educational systems. Moreover, the perceived benefits diversity brings to an educational system and the wider society are reviewed. This is followed by an examination of the theoretical concepts and models that underpin the academic literature on institutional

diversity, differentiation and diversification in Chapter Five. Particular attention is paid to typological and classificatory studies.

Chapter Six is the first of two methodological chapters. It outlines the main sources of data and the rationale for the selection of variables. In Chapter Seven the methods of analysis are outlined along with the justification for their selection.

Chapters Eight and Nine present the results of the analysis of descriptive statistics on course characteristics and student populations respectively. Each variable is examined at both the system and institutional level. In Chapter Ten, the findings of a two-way variable analysis are presented to show the strength of the interactions and associations between each of the course and student variables. These associations partly explain the profiles seen in the later analysis as well as examining links between the two data sets of student and course characteristics.

The results of the cluster analysis on course and student characteristics are described in Chapters Eleven and Twelve respectively. This is initially presented using an analysis of the membership of each of the clusters within the individual variables and a description of which characteristics are represented by the respective cluster. This is followed by a breakdown of all the clusters identified by the cluster analysis and what this indicates about the diversity of the sector. An alternative approach to the cluster analysis is outlined in Chapter Thirteen. This analysis uses less strict criteria for grouping colleges, with a greater concentration on course and student characteristics, rather than the size of colleges.

Chapter Fourteen summarises the overall findings of the research. Key patterns are identified and considered in relation to the current classification of further education colleges. Finally, Chapter Fifteen reflects on the scope, conduct and rationale for the study as well as its contribution to knowledge and its potential to inform further research. By way of conclusion, an argument is made for a review and revision of the standard classification, especially at a time when the number of colleges is expected to reduce as a result of mergers and their future role in technical and apprenticeship education is emphasised.

Chapter 2: The contemporary history and development of further education in England

This chapter is the first of four reviewing the literature relevant to this study: first it situates the further education (FE) sector in relation to the other education sectors in England and secondly, it describes how the modern FE sector has developed from its roots in technical education, including how it proceeded through to its current stage of development.

2.1: The further education sector in England

This section describes what part the FE sector plays in the education sector as a whole, considering both of its near neighbours in education, the secondary schools and the higher education (HE) sector (mainly universities). It also briefly discusses how the relationship with the schools sector has changed over the past 100 years or so.

The FE sector is considered a part of the post-compulsory (i.e. after school leaving age) or tertiary education sector, with the HE sector comprising the other part of post-compulsory education. However, in modern times these boundaries have become blurred, as both higher education and some compulsory age students are enrolled on courses in the FE sector (Parry, 2009). Nonetheless, the school leaving age has been the most significant determinant for when students become available to enter FE, particularly in the past (for further details see Annex One).

FE, as noted above, is situated alongside the HE sector as part of a broader post-compulsory education sector. It has been recently described in the Lingfield Report (Lingfield, 2012) as:

> All forms and levels of the educational process involving, in addition to general knowledge, the study of technologies and related sciences, the acquisition of practical skills, know-how, attitudes and understanding relating to occupations in the various sectors of economic and social life (p. 14).

This definition, which, according to the report, was the UNESCO definition for Technical and Vocational education and training, indicates how wide ranging the scope of the modern FE sector has become. The remainder of this chapter discusses how the FE sector has developed to this position from its roots in technical education.

2.2: The early development of the further education sector

Pre-1944

Prior to 1944, FE in England was originally limited to technical education carried out on a voluntary basis through employers, though other forms of self-education existed. Technical education usually took the form of apprenticeships and was marginalised from general education and low in status (Green and Lucas, 1999). The main precursors to the technical colleges were the Mechanics Institutes of the 1820s. However, these were largely unsuccessful as their middle class ethos alienated potential working class recruits. Furthermore, in the development of their programmes the institutes began a process of separating general, scientific and technical education. It was this process that was reinforced

as a result of strong political and educational debates that created the academic and vocational divide that still affects our system today (Hyland and Merrill, 2003).

The voluntary tradition came under ever-increasing criticism from the mid nineteenth century to 1944, as different approaches to FE, particularly technical education, were attempted. This criticism arose in part due to the poor quality of technical education available to British workers compared to other established European countries (such as France and particularly Germany). In this period, the 1889 Technical Instruction Act and the 1890 Local Taxation Act were passed, providing more public funding for technical education. This money allowed for a range of technical colleges and polytechnics to be set up in the 1890s. Nonetheless, there was a sharp divide between general education and technical education and a definitive separation of skills and knowledge, historically linked to the Mechanics Institutes programme development of the 1820s. This was in contrast to the aforementioned countries of France and Germany where general education and technical education were interlinked (Green and Lucas, 1999).

The period between the passing of the 1902 and 1944 Education Acts (Education Act, 1902, 1944) was a time of expansion in technical education, particularly in commercial fields (Green and Lucas, 1999). This was in part attributed to the creation of the National Certificate, available at both ordinary and advanced level (Hyland and Merrill, 2003), which would become the mainstay of vocational education and training in FE colleges.

The 1918 Education Act known as the Fisher Act (Education Act, 1918), required local authorities to provide part time education for all young people up to the age of 18, who were not in full time education (Hyland and Merrill, 2003). The Fisher Act (the implementation of the 1917 Lewis Report (Bostock and Wood, 2012)) attempted to establish further modes of study in which young people could be educated, but this aspect of the Act was never fully implemented (though they did enrol 30,000 students at junior technical schools in 1937). This failure was mainly due to the hostility of parents and employers to the day-release elements of the system, combined with the economic downturn of the 1920s (Hyland and Merrill, 2003).

During this period there was also some expansion of adult non-vocational education with community education pioneered by Henry Morris in the 1920s and 1930s and the Women's Institutes founded in 1924. As Green and Lucas (1999) point out, these developments combined to substantially expand the sector, but fell far short of creating a national FE system. During the Second World War there was a further expansion in technical courses and engineering cadetships as well as higher national certificates in industry (war production) and the armed forces (Hyland and Merrill, 2003).

The expansion of provision during the war years was followed by further rapid growth after the Second World War, as the demobilised military required training for work at home. During this time, alongside the technical colleges, the adult education institutes started to cater for part-time academic, vocational and leisure activities (Green and Lucas, 1999).

1944-1987

The 1944 Education Act was the first to make it a legal duty for the Local Education Authorities (LEAs) to secure *'adequate'* provision of FE (Hodgson, Bailey and Lucas, 2015; Cantor and Roberts, 1972). Though no definition of what *'adequate'* constituted was presented, the Act

nonetheless sought to achieve for FE what the 1918 Fisher Act could not: by implementing day release, physical, vocational and practical training through the establishment and maintenance of county colleges which the LEAs were now required to set up. In the first year of this policy nothing extra was spent on colleges but gradually progress was made. Employers were asked by government to cooperate with the new colleges, which led to colleges becoming established as providers of day-release vocational education and training for those serving apprenticeships (Green and Lucas, 1999).

This extension of provision, after a slow start, led to 335,000 being enrolled on day-release courses in 1954. Also during this time period, the Percy Report of 1945 led to the establishment of ten colleges of advanced technology by 1956, heralding the beginning of '*advanced further education*', which eventually led to the creation of the polytechnics in the 1960s (Hyland and Merrill, 2003). From this point, FE encompassed advanced FE (AFE), what we now call HE, and non-advanced FE (NAFE). At one end were the polytechnics doing mostly AFE and at the other end were some FE Colleges doing only NAFE. FE institutions had different balances of AFE and NAFE (Parry and Thompson, 2002).

In 1956 the publication of a government White Paper, *Technical Education*, announced legislation proposing a new diploma in technology equivalent in level to the university bachelor degree. It also set targets of doubling day-release students in five years from the 335,000 in 1954. While this would have substantially increased this aspect of education, these targets were not met as even ten years later those on day-release had only risen to 650,000 (Green and Lucas, 1999). The Crowther Report (Crowther, 1959) criticised the FE sector for its confusion and proliferation of courses, its high part-time attendance and low retention rates, calling for more day-release and sandwich courses.

The 1958 Carr Report had also criticised aspects of the FE sector. Carr had focused on the poor quality of the apprenticeship system. The report stated that there were unduly lengthy periods of time-serving, a failure to train to any specific standards and imparting a narrow skill set with limited general education and theoretical aspects (Green and Lucas, 1999). However, the report also stated the training needs of many groups were not being met, especially women and semi-skilled workers.

These criticisms and the resulting 1961 White Paper, *Better Opportunities in Technical Education,* which put a greater emphasis on lower levels of study, led to increases in provision for technicians, craftsmen and operatives. Furthermore, government initiatives led to a significant shift towards full-time, sandwich and day-release courses between 1959 and 1965. The 1964 Industrial Training Act sought to further remedy the limitations identified by the Carr Report as most programmes were limited to relatively few employment areas, tended to exclude girls and women and were often used by employers as a relatively cheap way of training their workers (Hyland and Merrill, 2003). This led to the establishment of Industrial Training Boards (ITBs) which by 1966 covered 7.5 million workers, though it never became a national apprenticeship system. Despite this, the ITBs made significant advances in improving the quality of training and their modular engineering training initiated greater flexibility and breadth in the apprentice training system (Green and Lucas, 1999). However, the overall objectives of the ITBs, of opening up apprenticeships to previously excluded groups, changing the old practices of time-serving and age restrictions were not met. This Green and Lucas (1999) attribute, not to failures in the principle of government intervention in FE, but to a lack

of binding powers for the Trade Unions and a lack of power to compensate for this in the Central Training Council.

Around the same time, the 1963 Robbins Report (Robbins, 1963) into HE was also to have a significant effect on the FE sector. The report recommended that the government increase provision of HE in universities but it also recommended that numbers be expanded in colleges of advanced technology, teacher training institutions and the polytechnics (Scott, 1995). Shortly thereafter, the 1966 White Paper, *A Plan for Polytechnics and Other Colleges*, created the binary divide between universities and polytechnics as providers of HE (National Archives, 2015). Over the next three decades, the polytechnics and colleges of higher education, like the FE colleges, remained under local authority control (Pratt, 1997).

Furthermore, in 1972, the James Report recommended that the teacher training colleges should diversify their provision to more general higher education (Cantor and Roberts, 1983). Some HE has been taught in FE colleges since the forming of the sector in 1944 but only to a limited degree, with small numbers of colleges offering degrees from the University of London and Higher National Diploma and Certificate courses. These changes together with the impacts of the Industrial Training Act resulted in the mid to late 1960's and early 1970's being a time of substantial changes in the function of the FE sector.

The 1973 Employment and Training Act established the Manpower Services Commission which was a national body created in 1974 to coordinate vocational training. It was to oversee and develop government initiatives such as the Youth Opportunities Programme and the Training Opportunities Scheme, which offered retraining and skills development to currently unemployed adults. This new stream of funding was available to colleges, but also to private training companies, which was resented in some parts of the FE sector as it had seen itself as the main, if not sole provider of '*off-the-job*' training (Wallace, 2015).

This prior focus on vocational courses is part of the reason the FE sector has been seen as lower status to that of the HE sector both in terms of funding and prestige (Young, 1999; Dearing, 1996). Indeed, the government have made repeated attempts such as this, to create a vocational track equal in perceived prestige to the academic track, but have met with repeated failure (Unwin, 1997; Finegold and Soskice, 1988). However, as discussed in the previous section, the end of the 1960's and onwards to recent times saw the diversification of colleges from technical institutions into the general FE colleges we have today. This included the introduction of more and more academic courses taught at institutions of FE (Green and Lucas, 1999). Initially this came from the growth of the 'second chance' O and A-level market in turn stimulated by the expansion of HE and the fact that many schools were finding it increasingly difficult to maintain viable sixth-forms. This process continued throughout the 70's and into the 80's and indeed by the end of the 1980's the sector was responsible for some 40% of A-level teaching, though still with a high density of vocational training (Green and Lucas, 1999). This growth continued into the 90's (and beyond) with colleges achieving a higher proportion of A-level candidates than that of schools.

A second reason for the broadening of the curriculum in FE colleges was the decline in youth employment from the mid 1970's, to which the government reacted by introducing important initiatives in vocational qualifications for the unemployed school leaver (Avis, 1983). For adult returners there were also initiatives resulting in numerous new qualifications in both academic

(the new O and A-level qualifications) and vocational education. Finally, the 1973 oil crisis, the economic depression of the 1970s (a contributing factor to the youth unemployment) and the major de-industrialisation of the manufacturing sector resulted in a decline in FE college provision in their economic and work based role, particularly in engineering, construction and other traditional industries such as shipbuilding (Green and Lucas, 1999). As a result of this decline it may have been inevitable that colleges would seek to expand into other areas as they sought to remain viable, though of course increasing demand for other services would also have been a contributing factor.

College organisational structures changed substantially during the mid to late 1980s with colleges moving away from the previous structure of sets of competing departments to which staff held allegiance, towards a corporate identity within which strategic planning was possible (Green and Lucas, 1999). This likely precursor to the incorporation of colleges in 1992 enabled colleges to take better advantage of opportunities created by a demand for courses by an increasingly diverse student body; and to deal with increasingly diverse demands of various government departments and agencies, to which they were accountable. For example, the establishment of the National Council for Vocational Qualifications following a review of vocational qualifications in 1986, led to the introduction of the National Vocational Qualification (NVQ), for which colleges were accorded major responsibility. Furthermore, the government was encouraging institutions to become more responsive to the needs of employers and other community bodies (Hyland and Merrill, 2003), reinforcing the need for strategic planning.

1988-1992

The end of the 1980s saw the Education Reform Act of 1988 which increased the powers of college (and school) governing bodies whilst reducing the power of local authorities. This was in part facilitated by the removal of those institutions predominantly concerned with AFE into the separate HE sector: mainly the polytechnics but also included were a small number of colleges of higher education. Those institutions remaining in the FE sector were colleges predominantly (but not exclusively) concerned with NAFE which is what we have today (Parry and Thompson, 2002). This was seen as a first step towards full independence for colleges, eventually created by the granting of corporate status by the 1992 Further and Higher Education Act (Hyland and Merrill, 2003).

2.3: The development of further education colleges after incorporation

The incorporation of colleges can be seen in two parts. Firstly, there is the change to the ownership and control of colleges shifting from the LEAs to the colleges themselves. Each college became an individual corporation ostensibly with autonomy to act as it saw fit. However, the second part of incorporation was new funding regimes and regulations. These aspects greatly limited this freedom (Hodgson *et al.,* 2015; Fletcher, Gravatt and Sherlock, 2015). Nonetheless, by giving colleges incorporated status, the government wanted them to emulate the experience and achievements of the polytechnics (rapid expansion and widening participation at lower unit costs), which were removed from local government control after 1988 (Nash and Jones, 2015).

During the entire post-92 period, colleges have continued to offer qualifications accredited by

external bodies such as EDEXCEL (part of the Pearson qualifications group), OCR (Oxford, Cambridge and the Royal Society of Arts) and the Assessment and Qualifications Alliance. Some of the key qualification developments over this time period are discussed in the following sections and further details on modern qualifications can be found in Chapter Three. Similarly, institutional mergers have been a common theme since incorporation and 131 mergers have occurred between 1993 and 2016 (AoC, 2016a). This major topic is also considered in detail in Chapter Three.

The incorporation of colleges in 1992 led to major changes to the funding system of the FE sector. Prior to 1992, the FE sector was funded largely with public money through local authorities but, starting with the funding and oversight of the FE sector being transferred to the Further Education Funding Council (FEFC) at the time of their incorporation (Fletcher *et al.,* 2015), the last 23 years have seen major changes to the way the FE sector is funded. Moreover, Fletcher *et al.* (2015) contend that since incorporation there have been four major phases up to the general election of 2015, which were:

1. an early post-incorporation period focussed on growth and increased efficiency, alongside the assimilation of all colleges into a common system
2. a '*late FEFC*' phase, marked by a reaction against some of the more dramatic instances of gaming the system by some colleges
3. a third period of increased emphasis on planning and targets, introduced by the Learning and Skills Council (LSC) after 2001
4. in the most recent period, greater freedom from targets, balanced by more elaborate eligibility rules

The following sub-sections detail the major changes to funding and other aspects of the FE sector organisation, during each of these phases up to modern times. Where possible these changes are organised chronologically, but some topics contain multiple changes and thus are arranged chronologically within that topic.

1992-2000

This section covers the FEFC years. The incorporation of colleges, as a result of the 1992 Further and Higher Education Act, was the most substantial change to the sector since its formation in the 1944 Education Act (Howard, 2009). It included changes to system structure, funding, inspection and pay and conditions for teaching staff for the FE sector. The HE sector was also substantially changed with the former FE sector institutions, the polytechnics (and some colleges of higher education), being entitled to become universities, thus abolishing the formal binary divide between HE institutions. The HE sector was to be funded by the Higher Education Funding Council for England (HEFCE) with data collected by the Higher Education Statistics Agency.

Similarly, the FE sector was to be funded by the Further Education Funding Council (FEFC) but the FEFC would collect its own data (Further and Higher Education Act, 1992). Their response to this latter provision was to create the Individualised Learner Record (then known as the Individualised Student Record) which was the most comprehensive collection of student data ever undertaken at that time (Howard, 2009). In addition to the FEFC, a separate funding stream was set up to oversee the work-based training route and much of adult skills development in the workplace (Panchamia, 2012; Howard, 2009), overseen by the 72 newly

created Training and Enterprise Councils (TECs). The TECs were a replacement for the Manpower Services Commission which had previously been absorbed into the Department of Employment in 1988 and renamed, first as the Training Commission and then as the Training Agency, before finally being entirely replaced by the TECs in 1992 (Wallace, 2015). These two major competing funding streams were further complicated by the presence of separate arrangements for the funding of programmes for the adult unemployed and another system for non-accredited adult learning, over which LEAs had control (Howard, 2009).

The 1992 Act also saw the FE college sector's institutions removed from local education authority control and located in a new enlarged FE sector as a result of the addition of sixth form colleges (previously under schools regulations). Furthermore, they became corporate bodies in a process that became known as the incorporation of colleges with the intent of institutions competing with each other for students and thus funding (Further and Higher Education Act, 1992). During this time sixth form, general FE and specialist became common descriptors of colleges used in both academic and government literature.

The FEFC introduced a new funding system which has been described as an output based funding model (Panchamia, 2012). The funding system prior to the FEFC changes consisted of annual block grants from local authorities (LAs), which were based on the number of expected student enrolments regardless of performance or outcomes. The FEFC introduced a new system, intended to maximize student retention and achievement, which provided funding incentives for course completion, achievement of qualification or job placement (Panchamia, 2012). In addition to this public funding, the newly independent colleges were allowed to keep any further income generated from private sources, giving them a real incentive to diversify their sources of income (McClure, 2000).

As institutions began to cope with the new funding structure from the FEFC, a diverse selection of strategies were learned and implemented, though not all of them were legitimate (Smithers and Robinson, 2000). For example, some institutions engaged in '*unit farming*', a practice which involved entering students for extra qualifications within a single course, thereby receiving additional funding for the same number of students (Panchamia, 2012). Alternatively, there was the practice of '*unit maximization*', which involved prioritising those students who would attract the greatest number of funding units. In addition to the core funding, the government was also supplying a Demand Led Element (DLE) intended to stimulate growth in the sector (McClure, 2000). The DLE was originally limited to full-time only students which were a minority in FE; this targeted funding could have led to an increase in full-time students. However, due to the flexibility of the government definition of what a full-time student was, instead it largely led to numerous students who had previously been classified as part-time being reclassified as full-time (McClure, 2000).

The FEFC also introduced a new inspectorate and quality assurance protocols: previously the FE sector institutions had been subject to occasional inspections by Her Majesty's Inspectorate and in most LEAs, by local inspectors of education (Fletcher *et al.,* 2015). This newly created inspectorate was the first specifically dedicated to the FE sector and included the development of performance indicators and seven key protocols of inspection which were:

1. regular inspections of every college on a four-year cycle
2. a fixed three-month period of notice for inspections

3. a five-point numerical grading scale
4. the extensive use of associate inspectors drawn from the sector
5. an explicit and transparent inspection framework
6. a process of systematic annual self-assessment
7. detailed published inspection reports

The new regime was generally well received by colleges despite some colleges not faring well in the new nationally published reports. These inspections interacted with the funding system with colleges not allowed to grow in areas identified as poor quality, but despite this the arrangements were generally seen as supportive rather than confrontational (Fletcher *et al.,* 2015). However, this new inspectorate was not alone in the FE sector as the newly created TECs, in addition to having their own funding stream, also introduced their own inspectors (Howard, 2009), further exacerbating the confusion in the sector with multiple funding schemes and also inspectorates.

In the first of several revisions to the apprenticeship scheme over the next 20+ years, in 1994 the apprenticeship was reinvented and termed the 'modern apprenticeship'. It was part of a drive to improve technical skills in the workforce and was funded by the TECs (Vickerstaff, 1998). The then Conservative government originally designed a three year programme at level three, which was based on German, Scandinavian and Swiss models, in order to close the skills gap between the UK and these countries (Steedman, 2011). The Conservative government also sought to guarantee work based training for all 16 and 17 year olds who wanted a place.

The Labour government of 1997 to 2010 further revised the apprenticeship programme in the days of the FEFC/TECs by creating level two apprenticeships from a revision of government training programmes to address concerns from employers about a lack of qualified applicants for level three programmes (Steedman, 2011). This improved the quality of low level skills programmes as students switched over from other work based learning provision to level two apprenticeships but failed to address the lack of employer interest in offering apprenticeships. Indeed, the number of advanced apprenticeships (level 3) actually fell during the Labour FEFC years (and beyond) (Steedman, 2011).

The latter days of the FEFC saw some colleges grow substantially as they were not subject to restrictions on where they could recruit. Some grew through the use of new franchising agreements where delivery was *via* low cost partners, which could be any distance from the franchising college. This increased competition between institutions, as it was possible to be undercut by institutions many miles away, which made it difficult for any one college to stand out in the race for unit growth (Fletcher *et al.,* 2015). These changes in funding methodology were intended to change behaviours in order to increase efficiency by driving down unit costs and increasing the achievement of qualifications with rewards for completion and achievement (Howard, 2009).

A second type of franchising agreement was between universities and some colleges. By the time of the Dearing Report (Dearing, 1997), 10 per cent of HE students were being taught in FE institutions. Furthermore, Dearing then recommended to government that it should instead attempt to increase the number of HE students in FE institutions at sub-degree level and that they should be funded directly instead of through franchising (Dearing, 1997, recommendation

67). However, this did also include a proviso that degree level courses should not be funded for the FE sector (Dearing, 1997).

Contemporaneously, the Kennedy Report (Kennedy, 1997) investigated widening participation in FE. Its main conclusions were:

- Any national strategy of widening participation must have the FE sector at its core, emphasising the role of colleges in social inclusion and lifelong learning
- Market principles alone (as introduced by the 1992 Act) would not widen participation due to incentives in the funding model to recruit those students most likely to succeed
- The competition model inherent in the incorporation of colleges reduces opportunities for collaborative, strategic and operational approaches, particularly at the local level
- Funding was the strongest lever of control available to the government to achieve it, but that the then funding model of the FEFC was insufficient for this purpose.

Furthermore, it made recommendations to improve the availability of information, advice and guidance to students with the aim of widening participation and that new systems of financial support needed to be made available to students.

McClure (2000) points out that colleges had been used to being part of a planning process, with different authorities attempting to plan and coordinate their provision with other LAs rather than the competitive environment that was introduced by incorporation. This created new challenges for college management as they were now on their own in responding to the needs of their localities as well as attempting to secure enough funding to remain solvent.

The confusion over funding and inspection added to the issues identified by Dearing and Kennedy, which together eventually led to the FEFC and the TECs being replaced by a new body. The then Secretary of State, David Blunkett (1999), stated in his Foreword to the 1999 White Paper, *Learning to Succeed, a new framework for post-16 learning*, that both commentary and consultation had identified the "inconsistency and contradictions in present funding and delivery mechanisms. There was widespread support for fundamental change and, in particular, for the creation of a single body to oversee national strategies for post-16 learning". (p. 1).

2001-2010

2001 saw the introduction of the new body, the Learning and Skills Council (LSC). The LSC was given responsibility for the planning (unlike the FEFC), funding and regulation of learning opportunities in community and adult learning, work based training and other FE. This amounted to all education and training post-16, with the exception of HE, being brought together under a common planning framework. The LSC was formed to replace several organisations; the Further Education Funding Council, the 72 Training and Enterprise Councils, the three separate Inspectorates and to absorb the functionality for this area of education for sixth form colleges and adult and community learning from local authorities and other voluntary and community organisations (Coffield, Edward, Finlay, Hodgson, Spours and Steer, 2008). Therefore, this meant that colleges which had previously had their own sector under the FEFC/TEC funding system were now joined in the FE sector by a number of different organisational types including private training companies, charities and various community organisations, though colleges remained the dominant providers. For the first time, a public

body was given statutory duty to encourage participation in learning (Blunkett, 2000a). Each year the Secretary of State's annual remit and grant letters added new objectives and provided new targets or areas of work (Coffield, 2008).

Under the LSC, there were serious attempts to encourage general FE Colleges to specialise in one or more vocational areas and to make them their core mission. Colleges which did this were able to be recognised as centres of vocational excellence (CoVEs) (Blunkett, 2000b). The CoVEs were intended to tackle the skills deficit in England by increasing specialisation in colleges, an approach that had previously met with success in the schools sector (Blunkett, 2000b). Though this programme was largely considered a success (Hodgson *et al.,* 2015), the skills deficit and related issues are still problems today. Similarly, the Foster Report of 2005 recommended that colleges recover their vocational origins and their traditions as technical colleges (Foster, 2005). However, despite these attempts the FE colleges largely retained their broad missions with courses across multiple types of education provision remaining available throughout the LSC years and beyond (Stanton, Morris and Norrington, 2015)

This drive towards vocational excellence precipitated the introduction of a new vocational qualification, the Foundation Degree, which was introduced in 2001 with the intention of tackling the historic skills deficit at the intermediate levels. The Foundation Degree was intended to be delivered largely (but not exclusively) by FE colleges, in line with Dearing's recommendations of 1997 for sub-degree HE. It was a short cycle qualification at two years full-time rather than three at bachelor's degree level but was intended to guarantee arrangements for progression to the bachelor's degree. Furthermore, the government involved employers in its design and operation, thus enabling students to apply their learning to specific workplace scenarios (Parry, 2012).

In 2002 the government published the White Paper, *Success for All*, which proposed reform of the FE skills sector. It was intended to tighten the links between employers and course design, particularly of the foundation degree and apprenticeships (DfES, 2002). Moreover, it aimed to improve choice available to students in order to meet more learner needs, improve the standards and professionalisation of teachers and teaching and establish a new planning, funding and accountability system. This included an expansion of the CoVE network in order to strengthen its focus on meeting regional and sub-regional skill needs (DfES, 2002). Furthermore, a process termed the strategic area review was initiated in which the intent was to determine the configuration of provision which was best suited to meet both the skill requirements and learner needs of a region (DfES, 2002). These reviews were conducted by local LSCs and, in addition to meeting needs requirements, were also intended to drive up standards and success rates, as well as improving collaboration between providers to achieve economic and educational success for their region (DfES, 2002).

At the same time the government also introduced Individualised Learning Accounts (ILAs). Despite the ILA and the LSC being introduced almost simultaneously the two reforms consisted of fundamentally opposite approaches with the LSC pushing for a centrally planned approach to the FE sector and the ILAs aiming to give individuals more choice and control over the type of provision available. The ILAs only lasted eighteen months; poor design led to poor quality provision, outright fraud and a lack of reliable information for learners to make good decisions on which courses to take, led to its closure. This failure contributed to shaping the future of the LSC as it illustrated the need for careful regulation of choice-based markets and reinforced

support for an increasing centralised approach to the development of the sector (Panchamia, 2012).

In contrast the Foster Report (Foster, 2005) recommended that, to bring it in line with other public services (such as the NHS), the FE sector should implement a learner-centred approach. The government funded scheme Train2Gain was rolled out nationally in 2006 (after being introduced in 2002). It was an attempt to meet both these recommendations and those of increased competition and employment focus also in the report. In Train2Gain, funding was intended to follow choices made by employers and individuals. Providers (including colleges and private training companies) would then compete with each other to provide the work-based training (Panchamia, 2012).

Furthermore, Skills Accounts were introduced during this time to give employees access to information and advice about the quality of training courses. Quality of provision, particularly by some private training organisations was a problem during the Train2Gain scheme, as was the limited options available for funding, with the government primarily funding NVQ level two and three qualifications central to their skills targets. Indeed the scheme was also criticised for failure to involve employers or employees in its development and its tendency to simply assess existing skills rather than offer additional training (Fletcher *et al.,* 2015; Lanning and Lawton, 2012). The scheme was eventually abolished by the coalition government after they came to power in 2010, partly for these reasons but also because it was felt by the new coalition government that the scheme provided funding for training that employers would have paid for themselves (Lanning and Lawton, 2012; Hayes, 2010; Spending Review, 2010).

In the mid 2000's, the LSC also included unprecedented levels of central planning and intervention in the management of colleges, with LSC staff seeking to promote courses which were accredited over those that were not, as well as those which met government targets (Fletcher *et al.,* 2015). Initially there was also less emphasis on improving efficiency as a result of higher public spending in the first few years of the LSC, as budgets were prioritised for those institutions which could best increase learner numbers, though this became less so after 2005. There was also more emphasis placed on increasing the financial contribution of employers and students from 25 percent of costs to 50 percent (Fletcher *et al.,* 2015).

The Apprenticeships, Skills, Children and Learners Act of 2009, included further reform to the apprenticeship scheme with the creation of a National Apprenticeship Service. This service was given the task of recruiting employers to offer increased numbers of apprenticeship places. Furthermore, the Act provided a guarantee of an apprenticeship (rather than worked based learning) to any school leaver that was appropriately qualified (defined as 5 GCSEs A*-C), although this was repealed in 2011 by the coalition government (Steedman, 2011). The Act also established Sixth Form College Corporations which were distinct from FE Corporations and regulated by the Department for Education rather than the Department for Business, Innovation and Skills (BIS, 2014). Prior to this there had been no formal legal differences between the various college types which while used extensively, were informal categories (DIUS, 2008). This was a likely precursor to the funding body changes described below as it separates a form of education almost exclusively utilised by young people from that of more general FE colleges commonly utilised by adults.

The LSC years also saw the start of cuts to adult education funding, though Alan Tuckett of the National Institute of Adult and Continuing Education formed an agreement with Ivan Lewis then Parliamentary Under-Secretary in the Department for Education and Skills (Skills and Vocational Education), to safeguard spending on non-vocational adult education (set at £210 million) (Perry and Davies, 2015). The fall in the number of adult learners in the FE sector has been dramatic with 3,480,000 in 2002/3 to 1,500,000 ten years later. Further cuts to adult education since then have led to further decreases and even caused the Association of Colleges to comment that if cuts continue, adult education may be a thing of the past (AoC, 2015).

Throughout the LSC years funding was used as a major lever of control over colleges by central government. The LSC did introduce a national funding formula for school sixth forms and took slow steps towards harmonising the levels of funding for colleges and school sixth forms for students of the same age (Fletcher *et al.,* 2015).

The LSC's difficulties led to it being shut down in 2010 and replaced by new funding agencies, the Young People's Learning Agency (YPLA), which provided funding for younger students in the 16-19 age bracket and the SFA which allocated funding for adult learners.

2010-current

These agencies were of a smaller combined size than the LSC had been due to austerity measures under the new coalition government at the time with a mandate to cut costs, focus resources on government priorities and simplify funding methods (Fletcher *et al.,* 2015).

The YPLA did not last long: the coalition quickly closing it in 2012 and replacing it with the Education Funding Agency whose remit was extended to include funding for education from age three to nineteen (Hodgson *et al.,* 2015). This led to a new funding approach for younger students in FE with such students now funded on a per capita basis[1]. This new funding system was also intended to remove perverse incentives which encouraged colleges to attempt to maximise the number of qualifications attempted, as identified by the Wolf Report (see below). Also removed was the financial incentive for successful outcomes, although the retention of students for the full year funding incentive remained (Fletcher *et al.,* 2015).

This meant that the FE sector in England was now funded for teaching by three separate government bodies, the Education Funding Agency (EFA), SFA and, for some HE students in FE colleges, HEFCE. The following paragraphs examine the funding models for the two FE specific funding streams.

The funding model which the EFA introduced at this time changed the system from a qualification funding model to a student funding model (Mucklow, 2013). This meant that all funding was equal for any student on any course that was full-time. If a course was part-time then institutions would receive funding per student based on the full-time equivalency. This was calculated in four categories with each category receiving a set amount of funding based on the ratio of hours compared to a full-time course. Furthermore, students now had the same base rate regardless of whether or not they were undertaking a vocational or academic programme (EFA, 2013). The subject studied would affect funding levels but only regarding

[1] With weighting for expensive subjects, a London weighting and a weighting for disadvantaged learners.

how expensive provision in that subject was, not whether or not it was being studied in an academic or vocational setting. However, it should be noted that only vocational programmes were considered to require modification through this means (EFA, 2013).

Like the previous qualification-centred funding model the new learner-centred model was affected by several factors that modify the funding an individual institution would be allocated. In addition to those already discussed above these were: a disadvantage uplift factor for students from disadvantaged backgrounds, additional learning support for students with disabilities or learning disabilities and a modifier for expensive geographical regions.

Conversely, the SFA retained a qualifications based funding model, though the new system was simplified (SFA, 2013). Under this system the base rate was determined by the subject studied for all qualifications, regardless of whether they are vocational or academic. This rate was then modified by a disadvantage uplift factor and geographical area factor (similar to the EFA system) (SFA, 2013). However, additional learning support was then calculated separately from funding per student in the SFA model and was to be paid from one funding allocation to providers (reduced from three separate funding streams). Additionally, the SFA withdrew financial support for courses at level three and above for learners aged 24 and over; this was replaced by a loans system for tuition fees, similar to that in the HE sector (SFA, 2013). An impact assessment by the Department for Business, Innovation and Skills (BIS) criticised this policy after it found that 250,000 adult learners may be lost to the FE sector from the introduction of loans (UCU, 2013). Furthermore, the University and College Union (UCU) feared that this may cut down on enrolments in specific course types potentially rendering them unviable (UCU, 2013).

More recently funding cuts for adult education have continued with Julian Gravatt (2015) of the Association of Colleges (AoC) stating that "the consequences of protecting the £1.6 billion apprenticeship budget and expanding the unimpressive employer ownership programme is a 25% reduction in spending on adult FE for the 2015/16 academic year". (p. 1).

This, Gravatt notes, comes after a brief period of protected budgets that ended in 2012. Since then he describes an "increasingly fast withdrawal" (p. 1) by the government from funding adult FE with no adequate plan in place for securing alternative funding from other sources. Whilst the AoC notes that these cuts have slowed down in 2016 with the SFA announcing only a small cut in real terms, there are still substantial changes coming to the funding of the FE sector (AoC, 2016c).

In addition to changes to funding bodies and their funding policies, this period also saw an investigation into vocational education with the Wolf Report (Wolf, 2011). This report paid particular attention to the quality of vocational qualifications, especially the number of vocational qualifications that did not actually provide learners with skills which would enhance their prospects of employment. It also endorsed the apprenticeship as a strong route through vocational education which is a current government priority. Finally, the report discussed the importance of mathematics and English GCSEs to the employment of young people. It suggested numerous methods to improve these skills for those learners who had failed to attain at least a C grade in these subjects in their pre-16 education. It also suggested that the ambition should be to reduce the levels of remedial education for such subjects in the FE sector, by improving pass rates prior to this stage.

A follow up report to the original 2011 Wolf Report was published in 2015 (DfE, 2015). It evaluated the progress made in attaining the Wolf Report's various recommendations. For example, it noted the new structures in place for students who have not attained GCSE grade A*-C in English and mathematics and the redesign of apprenticeships by employers in order to meet employer needs. Finally, it also described the success of the new funding system, identified above, in meeting the goals of the original Wolf Report (DfE, 2015).

In addition to the changes to the apprenticeship system resulting from the Wolf Report this period also saw numerous other changes to the apprenticeship system. These included (Mirza-Davies, 2015):

- Further funding was made available to further develop high level apprenticeships in 2010.
- The introduction of employer grants of £1500 to small businesses hiring an apprentice in 2012.
- Also in 2012, there were numerous revisions to the minimum standards for apprenticeships; including at least 280 hours of guided learning in the first year and a minimum of 30 hours a week employed work. These standards were reviewed and revised again in 2014.
- The Richard Review of apprenticeships in England was also conducted in 2012 and had numerous recommendations on the target audience for apprenticeships, basic skill requirements, course design and government involvement.
- The introduction of an access qualification, the traineeship, in 2013, was intended to get young people (under 24) who are unemployed and have little work experience, onto apprenticeship programmes or into work.
- In 2015 the government's productivity plan (other aspects discussed below) announced the 'apprenticeship levy', which is a business tax designed to improve employer funded training for their workforce.

A number of short lived programmes such as, advanced learning loans for apprentices, the access to apprenticeships pathway (funding for people on apprenticeships with additional needs) have also had an influence on the progression of apprenticeships in this time (Mirza-Davies, 2015). However, their impact was limited due to the short life span of these programmes.

The Lingfield Report (Lingfield, 2012), on the Independent Review of 'Professionalism in Further Education', commissioned by the then Minister of State for Further Education, Skills and Lifelong Learning, John Hayes MP, discussed enhancing the professionalism of the sector, the inspection and autonomy of the sector and the creation of an FE Guild and FE Covenant. The Covenant, which was to be created under the purview of the FE Guild, would be a statement of the duties of FE employers and staff, particularly regarding aspects of professionalism and staff development.

The report stated that the proposed FE Guild should have the following areas of responsibility:

1. Coordinate qualifications within the FE sector to reduce their profusion and to establish benchmark qualifications by working with the national awarding bodies
2. Grant chartered status to high performing providers to allow greater autonomy and freedom from inspection

3. Raise standards of college governance
4. Improve feeling of professional identity for lecturers and improve generally the levels of professionalism of lecturers and employers.

When the Guild was finally launched in August 2013 it was formally called the Education and Training Foundation after its development by the Association of Colleges and the Association of Employment and Learning Providers. Its overall remit closely matched the four areas of responsibility suggested by Lingfield and its current specific aims within that remit are (The Education and Training Foundation, 2015):

- To raise the quality and professionalism of teachers and trainers across the FE and training sector
- To deliver consistently excellent outcomes for learners and employers
- To support colleges and training providers of all types in achieving their own improvement objectives
- To promote this vibrant sector to employers and national influencers, and raise awareness of its vital role in rebalancing the economy. (p. 1).

In addition, the Lingfield Report notes criticisms from institutions of the use of two funding bodies for the FE sector (EFA and SFA) and the number of adults leaving school with poor literacy and numeracy levels.

As previously noted, in 2015 the government introduced their plan for improving national productivity entitled *Fixing the foundations: Creating a more prosperous nation* (HM Treasury, 2015). This plan introduced policy for each of the education sectors and in the FE sector it announced the intended creation of institutes of technology. These institutes are intended to focus on high level skills (three, four and five) demanded by employers (HM Treasury, 2015). This was in addition to the five new specialist national colleges announced the previous year (Cable, 2014). Moreover, the plan initiated a new wave of area reviews. These reviews are intended to invite providers and stakeholders to participate in the reshaping and re-commissioning of local and regional provision, in order to improve efficiency and ensure financial resilience. Furthermore, as a result of these reviews the government anticipates that many colleges will be invited to specialise according to local economic priorities and that as a result some will need to become institutes of technology (HM Treasury, 2015).

The productivity plan also announced the government's intention to reform the professional and technical education system in England. This resulted in the Post-16 Skills Plan announced by Department for Business, Innovation and Skills and the Department for Education in July 2016 (BIS and DfE, 2016). The Post-16 Skills Plan is based on the findings of the Sainsbury Report entitled *Technical education reform: the case for change* (Sainsbury, 2016) and lays out substantial changes to the vocational/technical routes in the FE sector. The Sainsbury Report and Post-16 Skills Plan builds on the work of Alison Wolf (who was also on the panel of the report) to reduce the number of qualifications and awarding bodies for technical qualifications. The technical routes available will cover 15 different occupations or occupational groups and the qualifications would be licensed, after a competitive bidding process, to one awarding body per route for level two and three qualifications. At higher levels the government will only fund qualifications that meet the required standards set by a panel of professionals, which will be kept on a register by the Institute for Apprenticeships.

This expansion of the Institute's role to cover all technical education will include two year college based courses, rather than only apprenticeships (BIS and DfE, 2016). In addition to qualification reform, the report sets out plans for specialist national colleges which will focus on key sectors of the economy, attempting to address existing skills deficits.

In summary, this chapter has described the development of the FE sector from its roots in technical education through to the sector we have today. It has highlighted the repeated government pressure on returning to those technical roots through vocational courses, that has been a constant throughout the past 25 years. This pressure, coupled with continued cuts to adult education funding and repeated changes to the overall funding model and even the bodies responsible for that funding, have contributed to keeping the sector in turmoil. The following chapter discusses the state of institutions and qualifications in 2011/2012, the time of the data used in this study.

Chapter 3: Institutions and qualifications in the English FE sector

This chapter focuses on the institutions in the FE sector, the qualifications they offer and the effect mergers have had on the sector. Additionally four government commissioned reports on topics linked to typologies in the FE sector are discussed.

3.1: Institutional categories

This section discusses the types of institution currently within the FE sector and identifies those institution types included in this study. There is no formal designation of institutional type in the FE sector as discussed in the previous chapter. However, there are a number of informal types recognised by the Individualised Learner Record (ILR) introduced in Chapter Two and it is on those that this section will focus. There are 33 types of institution recognised by the ILR covering 1,258 recognised active FE providers that returned data for the 2011/12 data collection. Table 3.1 identifies all these types and the numbers of them represented in the FE sector. The college types in the FE sector that are included in this study are highlighted in bold. The reasoning for including only the colleges within the project is covered in more detail in Chapters Six and Seven but includes simply their being the majority providers of FE in England and, until the creation of the LSC, they occupied their own sector. Furthermore, the data available is more complete for colleges than for private organisations, which despite their large numbers represent only a minority of students (compared to colleges).

In addition to general FE and sixth form colleges (which typically specialise in the education of younger students), the highlighted colleges in Table 3.1 include four distinct types of specialist colleges. Of these, two are subject specialist college types in agriculture and horticulture and art, design and performing arts. Specialist designated colleges specialise in adult education and special colleges are those which are primarily concerned with residential education of students with special educational needs, focusing primarily on life skills.

3.2: Qualifications and their frameworks

This section describes and discusses the various qualifications offered by colleges in the FE sector and how they are structured in England. Qualifications range from basic life skills including numeracy and literacy to higher level qualifications such as academic degrees and high skill technical and vocational education. The structure of these qualifications in England is determined by three frameworks: the Qualifications and Credit Framework (QCF), the National Qualifications Framework (NQF) and the Framework for Higher Education Qualifications (FHEQ).

Table 3.1 - Recognised institutional types and their representation

Institutional type	Number represented	Institutional type	Number represented
Private Limited Company	423	Academy-Converter	3
General FE College including Tertiary	224	Academy-Sponsor Led	3
PRI/LTD BY GUAR/NSC*	157	Community Interest Company	3
Local Education Authority	141	Limited Liability Partnership	3
Sixth Form College	94	Other Local Authority	3
PRI/LBG/NSC/S.30**	61	**Special College - Art, Design and Performing Arts**	3
Higher Education Organisation	27	Local Authority Dept	2
Public Limited Company	27	Private Unlimited Company	2
Special College - Agriculture and Horticulture	16	Trade Union	2
Special College	11	Company Incorporated by Royal Charter (England/Wales)	1
Specialist Designated College	10	Fire Authority	1
Sole Trader	9	Other Public Organisation	1
Charitable	8	Public Corporations & Trading Funds	1
Industrial/Provident (England/Wales)	6	Pupil Referral Unit	1
NHS-English Non Foundation Trust	5	School-Independent-Special Educational Needs Approved	1
Central Government Department	4	Social Services	1
School-Community	4		
Total			**1258**

* *Private company, limited by guarantee, no share capital issued (Companies House, 2016).*

** *Private company, limited by guarantee, no share capital issued, registered under Section 30 of the Companies Act (Companies House, 2016).*

The NQF and the FHEQ were introduced in the 1992 Further and Higher Education Act and were part of the Bologna (1999) process and the QCF was introduced in 2010 to regulate more flexible approaches to attaining a qualification (OfQUAL, 2013). Table 3.2 describes the characteristics of the qualifications positioned in the NQF, QCF and the FHEQ.

Table 3.2 - The qualification frameworks and the characteristics of their qualifications

The QCF	The NQF	The FHEQ
Mainly vocationally related and NVQ qualifications.	The full range of qualification types, including general, vocationally related qualifications and some NVQs.	Applies to degrees, diplomas, certificates and other academic awards granted by a higher education provider in the exercise of its degree awarding powers.

Source: Pearson (2015) and (QAA, 2008)

All three frameworks set out the level at which qualifications are recognised in England. This level is a rating of notional difficulty and value compared to other qualifications (GOV, 2015; QAA, 2008). For example, two qualifications that are well recognised in England are the GCSE and A-level. These qualifications are usually taken at 16 and 18 respectively and the GCSE is considered the pre cursor and entry requirement to the A-level. Thus on the NQF and QCF, the GCSE is at level two and the A-level is at level three. Further examples of the qualifications positioned in the respective frameworks can be found in Tables 3.3 and 3.4.

Originally, the NQF had covered six different qualification levels, which were entry level up to level five. However, in 2004 the old level four was subdivided into levels four, five and six and the old level five was subdivided into level seven and level eight (QCA, 2004). These changes are summarised in Table 3.5 and were made in order to better match with the FHEQ and the International Standard Classification of Education (a level classification system run by the United Nations) to enable potential students (and other stakeholders) to better identify possible progression routes for career paths (QCA, 2004).

Table 3.3 - Example qualifications on the NQF and QCF

National Qualifications Framework		Qualifications and Credit Framework	
Level	**Example qualifications**	**Level**	**Example qualifications**
8	- NVQs level 5	8	- Vocational Qualifications level 8
7	- BTEC Advanced Professional Award, Certificate and Diploma level 7 - Fellowship and Fellowship Diploma - Postgraduate Certificate - Postgraduate Diploma - NVQ level 5	7	- BTEC Advanced Professional Award, Certificate and Diploma level 7
6	- NVQ level 4	6	- BTEC Advanced Professional Award, Certificate and Diploma level 6
5	- HND - NVQ level 4 - Higher Diploma	5	- BTEC Professional Award, Certificate and Diploma level 5 - HNC - HND
4	- Certificate of Higher Education - Key Skills level 4 - NVQ level 4	4	- BTEC Professional Award, Certificate and Diploma level 4
3	- AS and A-level - Advanced Extension Award - Cambridge International Award - International Baccalaureate - Key Skills level 3 - NVQ level 3 - Advanced Diploma - Progression Diploma	3	- BTEC Award, Certificate and Diploma level 3 - BTEC National - OCR National - Cambridge National
2	- GCSE (grades A*-C) - Key Skills level 2, Skills for Life level 2 - NVQ level 2 - Higher Diploma	2	- BTEC Award, Certificate and Diploma level 2 - Functional Skills level 2
1	- GCSE (grades D-G) - Key Skills level 1 - NVQ level 1 - Skills for Life level 1 - Foundation Diploma	1	- BTEC Award, Certificate and Diploma level 1 - Foundation Learning level 1 - Functional Skills level 1 - OCR National
Entry	- Entry level Certificate - Entry level Skills for Life	Entry	- Entry level Award, Certificate and Diploma - Entry level Functional Skills - Entry level Foundation Learning

Source: Pearson (2015)

Table 3.4 - Example qualifications on the FHEQ

Framework for Higher Education Qualifications	
Level	**Example qualifications**
8	Doctoral degrees (e.g. PhD/DPhil (including new-route PhD), EdD, DBA, DClinPsy)**
7	Master's degrees (e.g. MPhil, MLitt, MRes, MA, MSc) Integrated master's degrees*** (e.g. MEng, MChem, MPhys, MPharm) Postgraduate diplomas & certificates Postgraduate Certificate in Education (PGCE)****
6	Bachelor's degrees with honours (e.g. BA/BSc Hons) Bachelor's degrees Professional Graduate Certificate in Education (PGCE)**** Graduate diplomas & certificates
5	Foundation degrees (e.g. FdA, FdSc) Diplomas of Higher Education (DipHE) Higher National Diplomas (HND)
4	Higher National Certificates (HNC)***** Certificates of Higher Education (CertHE)

Source: QAA (2008)

Table 3.5 - Changes to the NQF in 2004

National Qualifications Framework	
Original levels	**Revised levels**
5 Level 5 NVQ in Construction Project Management* Level 5 Diploma in Translation	**8** Specialist awards
	7 Level 7 Diploma in Translation
4 Level 4 NVQ in Advice and Guidance* Level 4 Diploma in Management Level 4 BTEC Higher National Diploma in 3D Design Level 4 Certificate in Early Years Practice	**6** Level 6 Diploma in Management
	5 Level 5 BTEC Higher National Diploma in 3D Design
	4 Level 4 Certificate in Early Years Practice

Source: QCA (2004)

** Formerly, in the 2001 edition of the FHEQ, the levels were identified as Certificate (C), Intermediate (I), Honours (H), Master's (M) and Doctoral (D) level.*

*** Professional doctorate programmes include some taught elements in addition to the research dissertation. Practice varies but typically professional doctorates include post-graduate study equivalent to a minimum of three full-time calendar years with level 7 study representing no more than one-third of this.*

**** Integrated master's degree programmes typically include study equivalent to at least four full-time academic years, of which study equivalent to at least one full-time academic year is at level 7. Thus study at bachelor's level is integrated with study at master's level and the programmes are designed to meet the level 6 and level 7 qualification descriptors in full.*

***** In April 2005, the Universities Council for the Education of Teachers, the Standing Conference of Principals, Universities UK and QAA issued a joint statement on the PGCE qualification title. The full statement may be accessed at: www.qaa.ac.uk/academicinfrastructure/FHEQ/PGCEstatement.asp*

****** Higher National Certificates (HNCs) are positioned at level 4, to reflect typical practice among higher education awarding bodies that award the HNC under licence from Edexcel.*

3.3: Institutional mergers

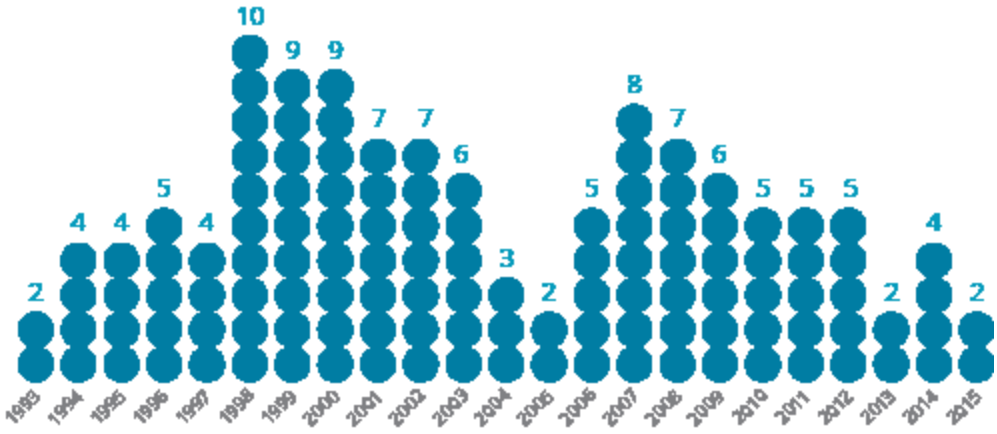
One aspect of the FE sector that has not been covered in detail to this point is that of institutional mergers. This section describes the numerical history of FE institutional mergers, what drives institutions to merge, the types of merger and what influences their successful completion. Furthermore, the benefits arising from merger, both perceived and evidenced, are described. This section draws heavily on two major government commissioned reports; firstly the report entitled *The Evidence Base on College Size and Mergers in the Further Education Sector* by Laura Payne (2008) and secondly, *Understanding FE Mergers* written by Natasha Calvert (2009). Additionally, analysis provided by the Association of Colleges (AoC) on mergers is also considered (AoC, 2016a).

The Payne Report (Payne, 2008) was commissioned by the Department for Innovation, Universities and Skills. It formed part of the evidence base for the government document, 'Further Education Colleges - Models for Success' (DIUS, 2008) (other aspects of which are discussed in Section 3.4.4), which set out the expected future shape of the FE college sector. The Calvert Report (Calvert, 2009) was the result of research undertaken by the Learning and Skills Network to examine the factors which drive mergers among colleges, the circumstances in which they happen and the elements that make them work. Finally, the AoC presented material for the use of their members in understanding and implementing mergers (AoC, 2016a). In addition to these three major contributors, other publications are drawn on where relevant.

Prior to the release of the 2008 government report entitled *Further Education Colleges - Models for Success*, mergers had been on the rise and as a result there had been a substantial decrease in college numbers since incorporation. A report by Klynveld, Peat, Marwick and Goerdeler (KPMG, 2010) noted that in 1992 there were 492 named colleges in the 1992 Further and Higher Education Act but by the release of the *Models for Success* report this number had dropped to 376.

This decrease had been as a result of merger rather than closure of institutions of which there had only been a few (KPMG, 2010). Payne (2008) identified 72 specific mergers since 1992 and an expectation for 10 further mergers in 2008. More recently, the AoC (2016a) identified 131 mergers between 1993 and 2016 inclusive (or 108 between 1993 and 2011 inclusive, the base year for this study. Indeed, the AoC break this information down by year in Figure 3.1 (with 10 more confirmed for 2016). This evidence clearly demonstrates mergers have been relatively common phenomena since incorporation, with the potential for substantial influence over the diversity of the FE sector. The remainder of this section discusses the most common drivers behind mergers, their perceived benefits and what influences their success.

Figure 3.1 - College mergers by year since incorporation



Source: AoC (2016a)

3.3.1: The drivers behind mergers

Payne (2008) investigated the drivers behind merger activity and identified the policy environment as the key driver, such as the Rationalisation fund identified by the AoC (2016a). Other drivers identified by Payne (2008) included:

- Key personnel with strategic vision
- Financial difficulties
- Enhancing core business
- Defence against competition
- Strategic strengthening of position (p. 3).

However, Calvert (2009) approached drivers in a slightly different way; initially she identified two different types. The first type was described as a rescue merger in which one party steps in to '*rescue*' a failing or non-viable institution through a merger and the second a strategic merger, in which colleges come together to strengthen their position. The latter is often to enable them to respond better to changes in policy or funding. Furthermore, *'failing*' can mean either financial or academic failure (i.e. poor inspection results) or both. However, Calvert does note that this can be an oversimplification and that drivers are often a combination of many factors.

In taken over colleges (i.e. rescued), the interviews conducted by Calvert identified poor leadership or management as the most common root cause for the failure of the college. However, Calvert also identifies small colleges with a restricted focus, such as land-based or dedicated sixth form colleges, as being particularly vulnerable to financial difficulties.

The stronger college in rescue mergers usually had a strong inspection grade and was usually relatively close geographically. In addition to this, Calvert (2009) identifies six common features that weaker colleges look for in merger partner selection, which were:

1. good inspection grades

2. experience and expertise in the related field of a specialist college, such as land-based studies
3. an understanding of the specific issues facing the college, for instance serving a rural and sparsely populated community
4. a compatible '*vision*'
5. complementary curricula
6. good transport links. (p. 10).

Similarly, Calvert (2009) identifies five common reasons given by the stronger college for accepting the merger:

1. tactical acquisition i.e. to prevent a rival from conducting the merger instead
2. a desire to expand and create the '*critical mass*'
3. potential for review of estates and capital development
4. synergies or complementary aspects of curriculum
5. potential opportunity to refresh and revitalise the college. (p. 10).

In addition to these reasons, some boards and staff reported reservations about taking on a failing college and the possible impact on their own provision.

Calvert (2009) also discusses the drivers behind strategic mergers. Although this area is somewhat less clear, it is possible to identify six strategic drivers:

1. larger institutions potentially having more influence over policy agenda
2. efficiency savings and economies of scale
3. size of institution offers some protection from market volatility
4. the possible return of FE funding to local authorities
5. improve local provision by reducing duplication and increased coordination
6. both colleges facing similar issues and joint expertise could be utilised to address these

Although, both lists of drivers are similar in the Calvert and Payne reports, the division between strategic and rescue mergers and the different drivers within each identified by Calvert are a key point. Nonetheless, Calvert does note that strategic mergers have been on the rise in the FE sector and this links directly to the benefits institutions expect to derive from merger activity.

3.3.2: The benefits of mergers

The Calvert Report only touches on the benefits of mergers as it was largely outside their remit. Thus this section largely focuses on the conclusions of the Payne report.

The Payne Report (2008), states that "traditional economic theory suggests that competitive markets are desirable because they are more efficient than less competitive market structures. However, when economies of scale exist... monopolistic market structures might be more efficient than more competitive structures". (p. 2). The report concludes that after considering what the FE sector provides, there may be a strong case for economies of scale (and scope). It demonstrates that while on the surface the FE market is competitive with many institutions offering similar courses to many customers, in reality due to the local travel to learn area, many providers (particularly in rural areas) enjoy a local monopoly.

The Payne Report (2008) notes a number of benefits to mergers in private markets and then describes how the equivalent works in the FE market. It suggests that institutions merging to create larger institutions may allow them to "exploit cost savings, employ more efficient corporate services, increase investment in estates and research and development, diversify their curriculum offer, and better adapt to changes in policy or local conditions". (p. 2). However, it also argues that college mergers would reduce competition in the FE sector and the impact on learner and employer choice is ambiguous (e.g. reduced provider choice but potentially increased curriculum choice). Alternatively where local provision is failing, a merger may result in that provision being retained, thus increasing choice (or at least not reducing it).

However, when Payne investigated the evidence she found that it was both limited in scope and inconclusive. Payne's evaluation of short term benefits of mergers concluded that there was little evidence to indicate there were any. Furthermore, it was too early to evaluate longer term benefits and that success of mergers was not certain as they may be dependent on a complex set of local factors and conditions.

Nonetheless Payne (2008) identified the benefits of mergers in the FE sector as:

1. efficiencies through curriculum integration
2. reduction of over-provision
3. improved access to capital funds and betterment of estates. (p. 3).

The final section of the report was testing the hypothesis that there was a relationship between college size and performance. The report measured success by pass rates and found that there was no relationship between this and college size. Similarly, it concluded that there was no evidence of a relationship between size and financial health. However, it reported on the correlation between college size and OfSTED inspection grade. The patterns identified were that larger colleges tend to have a higher grade, but not all larger colleges do well and colleges of any size can get the top grade.

3.3.3: The implementation and success of mergers

The AoC (2016a) note that the FEFC created a designation for two types of merger, Type A and Type B, which they define as follows:

- Type A merger takes place where all the existing corporations are dissolved and a new one created.
- Type B merger takes place where one corporation continues and the others are dissolved with the staff, assets and liabilities transferring into it.

They state that Type B mergers have occurred in 80% of college to college mergers as they have several advantages (AoC, 2016a):

- Continuity of name and brand for one of the colleges.
- Continuity of employment and contracts.
- Easier to explain to students and stakeholders.
- Minimises risk of delay pending official approval.
- Likely to be quicker and more predictable because the colleges are in control of the timetable.

The AoC also note that there have been some mergers between sectors and with private organisations or local authority services. In the past 20 years, cross-sector mergers have been relatively few as legal distinctions between the sectors make them problematic; only 12 involving the HE sector and two involving the schools sector, occurring during the same time period. Nonetheless, the AoC report in addition, a modest number of transfers out of the FE sector into the HE sector by institutions, mainly colleges of art and design, which have also changed the college numbers. Moreover, the AoC estimate roughly 150 acquisitions of private training organisations by colleges in this time period, making this type of change in the institutional landscape the most common. However, such acquisitions do not change the number of colleges in the sector.

Returning to college to college mergers; Calvert (2009) notes that mergers are not always successful and can be halted, even at a late stage. Indeed, Payne (2008) contends that there was no consistent message about the conditions in which mergers were most likely to succeed. Despite this, Payne's recommendations for the analysis of merger proposals were that merger proposals should be considered on a case-by-case basis with three key criteria:

1. the key drivers for merging must be identified and clearly understood
2. the aims of the merger must be clearly articulated
3. the anticipated benefits must be evidenced and subject to risk analysis

Moreover, Payne also recommended that all mergers should continue to be rigorously evaluated after approval and that further research into the benefits and challenges of economies of scale and scope in FE should be conducted, particularly with reference to mergers. It should be noted that the parent report *Further Education Colleges - Models for Success* (DIUS, 2008) accepted these recommendations and the criteria for college mergers was revised.

However, Calvert (2009) developed nine critical success factors to merger activity, whilst also acknowledging that each merger situation was unique and that such generalities can be difficult. Nonetheless the factors were:

1. a clear and unified vision for the merger and a shared vision for the merged college
2. clear and consistent communication with everyone, including staff, learners and stakeholders
3. a balance in relation to staff between the need for communication and dialogue about the merger and allowing them to '*get on with their day job*' with as little disruption as possible
4. planning starting as early as possible: there is a tension between wanting to implement new systems early and not having authority to do so until after the merger has taken place
5. recognising that harmonising systems can take a lot longer than anticipated – in particular the '*cultural aspect*' of training people up and encouraging them to develop new ways of working
6. further to the point above, recognising that changing the culture of a college can take a long time and should not be under-estimated (even where change is broadly welcomed, because it is clear that existing systems were not working effectively). Therefore the transition process must be carefully managed. People need to

understand why and how things are changing and what it will mean for them
7. retaining local branding and a degree of operational independence in some cases, for instance where the original college is serving a distinct and separate community
8. not underestimating the costs of implementing mergers – it can take a long time for real savings through rationalisation and streamlining to be realised
9. implementing some changes relatively quickly – so that some initial impact is seen and a '*new era*' marked. (p. 30).

Similar to Payne, Calvert also draws the conclusion that mergers should be considered on a case by case basis as the factors driving mergers can be highly specific to the situation. These recommendations largely appear to have stood the test of time, as the AoC present a similar list in their merger tips document (AoC, 2016b). The justification here for a consideration of mergers is that they change the size and configuration of institutions, sometimes in major ways. In turn, the outcomes of mergers pose challenges to existing classifications and the design of new typologies.

3.4: Report summaries

This section presents summaries of four government commissioned reports on different aspects of FE provision that are significant to this study. Firstly, there are two reports written in 2003 for the Strategic Area Reviews of that time. They describe two possible approaches to typologies of FE institutions which, while qualitative in nature, are a sample of what limited work there has been in this field in the FE sector. Secondly, there is an unpublished report written by Morland and Macleod in 2002 which statistically investigates the characteristics of FE colleges in order to develop a taxonomy (or typology). This report is the closest in nature to the research for this thesis. Finally, there is a report into the shape of the FE sector which presents a number of organisational models available to FE colleges, as well as detailing tools available to government which can affect the shape of the FE sector.

3.4.1: Organisation of provision of post-16 education and training

The *Organisation of provision of post-16 education and training* report was commissioned by the Department for Education and Skills to inform the guidance for Strategic Area Reviews (Edem, Spencer, and Fyfield, 2003a) and had the stated purpose of developing a typology of models of organisation for post-16 education and training. The Strategic Area Review was an investigation conducted on behalf of the government by the local LSCs to inform strategy on meeting learner, employer and community needs and to improve choice and quality of post-16 education and skills provision (LSC, 2003). The report was also expected to be useful to local LSC staff, local authorities and providers.

Edem et al. (2003a) state that the report considers four key areas:

1. the implication of national strategy and policy
2. regional and local strategy
3. overseas models of post-school provision
4. wider models of organisation drawn from a review of key literature, in order to develop a typology of provision. (p. 1).

Within this overall structure the report has two primary foci; firstly it discusses the level of specialism within individual institutions and the type and amount of collaboration between institutions in the local or regional area(s). The former is used to create a theoretical typology of institutions within an education system with general institutions at one end and specialist institutions at the other end of a spectrum. However, it does not assume any particular type of specialisation and instead concludes that any form of specialisation, be it in a subject or subject group, a specific age range and/or including or excluding specific levels of study, can be characteristics of a specialist institution.

This typology is then extended to include the level of collaboration an institution is involved in, which is again on a spectrum, between tight formal arrangements to '*loose*' informal arrangements. Several examples are given including *inter alia* a tight collaboration of specialist colleges, the North-East Colleges Network which is a consortium of 15 colleges in the North East under a Company Limited by Guarantee to provide networked education and training services, predominantly using flexible online training. Other examples included cross-sector collaborations such as the Abingdon schools-college consortium which is a broad-based loose collaboration. It included three schools and Whitney College of FE to collaborate largely on A-level courses. Nonetheless, these combined features were used to create a four-way typological model with institutions placed on a map depending on how they are best described on each spectrum (specialist to broad and tight to *'loose'* collaborations) as their proposed typology.

Secondly, the report discusses the local, regional and national strategies for various types of learning and how provision is organised, both regarding collaboration between institutions and the involvement of local government and/or the local LSC in order to situate the report in context.

It uses this context to conclude with nine questions which the authors saw as important to consider within the Strategic Area Reviews. These questions were (Edem *et al.,* 2003a):

1. What is the prevalent form of organisation within an area?
2. Is it desirable to consider other forms of organisation?
3. Are some forms of organisation more ideally suited to some types of areas than others?
4. What factors are necessary to support the effective functioning of organisational arrangements?
5. Are the appropriate mechanisms in place to coordinate the different types of provider? Is there a history of collaboration?
6. Are the organisational arrangements likely to meet the future learning and skills needs of learners, employers and the community?
7. Are there new types of organisation that might be appropriate?
8. Is there a prevalent or high-volume provider which has a major influence on provision?
9. Are small-scale specialist providers sufficiently protected within a local system? (p21-22).

3.4.2: Provider missions and their development

The report entitled *Provider missions and their development* was again commissioned by the Department for Education and Skills, this time to inform the guidelines established by the

Strategic Area Review (SAR) framework. It identifies a range of practice in establishing an institutional mission and presents proposals for their effective development and review (Edem, Spencer, and Fyfield, 2003b). Furthermore, it identifies the timescale for the provider review process as part of the SAR process described in the previous section.

The report defines first vision, and then mission statement as (taken from Denton, 2001):

> [Vision]...defining your destination...the organisation's aspirations for the future that appeal to the emotions and beliefs of organisational members. Mission, on the other hand, is similar to our identity and includes such concepts as an organisation's purpose, competitive distinctiveness, market definition, principal economic concerns and core values (Edem et al, 2003b, p. 3).

The authors first define both vision and then mission in order to highlight the differences between the two and they then focus on mission statements. The report notes that there are differing views on the merits or otherwise of mission statements and presents research supporting both sides of the argument. However, they conclude that the criticism of mission statements tends to be focused on how they are developed, particularly with the level of involvement of key stakeholders. Indeed, the conclusion of the report is that mission statements are important and that getting their development right is critical. Furthermore, they note that while most literature is based in the corporate context, the definition of missions in an educational context is very similar.

The report analyses a sample of 18 colleges on the content of their mission statements. These colleges ranged in size, provision focus (adult or FE), degree of specialisation and geographical location. Eight of these institutions were selected for a follow up telephone survey, in which they were asked about their mission development process and the degree to which this was used as a strategic driver (again covering a range of institutions). In addition 11 schools, 15 work-based learning (WBL) providers, six national/multi-national companies and five local LSCs were also randomly chosen with six schools and five WBL providers also followed up with a telephone survey.

These institutions' mission statements were then analysed using the work of Peeke (1994) to determine their effectiveness. The survey revealed that missions were most often generic across the whole organisation (i.e. schools did not have separate mission statements for their sixth form). Some exceptions existed such as separate missions for the Centre of Vocational Excellence (CoVE) status department and where these did exist they also tended to include reference to the contribution to the organisation's overall mission.

The report concluded that FE institutions did not generally meet the accepted criteria in all seven categories presented by Peeke (1994). However, it did note that colleges did regularly review and amend their mission statement in the context of strategic planning. The most significant impetus for radical review was a change of principal or head teacher. Though, during these reviews, consultations with stakeholders were generally limited to internal groups rather than including parents, employers and to a lesser extent, students. Equally, the systematic use of missions was more commonly utilised in FE institutions, when compared to schools, in order to develop strategy, quality assurance and review systems, though there was only limited evidence that mission was used as a instigator of institutional function.

These points and the literature review conducted for the report drew the authors to conclude that the following criteria should be used for mission development and review (Edem et al., 2003b):

1. mission development must involve all key stakeholders
2. mission must drive the operations of the organisation
3. mission must be reviewed regularly to ensure that it reflects the environment in which the organisation operates
4. mission should emphasise the distinctiveness of an organisation's operation
5. Provider mission, learner needs and employer needs should be linked - what contributions do providers make to the economy?
6. local LSCs need a coherent approach and should make greater use of individual provider missions to help plan and develop local strategic options, choices and patterns of provision. (p. 21).

Finally the report concludes with a framework for mission development and review. It begins this section with three key points that a mission statement must do in order to be successful (Edem *et al.,* 2003b) it:

1. must clearly identify provider purpose and distinctiveness
2. requires management commitment and '*buy in*' by relevant stakeholder, e.g. staff governors, managers and clients
3. should have features which enable it to make an impact on strategy, drive provider operations and enable judgements about effectiveness. (p. 22).

The authors use these key points to conclude that the key elements of a framework should be:

1. location of mission within an area strategic context (in this case, *Success for all* (DfES, 2002) and the SAR process)
2. clear identification of the organisation's purpose or '*reason for being*', including its key values
3. involvement of stakeholders and customers
4. description of mission in a statement containing key values, objectives and related targets that are measurable over time
5. description of mission that emphasises the distinctiveness of provider operations now and in the future
6. use of the mission elements to form the basis of strategic and operational processes
7. annual review of mission, objectives and related targets to ensure continued relevance to the environment. (p. 22).

3.4.3: Taxonomy of further education colleges

The report entitled *Taxonomy of further education colleges* contained the findings from a preliminary investigation into the characteristics of FE colleges. It was unpublished but was written by Peter Morland of KPMG and Deirdre Macleod of Critical Thinking (Morland and Macleod, 2002). Included in the original report was a data disk which contained all tables and figures from the report. Unfortunately, there was no access to this data due to the report's unpublished status and thus this section is limited to that which was available in the paper copy, which mainly focused on the methods used within their project.

The stated purpose of the report was to attempt to identify clusters of common characteristics of college activity in order to produce a new and meaningful typology of colleges. In so doing, they selected four variables which could be characterised by volume of activity. These were:

1. age of learners
2. mode of delivery
3. qualification level
4. programme area (subject of study)

Furthermore, they also conducted a separate investigation into the influence of college size as a distinguishing feature.

The study was limited to general FE colleges only, therefore excluding sixth form colleges and any form of specialist college. This left them with 279 general FE colleges from the 1999/2000 academic year for the study. Their data was from the Individualised Student Record and was aggregated for use in the study.

The report's authors initially explored the data, examining it for patterns of breadth and volume of activity within each variable. This they used to categorise institutions into one of three categories for each variable, which were narrow, medium or broad. Furthermore, they also categorised institutions by whether or not the college had a subject area that accounted for more than 35% of its activity and by whether or not the college had five or more subject areas that accounted for less than 5% of its activity each. Institutions were then grouped according to characteristics in common. For the final results the authors identified 10 groups with at least five institutions in each group, with all smaller groups discarded. This meant that their final typology accounted for 80% of the institutions in the study which the authors recognised as a limitation of the study. However, they suggested it was a useful starting point for further investigations into the categorisation of colleges despite their recognised limitations. These were (Morland and Macleod, 2002):

- The boundaries of the groupings were arbitrarily selected and therefore a result of a judgement by the authors.
- The groupings can be made more or less specific by adding to or reducing the number of variables or dimensions which are used to delineate them.
- The groupings are based on fairly general categories of activity, which define groupings on the basis of broad, medium or narrow breadth of activity across different variables. These groupings are not specific about which subject areas, qualification levels or age groups make up these groups. For example, it is possible that colleges falling within the narrow breadth subject area grouping, each say offering courses in three programme areas, could all be offering their courses in different programme areas from each other.
- The variables, classes and dimensions that the authors chose to investigate were chosen mainly for the reasons that data on them was accessible and that they appeared to represent important dimensions of college activity. They state that they did not conduct any prior analysis to conclude that they were, in fact, the most important dimensions of activity or even those most worthy of investigation. Thus different groupings could have been derived by introducing other variables or dimensions to the analysis.

- Finally, they note that the study shows nothing about why the existing groups have emerged or about how they are likely to change in the future. (p. 17).

In addition to these main findings they also investigated size of institution by headcount. However, they determined that, after their preliminary analysis in which they derived six groups of colleges based on size, programme area and qualification level offered the most scope for further investigations into groupings.

3.4.4: Further education colleges - models for success

The report, Further education colleges - models for success, was commissioned by the Department for Innovation, Universities and Skills (DIUS) in 2008. Its stated purpose was to (DIUS, 2008):

- Briefly summarise government expectations of the future shape of FE college and provider landscape.
- Describe a range of business models available to the sector.
- Set out the criteria against which future proposals to create, close or merge colleges will be considered, taking account of the changed environment.
- Set the framework within which the Learning and Skills Council could consider proposals for structural reorganisation. (p. 6-7).

This purpose was intended to support the then government's intentions for the FE sector, which were to (DIUS, 2008):

- Develop innovative and collaborative learning routes.
- Listen and respond to the needs of employers.
- Reach out to those that are least likely to engage in learning.
- Offer a wide range of opportunities and resources to local communities. (p. 3).

The report stated that it was not the governments' intention to specify or impose any particular model of organisation. However, they qualify this by stating that they did expect collaboration between organisations and innovation in delivery models.

The report's initial conclusion is that there is no evidence suggesting that size is an indicator of effectiveness or performance for colleges. Both this report and the Payne Report (2008) (discussed in Section 3.3) use this point to build a discussion of the concept and conduct of institutional mergers. The Payne Report provided the evidence for this parent document.

Therefore, this section focuses on the remaining aspects of the *Further Education Colleges - Models for Success* report which are divided into two topics:

1. Shaping the System - Tools for Government
2. Models of Delivery of Collaboration for Colleges

The report presents six tools available for the government to ensure that the identified needs of learners and employers in a local area were met. Firstly, there is the Sixth-Form Presumption which was an agreement whereby a high-performing school, upon its re-designation as a specialist school opts for a vocational specialism, is allowed to propose a new post-16 provision with the presumption of approval. This was an existing agreement that was extended by the government but with the addition of a caveat that stated the provider must

demonstrate that the additional provision would fit into current local provision by presenting evidence of collaboration.

The LSC were to hold

> competitions for new 16-19 provision in cases where '*a need is identified for 200 or more new 16-19 places to meet basic need, to improve quality and/or to improve the balance of provision in area*' where need cannot be fulfilled by allowing schools to expand under the Sixth-Form Presumption (DIUS, 2008, p. 11).

However, in addition, the government also had the power to create, by order of the Secretary of State, "an institution … delivering full-time education to 16-19 year olds that is maintained by a Local Authority" (DIUS, 2008, p. 12).

The FE presumption prioritised bids for 16-19 capital funding from existing successful FE colleges wishing to expand to deliver diplomas (though with some requirements). The next tool available was the creation of academies which were established by independent sponsors and funded by the Department for Children, Schools and Families. While they were outside the purview of the local authorities they were set up with their agreement and collaborated with it and other schools in the area. They most commonly operated with the age group of 11-18 but there was no formal restriction. The creation and dissolution (closure) of colleges was through the 1992 Further and Higher Education Act and must include a period of public consultation.

Finally, the 2006 Education and Inspections Act allowed the government to extend the power to innovate to FE colleges (Education and Inspections Act, 2006). This allowed the Secretary of State to prevent innovative approaches to raising educational standards from being held back by legislation. This in turn allowed colleges to apply to trial a new approach for up to three years (DIUS, 2008).

The report also presents a number of models for delivery of collaborative work which colleges are free to adopt. Though the report recognises that there is no '*one size fits all*' approach, it does state that the DIUS expects collaboration between organisations. The collaborative delivery arrangements the report presents are (DIUS, 2008):

- One provider leads the group - such a provider would provide the legal entity for contracting and may also provide specific expertise on behalf of the group, e.g. in marketing, quality assurance or LSC liaison.
- A representative structure - in this model there is a clearly defined and published structure allowing each member to be represented at decision making level (e.g. on a board or joint committee).
- A statutory joint committee - allows colleges to participate in joint committees with other colleges and/or schools. Powers can then be delegated from member organisations to the committee in order to facilitate joint projects.
- An incorporated organisation/company - colleges may consider establishing or acquiring a company in order to meet a specific need or to deliver specific services, e.g. a specific trading company could be set up to focus on local employers, establish a different brand or to focus on a specific industry sector.

- Employer-led specialist networks - employers and sector skills councils are able to lead specialist networks through their development of National Skills Academies (NSAs). NSAs are innovative employer-led, sector-based education and training organisations which are national centres of excellence.
- Working with the third sector - this is a publication on the voluntary and not-for-profit sector which colleges can get involved with in numerous ways not listed in the report. (p. 15-16).

In addition to these types of collaboration the report also considers three types of Trust arrangements. Firstly, the unincorporated organisation/association which is run by a set of rules or '*constitution*' and secondly companies registered under the Companies Act. The latter is a more formal arrangement with a legal personality enabling it to own land and enter into contracts in its own name. Finally, there is the charitable incorporated organisation which is enabled by the Charities Act of 2006, although at the time of the report this was not fully available to FE colleges and was more suitable for Trust schools.

Building on the contextual history outlined in Chapter Two, this chapter has focused on the types and levels of qualifications represented in the contemporary FE sector and the characteristics of college mergers and collaborative partnerships. Both the range of qualifications offered by institutions and the number and nature of mergers will have an important influence on size, shape and profile of the population of colleges. More particularly, they will bear on the extent of diversity demonstrated within and between individual establishments.

Chapter 4: Dimensions of difference and diversity

This chapter examines the concept of institutional diversity and the various definitions of its different aspects. Furthermore, it explores the perceived benefits diversity brings to an educational system and the societies within its scope. As the literature is largely centred on HE systems both in the UK and abroad, this chapter discusses how these concepts relate to the English FE system.

4.1: What is diversity?

Huisman (1995) notes that despite issues of differentiation and diversity being common topics in many countries' HE systems, these terms often have different meanings in different contexts. Therefore, it is necessary to define the meaning of these terms (and related concepts) for this study and also provide an explanation of the types of diversity and the variations used to discuss them in an educational context.

Diversity can initially be defined as the state or quality of being different or varied (Collins English Dictionary, 2003). However, a general definition of diversity in an educational context is offered by Trow who describes diversity in higher education as:

> […] the existence of distinct forms of post-secondary education, of institutions and groups of institutions within a state or nation that have different and distinctive missions, educate and train for different lives and careers, have different styles of instruction, are organised and funded and operate under different laws and relationships to government (Trow, 1995 as cited in Meek, Goedegebuure, and Huisman, 2000, p. 3).

Alternatively, the Higher Education Funding Council for England (HEFCE) describe a diverse HE sector as "one with the capacity to meet the varying needs and aspirations of those it serves: students, employers, purchasers of HE services, and the wider community" (HEFCE, 2000, p. 4). These definitions, though referring directly to HE, can be equally applied to FE as another form of post-secondary education. Indeed, the pre-existing types of FE institution (such as the sixth form college, the general FE college and the assorted types of specialist college) could, as in the Trow definition, all be considered to be a distinct form of post-secondary institution (though they do also provide upper secondary education).

Indeed, the FE sector covers a much broader range of students across the National Qualifications Framework, from entry level all the way up to the vocational equivalent of the doctorate, so there is significant scope for variation across the concepts Trow (1995) describes. However, as HEFCE (2000) point out it is important not to promote diversity for diversity's sake. Diversity within a system must be to meet a specific need, be it educational, social, political, commercial or cultural. Furthermore, HEFCE (2000) note that diversity for diversities sake is not a worthwhile goal as at some point it can lead to over-specialisation which increases costs and prohibits the use of economies of scale, leading to the education sector becoming unviable for long term maintenance. Thus goals in diversity need to be balanced against resources and other goals. HEFCE (2000) conclude that the goal must therefore "be to secure the pattern of diversity that most cost-effectively meets the needs and aspirations of the greatest number of stakeholders". (p. 4).

Alternatively, by drawing upon work by Huisman (1995), it is possible to define diversity by relating it to biological theory. Huisman states that in biological theory, diversity is an indicator of both the number of different types of species and the dispersion of these species within a community. In an education context (equally applicable to HE and FE), diversity is a term used to describe aspects of a system (dispersion of institution types, study programmes, organisational structures etc) or at a lower level the dispersion of characteristics of any system under study, for example, a particular institution, a particular course type (e.g. A-levels) or a particular group of institutions within a larger system (e.g. all science departments). Furthermore, it may be used to describe the variety of characteristics in a student body or the assorted modes of attendance available for a particular subject within a college. In summary, the diversity of an institution can be analysed on many levels and aspects, including but not limited to, those outlined above.

Birnbaum (1983) refines these definitions by discussing two types of diversity. He describes the concepts of internal and external diversity. Internal diversity is described as relating to the differences within institutions, whereas external diversity relates to differences between institutions. For example, an FE college might enhance their internal diversity if one that offered courses in mathematics, English and science also began to offer courses in psychology, or if a full-time only institution began offering evening classes. The external diversity of the FE sector would be enhanced if a college was created specialising in a new subject area or targeting a group of previously un-catered for students. Birnbaum (1983) notes that external diversity may be negatively correlated with internal diversity as if an institution diversifies internally it may come to share characteristics with another institution type.

In addition to internal and external diversity there are the concepts of horizontal and vertical diversity. Horizontal diversity is differentiating institutions based on differing curricular thrusts, missions and/or profiles; it considers institutions equal but different. On the other hand, vertical diversity is used to differentiate institutions according to reputation, quality, status etc; it considers some institutions to be 'better' than others (Teichler, 1998). These concepts are commonly accepted by most authors on diversity but there is often no clear way to define how some variations between universities ought to be classified, as this can be a subjective concept. For example, if you take two universities: one which teaches only undergraduate students and one which teaches only post-graduate students, Clark's (1978) classification (see below) states that the post-graduate only institution is vertically diversified as it teaches at a higher level. However, you could say that they are horizontally diversified as they have a different mission. This issue has been encountered by existing classifications such as the Carnegie Foundation's classification, which differentiated institutions by mission only to have this interpreted by some as a ranking judgement (McCormick and Zhao, 2005).

Clark (1983, 1978) expands this concept further by describing four categories of the ways in which institutions can be horizontally or vertically differentiated (two in each) within a system. Differentiations within institutions on the horizontal plane may be denoted as sections and on the vertical plane as tiers. Alternatively, differentiations between institutions are described laterally as sectors and vertically as hierarchies.

Clark's (1983, 1978) first category is a section-based division and occurs typically on two levels (though he does note that as many as four can be present in more complex institutions). He categorises these divisions as either narrow or broad and they are as follows:

- Narrow - the basic building blocks or operating units, generally known as chair, institute or department, encompass a speciality within a profession (e.g. constitutional law) or an entire basic discipline (e.g. physics)
- Broad - generally known by such titles as faculty, school or college, encompass all preparation for a certain occupation (e.g. law or business) or a set of basic disciplines (e.g. the humanities or the natural sciences). (p. 37).

Arguably, according to Clark's first category, FE institutions would most likely be differentiated by subject groups and specialities.

Clark's (1978) second category was that of tiers of education, which he states is the first of the vertical diversity categories. Clark states that in two tier systems there is a generalist bachelor's degree with limited amounts of specialisation and connection to a particular job role, which is available to all or most people (e.g. it is not especially selective). This is followed by a second tier which is both highly selective and has strong specialisation and links to a particular job role (such as law, medicine or other professional faculty). Clark uses the US HE system as his example of this with their 2-year community colleges at one end of the system and the graduate schools in law, medicine, architecture etc, at the other. Alternatively, there is the single tier system such as in the UK where a student can specialise immediately in a given field or professional discipline. There is no truly comparable system in English FE and indeed, such a concept, is to an extent, out of date for even the UK HE system with graduate entry only medical schools becoming more common (e.g. the University of Warwick and the University of Swansea medical schools). However, Clark (1983) also notes that the level of interdependence between departments at educational institutions varies depending on the commitment to general education. For example, the two tier system in the US, described by Clark, has a high level of commitment to general education. In the UK FE system there is a certain commitment to key skills (English, mathematics and information technology (IT)) with many courses having a key skills element as part of their structure. This could reasonably be considered to be general education. Furthermore, A-level students often take a general studies A-level in addition to their more specialist qualifications. Therefore, it can be concluded that the FE system does have some commitment to general education, although analysis of this is beyond the scope of this study.

Clark's third category, sectors, describes the structure of the system with four different structural types within Clark's category. These are (Clark, 1978):

1. single public system and single institution type
2. several sectors within one governmental system
3. several sectors in more than one formal public sub-system
4. several sectors under private support as well as public system allocation

Clark argues that the United Kingdom is closest to category three in this list with the public sectors of Wales, Scotland, Northern Ireland and England providing the multiple public systems and the numerous types of university, polytechnics and FE institutions accounting for the multiple sectors and institutions. Clark does not use the same language that is used in

contemporary descriptions of educational structures but more recent work does examine similar concepts (e.g. Scott, 1995).

Clark's final category is that of hierarchies in which institutions are vertically differentiated based on educational task and institutional prestige. Clark describes differentiation based on educational task as similar to that of sectors with lesser ranked institutions functioning at lower levels of the education ladder (e.g. institutions teaching up to level four students being lower ranked than an institution that teaches up to level five). Differentiation by institutional prestige is based on the perception of the quality of the institution. This type of differentiation is commonly found in the English HE sector with league tables; employers and the government paying significant attention to this issue. It is of less importance in the FE sector with relatively little national attention in the media paid to the quality and reputation of FE colleges. However, it is arguable that some FE institutions have an expected educational task. For example, sixth form colleges are primarily focused on 16-18 education in A-level and second chance GCSE education. Similarly, the recently formed academies are intended for vocational 14-19 education. Indeed, it is only general FE colleges that have no specific role beyond providing FE to those who require it. However, within all types of FE institution there is scope for a differentiated educational task regarding the targeted demographic, covering areas such as ethnicity, age, gender, socio-economic status and educational disadvantage.

An alternative (though arguably complementary) concept to Clark's is that of Birnbaum (1983), who suggests seven categories of external diversity (i.e. differences between institutions) which can be used to evaluate HE systems and institutions. Huisman (1995) presents an excellent summary of these, which is as follows:

- **Systemic** diversity referring to the differences in institutional type, size and control within an educational system.
- **Structural** diversity referring to institutional differences resulting from historical and legal foundations, or differences in the division of authority within institutions.
- **Programmatic** diversity, which relates to the degree level, degree area, comprehensiveness, mission and emphasis of programmes and services provided by the institutions.
- **Procedural** diversity describes differences in the ways that teaching, research and or services are provided by institutions.
- **Reputational** diversity communicates the perceived differences in institutions based on status and prestige.
- **Constituential** diversity alludes to differences in students served and constituents in the institutions (faculty, administration).
- **Values and climate** diversity is associated with differences in social environment and culture. (p. 22-23).

Each of these areas can be applied to the FE sector, though some are of less importance to FE than HE (such as reputational). However, the exact context needs to be adapted; for example, programmatic diversity in HE describes *inter alia* degree level and subject area. In FE this would still include the subject area but the description would be extended to describe the level of study on the National Qualifications Framework, rather than limiting it to bachelor's, master's, doctoral etc. Other concepts such as 'constituential' diversity and procedural

diversity, while different in FE settings to HE can be applied more directly but as a whole the framework holds up for studying FE.

This section has defined diversity in educational contexts and the following section discusses why diversity is important.

4.2: Why is diversity important?

This section examines the views of researchers and HEFCE on why diversity is beneficial to an education sector. Much of the literature on the importance of diversity focuses on HE sectors in general and the US HE system in particular. This is initially highlighted by the development of HE systems across most of Western Europe and the United States of America and the importance most governments attach to diversity in this development. Following this is a discussion of the perceived benefits of diversity to an educational system and its various stakeholders. This framework is then applied to the FE sector in England.

Codling and Meek (2006) and Goedegebuure and Meek (1997) note the similarities in the post-war development of higher education across most of Western Europe and the United States of America. Five stages are identified in the 1997 paper and are then considered and added to by Codling and Meek (2006):

1. rapid expansion in the 1950s and 1960s
2. diversification in the 1960s and early 1970s
3. consolidation and the establishment of more economical alternatives to the university in the late 1970s
4. a focus on specific issues such as diversity, quality improvement, efficiency and internationalisation in the 1980s
5. reduction in public expenditure and a focus on economic viability in the 1990s
6. commercialisation of research products and observable contribution to the knowledge economy. (p. 32).

Codling and Meek also assert that as various HE systems progressed through each stage of development, their respective governments maintained a desire to promote diversity and differentiation within their system.

This developmental pattern highlights the importance of diversity to the progression of HE systems from elite to mass HE. Furthermore, in noting the policy focus of governments on diversity through this time, Codling and Meek (2006) illustrate the importance governments attach to diversity in furthering their aims. Conversely, Trow (1974) in his seminal paper on the problems in the transition from elite to mass higher education suggests that diversity is seen as a threat to the power of the state and to the orderly governmental and bureaucratic process. Furthermore, it was also seen as academic anarchy and a threat to the traditional values of HE (Trow, 1974). Nevertheless, in more modern English HE, the government still attaches importance to the presence of institutional diversity (HEFCE, 2000) and alternative forms of HE e.g. the introduction of the foundation degree.

There are three key authors who discuss the benefits of diversity to an educational system and its various stakeholders. The first of these authors, Stadtman (1980), notes six key benefits of diversity:

1. increases range of choices available to learners
2. makes higher education available to virtually everyone, despite differences among individuals
3. matches education to the needs, goals, learning styles, speed and ability of individual students
4. enables institutions to select their own missions and confine the activities to those which are consistent with their location, resources, levels of instruction and clienteles
5. respond to the pressure of a society that is in itself characterised by great complexity and diversity
6. becomes a precondition of college and university freedom and autonomy because the greater the differences are among institutions, the more difficult it is for a central authority to convert them into instruments of indoctrination rather than of education. (p. 98-99).

Birnbaum (1983) examined and extended Stadtman's list by first sub-dividing the benefits into three categories, institutional, societal and system arguments. Each category had several dimensions and these were examined in detail, with Birnbaum (1983) arguing that a diverse education system is better able to address the respective difficulties. Van Vught (2008) listed seven similar areas in which a diverse system is expected to function more effectively. Van Vught's statements fit into the same broad categories envisaged by Birnbaum and both Birnbaum's and Van Vught's concepts have been summarised in Table 4.1. The system category for Birnbaum, despite being an extensive section in his book, contained only limited discussion of the benefits of diversity and was more concerned with the mechanisms that promote diversity.

Both Birnbaum (1983) and van Vught (2008) make statements similar to each other and to Stadtman's work in 1980, though there is some divergence and in particular modernisation in van Vught's work. Van Vught discusses the more applied nature of modern HE in noting the connection to the labour market that HE now has. Both students and governments prefer HE programmes to have a link with future employment and this was not considered such an important issue in previous years, perhaps explaining its absence from the earlier work by Birnbaum and Stadtman. However, there is still substantial agreement between the three authors. There follows a discussion of some of the key points and how they can be applied to the FE sector.

All three authors note the importance of meeting a diverse range of student needs and all concur that this is better accomplished by a diversified HE system. The FE system also has a diverse range of students for which it needs to provide education and training. Indeed, with both vocational and academic training to provide for, it is arguable that the FE system has a more diverse range of student needs to cater for than the HE system. Furthermore, the FE system provides courses in academic and vocational subjects leading to university entry, but also provides basic and advanced courses which provide the training of numerous skilled workers in a variety of fields (e.g. agriculture, stonemasonry, welding etc), which are not available in the HE or schools sectors. According to the three authors, this broad range of provision by the FE sector suggests the possibility of great diversity either within or between FE institutions.

Table 4.1: Comparison of Birnbaum's and Van Vught's concepts

Category	Argument	Birnbaum (1983)	Van Vught (2008, p. 154-155)
Institutional	Meeting students' needs	This category covers all possible requirements a student may have regarding *inter alia* educational standards, teaching environment, institutional size, same sex institutions, learning support for both disabilities and learning difficulties, living environment, learning mode etc.	A more diversified system is assumed to be better able to offer access to higher education to students with different educational backgrounds and with a variety of histories of academic achievements. A diversified system, in which the performance of HE institutions varies, each student is offered an opportunity to work and compete with students of similar background. Each student has the opportunity to find an educational environment in which chances for success are realistic.
	Increasing institutional effectiveness	Institutional specialisation increases institutional effectiveness and that therefore, numerous institutional types are required in order to perform the many functions society requires of HE institutions (see Hannan and Freeman, 1977 in Section 5.1 for the organisational theory behind this).	Diversity is assumed to increase the level of effectiveness of HE institutions. This argument was postulated by the Carnegie Foundation (1973) that suggested that institutional specialisation allows HE institutions to focus their attention and energy, which helps them in producing higher levels of effectiveness.
	Providing models	Institutions dealing with a particular problem or attempting to take advantage of a new opportunity have two key advantages in a diverse system. Firstly, other institutions are more likely to have encountered the issue previously and are able to provide a model of what to do to overcome the issue (or at least what not to do). Secondly, when institutions make mistakes or problems arise, in a diverse system it is unlikely to affect the whole system. Thus, diversity permits low risk (for the system) experimentation since failure is isolated to a single, or small group of institution(s).	Not discussed
	Protecting institutional autonomy and academic freedom	In a diverse system the crosscutting pressures upon different institutions are so varied that all institutions are unlikely to face the same threat to academic freedom at any one time.	Not discussed

Table 4.1 continued			
Category	**Argument**	**Birnbaum (1983)**	**Van Vught (2008, p. 154-155)**
Societal	Providing for social mobility	Institutional diversity increases the chances of social mobility by offering more numerous entry points into HE and by catering for different academic standards.	Diversity provides for social mobility, by offering different modes of entry into HE and by providing multiple forms of transfer. A diversified system stimulates upward mobility as well as honourable downward mobility. A diversified system also allows for corrections of errors of choice; it provides extra opportunities for success; it rectifies poor motivation; and it broadens educational horizons.
	Serving the political needs of interest groups	Institutions can be set up to serve the needs of religious, ethnic, geographical or socio-economic sub-groups. A diverse system can provide for the perpetuation of multiple groups culture and protection of their identities.	Diversity serves the political needs of interest groups. The idea is that a diverse system ensures the needs of different groups in society to have their own identity and their own political legitimisation. In less diversified HE systems the needs of specific groups may remain unaddressed, which may cause internal debates in an HE system and various kinds of disruptions.
	Permit both elite and mass higher education	A diverse system is able to provide both elite and mass HE with different institution types providing the different type of education for different groups of students.	Diversity permits the crucial combination of elite and mass HE.
	Facilitate reform through competition	Competition facilitates the development of new programmes, degrees and pedagogies through the need to acquire scarce resources and students. Thus competition can be seen as both a consequence and a cause of diversity.	Not discussed
	Responsiveness to the labour market	Not discussed	A more diversified system is assumed to be better able to meet the needs of the labour market. The point of view here is that in modern society an increasing variety of specialisations in the labour market is necessary to allow further economic and social development.

Table 4.1 continued			
Category	**Argument**	**Birnbaum (1983)**	**Van Vught (2008, p. 155)**
System	Responsive to the environment	Diverse systems can be both more sensitive and more responsive to environmental pressures. This allows the system to be more stable and survive all kinds of catastrophes.	Not discussed
	Innovation and risk	Not discussed	Diversity is assumed to offer opportunities for experimenting with innovation. In diversified HE systems, institutions have the option to assess the viability of innovations created by other institutions, without necessarily having to implement these innovations themselves. Diversity offers the possibility to explore the effects of innovative behaviour without the need to implement the innovation for all institutions at the same time. Diversity permits low-risk experimentation.

Moreover, Birnbaum and van Vught also agree that the benefits of specialisation include increased institutional effectiveness and that this is more likely to occur in a diverse system (also implicit in Stadtman's fourth point). The FE system includes specialist colleges in particular subject areas (primarily the performance arts and agriculture) and institutions which specialise in one type of educational provision (academic or vocational).

It is only Birnbaum (1983) who considers the benefits of a diverse system for providing models for responses to institutional challenges. This is perhaps because institutions or groups of institutions using other institutions as models for behaviour could, quite naturally, reduce diversity within the system as institutions replicate provision. However, it is arguable that institutions could use the behaviour of foreign institutions as a model without compromising the diversity of their own system. Nonetheless, this is related to van Vught's point on innovative behaviour as innovating institutions provide models for other institutions. Furthermore, Clark (1983) argues that it makes sense to have multiple institutions attempting the same innovation even in the same locality, as this makes it easier for errors to be caught and compensated for. Clark states that if comparison between institution types performing similar or identical tasks is possible, errors in programs and institutional types may be caught and brought to light before they become entrenched. Clark postulates that such redundancy of institutional type allows for individual units or types to operate defectively without doing critical injury to the whole system. These related concepts suggest, when considered together, that within a diverse system (either in FE or HE) an individual institution experimenting with an innovative approach will not only be of less risk to the system, but that any errors in the innovation or within a particular institutional type are more likely to be detected early and corrected before any damage is done. Furthermore, once innovations have been tested and any errors corrected, a diverse system allows other institutions to replicate the safely modelled behaviour, albeit with the attached threat to diversity.

While Stadtman perhaps overstates his sixth point on institutional autonomy, both he and Birnbaum concur on both its importance to the HE system and the positive effect a diverse system has on it. Whilst FE institutions do not have the same level of academic freedom as do universities (e.g. they may not award their own qualifications), this aspect is still an important consideration of diversity for FE institutions as institutions which are free to make their own decisions may discover new avenues for enhancing diversity. Conversely, van Vught (2008) argues that the presence of strong academic norms, often associated with academic freedom, actually inhibits the spread of diversity (this is discussed in greater length in the following chapter).

The societal benefits category, within which both Birnbaum and van Vught make several points, effectively describes some of the complexities of society to which Stadtman refers in his fifth point. Each of Birnbaum's and van Vught's points, with the exception of the ones regarding mass and elite HE, are equally appropriate to the FE system, though with different dimensions. The FE system provides for social mobility just as the HE system does, though usually lower down the social ladder, or at least earlier in the developmental stage for students who use FE sector to enter the final stage of their development in HE. Equally, there are requirements of political interest groups within both FE and HE in England.

Both Birnbaum and van Vught have one area each which the other does not mention in the societal category. Birnbaum discusses the benefits of diversity on competition whereas van

Vught does not. Van Vught sees competition as a mechanism which influences diversity rather than a benefit of it, though both authors use the same theoretical background of Hannan and Freeman (1977) so this is possibly a difference in interpretation.

Van Vught, in discussing the needs of the labour market in relation to the HE system, highlights the current importance attached by governments in HE qualifications leading to improved job prospects. This modern focus was not as apparent in previous decades, with general educational achievement being paramount. Furthermore, as Birnbaum was writing in the US where the first degree includes a high level of general education, with post-graduate work only locking you in to a particular profession, there is understandably less focus on the labour market. In an educational sector that has a significant vocational element such as the English FE sector, the requirements of the labour market are equally significant to government aims (though there is also quality of life education which doesn't necessarily lead to improved job prospects). The FE sector as a whole provides a significant proportion of the mass tertiary education required by modern society in England, as the adult and community learning and many vocationally focused programmes are run as part of the FE sector. Furthermore, the FE sector also provides a substantial proportion of the A-level qualifications in this country which forms the primary basis for HE institutions and FE institutions offering HE from which to select their students. Each of these educational programmes can contribute substantially to an individual being able to achieve good employment prospects, even if only as an early part of an academic career. Furthermore, as noted earlier there are many programmes which lead to skilled employment that are available only in the FE sector. These vocational programmes combined with the academic programmes available in the FE sector suggest that the diversity of the FE system is highly significant in meeting the needs of the labour market.

The sole systemic argument presented by Birnbaum is that diverse HE education systems are more responsive to their environments. Therefore, arguably a diverse FE system would also be more responsive to its environment. However, the impact of the systemic environment on institutions and the extent to which institutions can influence their environment is a much discussed topic, which is covered in Sections 5.1 and 5.2.1.

As has been demonstrated, each of Birnbaum's (1983) and van Vught's (2008) conclusions, though referring to HE systems, can be equally applied to an FE system. The exception being that of the societal arguments for elite and mass HE as it is referring directly to an HE issue. Though even here, as FE institutions do provide some HE, primarily at a sub-degree level, there is still some small relevance in this area. Equally, it could be argued that the FE system in England must play a part in facilitating access to both mass and elite HE. The A-levels system is considered to be the standard route of access to elite HE and the FE system provides substantial A-level education. Moreover, the FE system also provides access to HE courses and vocational qualifications such as the BTEC National, which are often used to enter HE. It is arguable that a diverse system is better able to meet the requirements of this dual role through sixth form colleges on the academic side and academies on the vocational side (with general FE colleges doing both).

Furthermore, van Vught (2008) states mass systems are generally more diversified than elite systems. He notes that such diversified mass systems are better able to respond to a wider range of demands from the labour market, due to their ability to absorb a more heterogeneous clientele. Initially this statement appears in contrast to the point made by both

Birnbaum and van Vught that diversity is essential for allowing the existence of mass and elite HE within the same system, as it looks at both elite and mass systems in isolation. However, as mass systems tend to include an elite sub-system as a part of their provision, it is reasonable to conclude that as a mass system provides both elite and mass HE, it would naturally be more diverse and provide for more groups of students than would a purely elite system. Indeed, van Vught notes that Trow (1979), in his seminal analysis of mass and elite systems, suggests that in order for elite higher education to continue a comprehensive system of non-elite institutions must provide the majority of students the relevant knowledge and skills to find employment. The FE institutions could be argued to be a significant part of such a comprehensive system due to their provision of sub-degree HE.

This chapter has defined diversity in educational contexts and discussed why diversity is considered important. It has discussed key theoretical contributors to this study such as Huisman (1995) and Birnbaum (1983). It has also highlighted key concepts such as vertical and horizontal diversity, internal and external diversity and explored Birnbaum's key framework of diversity that is used throughout this study. The next chapter discusses how this diversity occurs and what influences institutional diversification or de-diversification.

Chapter 5: Theories, models and typologies

The previous chapter discussed and defined diversity and its importance. Initially, this chapter considers the process by which educational systems become diversified. Huisman (1995) refers to this process as differentiation which he defines by relating it to biological theory (as he did for diversity). The process of differentiation in biological theory is that of parts of a whole system developing their own specific function within the system, which contributes to the functioning of the system (such as the growth of the human body from conception). Huisman contends that this process, when applied to the study of diversity in HE could, as an example, be used to describe an institution in which research and teaching were inseparably intertwined becoming institutionalised within different structures. Huisman also used the work of Rhoades (1990), to add that an entirely new process within an educational sector would also constitute differentiation. Both of these concepts can be applied to the FE sector. Indeed, many colleges as a result of the 1997 policies of the New Labour government under Tony Blair have added courses of HE to their provision (Labour Party Manifesto, 1997). This could be argued to be a new function within an existing system (i.e. an individual institution); this definition could be applied to aspects of the FE sector.

Rossi (2009) noted that most studies of institutional diversity utilise a form of organisational theory to explain the mechanisms of differentiation. However, she concludes that there is no single prevailing theory or a general consensus of opinion about the mechanisms that promote diversity. Furthermore, she highlighted the lack of consensus between researchers on whether or not institutions naturally diversify and whether the market has a positive or negative effect on the levels of diversity. Authors such as Huisman (1995) and, more recently, van Vught (2008) have identified three key theoretical approaches of organisation theory: the population ecology of organisations, resource dependency theory and institutional isomorphism. This chapter therefore explores all three approaches separately and discusses how each might apply to the FE sector.

The second part of this chapter moves on from general organisation theory to discuss what factors may influence the process of differentiation and thus the diversity specifically within an educational system. This work is largely drawn from research into HE sectors of education in various countries, as there is no research discussing these aspects within the FE sector. Codling and Meek (2006) state that most HE systems have become more homogeneous as government policy in most countries has been ineffective in supporting the positive rhetoric on diversity. They refer to five factors, namely: the environment, system structure and policy, funding, competition and co-operation, and ranking as being the primary causes for this homogenisation. Therefore, the second part of this chapter is based on this premise, as it was found to be a reasonable structure for the available research. Finally, a discussion of the studies of institutional diversity in the HE sector is presented in order to contextualise how these theories are examined in practice within an educational sector.

5.1: Organisation theory

Hannan and Freeman's (1977) seminal paper on the population ecology of organisations itself sought to extend the sociological theory of human ecology first developed by Hawley (1950, 1968) by adding competition models and niche theory. Hannan and Freeman (1977)

summarise Hawley's work by stating that isomorphism (organisations becoming more homogeneous) occurs when organisations adapt to uniform environmental conditions by adopting the optimum form to succeed in those conditions. This occurs, according to Hawley, through a process of rational adaptation where senior managers make rational decisions in order to adapt to environmental conditions, which leads to one optimal organisational form per set of environmental conditions with all organisations either eventually adopting this form or ceasing to exist. Hannan and Freeman (1977) counter this by suggesting that organisations can also be '*selected out*' of a community of organisations which would reduce the number of institutional types in that community.

Furthermore, they conclude that a focus on selection invites and places emphasis on competition, thus leading to the first of Hannan and Freeman's extensions to Hawley's work. Hannan and Freeman (1977) state that as long as the resources that sustain organisations are finite and populations have limited capacity to expand, competition will follow. However, they note that in Hawley's later work there is almost no reliance on competitive mechanisms and instead a focus on adaptation logic is used to explain isomorphic tendencies. Hannan and Freeman proposed adding an explicit focus on competition as a mechanism producing isomorphism. The proposed competition model contained several key view points and ideas (Hannan and Freeman, 1977):

1. Resources available at any moment for each form of organisation are finite and fixed.
2. The rate at which units are added to populations of organisations depends on how much of the fixed capacity has already been exhausted.
3. The greater the un-exhausted capacity in an environment, the faster should be the rate of growth of populations of organisation. However, the rate at which populations of organisations can expand into unused capacity varies among forms of organisation. (p. 941).

Hannan and Freeman (1977) state this allows for "two distinctive ecological considerations: the capacity of the environment to support forms of organisation and the rate at which the populations grow (or decline) when the environmental support changes". (p. 941). They add that under their competition model, the expansion of either markets or state control mechanisms tends to have the consequence of reducing or eliminating the number of constraints which are idiosyncratic to local environments. This would result in a more uniform environment for organisations to operate. However, implicit in this is that if markets remain local then competition for resources is kept between local organisations, for example an FE college in Portsmouth is not in the same market as an FE college in Leeds as they do not compete for the same students. However, in FE, funding is primarily from the central government with the total funding limited to a fixed amount with colleges receiving a fixed allocation based on student numbers. Therefore, the total funding available to others is depleted by any FE institution securing funding, thus, all colleges are indirectly in competition with each other regardless of whether or not they are competing for the same students. This raises doubts in the appropriateness of applying Hannan and Freeman's competition model to the FE sector.

Nonetheless, Hannan and Freeman (1977) explore the consequences of their model, giving examples in several market sectors including education. They suggest that the expansion of markets and of state control mechanisms through social systems tends to eliminate or reduce

the number of constraints which are idiosyncratic to local environments. They suggest that expansion of the economic and political centre should tend to replace some local constraints with more uniform ones, leading to fewer constraints on organisation in the whole system. Provided national constraints are fairly homogeneous, this would imply that the change in constraint structure ought to lower organisational diversity. Hannan and Freeman also consider the effect of their competition model on organisational size, but as this is targeted at a single organisational type this is not directly relevant to this study of institutional diversity.

When introducing niche theory, Hannan and Freeman (1977) state that "the principle of isomorphism implies that social organisations in equilibrium will exhibit structural features that are specialized to salient features of the resource environment". (p. 946). However, they caveat this by noting that intuitively this would only hold for stable environments. They suggest that, in an unstable environment generalist organisations are most likely to thrive as they can cope with multiple environmental configurations rather than being ideally configured for just one (like a specialist organisation). A niche is then "all those combinations of resource levels at which the population can survive and reproduce itself" (Hannan and Freeman, 1977, p. 947).

Hannan and Freeman (1977) consider specialist and generalist organisations in terms of niche width; a specialist organisation has a narrow range of conditions over which it can compete. Specialist organisations flourish because they maximize exploitation of the environment and accept the risk arising from their environment changing, whereas generalist organisations accept a lower level of exploitation in return for greater security. The equilibrium distribution between these organisational forms depends on the shape of the fitness sets and on properties of the environment. In effect, there is a set of circumstances in which specialist organisations can operate successfully but they cannot operate successfully outside these conditions.

According to Hannan and Freeman (1977), specialism means lower requirements for excess capacity but in a rapidly changing environment what constitutes excess capacity is likely to change frequently whereas in a fairly stable environment less excess capacity is needed in a given pattern of allocation for longer periods of time. While performance managers may see such allocations as wasteful, they may be essential for survival. Thus for the question, which forms survive and which forms disappear, under a given set of environmental circumstances? Niche width can be a key consideration:

- Specialists out-compete generalists over the range of outcomes in which they have specialised (because of the fixed level of fitness assumption). As long as the environmental variation remains within that interval, generalists have no adaptive advantage and will be selected against.
- However, if the environment is only occasionally within the interval, specialists will fare less well than generalists. (p. 950).

In FE the term specialism may not correspond wholly with the above usage. For example, specialist colleges tend to specialise in certain subject areas (e.g. performing arts, agriculture) but this does not mean that they carry any less overheads in terms of, say, non-teaching staff and may have high overheads in terms of equipment. Thus the specialism here may not confer the overhead cost benefits envisaged by Hannan and Freeman but they are, like other

specialist organisations in principle, at risk from rapid changes in the demand for their product (the subject areas in which they specialise). While costs may not be too different for the specialist college, they should be more effective in teaching their specialist areas and this should confer a higher reputation and a competitive advantage in attracting students.

How fast the environment changes helps determine whether it is better to specialise. Hannan and Freeman (1977) discuss this in terms of the '*grain'* of an environment; this '*grain'* influences whether specialist or generalist organisations prosper. '*Fine-grained*' conditions are when organisations encounter many units or replications or when the length of time environmental states last is relatively short compared to organisation's lifetimes. The opposite environment would be considered '*coarse-grained'*. Hannan and Freeman considered the penalty for sub-optimal strategies organisations incurred to be the key distinction between the two types of environmental variation. The gamble for an organisation is whether or not its environment produces a state favourable to its organisational form. The analysis is complex. For example, specialism is optimal in a stable environment but when variation is 'coarse-grained' organisations will falter as a result of poor choices and if conditions remain adverse for too long an organisation which cannot adapt will fail.

Hannan and Freeman (1977) cite the structure of modern universities as an example of a '*holding company'* structure where the environment is uncertain and '*coarse-grained'* and sub-units difficult to set up and tear down. The universities face variation in income, enrolment and research support over time as well as the yield on any invested endowment securities. Only some of these resources follow predictable cycles. However, it is expensive to build up and dismantle academic units in terms of financial and other resources. Consequently, universities typically '*tax'* sub-units with plentiful environments to subsidise less fortunate sub-units. Thus faculty positions may be allocated in accord with what they call '*some fixed master plan'*, under-supporting the rapidly growing departments and maintaining excess faculty in others. There may be parallels to this situation in FE Colleges in response, for example, to variation in demand for courses or subjects.

This generalist argument does not always apply; for example there has been considerable concern over the closure of chemistry and other departments in the UK in response to falling numbers (RSC, 2005)[2]. Thus even generalist organisations in the education sector must in time respond to protracted adverse conditions, even where it goes against their overall policy.

Indeed, Hannan and Freeman (1977) do not define the range of validity of their model but do acknowledge that it may be too simplistic a model and that various population ecology models suggest that it is. Moreover, in their 1984 paper, they conceded that the 1977 paper on population ecology theory relied on a number of simplifying assumptions. Perhaps the most important was the stance that individual organisations are influenced by strong forces of

[2] In 2005 the Royal Society of Chemistry (RSC) wrote "*Over the last ten years approximately 30 chemistry departments have been closed within UK universities, leaving us with just over 40 remaining. There has been a recent rash of department closures including well established departments such as Kings College London, Queen Mary College London, Swansea and most recently Exeter. The closure of such departments is causing alarm not only in the academic community but also in industry and government. Closures are occurring not just in chemistry but in other key sciences, such as physics (Newcastle) and mathematics (Hull) (*RSC, 2005, *p. 1)*". They saw the policies of the Funding Councils as a major cause (RSC, 2005).

inertia, that is, that they rarely succeed in making major changes to strategy and structure in the face of environmental challenges (Hannan and Freeman, 1984).

Further, their 1984 paper considered whether organisational structures suffer from inertia in the face of environmental turbulence. They argued that "selection pressures in modern societies favour organisations that can reliably produce collective action and can account rationally for their activities." (p. 162). They see the capacity for reliable and accountable performance as necessary to reproduce a structure with high fidelity which in turn implies structural inertia (Hannan and Freeman, 1984). It follows that if selection favours reliable, accountable organisations, it also favours organisations with high levels of inertia; this is consistent with the view that selection tends to favour stable systems.

Hannan and Freeman (1984) go on to argue that this claim does not necessarily mean that most organisations have high inertia because "selection pressures may not be strong enough to screen exhaustively for the '*most fit'* organisations". (p. 163). They also note that most organisational populations will often gain new entrants and that these new organisations are less likely to have high inertia. They are also more likely to adopt innovative structures that can be radically different from those that would dominate in a steady state environment in which there were no new entrants.

There are many selective pressures other than reproducibility of structure and if one of these dominates organisations with the appropriate characteristics for that environment, it would be favoured even if they have relatively low levels of reproducibility. Similarly, environments featuring turbulent and uncertain change may not constitute a systematic regime of selection since the favoured traits may shift too quickly for a clear trend to emerge. In this case, organisational forms able to take quick advantage of new opportunities and respond quickly to such opportunities would be favoured; indeed such dynamics may dilute the importance of reliability and accountability in organisational selection. Hence, one cannot assume that selection processes always favour organisations with high inertia; not all observed populations contain only such organisations.

These considerations led Hannan and Freeman (1984) to suggest there would be systematic variation within populations of organisations, in the strength of the pressure of inertia exerted against individual organisations, largely explained by older organisations being under greater inertial pressure than newer organisations. However, they also see older organisations as less likely to cease to operate than newer organisations. They also note the effect of size on different aspects of change in organisational structure. They see large organisations as less likely than smaller organisations to attempt structural change but as more likely to stay in business if they do so. They also postulate that there may be an effect of size on the success rate of structural change but they lacked the data to reach a final conclusion.

For the FE sector this would appear to suggest that large colleges are less responsive to change, at least in an organisational sense, but it must be remembered that decisions are taken at the authority level (in this case senior management or political) and that some of the commercial competitive pressures of the private sector do not apply. Moreover, larger colleges may have the resources to offer a greater range of courses at less risk.

Scott (1987) notes that the population ecology perspective is particularly useful in focusing on the core features of an organisation, explaining the life chances of smaller and more numerous

organisations and accounting for changes in organisational forms over longer periods. In contrast he sees the (following) resource dependency perspective as an approach with an emphasis on the more peripheral features of organisations, which is better applied to larger and more powerful organisations and stresses change occurring over shorter periods.

Conversely, van Vught (2008) considers the two perspectives to be closely related. However, both Pfeffer (2003) and Hannan and Freeman (1989) consider them to be distinctly different approaches. Indeed, it was Pfeffer himself in 2003 in the introduction to the classic edition of his 1978 book co-authored with Salancik (one of the original authors[3]) that presented a comparison between the approaches. Pfeffer (2003) states that resource dependence, like population ecology focuses on the effects of the environment on organisations and in particular the intensity of competition for resources. However, the biggest difference is that population ecology theory focuses on selection and resource dependency theory on adaptation (like Hawley's (1968, 1950) original theories). Furthermore, Pfeffer (2003) describes five key differences between the approaches:

1. Resource dependence admits much more possibility of organisations altering their environments, whereas population ecology takes the environmental conditions resulting in the selection processes as a given.
2. Resource dependence includes the likelihood of organisations adapting in response to external forces. Whereas, population ecology has differential selection through the birth and death processes of organisations as the primary way in which organisational populations change.
3. Resource dependence focuses on organisational decisions, while population ecology does not address how organisational structures and behaviours emerge to be selected.
4. Population ecology because of its study of birth and death processes lends itself to studies that are more longitudinal in nature, though it is noted that there is nothing inherently static about resource dependencies predictions.
5. Population ecology does not address the causes of internal organisational dynamics such as contests for power leadership succession and similar issues, though Pfeffer does acknowledge that these could be modelled using a natural selection logic. (p. xiv).

Though there is nothing in Pfeffer's descriptions which suggests overall agreement with Scott (1987), both acknowledge that population ecology studies are better suited to longitudinal work. Furthermore, resource dependence is not a theory specifically for the study of organisational diversity. Rather, it is a theory of organisational behaviour; it does however suggest a number of potential reasons which may cause organisations to diversify. Additionally, population ecology is aimed at groups of institutions, whereas resource dependence is aimed at the environmental effects on individual institutions and the adaptations made as a result (be they to modify that environment or adhere to its demands). Nonetheless, it is perhaps most significant to note that Pfeffer and Salancik (1978) state that only about 10% of organisational performance is accounted for by administrative action, the rest is accounted to environmental conditions. This finding supports both resource dependence and population ecology with their focus on the impact of environmental conditions, either through selection in population ecology or interaction in resource

[3] Gerald Salancik had died by the time Pfeffer (2003) wrote the author's note to the reprint of the classic edition, so it is not known if he agreed with his colleague about the differences between the two approaches.

dependence (the interaction with the environment of resource dependence is an extension of adaptive reasoning).

Pfeffer and Salancik (1978) contend that the more dependent an organisation is on another organisation for resources, the more influence an organisation can exert over the dependant organisation. This would be considered an environmental constraint by Hannan and Freeman (1977) which they contend reduces the diversity of a system. In the English FE sector, as previously noted, the government controls most (if not all) of the resources available to FE institutions which would mean they are able to exert significant influence over the behaviour of FE institutions. Therefore, if both Hannan and Freeman (1977) and Pfeffer and Salancik (1978) are correct, we would expect significant homogenisation resultant from government policies.

However, Pfeffer and Salancik (1978) also contend that organisations may employ strategies that attempt to mitigate the impact of other organisations (such as the government in FE) on their own functions and operations. Such strategies, often secretive in nature, attempt to prevent influential organisations from finding out how well their demands are being satisfied. Examples of this would firstly include, HE institutions providing league table compilers with information which, though technically accurate, is designed to show the institution in the best possible light. A second example would be, in the FE sector, keeping failing students on their course for as long as possible in order to maximise funding. Pfeffer and Salancik also describe other strategies of mitigation ranging from lobbying for laws to diversification of funding sources.

Pfeffer and Salancik (1978) discuss the use of mergers to deal with interdependence of organisations. While clearly institutions cannot merge with the government in order to reduce their dependence on it, mergers may still play a role in the diversification or homogenisation of the FE sector. Pfeffer and Salancik discuss three types of merger, horizontal, vertical and diversification (note: in this context a diversification merger is referring to the internal diversity of an individual organisation rather than the system). Horizontal mergers are the acquisition of competitor organisations, in the FE sector this would be the merging of two institutions with highly similar educational profiles (i.e. a similar mix of subjects and levels). Vertical merger is the acquisition of an organisation either forward or backward in the production chain (e.g. a steel company merging with a coal producer). Initially, this sort of merger appears to have limited applicability within the FE sector as clearly, institutions may not merge with the government or students. However, HE institutions mainly rely on the supply of students trained to A-level or equivalent standard and thus, an HE institution merging with an FE institution could be seen as this type of merger. Though a very unlikely scenario, a private organisation merging with a college in order to provide its training services in house, would also be an example of a vertical merger.

A diversification merger is the acquisition of a second organisation which is neither in the same business nor in a direct exchange relationship with the original organisation. In the FE sector the closest example of this would be a college merging with another college with a substantially different educational portfolio to the original college. While both institutions are in the same business they would attract substantially different types of students resulting in an increase in the internal diversity of the original organisation. All of these types of merger may

have an impact on the external diversity of the FE system though potentially this may be positive or negative depending on the current institutional profiles.

One type of merger within the FE sector has involved the merging of a general FE college with a local sixth form college. This could be considered to be either a diversification merger or a horizontal merger as, to an extent, it shares characteristics of both. General FE colleges do tend to offer some A-level education which is the primary focus of sixth form colleges. Therefore, this merger would be a horizontal merger. On the other hand the A-level provision at sixth form colleges may be more extensive either in terms of numbers of students or in subjects offered. Therefore, to a limited extent such a merger may also be considered to be a diversification merger. This illustrates the possibility for cross-over between merger types as organisations seldom match each other's profiles exactly.

In Chapter Seven of their book, Pfeffer and Salancik (1978) discuss collusion between businesses and the reasons why it is both useful to the colluding organisations and detrimental to other parties. They state that when uncertainty resulting from interdependence would be most problematic, there is most likely to be increases in inter-firm collusion. Inter-firm collusion is not random between firms; instead it occurs in circumstances when uncoordinated action would adversely affect each other's performance. However, such collusion is often considered bad or disturbing by outsiders and Pfeffer and Salancik suggest that the reason for this is that if two firms agree to cooperate (thus reducing competition) they create an environment which establishes greater interdependence for those who buy their goods.

In the FE sector, institutions are often, contradictorily, both expected to compete with each other for students and encouraged to work together in order to minimise the replication of provision in a local area. Though positive for both the organisations and the government who funds such provision, this results in a reduction in student choice regarding which institution to attend for a specific course. However, from the diversity perspective, there is potential for an increase in system diversity as local institutions specialise in subject areas or levels. For example, York College does not offer courses in agriculture or similar courses as these are covered by the local agricultural college (Askham Bryan College). It is such collusion and cooperation that ensures normal market forces have a different meaning in the education sector.

Another example of institutional collusion in the FE sector is that of the franchising agreements between institutions (previously discussed in Chapter Three). These agreements are an example of another concept of Pfeffer and Salancik (1978), the shifting of interdependent relationships. They contend that all the strategies for reducing the burden of interdependence from an organisation, merely shifts that interdependence onto another part of the system. For example, two institutions merging together in order to avoid competing with each other for students simply transfers the institutions' interdependence onto potential students. This means that if the new institution cannot manage to attract enough students to fill all courses then staff may need to be laid off or buildings or other capital may be lost. Furthermore, as the new much larger college is also still dependent on the government for resources, if the government allocates them less resources or stops funding particular courses or subject areas, then the new institution could struggle.

These examples show that the interdependence from the competition between institutions has been shifted to make the new institution even more dependent on the government and the consumers. Pfeffer and Salancik (1978) maintain that only two changes actually alter the amount of interdependence: an increase in the amount of available resources and a decrease in the number of contenders for resources. In the FE sector it is arguable that with state funding from a national pot being the primary available resource to all institutions, any enhancement of resources would actually increase institutions interdependence with both the government and the public. However, an increase in the diversity of sources of funding, such as from the private sector, would, as noted earlier, reduce institutional interdependence with government and to a lesser extent with public consumers of education.

Pfeffer and Salancik (1978) conclude that in order for organisational behaviour to change, their environment must be changed. For example, if the current trend of the FE sector is towards homogenisation (either in general or in a specific area) then the government would need to enact policy which changes the FE environment to one which encourages systemic diversification.

The final perspective examined in this sub-section is institutional isomorphism. Van Vught (2008) states that this approach asserts that organisations, "in order to survive, have to adapt to the existence of and pressures from other organisations in their environment. These adaptation processes tend to lead to homogenisation, as organisations react similarly to uniform environmental conditions". (p. 154). DiMaggio and Powell (1983) explain this as "isomorphism is a constraining process that forces organisations to resemble other organisations that face the same set of environmental conditions." (p. 149).

DiMaggio and Powell (1983) define three mechanisms of institutional isomorphism:

1. coercive isomorphism, which stems from political influence and the problem of legitimacy
2. mimetic isomorphism, which results from standard responses to uncertainty
3. normative isomorphism, which is associated with professionalisation. (p. 150).

Whilst DiMaggio and Powell acknowledge a certain amount of cross-over and observe that the three types intermingle in empirical settings, they contend that they tend to derive from different conditions and may lead to different outcomes.

DiMaggio and Powell (1983), as part of their description of coercive isomorphism include the work of Pfeffer and Salancik (1978). This, as described earlier in the section, results from pressure exerted on organisations by other organisations upon which they are dependant for resources (though DiMaggio and Powell do not identify why an organisation may be dependent on another). However, DiMaggio and Powell contend that this is not the only source of coercive isomorphism. They suggest that organisations can also be exposed to pressures of coercive isomorphism from cultural and societal sources. Therefore, they extend coercive isomorphism to include work by Meyer and Rowan (1977) on the influence of rationalised institutional rules on organisational structures.

Meyer and Rowan contend that these rules function as myths which organisations incorporate in order to gain legitimacy, resources, stability and enhanced survival prospects. Thus isomorphism occurs as more institutions adopt these myths in order to gain the resultant

benefits. The rules can be structures, procedures, practices, products, services or programs that are adopted not because they provide gains in efficiency or productivity but because they are seen as '*the right way to do things*'. Indeed, these can often conflict sharply with efficiency criteria and as such organisations seek to maintain ceremonial conformity with the institutionalised rules whilst de-coupling their formal structures from actual work activities (Meyer and Rowan, 1977). This is similar to the principle described by Pfeffer and Salancik (1978) of organisations hiding the true extent of their conformity to other organisations. Both involve presenting a different formal structure to promote legitimacy whilst avoiding direct negative effects on operating procedures. Therefore, coercive isomorphism, whether from resource dependency or from institutionalised rules can be mitigated by de-coupling procedures from formal structures (DiMaggio and Powell, 1983).

Mimetic processes are as a result of organisations seeking to emulate other organisations that they see as more successful, reputable or stable. The model of one organisation's behaviour on another's may be as a result of deliberate diffusion of ideas, such as in consulting firms or industry trade associations, or it may be unwanted with the copied organisation having no desire to be copied (DiMaggio and Powell, 1983).

Normative pressure for isomorphism stems from the level of professionalisation in an organisation. DiMaggio and Powell (1983) see professionalisation as "the collective struggle of members of an occupation to define the conditions and methods of their work to control the production of producers and to establish a cognitive base and 'legitimation' for their occupational autonomy". (p. 152). They see professionalisation as having two key sources of isomorphism, firstly, the prevalence of academic norms resulting from employing university educated staff. The second being the influence of professional bodies such as the British Psychological Society or the British Medical Association through which new models can spread quickly.

DiMaggio and Powell (1983) conclude that having identified the mechanisms of isomorphic behaviour it should be possible to predict empirically which organisational fields will be most homogeneous in structure, process and behaviour. While such empirical testing was beyond the scope of their paper they nonetheless form six organisational level and six field level (or system level) hypotheses. Each of these hypotheses was formed on the basis of *ceteris paribus* assumptions particularly regarding size, technology and centralisation of external resources.

Their organisational level predictors are:

1. The greater the dependence of an organisation on another organisation, the more similar it will become to that organisation in structure, climate and behavioural focus.
2. The greater the centralisation of organisation A's resources supply, the greater the extent to which organisation A will change 'isomorphically' to resemble organisations on which it depends for resources.
3. The more uncertain the relationship between means and ends, the greater the extent to which an organisation will model itself after organisations it perceives to be successful.
4. The more ambiguous the goals of an organisation, the greater the extent to which the organisation will model itself after an organisation that it perceives to be successful.

5. The greater the reliance on academic credentials in choosing managerial and staff personnel, the greater the extent to which an organisation will become like other organisations in its field.
6. The greater the participation of organisational managers in trade and professional associations, the more likely the organisation will be, or will become, like other organisations in its field. (p. 154-155).

The DiMaggio and Powell (1983) field (or system) level hypotheses are:

1. The greater the extent to which an organisational field is dependent upon a single (or several similar) source of support for vital resources, the higher the level of isomorphism.
2. The greater the extent to which the organisations in a field transact with agencies of the state, the greater the extent of isomorphism in the field as a whole.
3. The fewer the number of visible alternative organisational models in a field, the faster the rate of isomorphism in that field.
4. The greater the extent to which technologies are uncertain or goals are ambiguous within a field, the greater the rate of isomorphic change.
5. The greater the extent of professionalisation in a field the greater the amount of isomorphic change.
6. The greater the extent of 'structuration' of a field, the greater the degree of 'isomorphics'. (p. 155-156).

There are two hypotheses for each of the three isomorphic mechanisms at both organisational and field level, the first and second in each list are coercive isomorphism, the third and fourth are mimetic isomorphism and the last two are from normative pressures for isomorphism. Each list describes the effect of the same isomorphic mechanisms at their respective levels and is discussed below.

As DiMaggio and Powell acknowledge, the first two hypotheses are similar in nature to what is predicted from resource dependence theory by Pfeffer and Salancik (1978) and the extent to which they are present in the FE sector is discussed above. However, the third and fourth hypotheses are similar in nature to academic drift first proposed by Riesman (1956) as they involve an institution replicating the behaviour of one which it perceives to be more successful (see Section 5.2.1 below for how this phenomenon is explained in the HE sector). Although, the presence of academic drift in the FE sector has not been investigated, this does not rule out the possibility of institutional isomorphism as a result of either uncertainties in the relationship between means and ends or the ambiguity of goals in FE institutions. This would be an area for further research to investigate the presence of such isomorphic pressures in the FE sector but is beyond the scope of this study.

The fifth hypothesis is certainly present in the FE sector as teachers are becoming more professionalised as the government move towards a professional teaching qualification for all teachers in the FE sector. In addition to this, all teachers of academic subjects are usually required to hold a degree in whatever subject they are teaching. According to DiMaggio and Powell this will result in normative isomorphic pressures. The sixth hypothesis also has application to teachers in the FE environment including heads of department (effectively academic managers). Such staff will usually be a member of a teaching union and often are, or

have been, a member of a professional association for their subject as well. Both of these mechanisms have been observed in HE and school systems (see Oplatka, 2004; Riesman, 1956) and it would therefore be expected to see evidence of them in FE systems. However, no investigation of the English FE system has been conducted so this would be another area for further research. Nonetheless, it is reasonable to expect the existence of such pressures in the FE sector with the evidence from other education systems and other organisational fields.

In summary, all the theory in this section considers the diversification or de-diversification of institutions or organisations within a bounded system. Though lessons can be learned for this study, it must be remembered that the FE system does not have distinct boundaries but overlaps into the schools and HE sectors. Furthermore, the theories discussed in this section only consider internal diversity to a limited degree and are mostly focused on the differences between institutions rather than within them. Finally, they do not make quantitative predictions; rather they focus on concepts and reasoning. Nonetheless, it does provide lessons on what we might expect when examining the institutional diversity of the FE sector.

5.2: Factors influencing diversity in educational settings

This section presents the findings of some authors in the field of HE who have investigated the factors specifically within education systems that influence diversity. As noted earlier, this part of the chapter is further sub-divided into several sections which have been selected using the work of Codling and Meek (2006). These five sections are: the environment, system structure and policy, funding, competition and co-operation, and league tables and ranking. There is a certain amount of crossover between the ideas presented in the theoretical foundation section above and the following sections. However, the following sections are intended to highlight those issues that are specific to education systems and where necessary, as the work is largely drawn from the HE sector, these issues are contextualised for this study by relating them to the FE sector.

5.2.1: Environmental factors

The first environmental factor that has been found to influence diversity in HE systems is that of academic drift, a phenomenon similar in nature to aspects of Di Maggio and Powell's organisational theory, institutional isomorphism, described earlier in this chapter. Van Vught (2008) argues that if there is a strong presence of academic norms and values at an institution then academic drift will occur. Academic drift is a commonly accepted phenomenon originally expounded by Riesman (1956), which suggests that institutions seek to move up in status and prestige by replicating the behaviour of those institutions with more status. Riesman (1956) originally argued that this was due to lecturers and researchers from other institutions joining an institution and bringing with them ideas, practices and cultures from other, more prestigious, institutions, in a process termed by Riesman, '*the academic procession*' (though it is more generally known today as a form of academic drift). This would see institutional practices replicate those of the source institution of these new staff unless there was sufficient resistance from the pre-existing staff, which Riesman termed the '*home-guard*'.

Furthermore, Codling and Meek (2006) added to Riesman's original theory with the concept of vocational drift, this involves traditional universities moving towards the University of Technology Model (or vocational model) as the focus of research increasingly emphasises

applied/commercially relevant research. Both concepts are partially explained by the developmental theory called *Drift Theory*. Drift Theory suggests that types of HE institution will often deviate from the mission that they were established to pursue after only a short period of time (Teichler, 1998).

Moreover, Rhoades (1990), while agreeing that academics promoted de-differentiation also contended that it is through policy that governments can prevent and indeed reverse this trend. Rhoades concludes that in the four HE systems he studied between the 1960s to the 1980s, the English, French, Swedish and United States, differing levels of differentiation and de-differentiation occurred. He notes that in the US HE system there were the lowest levels of academic influence and that lay influence was high at both institutional and national levels. Each of the national systems experienced the anticipated levels of differentiation and de-differentiation. For example, the US system also experienced the most differentiation and the least de-differentiation. These results supported Rhoades' thesis that the more the academic/external lay group balance of power favours the academics, the less open the system will be to differentiation.

Teichler (1998) suggests that the expansion of HE systems can exert an environmental influence on HE institutional diversity and this can be described by the 'expansion and diversification' developmental theory, which states that:

> the expansion of higher education creates a pressure for diversification because the needs of the learners and other potential users of the services of higher education become more varied and because, as many actors involved believe, these varied needs might be more readily met through a certain 'division of labour' among institutions (Teichler, 1998, p. 7).

The expansion of HE leads to changes in the environmental conditions that institutions operate within. For example, new students come from more varied backgrounds and have more differentiated academic abilities; new subjects can be added for study at undergraduate and/or post-graduate level or new modes of attendance might be needed. The pressure for expansion can come from either an environmental (demand led) or policy (government led) source. Both sources would create different environments in which institutions operate but could (though not necessarily would) lead to similar actions by institutions (Teichler, 1998). These pressures for expansion could and indeed have existed in the FE sector as governmental pressures to absorb some of the expansion of HE fell on the FE sector, as well as the expansion of adult education, lifelong learning and the raising of the school leaving age. While the consequences for, and actions taken by, the FE institutions may differ from HE institutions the theory remains the same.

Similarly, Trow (1974) contends that the level of access to an HE system has a significant impact on the levels of diversity present within the system. He states that an elite system by its very nature tends to be highly homogeneous with institutions of similar characteristics with similar high standards. Whereas, the wider access becomes, progressing towards mass and then universal access the system begins to become more comprehensive, with more diverse standards, though with some linkages among the several segments of the system that allow mobility of students and staff (Trow, 1974). This could be argued to be both an environmental impact with the effects of changing student demand/choice and to a lesser extent the policy

and economic drivers potentially associated with a transition to mass and universal HE (if present).

Teichler (1998) also discusses *'flexibilization'* theory which points out

> ...weaknesses in segmented institutional types serving clearly distinct needs. The establishment of certain types of HE institutions seems to be an early response to changing needs. Over time, soft models and broad ranges of solutions might be superior to distinct types. (p. 481).

Scott (1996) suggests that a system that functions in a flexible manner is the system best able to adapt to market conditions with modern large-scale institutions capable of maintaining multiple missions simultaneously. Scott notes this market led approach (which largely dominates political thinking in English post-secondary education today), is hard to reconcile with a structured system which assigns missions to classes of institution (Scott, 1996, see Section 5.2.2 below for more details on system structure). Scott (1996) concludes that a flexible system "encourages a much finer grain and more flexible differentiation between and within institutions, regardless of their formal nomenclature". (p. 51).

In addition to theoretical work on the ways in which the environment can impact on HE institutions, some authors have considered specific aspects of environmental impact on diversity of HE institutions. Trow (1999) discusses the dramatic effect that advancing technology is having on universities and the way in which education is delivered and accessed. This additional environmental factor not only has the potential to create further diversity in programmes but also in institutions themselves. For example, historically a traditional model university does not include any internet based learning as it simply did not exist. However, in modern society, institutions have adapted to include advancing technology and the innovative ways in which students can be taught. The possibility of jointly, largely or even exclusively, distance learning institutions becomes more likely (e.g. the Open University in the UK).

In summary Codling and Meek (2006, p. 39) draw two conclusions that largely coincide with the theory presented in Section 5.1 by Hannan and Freeman (1977) which they summarised as:

1. The greater the uniformity of the environmental conditions within an HE system, the lower the potential for systemic diversity.
2. The greater the variation in environments within an HE system, the greater the potential for systemic diversity.

5.2.2: System structure and policy factors

One area in which some educational theorists differ from the organisational theories outlined in Section 5.1 is that of the effects of the state on diversity. Some authors, such as Birnbaum (1983) adhere to the direct interpretation of Hannan and Freeman, who state that government policies create a constraint on diversity. Others such as Codling and Meek (2006), Huisman (1995) and Rhoades (1990) acknowledge the possibility of policy intended to promote diversity. This debate is still on-going with Hazelkorn and Huisman (2008) reporting that both sides were still represented as recently as at the conference in 2007 on diversity of missions in HE and that views appear to vary dependent on the policy situation at the time of analysis. Furthermore, the conference suggested that government policies intended to ensure diversity

also limit it to the prescribed types. Equally, some authors acknowledge the possibility of both homogenising and heterogenising effects of government policy, such as van Vught (2008). The acknowledgement of policy intended to promote diversity fits better with that of resource dependency theory as organisational dependence does not necessarily mean an organisation (in this case the government) has to exert its influence on each dependent organisation in exactly the same way (though this scenario was not envisioned by Pfeffer and Salancik, 1978).

Therefore, while acknowledging that government influence can have both a positive and negative effect on diversity, this sub-section examines the impact policy can have on diversity. Perhaps the most significant way in which government can influence institutional diversity is that of the overall structure of institutions in the system. Scott (1996) describes five common structures found in HE systems across the world:

1. University dominated systems: in which any other institutions are seen as part of the secondary or at the most, technical education sectors (rather than HE), and in which the universities and these embryonic post-secondary institutions are regarded as separate sectors.
2. Dual systems: in which these other institutions are now acknowledged to be properly post-secondary and the need for co-ordination with the university sector is recognised, although the latter are still seen as structurally superior.
3. Binary systems: in which two parallel HE systems, one consisting of the traditional universities and the other based on '*alternative*' institutions, develop (there is a tendency for the relationship between the two systems to drift away from complementary towards competition).
4. Unified systems: in which a comprehensive HE system is created embracing both the traditional universities and other institutions, although important differences of status and reputation remain (particularly in respect of research).
5. Stratified systems: in which a common system is maintained but the missions of individual institutions, externally and internally become differentiated (this differentiation may come about as a result of political action or through the operation of the market). (p. 43).

Scott argues that HE systems tend to develop by progressing down this list (Scott, 1996), though he concedes that in reality this schema is too simple to capture all the subtleties of policy change. One subtlety Scott highlights, which is of particular relevance to this project, is that of the tendency for binary systems to replicate themselves at lower levels when unified systems are being established. The example Scott provides is the then new demarcation between HE institutions and FE institutions offering HE in England. Scott goes on to note that this new demarcation is likely to erode with time as a fully unified post-secondary education system develops (Scott, 1996).

Furthermore, Temple (2001) suggests that not only is this likely but it is desirable. He notes the weakening between the differing cultural values of FE and HE systems, in particular what he describes as the academic and operational competences. This he describes as the difference between '*knowing what*' and '*knowing how*'. However, he goes on to claim that not only has this difference been weakening but in some specific areas of HE it has never been the case. Temple uses the examples of medicine, law and engineering to demonstrate that there have always been HE courses that aimed to create individuals able to develop as vocational

practitioners, not purely theorists in medicine, law or engineering. Furthermore, Temple concludes that these fundamental methodologies and epistemologies of knowledge are being contested by authors such as Scott (2000) and what he terms 'M*ode 2*' knowledge production is becoming more significant and is described as trans-disciplinary and rooted in its applications (Temple, 2001). Examples of this can be seen in modern university life in which PhD programmes have added doctoral training programmes which focus on developing competencies in skills used in research such as quantitative or qualitative methods, grant application writing, overall writing skills and other professional skills training (Scott, 2000). Finally, Temple (2001) contends that the resistance by government, through policy, to bridging the divide between the FE and HE sectors is part of what prevents England from establishing an effective mass HE sector that promotes diversity and flexibility.

However, Scott (2009) notes that by 2009 the structural differentiation of further and higher education systems in England had actually increased in terms of funding systems, quality regimes, governance arrangements and organisational cultures. This suggests that the resistance by government to bridging the divide between HE and FE systems, described by Temple (2001), was maintained in the subsequent years. Nonetheless, Scott highlights the distinct role FE colleges play in delivering HE in England, with such institutions providing the bulk of part-time non degree (technical level) courses and contributing the most dynamic growth in two-year vocationally orientated foundation degrees. Scott identifies four areas which have prevented HE in FE from penetrating the mainstream. Firstly, the ratio of students studying HE in FE settings compared to students studying in the official HE sector has not increased and has remained at roughly twelve percent (Scott, 2009). Secondly, in addressing the skills agenda, Scott notes that colleges have tended to focus on lower level courses for 16-19 year olds, rather than more advanced courses for adult students. Thirdly, Scott contends that governmental strategic planning has created a policy environment that does not lend itself to the creation of a single funding council for FE and HE institutions. Finally, Scott notes that the transition of the English HE system from elite to a mass system has been problematic, with the current HE system retaining many of the characteristics of an elite system despite its quantitatively mass nature.

Scott concludes that the problems within these areas have combined to prevent the FE system from progressing to become an integrated part of an English tertiary education sector rather than having two separate sectors. However, he states that the contribution FE colleges make to the flexibility and accessibility of HE makes them an invaluable contributor to the sector, which will play a key role in resolving the tensions and even contradictions in the still unfinished English mass HE system, i.e. not yet one sector for FE and HE (Scott, 2009).

One significant structural difference between the HE and FE sectors, is that of control over the design and awarding of qualifications (Temple, 2001). All HE institutions award or aspire to award their own qualifications, whereas, FE institutions have always promoted the qualifications of external bodies. This limitation hampers the ability of FE sector institutions to promote programmatic diversity as innovative new areas of study cannot be designed and implemented by the institutions themselves. Nonetheless, such diversification is possible on a limited scale as awarding bodies develop programmes within the prescribed governmental parameters.

Pratt (2013) describes some of the measures which Finland uses to maintain their dual system of HE. The Finnish institutions are primarily differentiated by different degrees, degree titles and missions by the Finnish government (Pratt, 2013). The Universities confer (following the Bologna (1999) process, see below) bachelor's, master's, licentiate and doctoral degrees, though Pratt notes that most university bachelor's students continue on to master's level. In contrast, universities of applied sciences (formerly polytechnics), offer bachelor's and master's degrees and their bachelor's graduates generally enter the labour market after graduation (Pratt, 2013). Furthermore, a requirement of entry onto university of applied sciences (UAS) master's degrees in addition to a bachelor's degree from a UAS (or equivalent) is a minimum of three years work experience in a relevant discipline.

Both institution types also have different missions with the universities focusing on research and teaching based on research and the UAS intended to train professionals in response to labour market needs and to conduct research, development and innovation activities that support and promote regional development in particular. These structural differences enforced through policy, ensure that there are at least two distinct types of institution within the Finnish HE system. This division, though similar in nature to the academic/vocational divide in England, is different as both the labour market and the government consider both institution types equal and the master's degrees awarded by the UAS are considered equivalent to the university qualifications (Pratt, 2013).

Codling and Meek (2006) contend that under a binary system there is a natural homogenising effect, perhaps in response to the competitive attitudes Scott (1996) notes such systems foster. Codling and Meek (2003) demonstrate this effect by examining the state of the HE system of New Zealand in the 1990s in their paper addressing the impact of the state on institutional differentiation in New Zealand. They describe the impact of allowing polytechnics and colleges of education to offer degrees. This enabled such institutions to move into subject and qualification areas, previously the domain of universities, in search of more students, funding opportunities and prestige. Conversely, they also note the universities moving into areas previously the domain of polytechnics after government deregulation allowed opportunities for diversification in this area as well. Implicit in their research is that the market will cause individual institutions to diversify but the system as a whole will become more homogeneous (see Section 5.2.3).

Codling and Meek (2006) then drew some conclusions about the diversification/de-diversification effects of different structures. They stated that in a homogeneous environment the prevalent trend will be for HE institutions to converge unless specific legislation to counter this is introduced. Therefore they established three related theories as follows:

1. In an HE system existing in an essentially homogeneous environment, the greater the formal policy intervention to promote diversity, the greater the potential for systemic diversity.
2. Binary systems promote diversity providing that policy and regulation limit the natural tendencies for institutional convergence.
3. Unitary systems do not in themselves promote diversity. (p. 42)

Guri-Rosenblit, Sebkova and Teichler (2007) agreed that binary or unitary systems only positively impact on diversity if supported with appropriate policy. However, they linked the

lack of such policy back to academic drift (examined above), which they stated remains the natural trend within an HE system without policy intervention.

Another consideration, in addition to the overall structure of the HE sector, is highlighted by Guri-Rosenblit *et al.* (2007) who contend that boundaries of the HE system in a particular country have an impact on the level of diversity within the system. They note that the Organisation for Economic Co-operation and Development (OECD) coined the term tertiary education as a description of all post-secondary education. This term was intended to replace HE systems with tertiary education systems. For example, in the United States of America (USA) all post-secondary education is considered an important part of their HE system (reflecting a tertiary education approach), whereas, in England the FE and HE systems are considered separate entities. Therefore, it is difficult to compare the diversity of different national systems of either HE or FE as what is defined as a part of the HE or FE system may not be consistent between nations.

Moving beyond national government policy, Guri-Rosenblit *et al.* (2007) also note the influence of supra-national policies which originate from organisations such as the European Union (EU), which have had an impact on national education systems, such as the Bologna (1999) process and the Sorbonne Declaration (1998). Part of the Bologna Agreement was to establish Europe-wide standards of degree and post-graduate study. This, of course, reduced the programmatic diversity available across European countries but provided a recognised standard for students. However, there was still significant diversity in standards and quality across Europe both nationally and supra-nationally. For a summary of the effects of European policy on national HE systems prior to these developments see Teichler (1998).

For example, the Italian HE system has been substantially more affected by the Bologna process than the UK HE system. They modified their bachelor's degree from a four-year to a three-year course and introduced a two-year master's degree (Rossi, 2010). This illustrates the impact European policy can have on national education systems. However, the UK has been less affected by the Bologna process as the model agreed on was largely in line with the UK model at the time (though the master's degree is meant to be a two-year course rather than the one-year course commonly found in UK universities).

Guri-Rosenblit *et al.* (2007) also consider the creation of for profit private HE institutions in developing countries particularly Central and Eastern Europe. Some of these are linked with prestigious institutions of other countries such as America's Cornell University opening a branch of their medical school in Qatar. Such developments can have significant positive impacts on national systems of HE, raising standards and increasing opportunities for students in individual countries. However, Guri-Rosenblit *et al.* (2007) also note that the lack of regulation of these private institutions allows the operation of sub-standard '*degree-mills*' that provide low level education and the resentment this lack of regulation can create in highly regulated public institutions.

Hall and Thomas (2004) discuss the structural divide between general FE colleges and sixth form colleges, with the latter primarily offering level 3 A-level courses (and some lower level courses) and the general FE colleges potentially offering courses from all levels of the national qualifications framework (Hall and Thomas, 2004). However, Hall and Thomas discuss pilot programmes run by sixth form colleges and sixth forms in schools in which degree level

modules are taught at the sixth form institutions as part of either widening participation programmes or programmes aimed at academically gifted students, to provide them with additional challenge over the course of their study. This second provision, initially appearing in Dearing's review of qualifications for 16-19 year olds, (Dearing, 1996) has, according to Hall and Thomas (2004), been more problematic in its implementation. However, this type of provision, Hall and Thomas contend, would create significant further diversification in the HE (and FE) sector as it would target a currently untapped market.

Finally, Meek (2001) offers the perspective that regardless of overall structure, systems can have either top down or bottom up characteristics. Top down systems are characterised by strong central government policy in which responsive institutions are controlled by policy as compared to a bottom up system where government policy follows strong institutional leadership. According to Codling and Meek (2006), the contrast between these two perspectives suggests that there is an inverse relationship between government leadership and institutional autonomy. However, while this may be the case, Codling and Meek (2006) also conclude that it is also possible that in some HE systems, institutions are unaffected by policy as it either does not exist or has no impact. They categorise such systems as 'deregulated' or 'self-regulated' in other words, a policy of non-interference.

They asserted that the belief structure behind such non- interference was faith in the competitive market environment, limiting the necessity of central control beyond a basic framework. This belief assumes that market forces are enough to promote institutional diversity through differentiation and to ensure institutional quality. The following section on the influence of market forces and competition on the HE sector investigates and discusses this perspective.

5.2.3: Market effects and institutional competition and cooperation

The authors reviewed in the theoretical background section indicate that the free market and resultant competition can have an effect on the levels of diversity within a system. While most authors investigating education systems concur that there is an effect, many postulate that this effect is distorted by the market economy of education systems. Therefore, this section discusses what researchers into educational systems have discovered regarding the effects of the free market and competition and if it concurs with the organisation theory presented in Section 5.1.

Oplatka (2004), in their theoretical study of market forces in the schools sector, concludes that the market has a distorted affect in the schools sector rather than that expected by organisation theory. Oplatka states, this is partly because parents are not able to make informed choices on where to send their children to school due to a lack of transparent information about schools' core operations. This, they postulate, is caused by information about technical productivity and classroom methods being difficult to obtain objectively. Therefore, measures of control and evaluation are developed on a symbolic basis. For example, league tables, a source of information for parents, do not provide parents with information on the teaching and schooling processes. After all, a school's position on a league table is not simply a reflection of the quality of the teaching or schooling processes but also on the academic quality of the intake and other non-educational factors (Oplatka, 2004).

While in the HE or FE sectors, parents' choice is more the student's choice influenced by the parents, Oplatka's work could be generalised to these sectors. Indeed, the argument about lack of effective transparent information available to students is still significant; with information about the FE sector being less common with even the limited usefulness of league tables absent. Oplatka (2004) concludes that as the market is not properly able to function due to a lack of product assessment, its impact on the promotion of diversity is substantially reduced. Codling and Meek (2006) and Meek and Wood (1997) also acknowledge this divergence from a true competitive market environment in the HE sector, and further conclude that such environments instead lead to institutional convergence rather than the institutional diversification that governments expect from what Meek and Wood (1997) term a '*market steering approach*'. Similarly, Oplatka (2004) states that this limited influence of market forces coupled with the effects of institutional isomorphism theory (described in Section 5.1) and institutional rules (or academic norms), contribute substantially to explaining the lack of diversity in the school system.

Alternatively, Codling and Meek (2006), whilst also recognising that the competitive market functions differently in the HE sector than it does in a typical business environment, suggest that, in the HE sector the impact of a quasi-competitive market/competitive market works in conjunction with the level of demand and the available resources. This proposed interaction allows them to draw two conclusions on the impact this has on diversity:

1. During periods of high student demand and resource flow in a deregulated competitive market, the potential for institutional convergence increases.
2. During periods of low student demand and limited resources in a deregulated competitive market, the potential for systemic diversity increases. (p. 46).

Van Vught (2008) adds the proposal that the '*imperfect*' competitive markets also work in conjunction with institutional reputation to create several unintended consequences to institutional diversity. Firstly, the reputation race fuels the continuing increase in the private cost of HE as institutions compete for the more academically gifted students as well as total student numbers. This combination leads to the wealthier institutions widening the financial gap between the poorer institutions which further increases the tendency towards vertical differentiation over horizontal differentiation. Finally, this increase in educational costs contributes to increases in social stratification of students in institutions with the more expensive higher reputation institutions being more accessible to richer students. This research, while based on the USA, has some significance in the UK HE sector, particularly with recent increases in student fees. However, it is of less significance in the English FE sector as reputational competition has less importance than in the UK HE system, as students are more likely to attend local institutions.

Rossi (2009) demonstrates empirically that the Italian HE system has decreased in diversity of disciplines over the 2000/2001 to 2006/2007 academic years, meaning that institutions have become less specialised in the less popular subjects over this period. Rossi notes several funding policies and market conditions that have had an impact, both positive and negative, on the diversity of the HE system. Rossi provides further empirical evidence that suggests that competition, contrary to commonly held opinion, both cause institutions to diversify and to become more homogeneous. This is caused by institutions following student demand which, if all institutions react to it, will naturally cause them to offer similar courses (i.e. if psychology is

popular then more institutions will offer courses in psychology), potentially resulting in homogenisation. However, this added competition will also cause institutions to seek new markets for students in order to identify unmet needs which can be satisfied with new disciplines, courses or attendance types, potentially leading to diversification.

Furthermore, Rossi (2009) notes that when student mobility (i.e. distance travelled) is quite low, institutional competition is not at a national level but more at a regional level (a similarity to English FE). This can be used to identify sub-sets of institutions which compete with each other, particularly when used in conjunction with the percentage of local area students at an institution. In such circumstances it is arguable that the effects of competition are mitigated by this regionalism. However, institutions which diversify in order to tap into new markets may still be copied in order to acquire additional funding in other geographical regions.

Rossi (2009) divides institutions into three categories, regional, trans-regional and national, which are defined as:

- If more than 75% of the students are resident in the same region where the university is located, the university's market is defined as '*regional*'.
- If between 50 and 75% of the students are resident in the same region where the university is located, and more than 75% are resident either in that region or in a neighbouring region, the university's market is defined as '*trans-regional*'.
- If less than 50% of the students are resident in the same region where the university is located, the university's market is defined as '*national*'. (p. 406).

These groups, though arbitrarily created are logical and allow for the analysis of groups of institutions that present a similar profile in this area of recruitment. In the Italian example, Rossi was able to identify some diversity characteristics of each group of institutions. Rossi's (2009) reported results were:

> Regional institutions presented low specialisation in all subject areas, trans-regional institutions were on average over-specialised in the social sciences and arts and humanities and under-specialised in the natural and technical sciences and in the medical sciences; whereas national universities displayed even more extreme values of the specialisation index, being under-specialised in the natural and technical sciences and over-specialised in the social sciences and in the arts and humanities. This pattern had not changed substantially in the period 2000/2001 to 2006/2007. (p. 406).

Rossi states that this is the pattern that would be expected considering the popularity of such subjects for Italian students. Furthermore, she notes that regional institutions are more horizontally diversified than trans-national or national institutions (in subject area). However, during the period under study Rossi identified a downward trend of diversification for regional and trans-regional institutions in contrast to national institutions staying roughly stable, suggesting a homogenisation of the Italian HE system (Rossi, 2009).

Rossi concludes that there is no significant effect of competition on horizontal subject diversity at bachelor's level and only a weak effect at master's level (where there are less available students). She recommends that the anticipated diversity enhancing property of competition should not be taken for granted and that policy makers should in fact be aware of the possible reduction in institutional diversity from market competition.

5.2.4: Cooperative factors

In contrast to the competition model very little research has been conducted on the effects of institutional cooperation on institutional diversity. Nonetheless, Jones (1996), in investigating cooperation in the Canadian HE system, concluded that "a successful innovation at one institution is often adopted by others" (p. 86), which would result in institutional convergence. In opposition to this is the concept of local cooperation between institutions to avoid replication of provision. The UK government encouraged this stance (BIS, 2014), in effect supporting institutional diversity, at least on a local scale. One example is the informal cooperation agreement between York College and Askham Bryan College previously mentioned in Chapter Two.

5.2.5: Funding factors

Codling and Meek (2006) stated that funding policy is one of the most powerful forms of intervention available to governments in order to maintain differences between institutions. However, they contended that few countries appear to utilise it for this purpose. Nonetheless Codling and Meek conclude that:

1. The greater the financial incentives within an HE system that do not have explicit diversity objectives, the greater the potential for institutional convergence.
2. The greater the financial incentives within an HE system that do have explicit diversity objectives, the greater the potential for systemic diversity. (p. 44).

In contrast to Codling and Meek, Huisman (1995) concluded that state funding policy could have positive effects on institutional diversity. Huisman's conclusions focused on programmatic diversity, where he demonstrated that the Dutch government had enhanced programmatic diversity through policy without explicit intention to do so. He stated that combining a market steering approach with policy intervention enabled governments to facilitate increased diversity, without specifically intending to do so.

In addition to the limited usage of funding policy to create or maintain institutional diversity noted by Codling and Meek (2006), few other authors have examined the impact of funding policy on institutional diversity. This section initially examines the research, in addition to Huisman's, that has considered such effects. It then examines an example of funding policy by HEFCE that had explicitly stated diversity objectives, whilst discussing the limited amount of available evaluation of these policies by commentators. The purpose of this section is to demonstrate the apparent power of funding policy on institutional diversity, while acknowledging that this is an under-researched area.

While there has been limited research into the effects of policy on institutional diversity, some authors have theorised on the effects certain funding models may have on institutional diversity. For example, prior to the Dearing Report (Dearing, 1997) there were calls by many in the university sector to overhaul the funding strategies for teaching and research (e.g. Roberts, 1996; Richmond, 1996; Harrison, 1996). The Committee of Vice-Chancellors and Principles provided a report to Sir Ron Dearing which called for (amongst other things) funding regimes to support universities which sought to form working partnerships rather than competing on all fronts. It was suggested that this would enable institutions to maintain and enhance their diversity through cooperation (Roberts, 1996).

Another example is that of Harrison (1996), the chair of the National Academies' Policy Advisory Group (NAPAG) and Richmond (1996), who concluded that the system which funded both teaching and research in UK HE was unsustainable, due to the addition of the polytechnics into the university sector. Both Richmond and Harrison noted that in 1996 research funding agencies were reporting that up to 80% of their funding was going to a very limited number of institutions (sometimes as few as 10). They commented that this was not necessarily undesirable, as maintaining a diverse range of institutions met with stated government objectives and institutions could be differentiated by research mission (Harrison, 1996; Richmond, 1996). However, the NAPAG also concluded that this funding model was inequitable and would lead to institutional convergence due to institutions seeking to secure more funding through research and thus following academic drift. Their conclusion was that a new funding stream was necessary to encourage a diversity of mission. This funding stream was to be for professional development and teaching, targeted at those institutions with a high student to staff ratio. It was intended to reduce student to staff ratios in such institutions providing academics and staff with more time to keep abreast of their subjects, and so better perform as effective university teachers (Harrison, 1996).

Conversely, HEFCE (2000) maintained that their block grant teaching funding method and the dual support for research at the time actually maintained and encouraged diversity. They stated that the flexibility which institutions had in how they deployed their HEFCE funds allowed for a diversity of approach. Institutions were not limited to which programmes they had to spend their funds on as they were able to spread them out over all offered routes of study as long as they met their overall contract. This, HEFCE stated, allowed for different funding strategies, such as franchising and consortium funding for funding through FE institutions. They did, however accept that, like some commentators claimed; the transparency of this funding method could have caused institutions to feel constrained by the assumptions of HEFCE's method. However, HEFCE felt that the benefits to diversity of this transparency outweighed the negatives.

HEFCE (2000) also stated that they provided most HE institutions with resources for research infrastructure, coupled with additional funding directed towards institutions engaged in high quality research (the dual support system to which Richmond (1996) objected). HEFCE claimed that this system (unlike in Richmond's view) allowed institutions to have differentiated missions in different research areas by identifying fields in which they should attempt to perform well in the research assessment exercise (RAE). This funding, which was not tied to particular projects, enabled institutions to target where they wished to build up their research infrastructure, potentially creating opportunities for diversification. However, as Codling and Meek (2006) pointed out, research funding distributed using such a system will inevitably lead to a hierarchy of institutions, this in turn will cause academic drift as lower ranked institutions attempt to emulate higher ranked institutions, in order to maximise their research income. Furthermore, Codling and Meek (2006) argue that if only one or a limited number of types of research are recognised or are better funded then this will also cause institutional convergence as institutions will naturally follow the money. Indeed, Brown (2000, 1999), then principal of Southampton Institute (now Southampton Solent University), criticised the RAE at that time for inhibiting diversity by not embracing all the research that was being done across the sector, much like Codling and Meek suggest.

HEFCE had also introduced third stream funding by 2000 though not in the guise envisioned by Harrison (1996). This new funding stream, which was introduced as the Higher Education Reach-out to Business and the Community Fund and subsequently replaced in 2001 by the Higher Education Innovation Fund (HEIF), sought to improve diversity by funding a range of institutional engagement programmes with the assumption that all institutions should engage with business and the community, but in diverse ways (HEFCE, 2000). HEFCE intended this to reduce one of the factors which they felt militates against diversity, that some institutions felt pressure to develop a wide-ranging research programme. Though the success of this funding stream was never analysed directly for its influence on the diversity of institutions, the report to HEFCE by PACEC (Public and Corporate Economic Consultants) and the Centre for Business Research at the University of Cambridge in their analysis of the impact of the HEIF stream, determined considerable impact on HE institutional operations and identified a significant number of diverse initiatives funded by this stream (HEFCE, 2009). Therefore, it is reasonable to conclude that this funding policy had a significant impact on the diversity of institutions as the report states that business and community engagement varies at different institutions as they have different missions and priorities (HEFCE, 2009). Moreover, while the levels of diversity were never empirically tested or measured, the report gives good qualitative evidence for enhanced diversity.

HEFCE (2000) further stated that they also allocated additional funding for part-time, mature and/or widening participation students with the recognition that some student types have additional resource demands. These funding policies were intended to enhance the diversity of student intake (or 'constituential' diversity), though there are reservations regarding the equality of opportunity they represent (see Harris, 2010). Nevertheless, such policies provide additional support for such students who may have found it impossible to attend an HE institution without it. HEFCE (2000) also include additional funding for specialist, higher cost, institutions and small sized institutions in order to enhance institutional diversity (systemic diversity). Furthermore, they included additional funding for subjects that attract so few students that they could not remain viable if funded with the normal price-band rate, yet have other reasons for continuing their provision (such as academic, cultural or commercial). This, HEFCE stated, was in order to maintain subject diversity (or programmatic diversity). HEFCE provided funding which institutions competed for in order to grow, known as additional student numbers funding. Thus funding, as a control on growth rate of institutions can either be seen as a manifestation of the limits on growth from competition set out in Hannan and Freeman's theory (1977) or as an additional constraint set on growth rate by government policy interference with the market.

HEFCE acknowledged that their special funding initiatives, which are designed to implement government priorities, had been criticized by some commentators, who suggested they had an adverse effect on diversity as institutions felt obliged to seek their share of the extra funding, whether or not this reflected their institutional mission. However, HEFCE contended that by asking each institution their plan, they enabled institutions to chose which strategy they wished to adopt, consistent with their individual mission and objectives, in order to meet the stated objective. Finally, HEFCE stated that by targeting expanded provision in part-time, locally accessible sub-degree level courses mainly in FE colleges they were enhancing opportunities for institutional diversity.

The overall approach to strategic planning HEFCE (2000) outlined, is one of institutional autonomy, with institutions having the authority to determine their own mission and the means of achieving it. They note that some have argued that diversity may be better served by a more centrally influenced approach but HEFCE argue that placing the initiative with institutions best serves a dynamic and responsive HE service. However, HEFCE (2000) conclude that sometimes radical change is beyond the resources of a single institution or that if there is not sufficient incentive for a single institution to take the lead, development may be slowed or halted. This, HEFCE state, is addressed by the Restructuring and Collaboration fund which provides the support needed in these situations. Most commonly it was used to create new institutions, support collaborations or 'pump-prime new initiatives' (i.e. direct additional funds to important new initiatives) (HEFCE, 2000).

This brief description and discussion of HEFCE's funding policies and their intended effects on diversity are only a starting point and although this description most substantially impacted on the HE sector, some impact would also have been felt within the FE sector. Unfortunately, little further research has been conducted in analysing the effects of these types of policies on diversity, in particular in the FE sector and this is a huge area for further research.

5.2.6: Rankings and league table effects

Rankings and league tables are not commonly associated with the FE sector and thus this area is of less importance in this thesis. However, this section provides a brief overview of how such systems potentially affect the diversity of an education system, with theory drawn from the HE sector.

Marginson and Considine, (2000) identified ranking systems and league tables as one of the HE sector's strongest sources of the mimetic isomorphic tendencies identified by DiMaggio and Powell (1983). Codling and Meek (2006) describe this effectively by stating that

> ...once a ranking system has become established for the institutions of an HE system, there is an inevitable tendency for those ranked towards the bottom of the list to seek to raise their standing by copying the successful activities of those institutions higher on the list. (p. 48).

Such isomorphism is a result of active decision making on the part of the lower ranked institution which would be more likely to occur if there is a specific funding advantage to a higher institutional ranking (Marginson and Considine, 2000). Therefore, Codling and Meek (2006) declared two principles of the effect of institutional ranking on institutional diversity:

1. Whether or not institutional diversity occurs within an HE system, there will be a hierarchy of institutions and institutional types based on longevity, wealth and prestige.
2. Where institutional ranking is well established within an HE system, there is a greater potential for institutional convergence. (p. 48).

Furthermore, van der Wende (2008) concludes that rankings favour a particular type of institution, the research intensive university; providing such institutions with international recognition, encourages convergence on this institutional model. Hazelkorn and Huisman (2008) report that the conference on diversity of missions in HE in 2007 concurred with this stance, identifying the two major world university rankings (The Times QS World Ranking and

The Shanghai Academic Ranking) as favouring the research intensive university model which could lead to other types of institutions and their staff and students feeling marginalised or ignored. They state that this is especially apparent in, but not restricted to, the Shanghai rankings. This ranking, by measuring publications in *Science and Nature*, Nobel prizes and high citation researchers (awarded to the top 0.5% of researchers in their field globally), leave entire disciplines, for example engineering, the built environment, the arts and humanities, ignored by its methodology (Hazelkorn and Huisman, 2008).

Van Vught (2008) takes this conclusion one step further, by suggesting that in order to maintain or increase diversity in HE systems, additional HE ranking systems need to be developed, this would allow comparison of similar institutions within a particular type or category. This, he states, would allow stakeholders to analyse institutions on measures appropriate to their mission offering a better overall understanding (see also Bartelse and van Vught, 2007).

5.3: Typologies and diversity in higher education

This section examines several classifications or typologies of HE institutions. The Carnegie Classification, a United States of America classification system, is examined due to its position as the most well-known and commonly used classification system in world education research. The discussion is developed by examining the classifications created for English and UK HE. Finally, two examples of how HE classifications have been used in UK education research are briefly discussed and parallels are drawn with the FE sector in general and this project in particular.

The study of diversity in HE is substantially more developed than in FE, both in English HE and in particular in US HE. The Carnegie Classification (CC) of US HE is probably the longest standing and commonly recognised typological study of diversity in HE. It was originally developed in 1970 by the Carnegie Foundation for the Advancement of Teaching, for their analytical purposes and was published in 1973 for general usage (McCormick and Zhao, 2005). McCormick and Zhao (2005) further discuss the goals of the CC, highlighting that one of the original purposes of the CC was to "call attention to and emphasise the importance of the considerable institutional diversity of U.S. Higher Education". (p. 52). The resulting categories of institutions enabled researchers to make comparisons among similar institutions and to contrast them with different ones.

The classification was conducted to group institutions by specialisation and degree level. This resulted in the following categories:

- doctoral-granting institutions being grouped together
- masters level institutions (called comprehensive colleges)
- undergraduate liberal arts colleges
- two year colleges
- specialised institutions

All categories but the two year colleges were further broken down into sub-groups dependent on variables relevant to the grouping (e.g. research activity for doctoral institutions and level of selectivity for liberal arts colleges). This primarily allowed for institutions to be grouped

together by '*what they did*' and '*who they taught*', effectively grouping institutions by mission and student body (McCormick and Zhao, 2005).

The five initial groupings are a measure of institutional diversity at a programmatic level, with consideration given to the level of qualification offered by the institution. The sub-groups were a measure of diversity important to that particular category. For example, the research level sub-division of doctoral granting institutions is in effect a combination of programmatic and procedural diversity. The differentiation on research emphasis is arguably procedural diversity and the density of doctoral provision is again programmatic diversity. This demonstrates the importance of the elements being measured to each category of the sector. For example, the doctoral institutions being assessed primarily on research, indicates the significance such institutions attach to research (as is commonly recognised today). The liberal arts colleges are sub-grouped on the selectivity of each institution, which is clearly a measure of 'constituential' diversity, as it is differentiated on an aspect of the student body. This suggests that the status of institutions in this category is measured by the perceived quality of the students which they can attract. Equally, it is a measure of the diversity of the students which attend institutions in this category, from the academically gifted through to those who barely meet the academic standards to enter degree level study.

However, in the modern Carnegie Classification, while some of these categories are still intact from the original 1971 classification discussed by McCormick and Zhao (2005), significant changes have been made. For example, the doctoral granting universities are now only sub-divided into three categories (very high research, high research and research institutions). The two year colleges category is where the greatest changes have been made; in the past all colleges were grouped into one category, whereas now there are four initial groups and several smaller sub-groups beyond that (Carnegie Foundation, 2012a). It is difficult to argue that the basic classification differentiates all institutions on a key characteristic for each institution type, as simple measures such as size and for profit status are used to sub-divide some categories. However, these variables are still a measure of institutional diversity, with size being a systemic diversity factor and for profit status an aspect of structural diversity. It is only the sub-division based on campus type (whether single or multi campus) that is difficult to fit within Birnbaum's (1983) structure. It could perhaps be regarded as an aspect of systemic or structural diversity. Nonetheless, it is a valid way of sub-dividing institutions and is simply a small part of a hierarchical organisational structure useful for comparing such institutions. It should be noted that while some of the variables used to differentiate institutions may appear trivial, the primary purpose of the classification is not to rank institutions but to group them together with similar institutions to allow for comparison between both similar and different institutions. None of the classification differentiations are intended to indicate one institution is better than another, rather, the intent is simply to allow for comparisons using aspects of an institution. For example, comparing a small institution’s spending on library functions with a large institution would not be a fair comparison, as the larger institution has greater resources and is likely to need to cover more subjects and courses. This disparity would be expected and is by no means a criticism of the smaller institution. In contrast, comparing two institutions from the same group could illuminate failings or excellence in a variable that you would expect to be comparable in value.

This hierarchical structure (see Carnegie Foundation, 2012b) is different to that used by most statistical typologies created for English HE, though the overall intent of comparison, rather

than ranking described above, is the same. Statistical typologies tend to use a form of cluster analysis or related methods such as principal component analysis, factor analysis and discriminant analysis (Tight, 1988). Four such statistical typologies have been identified for the HE sector in England at various points in history, Tight (1996), Tight (1988), Dolton and Makepeace (1982) and King (1970).

King (1970) conducted a principal component analysis on 10 variables measuring number of staff and students, wastage rate, subject split, gender, library and residential provision and research focus. Using this method King analysed 41 UK universities including those in Scotland and Wales but excluding Northern Ireland. As this typology was created prior to the 1992 Further and Higher Education Act, it does not include the polytechnics and colleges of higher education that became HE institutions as a consequence of the Act. King identified four main groups of universities and 14 sub-groups, which have significant consistency with the historical foundation of the institutions (See Scott (1995) for the historical typology). However, there is some crossover between groups and sub-groups for institutions founded at different periods in time. These crossovers demonstrate that institutions can change over time perhaps indicating the presence of academic drift, i.e. when institutions drift towards replicating one '*ideal*' model, usually the most prestigious (Huisman, 1995). In a system which is intended to serve multiple purposes and constituents, this could pose a problem and Rhoades (1990) contends that it is political competition and the resulting state sponsorship that prevents this academic drift from becoming a problem. Conversely, Birnbaum (1983) contends that it is government interference that is the greatest barrier to differentiation and it is through competition between institutions that diversity is achieved.

Dolton and Makepeace (1982) modified and extended King's work in two significant ways: first they brought the data up-to-date and extended it by collecting information from more institutions and over more variables. Secondly, they extended the methodology to use cluster analysis in addition to King's principal component analysis, with the intention of investigating in more detail the links between institutions (Dolton and Makepeace, 1982). Dolton and Makepeace included six additional institutions in their classification (though still excluding polytechnics and colleges of HE) and collected data on 21 variables for each institution (though only 19 were used to calculate the typology). Like King, most of Dolton and Makepeace's variables can be considered aspects of diversity of the sector such as the percentage of students in particular subject groups or the average A-level offers at the institution.

The two variables not included in calculating the typologies measure changes after the University Grants Commission (UGC) funding cuts at that time. Dolton and Makepeace created their classification for the same reason that the Carnegie Classification was created, namely to analyse changes between similar institutions and to contrast them with different types of institution within the HE sector. They considered whether all institutions within each group of their classification had been equally affected by the UGC cuts, finding that the cuts had a greater effect on both technological and arts institutions than on Oxbridge, London and traditional civic universities (Dolton and Makepeace, 1982). However, even within the groups, significant disparity was identified. The technological group provided three of the most adversely affected institutions and two of the least affected. Dolton and Makepeace use this result to conclude that the cuts had been applied to the institutions unfairly and that the UGC should have used some form of classification to distribute their cuts to ensure an equitable approach. Dolton and Makepeace's use of their typology illustrates the possible use of a

typology for the FE sector and the ways in which it can be useful for either politicians or academics in their analyses of the FE sector.

Tight (1988) is the first author to include polytechnics and colleges of higher education in one of their typologies, though after 1988 they were established in their own HE sector. This is the closest anyone has come to producing a typology of FE institutions, though most of the institutions are no longer in the FE sector. Data focused mainly on the FE sector institutions' HE provision, though some consideration was given to numbers of students on non-advanced courses at polytechnics. Tight recognises that not all of the data is strictly comparable between HE sector and FE sector institutions, but that it is '*close enough*' to be used for the purpose of typology creation.

Like Dolton and Makepeace, Tight also uses both principal component analysis and cluster analysis, to analyse his data. However, as Tight was analysing two sectors of provision he used two sets of variables, though as noted above these were very similar. For the university sector he collected data on 19 variables for 51 institutions. In the FE sector for colleges he collected data on 15 variables for 33 institutions and for polytechnics three additional variables for 29 institutions. As noted above, these were not completely identical but they were reasonably comparable. The variables list Tight uses for the university sector is similar, though not identical to that of Dolton and Makepeace. It is therefore, perhaps, not surprising that the resultant five groups (and 19 sub-groups) are also similar, though there had been a small amount of movement between groups and also new members of the HE community that could now be classified.

It is the analysis of the polytechnics and colleges of HE that is the truly important extension of Dolton and Makepeace's work by Tight. Tight uses the university groups as a point of reference and comparison but identifies five distinct groups for the polytechnic sector. One of these, the technological group, is highly similar to that of technological universities, though Tight states that there are still important differences (most notably higher part-time student numbers). Unlike the university sector, Tight does not identify sub-groups within the polytechnic sector which he attributes to the smaller number of institutions.

Similarly, in Tight's analysis of colleges of higher education, he identifies five groups of institutions, though this time with one group containing three sub-groups. Each category was named after size and in some cases subject specialisation, though colleges held other characteristics in common with their fellow category members. Tight's analysis was conducted with a data set from 1984, eight years prior to the amalgamation of the three groups of institutions into one sector in 1992, and was perhaps the first indication of the cross-over between the further and higher education sectors at the time. Indeed, when Tight included all institutions regardless of sector into one analysis, he discovered that using the variables selected, technological universities and two of the polytechnic groups had much in common, so much so that they could arguably fit into one group. This similarity supports the joining of the HE sector by the larger polytechnics, a trend also found amongst the larger colleges, though often in subject areas other than technology (particularly in arts).

However, in contrast to Tight's findings in 1988, when Tight (1996) revisited the creation of an HE typology after the merging of the polytechnics and larger colleges of HE with the HE sector, his latest typology kept all the former polytechnics and colleges of HE separate from all the

universities. This can be partly explained by his use of a much more extensive data set with 42 variables, used to differentiate between institutions as opposed to 19 on the previous typology. Tight caveats his typology by stating that there was little to choose between some groups, particularly the technological universities and the large former polytechnics. Tight also concludes that certain key characteristics of diversity such as subject spread, study level and study mode are also key characteristics in defining many of the specialist groups. These aspects of programmatic and procedural diversity are also present in FE colleges and are included in the data set for this project and as such, have been identified as key characteristics for inclusion in the data analysis.

In Tight's study of institutional diversity in 2007, he uses a simplified version of Scott's (1995) typology, which he states was based on institutional history, nationality and designation (Tight 2007). This, he states, is due to statistical typologies largely confirming such 'common sense' classifications. As Tight was limiting his analysis to England only, the nationality of the institution was irrelevant and as such he used seven categories (reduced from Scott's 14), derived simply by history and in the case of specialist colleges, subject focus. Using the variables, size of institution by total student numbers, level of study, mode of study and percentage of students from the UK, Tight's typology considers four of Birnbaum's categories of diversity: systemic, programmatic, procedural and 'constituential' diversity.

Based purely on these characteristics, Tight is able to conclude that in terms of size of institutions, programmatic and student body characteristics, the sector is fairly diverse. However, he also concludes that while the system as a whole has substantial diversity in terms of the characteristics examined, institutions themselves tend towards two distinct types: these types are separated by mission; generalist and specialist. The generalist institutions tend to follow a large-scale multi-faculty, multi-level vision, which provides substantial diversity within each individual institution, but also means that the institutions themselves are very similar. Indeed, the exceptions to this being the specialist institutions, which while not inconsequential in number (21 out of 132 institutions), only account for 1.4% of the total students. Thus Tight argues that there is a second, alternative conclusion; institutions are becoming more and more similar with specialist institutions providing HE for relatively small numbers of students, with the rest attending institutions with largely identical visions.

In summary, the early sections of this chapter have defined the concepts of differentiation and de-differentiation and what influences these processes occurring according to organisation theory in general and in the field of HE in particular. The sections have attempted to relate this to the field of FE where possible but it is acknowledged that a theoretical base specific to FE does not currently exist. The concluding chapter of this thesis and the recommendations therein make some suggestions that would address this theoretical deficit. Finally, this section has presented the work of numerous authors within the HE field of study with similar objectives to those that this study has within the FE sector. Furthermore, they have used similar methodologies to that used by this study, which is presented in the following two chapters.

Chapter 6: Sources of data and selection of variables

This chapter describes where the data for this study originated and for what purpose it has been produced. It includes a brief history of the organisations from which the data was acquired and the process necessary for permission for this study to use it. Following this is a description of the format and structure of the data obtained and some examples of the data within each file. The scope of enquiry is then outlined including the year of data and the specific sub-set of institutions this study was limited to and the reasons for these decisions. The process of the selection of variables for use in this study is then described with each of the variables selected for use in this study defined. Furthermore, it discusses some of the other available variables that were not included and the reasoning behind these decisions. Finally, the properties of the selected variables are described in detail including how they are structured and any decisions made regarding data handling and management.

6.1: Sources of data

The data collection responsibilities in the FE sector have regularly moved from organisation to organisation since incorporation in 1992. This section clarifies who has been responsible for data collection in the FE sector, including who collected it when the data for this study was acquired and who collects it now. Furthermore, it describes the process required to acquire the data for this study and the overall purpose of the data collected.

The data selected for use in this study is the Individualised Learner Record (ILR) now produced and maintained by the SFA. The ILR is a collection of data about learners including their providers and their courses/qualifications that is requested from providers in the FE and skills sector (IA, 2014a). In addition to its use by the funding councils for the funding of institutions, The IA (2014b) state that it is intended to be

> ...used by organisations in the FE and skills sector to ensure that public money is being spent in line with government targets for quality and value-for-money, for future planning and to make the case for the sector in seeking further funding. (p. 1).

As noted in Chapter Three, this data set was first collected by the Further Education Funding Council when they were given responsibility by the government for their own data collection, though at this time it was called the Individualised Student Record. At the same time, the Training Enterprise Councils collected their own data for the WBL they funded (SFA, personal communication, June 18, 2015). Initially, when the LSC replaced these two funding bodies they continued with the same processes. However, from the 2002/2003 academic year the LSC introduced the Individualised Learner Record to collect data for all funding streams, including both FE and WBL data. Although the data were now collected by the same organisation, the LSC maintained separate formats, data collection requirements and timetables for the different types of provision and funding streams (SFA, personal communication, June 18, 2015).

In October 2006 the Information Authority (IA) was set up as an independent body, acting on behalf of organisations involved in FE and training in England with responsibility for setting data standards and governing data collection (SFA, personal communication, June 18, 2015; IA, 2014a). Their board was made up of representatives of data users (mainly the LSC and the

Department for Education) and providers of the data (FE colleges, private training companies etc.) and serviced by a secretariat who were employees of the LSC (SFA, personal communication, June 18, 2015; IA, 2014a). The IA took over the governance and specification of the ILR from the 2006/2007 academic year but the LSC continued to collect and publish the data (SFA, personal communication, June 18, 2015). However, in 2008 the Data Service (DS) was set up by the LSC as a single central point of information for FE and took over the collection of ILR data (SFA, personal communication, June 18, 2015; DS, 2014).

When the LSC was abolished in 2010 and replaced with the YPLA and the Skills Funding Agency, the Information Authority continued to govern the ILR and the IA secretariat transferred to the Skills Funding Agency. The DS transferred to the Skills Funding Agency and remained responsible for the collection of ILR data and operated as a shared service for both the Skills Funding Agency and the YPLA (SFA, personal communication, June 18, 2015).

For the 2011/2012 academic year, the year of data for this study, the ILR underwent a change of format, becoming a single collection for all providers and types of provision for the first time and is now published as a single dataset (SFA, personal communication, June 18, 2015; IA, 2011).

When the YPLA was replaced by the Education Funding Agency (EFA) in 2012 the IA and Data Service continued to govern and collect data for both the SFA and the new EFA (SFA, personal communication, June 18, 2015). However, in 2013 the IA was abolished and its responsibilities transferred to the Department for Business, Innovation and Skills, though the secretariat function remained part of the SFA. Contemporaneously, as part of the SFA re-organisation, the Data Service ceased to exist, though the collection of the ILR data remained the responsibility of the SFA (including the data collected on behalf of the EFA) (SFA, personal communication, June 18, 2015).

In summary, the collection of data in the FE sector has largely remained with the relevant funding body of the time, though the IA and the DS did survive between two funding agencies. The data provided for this study was through the IA and DS. An application for the availability and use of the data was required and it was submitted to the DS and a confidentiality agreement adhered to. This confidentiality agreement allowed the identification of individual institutions but not of individual students.

6.2: The ILR file structure

In order to discuss the content of the ILR it is first necessary to define some key terms. In the ILR, a provider is an entity that offers publicly funded courses in FE. A student or learner is an individual enrolled on one or more courses at an individual provider. An aim is a qualification or skill aimed for by the student e.g. a student might be attempting a GCSE in mathematics or learning conversational Spanish. A student may be attempting more than one aim in a single academic year e.g. four A-levels or various short courses in construction techniques.

The data received from the DS for this study was in SPSS (Statistical Package for the Social Sciences) format and came in six SPSS files - a summary description of each file is as follows:

1. Each record contained information on an individual qualification or course. This data is from the analytical learning aim reference application which defines all funding

agency recognised aims. The variables within this file included *inter alia* level of study (see Chapter Three for more detail), subject of study, the awarding body of the qualification, when accreditation of the qualification began/ended (where appropriate) and the qualification type (e.g. NVQ/A-level etc). The file was called LARA_1112.

2. Each record contained information on an individual provider within the FE system including *inter alia* the provider's name, administrative type, status (e.g. active/non active in 2011/2012) and total number of students. The file was called SILR1112_ADMIN.
3. Each record contained information on an individual aim attempted by a student. This was the largest file with 125 variables each providing some detail about the aim under study, ranging from funding information to mode (e.g. part-time/full-time), level and subject of study to student information such as age and gender. The file was called SILR1112_AIMS.
4. Each record contained information on an individual student. This was the second largest file with 93 variables each providing some detail about individual students including *inter alia* funding information, student details such as age, gender, ethnicity, disability status, and the level and mode of study. It did not include addresses, names or telephone numbers of individual students or anything else that would directly allow the identification of an individual. The file was called SILR1112_LEARNER.
5. Each record contained information on an individual HE aim attempted by a student. This included variables on UCAS points, current qualifications and funding details. It is similar in nature to the SILR1112_AIMS but provides additional information for HE aims. The file was called SILR1112_HE.
6. Each record contained information on an individual provider including names and addresses. The file was called SILR1112_PROVIDER_DETAILS.SAV but was not required for this study as all information relevant to this study was also available in other files.

The records in each file were linked together using a unique identifier for individual students, aims and providers. Thus, you could identify which students attended which institutions, what courses they were taking and what the details of those courses were. Additionally, there was some cross-over between files where the same information was recorded; this was most often the case between the aims and learners files.

6.3: Scope of inquiry

The purpose of this study is to present a cross-sectional picture of the nature and extent of diversity in the FE sector in the academic year 2011/2012. This section defines the limits of what is meant, in this context, by the FE sector. It defines which institutions are and are not included in the study and why.

Within the FE system there are a number of pre-defined types of institution classified by the ILR as discussed in Chapter Three. These institutions range from assorted types of college such as general FE, sixth form and various specialist colleges, to local authority organisations and private training companies. Colleges in the FE sector in England are the main providers of publicly-funded education and training up to and including level three in the National Qualifications Framework. The scope of enquiry of this study was limited to the 358

institutions identified as one of the six administrative types of college in the FE sector. Using the precise designations from the ILR, these institutional types are (number of institutions in brackets):

- general FE college (224)
- sixth form college (94)
- special college (11)
- special college - agriculture and horticulture (16)
- specialist designated college (10)
- special college - art, design and performing arts (3)

This excluded from the analysis private training organisations, charities and specific local authority provision (including school sixth forms) as well as any institution primarily registered as a higher education organisation (i.e. universities who offer some form of FE). This was in part done to keep the scope of enquiry manageable for the time frame but also to limit enquiry to public sector colleges specifically. This was because the data coverage and quality is less comprehensive for FE providers outside the sector of FE colleges. However, in principle the same methodology could be applied to other institutional types.

These 358 institutions were analysed for the 2011/2012 academic year, the most recent available data at the start of the analysis period. The study has been limited to this single year due to a wish to focus purely on institutional diversity at a given time rather to consider differentiation through time-series analysis. Moreover, any additional analysis beyond this focus would have been beyond the time-scale of a doctoral thesis, though further research into how the nature of diversity has changed over the course of time (differentiation) would be possible at a future date. However, this restriction results in there being no issue of data compatibility between data of different years.

6.4: Selection of variables

One of the key issues for the analysis of diversity is the selection of variables. It has been previously noted by other authors that it is possible to select such an extensive group of variables it will result in every institution being considered unique (Codling and Meek, 2006; Huisman, 2000). Furthermore, Codling and Meek (2006) note that "one of the fundamental difficulties with the selection of variables and consequential measurement of diversity is that diversity means different things to different interest groups" (p. 36).

Thus, the process of variable selection for this study was conducted after careful consideration of the literature on institutional diversity, mainly drawn from the HE sector. Key authors for this were Huisman, Meek and Wood (2007) who suggest five variables that are particularly suitable for studying diversity within the HE sector as they represent the primary goals of HE in teaching and research. These five variables are:

- institutional size
- form of institutional control
- range of disciplines offered
- degrees awarded
- modes of study

In addition to Huisman *et al.,* consideration was given to other studies in diversity, in particular the Carnegie Classification of HE institutions in the USA (originally published in 1973 and subsequently in 1976, 1987, 1994, 2000, 2005, 2010 and 2015) (The Carnegie Classification of Institutions of Higher Education, 2015). This classification primarily allows for institutions to be grouped together by '*what they did*' and '*who they taught*', effectively grouping institutions by mission and student body (McCormick and Zhao, 2005). Together these and other literature illuminated which variables are commonly considered useful for measuring institutional diversity and the variables selected for this study were:

1. size of institution by student headcount
2. mode of study - i.e. part or full-time study
3. level of study - derived from the National Qualifications Framework
4. subject of study
5. gender of student
6. age of student
7. ethnicity of student

The ILR contained a variable to represent each of these aspects and thus relevant data was available. Other variables within the ILR were considered but rejected. Firstly, there are the variables that are not relevant to institutional diversity (based on the literature) (e.g. destination after leaving). Secondly, there are variables that are sparsely populated or even unpopulated and thus do not have sufficient data to be considered for inclusion (e.g. current employment status). Thirdly, there are variables which contain isolated information; these variables contain information on a subset of the records in the file and thus do not describe a large enough range of institutional activity to be considered for inclusion. For example, there are several variables in the ILR that contain data relating only to basic skills training. These variables are only filled in for courses in key skills and could be used to describe that specific aspect of a college but have no significance to any other course type. Finally, there are duplicate variables which are slightly different ways of storing the same information. An example of such a variable is the two methods of describing an aim's subject of study.

Exploration of the data set could have allowed for other variables identifying student characteristics to be included (e.g. disability, social class or fee source). Disability and social class are commonly used variables in diversity studies but were not included in this study: disability due to having an incomplete response rate in the data set and social class as there was not a reliable measure available in the data set. It would have been possible to derive a measure of social class based on student postcode; however, as this was not available in the ILR it was not considered for inclusion at this time. It would be a possible area for future research.

Furthermore, variables such as grades of students and the next destination of students at the end of their qualification could have been included in the study. However, these have not been included as they are both commonly used as performance indicators rather than diversity measures and also because of the lack of comparability between different qualification types.

This study is intended to focus on horizontal diversity with the variables selected largely describing factors that are not generally considered to be ranked. However, one area which could be considered vertical diversity is that of the level of study of students. Some observers

(such as Clark, 1978) may consider this to be a prestige area with more advanced level students being '*better*' than less advanced (as in the example above). However, in this study this difference is intended to represent the diversity of mission only and is in no way intended to suggest one institution is better than another. Furthermore, there is only a relatively small volume of higher level learning in some institutions that varies from year to year. Therefore, it would not be suitable to describe such institutions only in terms of the highest level they offer, thus, taking into account the balance of the student population would allow for a more informative picture. The other area which could be considered vertical diversity is that of the subject of study. Some traditionalists view the natural sciences and mathematics as superior to more applied subjects such as engineering, the social sciences and arts. This study is not intended to reflect such views and any classification differences on grounds of subject are intended to reflect only the careers being trained for and the mission of the institution. Finally the study's selected variables fit into the theoretical frameworks on diversity of previous authors including *inter alia* Huisman *et al.* (2007), Huisman (1995), Birnbaum (1983) and Clark (1983).

6.5: Properties of variables

This section details how each of the variables is represented in the ILR and how they were converted for use in this study. Furthermore, it details any decisions made in the course of the analysis regarding the variables. Finally, any missing entries for each of the variables were either excluded from the percentage calculation if there were very few of them (such as in the age variable) or treated as a separate group if of sufficient size (over 5%) to analyse. For clarification, some of the following sections refer to the student level and the aims level of the data. This simply means that a variable is used to describe an individual student or an individual aim, though some variables describe both.

6.5.1: Size

The ILR includes a student headcount variable for each institution and this was selected as the representation of size for this study. Headcount has its limitations as a measure of size as it represents a student who is there for a week in the same way as a student who is there all year. This is less problematic in HE as the number of part-time students is relatively low compared to FE. Nonetheless, the literature recognises headcount as an adequate measure of size and thus it was deemed suitable for this study. A weighted variable by length of course i.e. full-time equivalent was considered but unfortunately the data was not available. Other options that could have been used include teaching funding, annual turnover, staff numbers (again full-time equivalent) and square footage of teaching space. Use of different measures of size could substantially change the results and this would be an interesting avenue for further study.

6.5.2: Mode of study

The ILR contains a variable for mode of study which categorises individual students into one of seven categories:

1. full-time full-year
2. full-time part-year

3. part-time - other including e-learning
4. part-time - open
5. part-time - distance learning
6. part-time - evening
7. not applicable/not known

This data was stored for each student but in order to analyse patterns of individual courses it was necessary to export mode of study into the aims data set; this allowed reference to the mode status of an individual student for all their individual aims.

During analysis, this variable was aggregated to the numbers and percentages of each mode of study in both the whole system and at individual institutions. In the later stages of analysis, these categories were combined to make a simpler full-time/part-time split. From the above list categories one and two made up the full time numbers/percentages and variables three to six made up the part-time numbers/percentages. This was done because of the very large numbers utilising only two modes of study, full-time full-year and part-time - other including e-learning (for full details see Chapter Eight). This allowed the analysis to be simplified without losing substantial differences between institutions.

6.5.3: Level of study

In FE, level of study is most commonly described by its position in the National Qualifications Framework (NQF), or the equivalent framework as discussed in Chapter Three. The ILR uses two variables for the description of level of study, both are described as a notional National Vocational Qualification (NVQ) equivalent but effectively match the NQF. Firstly, there is entry, one, two, three, four, five and higher (indicating HE) which maps to the older version of the NQF. The second matches the updated version of the NQF with levels six, seven and eight being added to the recognised levels. Both versions also included a mixed level and an unknown level category. The latter is often assigned to skills training courses which do not lead to a formal qualification (such as arts and crafts or basic IT skills). Furthermore, there is a level variable at both the student and aims levels. At the student level it is stored as the highest level aim attempted by the individual student, whereas, at the aims level it is provided for each individual aim.

This study elected to use the older definition of the NQF. This decision ensured colleges would not be defined by their provision of courses above level three, almost exclusively a very small percentage of their provision. It also reduced the time needed to analyse this very small percentage of the student population. In later analysis this was further reduced to a single category for students at level four and above (including higher), again due to the small numbers of students involved. For analysis each category was aggregated to the numbers and percentages in both the whole system and individual institutions.

6.5.4: Subject of study

In the FE sector, subject of study is analysed using the Sector Subject Area Classification system (SSAC) originally published by the Qualifications and Curriculum Authority (QCA) in 2001. The regulation of the system has since been taken over by the Office of Qualifications and Examinations Regulation (OfQUAL) who state that when a regulated qualification is accredited,

it must be assigned a code[4] within the SSAC system (OfQUAL, 2011) and these codes are primarily used during OfSTED inspections[5] and for statistical, management and planning purposes (Information Standards Board, 2015).

These codes come in two tiers; firstly, broad subject groups, where a qualification has to be in one or more of the subjects mentioned in the group (or be the closest matching category). The second tier is a more detailed description of these groups. For example, in the first tier a course in biology would be in the Science and Mathematics group, whereas in the second tier it would be placed in the Sciences group. Within the ILR, unlike all the other variables, subject of study is only available at the aims level and not at the student level. This is because many students are attempting multiple aims often in different subjects and therefore cannot be classified in only one subject group.

The more detailed tier was not used in this study as the detail level would have made the analysis prohibitively time consuming. Moreover, institutions could be separated in the cluster analysis over only small differences. Furthermore, it was necessary to keep the study within a manageable scope and therefore such analysis was not conducted at any stage. However, while the tier one subject assignments originally contained 15 separate subject groups from the original QCA classifications, it was decided to extend this classification with three further groups. The subjects groups used in this study are:

1. Health, Public Services and Care
2. Science and Mathematics
3. Agriculture, Horticulture and Animal Care
4. Engineering and Manufacturing Technologies
5. Construction, Planning and the Built Environment
6. Information and Communication Technology
7. Retail and Commercial Enterprise
8. Leisure, Travel and Tourism
9. Arts, Media and Publishing
10. History, Philosophy and Theology
11. Social Sciences
12. Languages, Literature and Culture
13. Education and Training
14. Preparation for Life and Work
15. Business, Administration and Law
16. ***Key and Basic Skills***
17. ***General Studies and Enrichment***
18. ***English as a Second Language***
19. Unknown or Not Applicable

The three subject groups listed in bold italics were the additions created for this study. They were assigned by reviewing the LARA database by qualification title and by reviewing websites of colleges offering such courses, the OfQUAL qualifications website and written material pertaining to specific courses. Most qualifications in the Key and Basic Skills category were

[4] The current coding system can be found at https://www.gov.uk/government/publications/types-of-regulated-qualifications/qualification-descriptions.
[5] OfSTED use a slightly modified version of the SSAC, see OfSTED (2014) for full details.

formerly in the Preparation for Life and Work category but were split up partly due to the Preparation for Life and Work category being very large and partly because of the logical differences between courses such as an award in home cooking skills and recognised key skills training in numeracy, information and communication technology and literacy. Furthermore, key skills are a recognised subject area and an area of interest for government policy and therefore specifically recognising such courses was logical. The General Studies and Enrichment group also contains courses largely originating from the Preparation for Life and Work group and were separated into another group as a result of the same logical differences. The courses that made up the English as a Second Language group came from both the Preparation for Life and Work group and the Languages, Literature and Culture group and were allocated into a separate group for analytical purposes as it was felt there may be a connection between this subject group and the ethnicity of students and this could be examined as part of the analysis. Details of all changes to qualification assignment can be found in Appendix 1 - SSA Update on the companion disk.

6.5.5: Gender of student

The ILR contains a variable in the learners file for the gender of student which are categorised as M for male and F for female. For analysis, each category was aggregated to the numbers and percentages of each gender in either the whole system or an individual institution.

6.5.6: Age of student

The ILR contains two variables representing the age of student. Firstly the precise age of the learner on August the 31st and secondly the age group of the learner on August the 31st. Both these variables were utilised at different stages of the analysis. The age bands used were:

1. under-16
2. 16-18
3. 19-20
4. 21-24
5. ***25-34***
6. ***35-44***
7. ***45-59***
8. 60+
9. missing age

The age bands 5 to 7 above shown in bold italics were in the original data set as a single large band. However, in the analysis it was decided to separate them into three groups in order to ascertain if there were any differences between the bands. For analytical purposes, the ages of students were used to calculate the arithmetic average (mean) age of students in both the whole system and at individual institutions. Additionally, the number and percentages of students in the various age bands were calculated at both institutional and system level.

6.5.7: Ethnicity of student

The ILR contains a variable for the ethnicity of students categorising students by the same 18 categories used in the official 2011 census (together with 'not provided') and they are shown below:

1. White - British
2. White - Irish
3. Gypsy or Irish Traveller
4. White - Any Other White Background
5. Mixed - White and Black Caribbean
6. Mixed - White and Black African
7. Mixed - White and Asian
8. Mixed - Any Other Mixed Background
9. Asian or Asian British - Indian
10. Asian or Asian British - Pakistani
11. Asian or Asian British - Bangladeshi
12. Asian or Asian British - Chinese
13. Asian or Asian British - Any Other Asian Background
14. Black or Black British - African
15. Black or Black British - Caribbean
16. Black or Black British - Any Other Black Background
17. Arab
18. Any Other Ethnic Group
19. Not Provided

It was decided to include the Arab category with the 'any other ethnic group category' as there were only very small numbers of the former category (less than 0.5% of students). However, some analysis was also conducted using more broad categories than those listed above and these were:

1. White British
2. White other[6]
3. Mixed
4. Asian
5. Black
6. Other ethnicity
7. Not provided

This was done in order to reduce the complexity of some analyses in order to make them manageable in the time-frame available.

[6] This group contained groups two, three and four from the original data and was kept separate from White British due to the potential for different behaviours between the two groups.

Chapter 7: Methods of analysis and presentation of results

The overall methodological approach of this study is an analysis of administrative quantitative data on FE colleges collected by the DS in order to explore the nature and extent of diversity in the FE sector. This analysis required four distinct steps; firstly an exploratory descriptive statistical analysis to establish single variable pictures and the presence or absence of diversity on each variable in isolation. Secondly, an analysis of how pairs of the variables selected were associated with each other in order to show how the relationships between them could be reflected in institutional profiles. Thirdly, two fine grained cluster analyses of all 358 selected institutions were conducted using the two distinct sets of variables in the study in order to group together similar institutions and thus identify the nature and extent of institutional diversity in the FE sector. These two distinct sets of variables were; firstly, size of institution coupled with mode, level and subject of study to provide an analysis based on the course characteristics of an institution. The second cluster analysis was conducted on size of institution coupled with the age, gender and ethnicity of students at the institution, providing an analysis based on the student characteristics of an institution. Finally, a second pair of coarse grained cluster analyses was conducted using the same sets of variables excluding size.

The following sub-sections provide additional details regarding decisions made at each stage of the analysis and its subsequent presentation.

7.1: Levels of analysis

The ILR file structure (detailed in the previous chapter) allows the examination of records from different perspectives; those used in this study were:

- System level
    1. Student level
    2. Aims level
- Institution level
    1. Student level
    2. Aims level

System level is here defined as the level of analysis where all students or aims within the scope of enquiry are considered at the same time i.e. examining the state of the whole system rather than individual institutions. Institution level is here defined as the level where all students or aims are aggregated into groups based on the institution at which they are taught. Furthermore, an individual data record can be drawn from either the student level, which is data attached to an individual student or the qualification/aims level, where data is attached to an individual qualification or aim attempted by a student (i.e. a student may be attempting multiple qualifications). These two data strata were available from the Learner and Aims files respectively, as described in Chapter Six.

7.2: Methods of analysis

In addition to the selection of variables another critical issue in the study of diversity is the selection of the appropriate analytical methodology, because as Huisman (2000) demonstrates, different techniques can produce different results from the same data set. In

2010 Rossi noted that empirically, the extent and dynamics of diversity in higher education have been investigated in different ways. She provides examples of several studies that have approached the research of diversity. The types of study Rossi (2010) notes are (with the authors of such studies that Rossi gives as examples in brackets): those that have constructed typologies of HE institutions and have shown how institutions move across categories over time (Aldersley, 1995; Birnbaum, 1983); or studies using cluster analysis (Geuna, 1999), the use of statistical performance indicators (Taylor, 2003) and the use of positioning indicators (i.e. data focusing on mission rather than performance) (Bonaccorsi and Daraio, 2008). This study is a cross-sectional analysis of a single academic year and thus could not analyse diversity over time (differentiation) but does include a variety of other options to examine diversity. The following sub-sections describe the methods used in this study.

7.2.1: Descriptive statistics

Initially, standard descriptive statistics were produced for each variable individually to explore the data and the results were examined for evidence of diversity. The statistics used, as appropriate, were arithmetic average (mean), mode, standard deviation, distribution (including kurtosis and skew), and the minimum and maximum values. In order to explore the tails of each distribution and to better understand the diversity they represent, particular consideration was given to the top and bottom twenty colleges under each parameter. The results of this analysis can be found in Chapters Eight and Nine.

In addition to these standard statistics, further details on age were also presented in Chapter Nine. Within the age variable additional statistics were produced for mature students and under-16 students in the light of their prevalence in policy literature.

These descriptive statistics were produced initially at the system level and then at the institutional level for all variables. As noted above, these statistics utilised data at the student level for all variables except the subject group, where the aims level was used. They were presented using tables and where appropriate, histograms or pie charts.

7.2.2: Association analysis

Chapter Ten presents an analysis on the associations between pairs of the variables selected in this study. It uses a chi-square test and an associated *post hoc* test, Cramer's V. The chi-square produces a statistical test of significance to indicate whether there is an association between two categorical variables. The Cramer's V *post hoc* test produces a value between 0 and 1 (much like a correlation coefficient) to test the strength of a statistically significant association. The strength of this association is judged by three cut off points; 0.1 and above being a weak association, unless it is at or above 0.3 when it becomes a moderate association and finally, at or above 0.5 becomes a strong association. Two other *post hoc* tests were available, the Phi and contingency coefficient. However, they were rejected for use in this study as the former is only useful when variables have no more than two categories (usually not the case in this study) and the latter is less accurate than Cramer's V when variables have more than two categories (Field, 2009). Graphs were used to present a visual representation of the associations between each pair of variables.

Finally, the chi-square test is only suitable for categorical variables and therefore size was excluded at this stage of the analysis as at the system level, it is only one variable. Furthermore, it was necessary to conduct this stage of the analysis entirely at the aims level in order to include the subject variable (as it is only available at the aims level). This was problematic as it makes comparison difficult between this stage of the analysis and the descriptive statistics or cluster analysis. However, it provides useful results as a standalone section as well as providing insight into what the cluster analysis results represent.

7.2.3: Cluster analysis

Cluster analysis is a class of multivariate methods which aim to classify a sample of entities (in this study, FE institutions). Cornish (2007) states that it operates "on the basis of a set of measured variables into a number of different groups such that similar entities are placed in the same group (p. 1)". Burns and Burns (2009) suggest that it can also be considered a data reduction tool that "creates sub-groups that are more manageable than individual datum. Like factor analysis, it examines the full complement of inter-relationships between variables ". (p. 552). It can be used in many fields such as marketing, to identify customers with similar buying habits or demographics, in medical practice to cluster patients with similar responses to target treatment or to create a typology of different diseases (Norušis, 2011). However, in studies most similar to this one, it has been used in the field of HE by authors such as Tight (1996, 1988), and Dolton and Makepeace (1982) (for full details see Chapter Five), to study institutional diversity and to create a typology of HE institutions.

Cluster analysis was selected as the appropriate choice for this stage of the analysis because of its focus on classification. Though similar to discriminant analysis (another technique for grouping entities), cluster analysis requires no prior knowledge of the membership of each cluster in order to classify new cases (unlike discriminant analysis). This is facilitated by the clusters being defined through the analysis of the data (Burns and Burns, 2009).

There are two main types of clustering methods: hierarchical and non-hierarchical. Within both types there are numerous methods to generate the clusters (Uprichard, 2009). Hierarchical clustering methods generate hierarchical or nested clusters, in contrast non-hierarchical methods produce a single strata or '*string*' of different clusters (Uprichard, 2009). Furthermore, hierarchical methods are further sub-divided into two groups of methods; agglomerative and divisive methods. Uprichard (2009) describes the differences between these as follows:

- *Agglomerative methods construct clusters by treating each case as a separate entity, and then 'fusing' the most similar ones together, until all cases are 'agglomerated' together within a specific structure.*
- *Divisive methods construct clusters the other way round, starting from one cluster of all the cases, and then 'dividing' off the most different cases, until all cases are 'divided' into appropriate clusters*. Divisive methods are then further sub-divided into two types:
    1. *Monothetic, which establishes clusters on the basis of (usually the absence or presence of) one attribute.*
    2. *Polythetic, which establishes clusters on the basis of more than one (usually several) attributes. (*p. 137).

Within each of these types of hierarchical method are as many different types as there are for non-hierarchical methods. Indeed, Uprichard (2009) notes that even within each of the methods there are usually many options to choose from regarding which similarity/dissimilarity measure(s) to use. Everitt, Landau and Leese (2011) state that there are an almost endless number of similarity or dissimilarity coefficients and that it is not possible to give a definitive answer on which measure to use for a given study. They do present some guidelines for certain data types but as none of these types are present in this study they are not included here (see Everitt *et al.* (2011) pages 68-69 for full details). Therefore, most authors agree that it is most appropriate to test multiple methods and select the one which provides the most meaningful results in your study.

The classification of colleges using cluster analysis in this study was conducted using SPSS. SPSS recognises three distinct methods of cluster analysis, two-step clustering, hierarchical clustering and k-means clustering. The first two are considered to be hierarchical methods (the second step of two-step clustering is the hierarchical method) though two-step clustering is more commonly used on very large data sets with both continuous and categorical data. All three methods were tested in order to produce the most meaningful solution and the k-means clustering method was selected for its ability to specify the number of clusters required, as this allowed the testing of different solutions in order to find the most meaningful. Although the two-step clustering process also allows this and solutions were very similar, the k-means method was selected for its simplicity in setting up and interpreting the results.

Cornish (2007) states that the steps that SPSS takes in order to derive the '*best*' solution for the given number of clusters are:

1. Choose initial cluster centres (essentially this first approximation comprises a set of variable values that are far apart — each entity forms a cluster of one and whose centre is the value of all the variables for that entity).
2. Assign each entity to its nearest cluster, defined in terms of the distance to the 'centroid' (mean value for each variable).
3. Find the 'centroids' of each of the clusters that have been formed.
4. Re-calculate the distance from each entity to each 'centroid' and move entities that are not in the cluster that they are closest to.
5. Continue this process iteratively until the 'centroids' remain relatively stable. (By default SPSS limits this to 10 iterations). (p. 4).

Non-hierarchical cluster analysis is often used when large data sets are involved (Cornish 2007), though in this case it was used simply because of its utility. Cornish also notes one advantage of non-hierarchical over hierarchical cluster analysis is its ability to move an entity from one cluster to another with each iteration process. This was an advantage for this study as it ensures institutions are in their appropriate cluster. Two disadvantages of non-hierarchical cluster analysis, noted by Cornish (2007) are:

1. It is often difficult to know how many clusters you are likely to have and therefore the analysis may have to be repeated several times.
2. It can be very sensitive to the choice of initial cluster centres. (p. 4).

However, in this study the first was dealt with partly by familiarity with the data and knowing what to expect and what would be meaningful, and also by repeated testing in order to choose

the most meaningful solution with the fewest number of groups. The second potential problem was dealt with both by testing numerous initial cluster centres, originally selected randomly and then enhanced through testing and increasing data familiarity until the most meaningful solution had been achieved. In order to reproduce this work the final cluster centres used in this study have been provided in Appendix 2 - Final cluster centres, on the companion disk. These can be used as the initial cluster centres for results reproduction.

In this study several decisions needed to be made for the clustering process in order to ensure an un-weighted approach with all variables given the same degree of importance. This issue initially arose due to the differing ways of storing the various data items for each institution. For example, the size variable was a simple single number value for each institution, whereas, the level variable was originally stored as the percentage of students at each level of study for a total of seven variables (eight if you counted unknown level). This resulted in single variables for size, gender (percentage of male students) and age (average age) and multiple variables for mode, level, subject and ethnicity. In effect this could have potentially given different weights to each of the latter variables.

Several decisions were made at this point to ensure as simple as possible approach without losing too much detail. Firstly, mode of study was simplified from its original seven category options to a simple full-time percentage variable. This lost relatively little detail as all except two categories of the mode of study were very sparely utilised. However, some unique institutions were missed due to this decision, like the Mary Ward Settlement enrolling 82.5% of its students on evening classes, a detail lost to the cluster analysis. Such details were picked up by the single variable pictures and thus not lost to the study.

Secondly, the number of groups for level of study was reduced (as noted in the previous chapter) to have a single category for study at a level higher than three. This prevented institutions being defined by their smallest proportion of their provision but it did require a small loss of detail that was deemed acceptable, though again this data is still available in the single variable pictures. These decisions did potentially hide some measure of diversity in the results; this loss was deemed acceptable in order to keep the number of clusters manageable and meaningful in the FE context. Conversely, it was originally intended to reduce the number of ethnic groups in the study to a simpler six category variation. However, when it was tested the groups in the cluster analysis came out the same as when no simplification had been used so the full detail level was left in. Nonetheless despite these reductions, the problem of differing numbers of variables required to describe each element of the study persisted. This varied from a single variable to describe size, age, gender and now mode of study to the 19 variables required to describe subject of study.

Therefore, a two stage process was adopted; in the first stage each element was put through its own clustering process thus grouping institutions by size, mode, level, subject, age, gender and ethnicity individually. This provided both an initial description of the nature and extent of institutional diversity for each variable and a basis to create a typology or typologies based on a single variable description for each element of the study.

A further difficulty to overcome was that of cluster analysis' tendency to be highly sensitive to outliers (Everitt et al., 2011). This was dealt with simply by allowing for extra clusters to contain the outliers and then simply manually merging these outliers with another appropriate

cluster. For example, it was necessary to move an extremely large college into the *'very large'* cluster despite its mathematically substantial differences to other members of that cluster. This prevented the cluster analysis from being overwhelmed by any major outliers while maintaining a meaningful solution in the 'real world'. This was necessary on size, level and subject in order to keep the number of clusters manageable, while maintaining meaningful results.

Initially, the intention had been to create a single typology using all seven variables. However, this was deemed impractical due to the high degree of variation it would need to describe. Thus, two typologies were created, both using size of institution as a baseline; one used the course characteristics of mode, level and subject of study and the other used the student characteristics of age, gender and ethnicity (see Chapters 11 and 12 respectively for results and analysis). The typologies were created by combining the clustering results for the four relevant variables, effectively creating a matrix of the combinations.

The main advantage to this method is that individual elements of the study can be compressed into less detail if certain aspects are considered more or less important. Equally, typologies using different combinations of the elements of this study can be easily created. For example, it would be simple to create a new matrix using mode, level and age and the combinations of these elements would provide different clusters. Furthermore, if fewer clusters are required then different combinations of element detail level could be applied and/or the number of elements could be lowered, e.g. simply small and large colleges rather than the four tier solution used in Chapter 11 and 12. An example of such a reduction in detail is presented in Chapter 13 along with the reasoning behind each stage of development and reduction.

Chapter 8: Single variable analysis: size and course characteristics

This chapter provides the first part of the descriptive statistical analysis of the seven variables under study. It covers size of colleges by student headcount and then the three variables describing course characteristics, mode, level and subject of study. Each of these variables is described in its own section, initially at a system level and then at the institutional (college) level. Furthermore, each of the current administrative types is analysed using each of the variables and where appropriate, the scope for institutional diversity is discussed.

8.1: Institutional size

This section describes the findings on the size of colleges under study as determined by student numbers (headcount). It presents the descriptive statistics, at both the system and then institutional level, of the colleges within the FE sector and how these numbers separate into the current college types.

8.1.1: Size at the system level

There are 358 colleges in this study with a total of 3,035,274 students. Table 8.1 shows how these students are distributed between the three major college types (together with a further breakdown into the specialist type constituent parts). Clearly the general FE colleges provide the vast majority of courses to students in the sector. However, a standout point from this data is that the specialist colleges have almost as many students as the sixth form colleges despite there being less than half as many colleges. This is due to there being an exceptionally large specialist college, the Workers Educational Association (a specialist designated college), with 62,021 students as detailed in Table 8.2.

Table 8.1 - Student number breakdown

College type	Number of colleges		Total student numbers	
	Number	Percent	Number	Percent
General FE college	224	62.6%	2,645,354	87.2%
Sixth form college	94	26.3%	197,243	6.5%
Specialist college (all types)	40	11.2%	192,677	6.3%
Total (all colleges)	***358***	**100.0%**	**3,035,274**	**100.0%**
Specialist college type	**Number of colleges**		**Total student numbers**	
	Number	**Percent**	**Number**	**Percent**
Special college	11	3.1%	1,098	<0.1%
Agricultural college	16	4.5%	67,142	2.2%
Specialist designated college	10	2.8%	120,198	4.0%
Special college - art, design and performing arts	3	0.8%	4,239	0.1%

8.1.2: Size at the institutional level

The total number of students in an individual college ranges from 11 to 88,695. There are only seven colleges larger than 30,000 students. The size of college increases through small

increments until the very high end of the range, at which point large increments create this small number of large outliers. These outliers are all multi-site colleges most of whom have been formed by mergers between colleges (the exception being the Workers' Educational Association).

Figure 8.1 shows that the size distribution of student numbers is substantially skewed to the left and has a strongly leptokurtic (or 'peaky') distribution (when compared to a normal distribution). This indicates that smaller colleges are substantially more common than large or medium colleges. Furthermore, Figure 8.1 and the mean of 8,478.4 and the standard deviation of 8,926.9 illustrate a wide spread around the mean with some very large outliers.

Figure 8.1- Distribution of college size by headcount

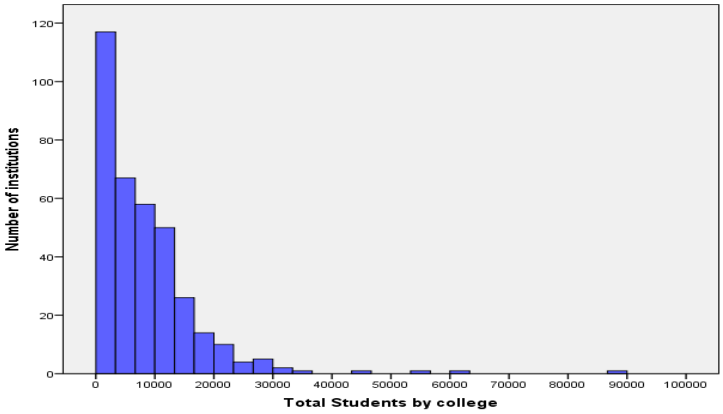


Table 8.2 also shows the range of sizes, the mean and the standard deviation for each administrative type. The general FE and specialist college types are relatively similar as they range from very small to very large and have a standard deviation that is also very large, indicating a generally wide distribution of college sizes in both administrative types. However, the bottom half of Table 8.2 shows the statistics for the individual administrative types, demonstrating that the various specialist college types vary considerably from one another with specialist designated colleges containing the most variation (and similarity to general FE college sizes). Furthermore, sixth form colleges have relatively low mean and standard deviation compared to that of general FE colleges, demonstrating that they are on the whole smaller in size, with proportionally less variation and deviation from the mean.

Table 8.2 - Descriptive statistics of size of administrative types

College type	Number	Minimum	Maximum	Mean	Standard deviation
General FE college	224	510	88,695	11,809.6	8,777.0
Sixth form college	94	441	5,524	2,098.3	876.6
Specialist college (all types)	40	11	62,021	4,816.9	10,561.3
Overall	**358**	**11**	**88,695**	**8,478.4**	**8,926.9**
Specialist college type	**Number**	**Minimum**	**Maximum**	**Mean**	**Standard deviation**
Special college	11	11	335	99.8	93.6
Agricultural college	16	1,843	8,454	4,196.4	1,788.0
Specialist designated college	10	83	62,021	12,019.8	19,712.1
Special college - Art, design and performing arts	3	1,059	1,984	1,413.0	499.2

8.2: Mode of study

This section provides the descriptive statistics for the mode of study variable, first at the system level and then at the institutional level. Furthermore, it examines the differences between the administrative types and draws conclusions about the diversity present between colleges in their offered modes of study. Note: it is possible that colleges may be offering modes, levels and subjects of study that do not have any 'take up' by students in the academic year under study. However, this information was not available in the data set and thus 'offered' is used as it is the commonly accepted term. This term is used in this way, where appropriate, throughout this chapter.

8.2.1: Mode of study at the system level

Table 8.3 shows that across all colleges in the FE sector the vast majority of students (82.8%) are enrolled in courses using one of two modes of study. Within these two modes roughly twice as many students are studying part-time compared to full-time. This pattern also holds true within the minority modes of study with 5.8% of students enrolled on full-time part-year courses and 11.3% spread over the remaining part-time options.

Table 8.3 - Mode of study in all colleges

Study mode	Frequency	Percent
Full-time full-year	838,621	27.6%
Full-time part-year	175,104	5.8%
Part-time - other including e-learning	1,674,945	55.2%
Part-time - open	15,505	0.5%
Part-time - distance learning	97,914	3.2%
Part-time - evening	219,741	7.2%
Not applicable/not known	13,444	0.4%
Total	**3,035,274**	**100.0%**

8.2.2: Mode of study at the institutional level

When examined at an institutional level the data shows that colleges across the sector vary greatly in their percentage of each mode of study. Table 8.4 shows that the two most common modes of study identified in Table 8.3, full-time full-year and part-time - other including e-learning, have the highest means, as you would expect. However, they also have very high standard deviations, suggesting a very wide spread around the mean and ranges from 0% to 100% of students being taught at that mode of study at different colleges.

Table 8.4 - Mode of study at an institutional level

Study mode	Colleges offering the mode of study		Mean	Standard deviation	Range
	Number	Percent			
Full-time full-year	357	99.7%	43.9%	30.2%	100.0%
Full-time part-year	296	82.7%	4.0%	4.7%	23.0%
Part-time - other including e-learning	350	97.8%	42.6%	24.8%	100.0%
Part-time - open	128	35.8%	0.4%	1.1%	8.1%
Part-time - distance learning	176	49.2%	2.5%	5.6%	38.4%
Part-time - evening	272	76.0%	6.4%	8.3%	82.5%
Not applicable/not known*	203	56.7%	0.3%	0.7%	5.7%

**Colleges do not 'offer' a 'not applicable/not known' mode of study but some colleges do declare at least one student in this category and therefore the overall statistics are included.*

Very few colleges do not offer any courses using these modes of study (only one and eight respectively (see Table 8.4). Figure 8.2 shows the distribution of the percentage of students attending full-time courses (any type) across all colleges. It shows that while there is a large cluster of colleges with full-time students percentage between 20% and 45% there is a bimodal distribution with another substantial group on or close to 100%. Furthermore, there are several colleges at most points on the graph confirming the presence of highly varied profiles. Figure 8.3 presents the percentage data part-time study (any type) which is a mirror of the full-time data.

Figure 8.2 - Distribution of college's full-time student percentage

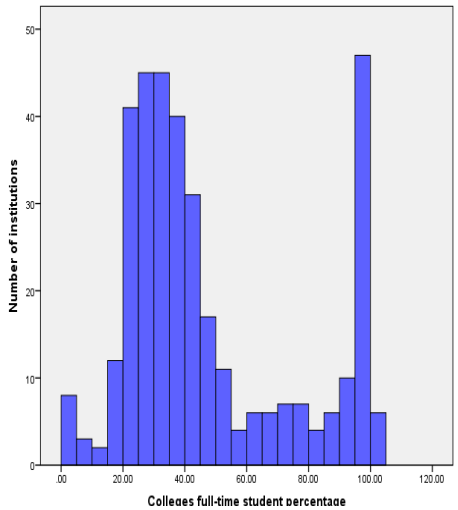
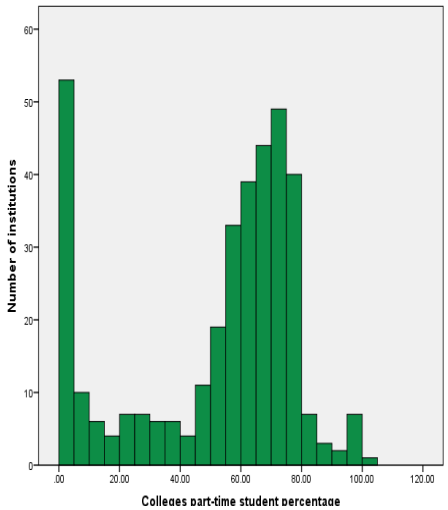


Figure 8.3 - Distribution of college's part-time student percentage



However, examining general FE colleges on their own (Figures 8.4 and 8.5) shows a very different picture. With the exception of a few outliers, general FE colleges are almost exclusively clustered between 20% and 45% full-time with few colleges falling outside this range. This accounts for one of the two peaks on the initial graph of all colleges and, though it does set general FE colleges apart in this regard, it is still a fairly wide distribution (20%-45%); a college with 20% full-time students would be considered to be substantially different from

another college with 45% full-time students. The part-time graph (Figure 8.5) is again a mirror image of the full-time data.

Figure 8.4 - Distribution of full-time student percentage for general FE colleges

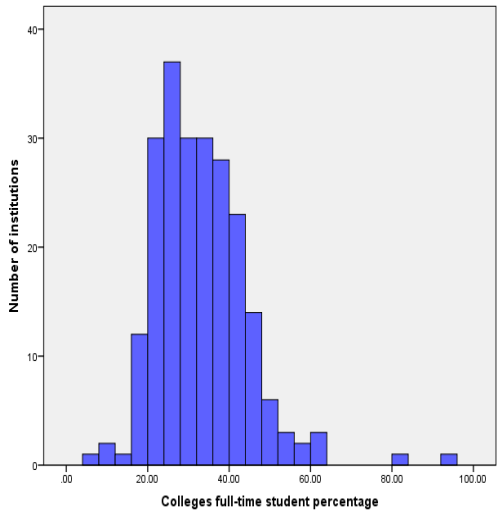
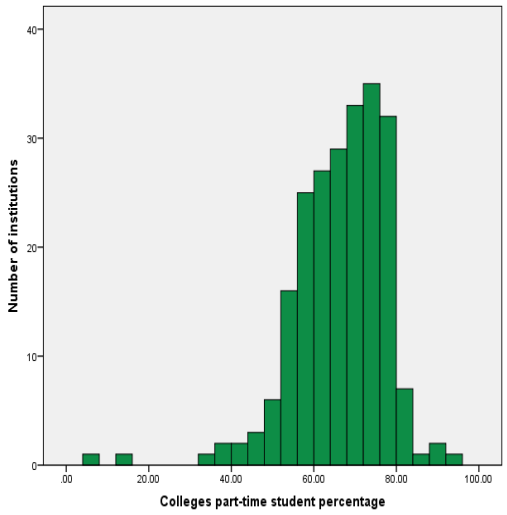


Figure 8.5 - Distribution of part-time student percentage for general FE colleges



Similarly, most sixth form colleges have between 95% and 100% of their students attending full-time courses as can be seen from Figure 8.6 (with accompanying part-time data in Figure 8.7). However, there are a small number of colleges who offer other part-time modes of study, with some very high variability in this minority of colleges. This suggests that while 'sixth form college' is a relatively good descriptor for this type of college and most so described follow the same pattern, there is scope for a better description of the minority colleges.

Figure 8.6 - Distribution of full-time student percentage for sixth form colleges

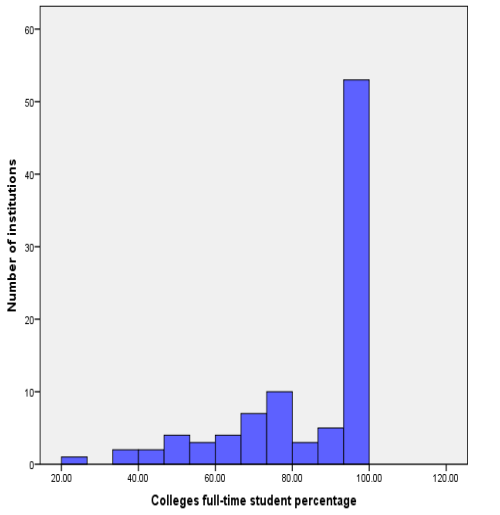
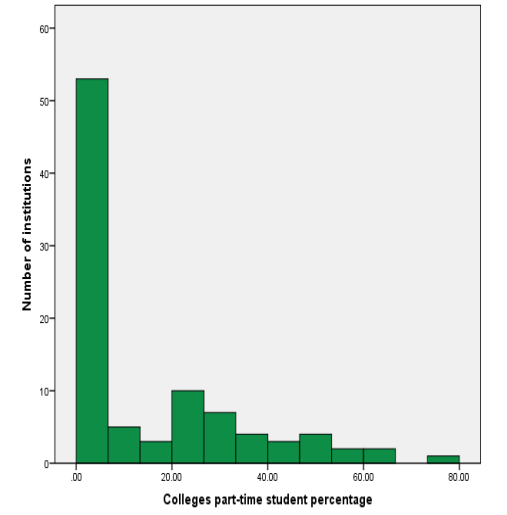


Figure 8.7 - Distribution of part-time student percentage for sixth form colleges



Conversely, Figure 8.8 (with accompanying part-time data in Figure 8.9) shows that specialist colleges have three major distinct types. This could have been because of the different varieties of specialist college represented in this sub-group. However, examining the data showed that this was not entirely the case. In each of the four sub-groups within the specialist college group, only agricultural and horticultural specialist colleges are highly similar (they are

represented by the middle spike in the 20% to 40% range). Other college types either had one or two significant outliers or a wide spread range.

Figure 8.8 - Distribution of full-time student percentage for specialist colleges

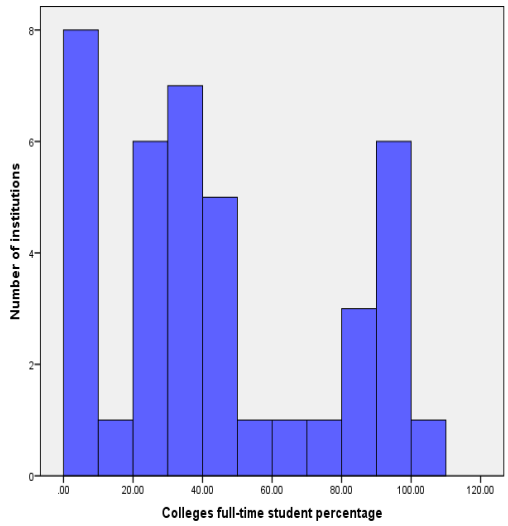
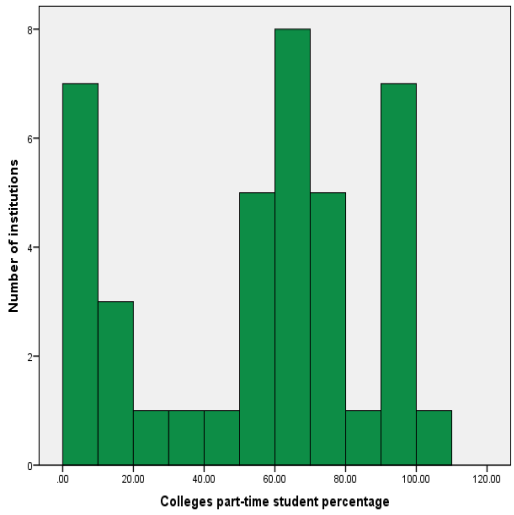


Figure 8.9 - Distribution of part-time student percentage for specialist colleges



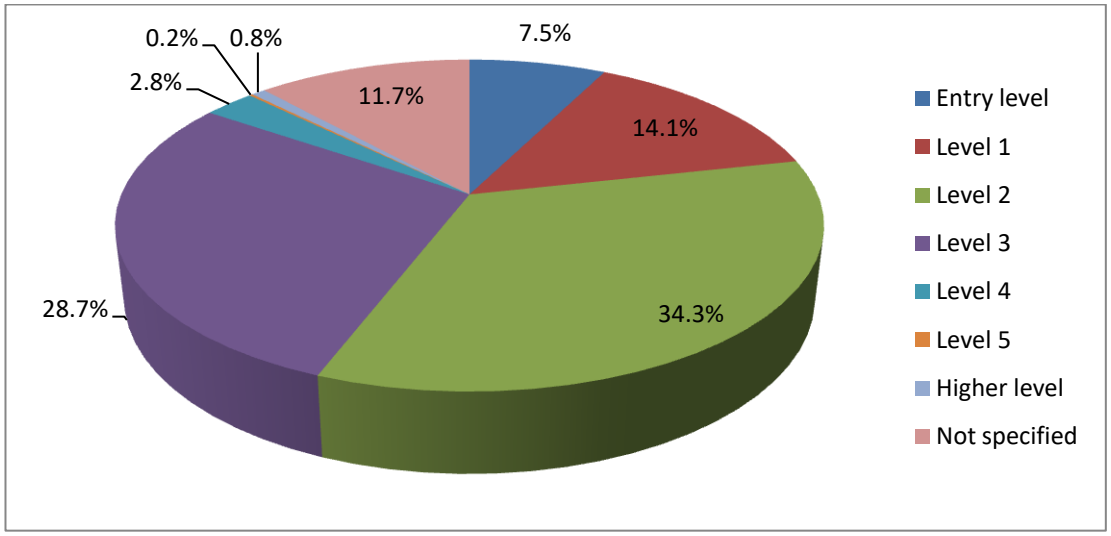
8.3: Level of study

This section examines the level of study of students first at a system level and then at an institutional level. The analysis uses the highest level of qualification attempted by each student. It also analyses how the current administrative types vary at each level.

8.3.1: Level of study at a system level

Figure 8.10 shows that the dominant level of courses in the FE sector is level two with level three a close second. Courses at entry level, level one and not specified level (this includes courses run for interest or skills training that do not come with a recognised qualification) are all also substantial minorities (7.5%, 14.1% and 11.7% respectively). Finally, only a very small minority of students engage in courses higher than level three with only 3.8% of students at level four and above, with the majority of those at level four (2.8%).

Figure 8.10 - Percentage of students at each level of study over the college system



Figures 8.11 to 8.13 show the same data as Figure 8.10 but for the respective administrative types. Examined together, they show that the current administrative types differ substantially in the profile of the levels of study provided within their respective colleges. The sixth form college type shows the most dramatic difference from the other types with 79.2% of their students engaged in level three studies with level two studies being the largest of the minorities (8.8%). Furthermore, within both of the other college types study at level three is not the largest group of students with general FE colleges enrolling more students in level two courses (37.1%). At specialist colleges level three is the fourth highest level for enrolments (15.4%) with not specified level, level one and level two all enrolling higher percentages (29.8%, 22.3% and 22.2% respectively). However, the specialist college group actually contains four different specialist college types and the profile of these differs markedly between types (full details of which can be found in Annex Two). Nonetheless, these markedly different profiles for all college types, confirms the importance of each of the administrative types based on level.

Figure 8.11 - Percentage of students at each level of study at general FE colleges

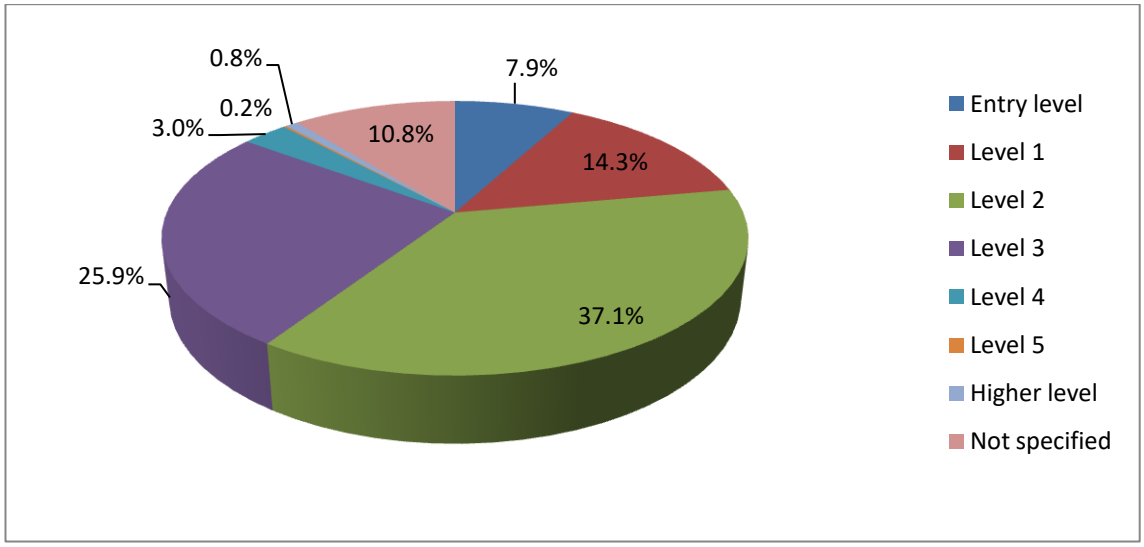


Figure 8.12 - Percentage of students at each level of study at sixth form colleges

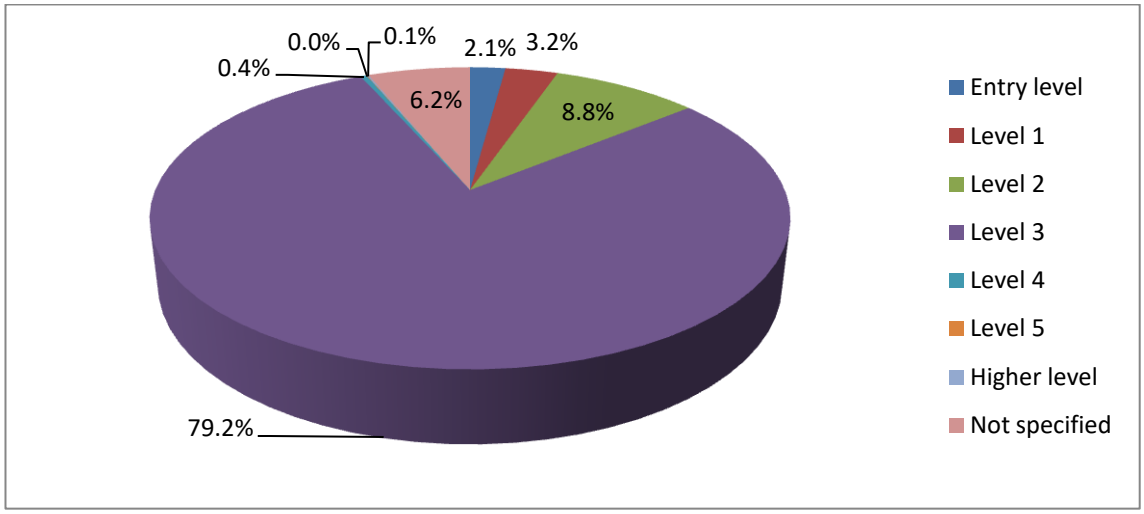
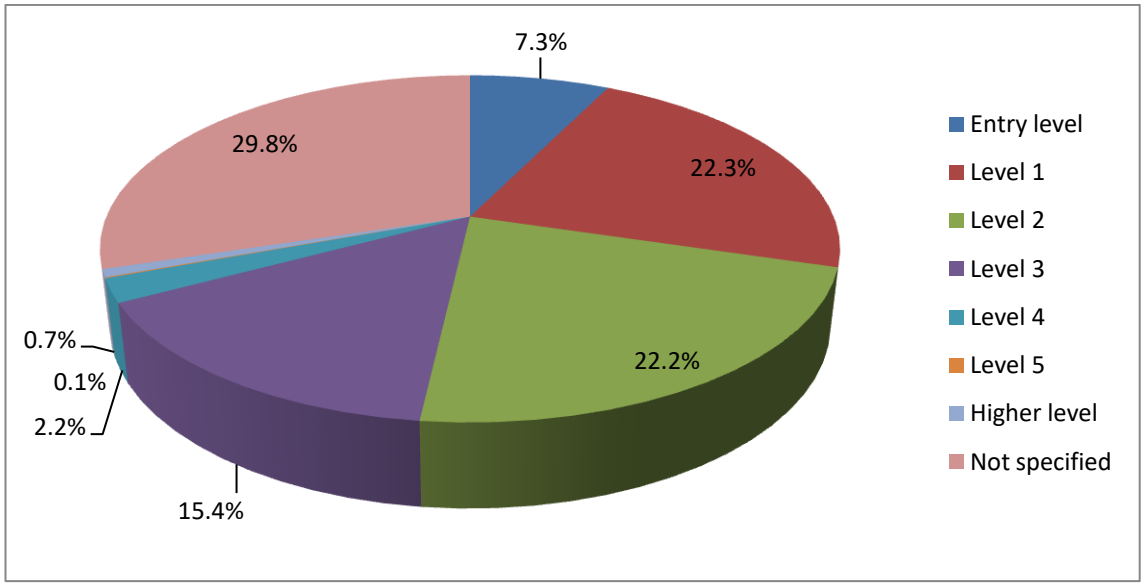


Figure 8.13 - Percentage of students at each level of study at specialist colleges



8.3.2: Level of study at an institutional level

Table 8.5 summarises the depth of engagement colleges have with each of the levels of study. It shows that colleges have varying degrees of engagement with the different levels and not all colleges offer all levels of study. Indeed, the levels of study considered to be higher education (four, five and higher) are substantially lower than all other levels of study. This is further reinforced by the differing mean percentages of students of each college (calculated at the college level and divided by the 358 colleges). Furthermore, the high standard deviations and ranges indicate substantial diversity between colleges at any given level with specialists in a particular level common for all levels not considered to be higher education. Levels four, five and higher arguably do not have a college with a percentage high enough to be considered a specialist in that level, but nonetheless there is at each level at least one college that is a substantial outlier. Combined, these features demonstrate a high degree of diversity at colleges both within and between individual levels of study.

Table 8.5 - Descriptive statistics for the colleges on level of study

Level of study	Colleges offering the level		Student proportion in each college		
	Number	Percent	Mean	Standard deviation	Range
Entry	299	83.5%	7.5%	13.6%	100.0%
One	315	88.0%	11.2%	10.3%	92.3%
Two	342	95.5%	27.1%	16.0%	69.6%
Three	347	96.9%	41.3%	28.1%	100.0%
Four	263	73.5%	2.3%	3.5%	29.4%
Five	158	44.1%	0.2%	0.3%	3.6%
Higher	148	41.3%	0.6%	1.8%	16.5%
Not provided	294	82.1%	9.6%	12.5%	100.0%

Figures 8.14 to 8.18 show the distribution of the percentage of students at each of the levels entry, one, two, three and unspecified, all of which are on the same scale. Figures 8.19 to 8.21, which are all on a different scale, show the same distribution information for levels four, five and higher. Levels two and three demonstrate the most diversity as the dispersion is wide and relatively evenly distributed. Nonetheless, there is still substantial difference between the two levels' distribution patterns even beyond the fact that for level two there is no college that goes above 69.6%. For example, there is a spike between 15% and 30% at level three, whereas at level two the spike is much flatter and between 25% and 40%.

The other three level categories on this scale (entry, one and not specified) all have a relatively similar shape with most colleges clustered between 0% and 20%. However, level one has fewer colleges at or close to 0% and thus a more even distribution than both the other two. Additionally, entry level has more specialist colleges with a greater (though still relatively small) number of colleges at or close to 100%.

The remaining levels (four, five and higher) are all considered to be higher education and represent only a small number of students and thus the percentages involved are all relatively low. Because of this it is hard to draw any conclusions about diversity beyond the percentage of colleges that actually offer some form of higher education.

Thus, Figure 8.22 shows the distribution of colleges offering any form of higher education. This in itself is a form of diversity, but only a very small number of colleges enrol a substantial percentage of students at these levels and thus defining most colleges by their percentage of higher education students would not be sensible.

Figure 8.14 - Distribution of colleges at entry level

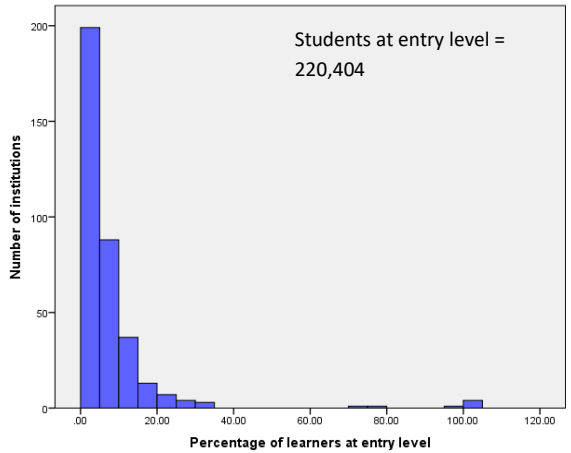


Figure 8.15 - Distribution of colleges at level one

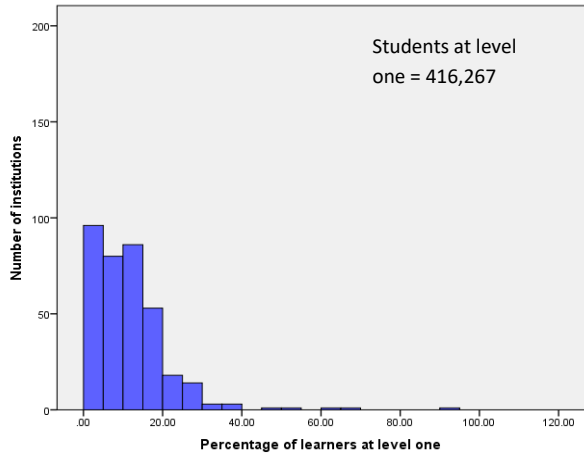


Figure 8.16 - Distribution of colleges at level two

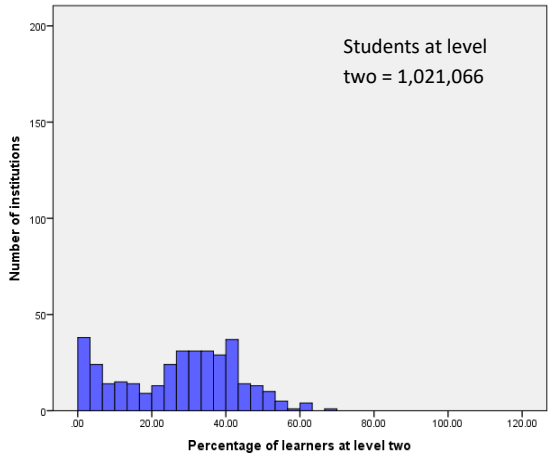


Figure 8.17 - Distribution of colleges at level three

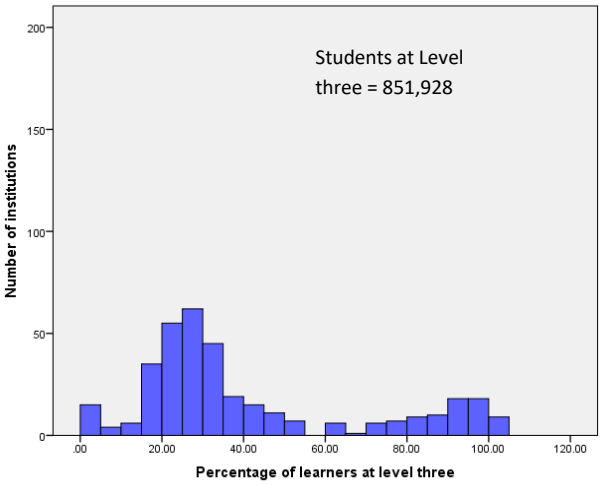


Figure 8.18 - Distribution of colleges at unspecified level

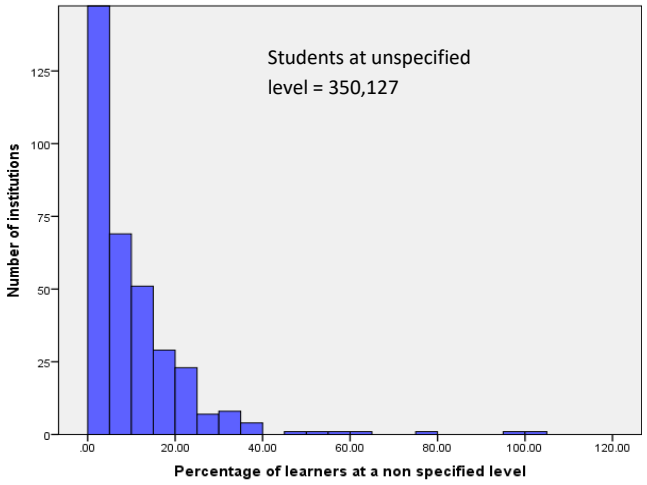


Figure 8.19 - Distribution of colleges at level four

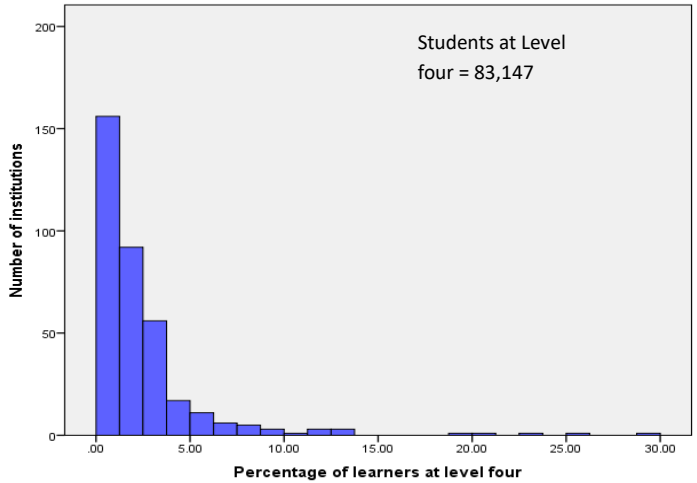


Figure 8.20 - Distribution of colleges at level five

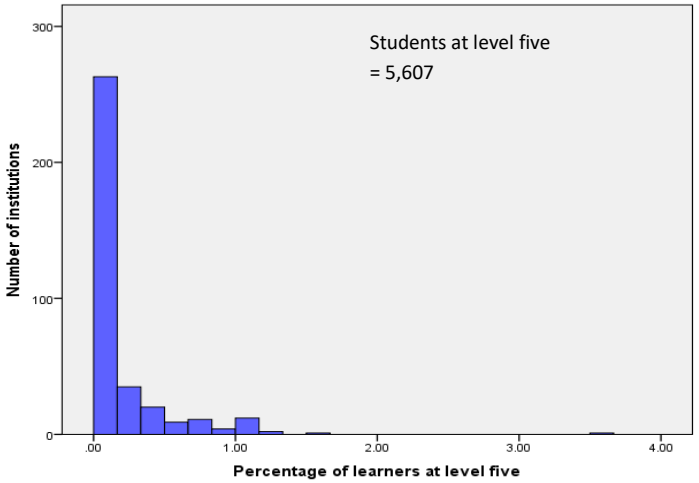


Figure 8.21 - Distribution of colleges at higher level

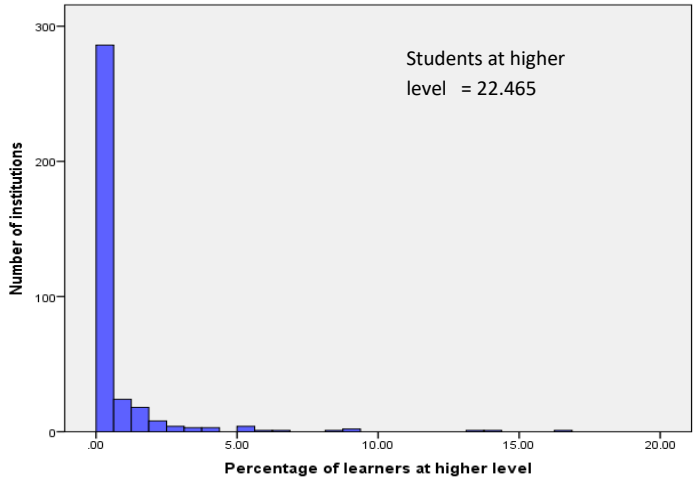
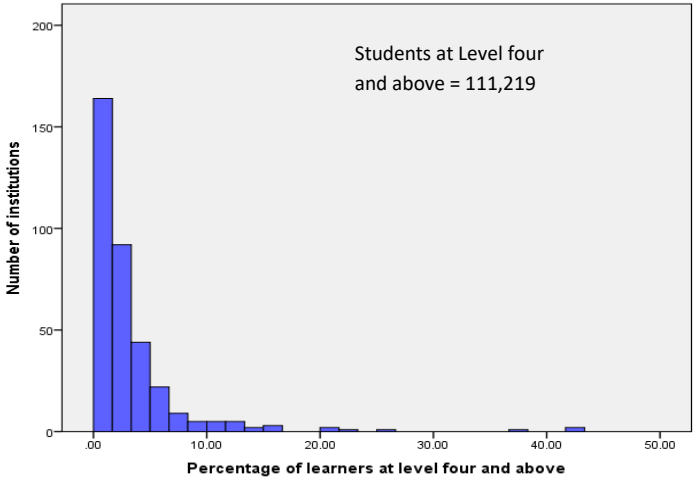


Figure 8.22 - Distribution of colleges at level four and above



8.3.3.1: Entry level

Table 8.6 shows how the percentage of entry level students breaks down over the administrative types. Sixth form colleges are 92.5% in the bottom two boxes, general FE colleges 76.4% and specialist colleges 72.5%. In the case of general FE colleges, the 167 colleges are roughly evenly distributed between the two boxes, a trend not replicated by sixth form or specialist colleges. However, it is in the specialist college group where we see the highest degree of specialisation in this level category with seven colleges enrolling at least 70% of their students on entry level courses. Moreover, the mean percentage of entry level students at sixth form colleges is 2.0% compared to 7.5% at general FE colleges and 20.1% at specialist colleges, confirming that entry level students have a much stronger presence in specialist colleges (in this case in the administrative type special college) than other college types.

Table 8.6 - Distribution of college types by percentage of entry level students

Percentage studying at entry level[1]	Sixth form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
100					4	10.0%
95-99					1	2.5%
70-79					2	5.0%
30-39			2	0.9%	1	2.5%
20-29	2	2.1%	8	3.6%	1	2.5%
15-19	1	1.1%	12	5.4%		
10-14	4	4.3%	31	13.8%	2	5.0%
5-9	2	2.1%	81	36.2%	5	12.5%
0-4	85	90.4%	90	40.2%	24	60.0%

[1]*Percentage studying rounded down*

There are 59 colleges who do not enrol a single student at entry level: comprising 53 sixth form colleges, and six specialist colleges. In addition, there are 17 colleges with less than 1% of students at entry level. The general FE college with the lowest percentage of students at entry level is Worthing College with 0.3% (63rd lowest) of their students on entry level courses, closely followed by the Leeds College of Building also with 0.3% (64th lowest).

Table 8.7 shows the 20 colleges with the highest percentage of students on entry level courses (along with the total students at all levels at the college). Within this list are two sixth form colleges, nine general FE colleges and nine specialist colleges suggesting that specialist colleges are most likely to have high percentages of entry level students (due to the ratio of specialist colleges to general FE colleges). However, closer inspection illustrates the point made above that the top seven specialist colleges have substantially higher percentages than any other college showing a high degree of specialisation at this level.

The above points all demonstrate that despite the relatively low total numbers of students at this level, there is still substantial diversity of colleges regarding entry level students.

Table 8.7 - The 20 colleges with the highest percentage of entry level students

Rank	College	Type[1]	Percentage of entry level students	Total students
1	Nash College	SC	100.0%	78
2	Pengwern College	SC	100.0%	31
3	The Congregation of the Daughters of the Cross of Liege	SC	100.0%	35
4	The David Lewis Centre	SC	100.0%	84
5	Lufton College of Further Education	SC	98.2%	109
6	Beaumont College - A Scope College	SC	77.7%	94
7	West of England College	SC	72.7%	11
8	City College, Birmingham	GFEC	34.6%	6676
9	Tower Hamlets College	GFEC	34.0%	7609
10	Orchard Hill College of Further Education	SC	30.5%	335
11	Working Men's College Corporation	SC	28.0%	4591
12	Joseph Chamberlain Sixth Form College	SFC	28.0%	2676
13	Hereward College of Further Education	GFEC	27.7%	510
14	Waltham Forest College	GFEC	27.2%	10000
15	Barnet and Southgate College	GFEC	24.6%	14922
16	Newham College of Further Education	GFEC	23.8%	20757
17	Kensington and Chelsea College	GFEC	23.7%	15951
18	College of North West London	GFEC	23.2%	11079
19	Harrow College	GFEC	21.5%	8700
20	Woking College	SFC	20.3%	1423

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

8.3.3.2: Level one

Table 8.8 shows how the percentage of level one students breaks down over the administrative types. Sixth form colleges are 93.6% in the bottom two boxes, general FE colleges 29.9% and specialist colleges 52.5%. However, in the case of specialist colleges, the 19 colleges are evenly distributed between the two boxes, a trend not replicated by sixth form or general FE colleges. Indeed, general FE colleges have 60 of the 67 colleges in the higher box (5-9%). This demonstrates that it is only sixth form colleges that enrol a relatively low percentage of their students at level one. Moreover, it is in the specialist college group where we see the highest degree of specialisation in this level category with five colleges enrolling at least 40% of their students on level one courses. Furthermore, the mean percentage of level one students at sixth form colleges is 2.6% compared to 13.8% at general FE colleges and 17.1% at specialist colleges, confirming that level one students have a much stronger presence in specialist colleges than other college types, though general FE colleges still enrol a substantial number of their students at this level. Additionally, general FE college percentages reach double figures in four consecutive boxes, indicating wide diversity of level one provision in general FE colleges.

Table 8.8 - Distribution of college types by percentage of level one students

Percentage studying at level one[1]	Sixth form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
90-99					1	2.5%
60-69					2	5.0%
40-59					2	5.0%
30-39			5	2.2%	1	2.5%
20-29	1	1.1%	25	11.2%	6	15.0%
15-19	3	3.2%	48	21.4%	2	5.0%
10-14	2	2.1%	79	35.3%	5	12.5%
5-9	9	9.6%	60	26.8%	11	27.5%
0-4	79	84.0%	7	3.1%	10	25.0%

[1]*Percentage studying rounded down*

There are 43 colleges who do not enrol a single student at level one: comprising 37 sixth form colleges and six specialist colleges. In addition, there are 19 colleges with less than 1% of students at level one. The general FE college with the lowest percentage of students at level one is Worthing College with 0.3% (46th lowest) of their students on level one courses, followed by the Seevic College with 2.1% (75th lowest).

Table 8.9 shows the 20 colleges with the highest percentage of students on level one courses. Within this list are one sixth form college, 12 general FE colleges and seven specialist colleges suggesting that general FE colleges and specialist colleges are both likely to have high percentages of level one students. However, closer inspection illustrates the point made above that the top five specialist colleges (In particular Hinwick Hall College) have substantially higher percentages than any other college showing a high degree of specialisation at this level.

The above points all demonstrate that despite the relatively low total numbers of students at this level, there is still substantial diversity of colleges regarding level one students.

Table 8.9 - The 20 colleges with the highest percentage of level one students

Rank	College	Type[1]	Percentage of level one students	Total students
1	Hinwick Hall College	SC	92.3%	39
2	Orchard Hill College of Further Education	SC	69.6%	335
3	Morley College Limited	SC	61.4%	13,166
4	Hartpury College	SC	50.9%	4,911
5	Working Men's College Corporation	SC	49.5%	4,591
6	Kensington and Chelsea College	GFEC	37.3%	15,951
7	Leeds College of Building	GFEC	35.6%	7,094
8	Shipley College	GFEC	35.4%	4,481
9	Abingdon and Witney College	GFEC	32.7%	7,946
10	Fircroft College of Adult Education	SC	32.4%	633
11	Stockton Riverside College	GFEC	31.1%	6,940
12	The Manchester College	GFEC	30.0%	88,695
13	Milton Keynes College	GFEC	29.6%	20,670

Table 8.9 continued				
Rank	**College**	**Type[1]**	**Percentage of level one students**	**Total students**
14	The College of Haringey, Enfield and North East London	GFEC	29.4%	23,091
15	Carshalton College	GFEC	29.1%	4,923
16	Strode's College	SFC	28.5%	2,857
17	Workers' Educational Association	SC	28.4%	62,021
18	East Durham College	GFEC	27.3%	7,119
19	Northumberland College	GFEC	26.5%	6,302
20	Richmond Adult Community College	GFEC	26.4%	7,897

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

8.3.3.3: Level two

Table 8.10 shows how the percentage of level two students breaks down over the administrative types. Sixth form colleges are 62.8% in the bottom two boxes, general FE colleges 0.4% and specialist colleges 40.0%. This reflects the generally higher numbers of students studying at level two in the system. However, it also indicates that similar to both the lower levels, sixth form colleges enrol relatively few students at this level compared to specialist and in particular general FE colleges. Furthermore, unlike the two previous levels, it is general FE colleges rather than specialist colleges that lead the way in specialising at this level, though that specialisation is less exclusive. Indeed, there is a wide spread of engagement in general FE colleges indicating strong diversity between general FE colleges. This is further illustrated by the mean percentages of level two students at sixth form colleges being 8.5% compared to 36.0% at general FE colleges and 21.3% at specialist colleges, confirming that level two students have a much stronger presence in general FE colleges than other college types.

Table 8.10 - Distribution of college types by percentage of level two students

Percentage studying at level two[1]	**Sixth form**		**General FE**		**Specialist**	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
60-69			5	2.2%		
50-59			14	6.3%	2	5.0%
45-49			16	7.1%	3	7.5%
40-44	1	1.1%	42	18.8%	2	5.0%
35-39			42	18.8%	2	5.0%
30-34	2	2.1%	35	15.6%	10	25.0%
25-29	1	1.1%	38	17.0%		
20-24	3	3.2%	24	10.7%	2	5.0%
15-19	6	6.4%	6	2.7%		
10-14	22	23.4%	1	0.4%	3	7.5%
5-9	20	21.3%	1	0.4%	4	10.0%
0-4	39	41.5%			12	30.0%

[1]*Percentage studying rounded down*

Of the 20 colleges with the lowest percentage of level two students, 16 have no students at this level and the remaining four are all under 0.6%. Within the 16 colleges with zero students at this level there are nine sixth form colleges and seven specialist colleges, the remaining four are all sixth form colleges. The general FE college with the lowest percentage of level two students is again Worthing College with 10.0% (76th lowest), below Richmond upon Thames College with the next lowest at 13.9% (98th lowest).

Table 8.11 shows the 20 colleges with the highest percentage of students on level two courses. Within this list are eighteen general FE colleges and two specialist colleges suggesting that general FE colleges are substantially more likely to have high percentages of level two students. Furthermore, each of the 20 is only a small increment on the previous rank, suggesting a wider and more even dispersion at this level.

The above points all demonstrate that the relatively high numbers of students studying at this level allow for a wide dispersion as well as substantial diversity. However, the degree of specialisation is lower than at previous levels as no college enrols more than 69.6% of their students at level two compared to 100% at entry level and 92.3% at level one.

Table 8.11 - The 20 colleges with the highest percentage of level two students

Rank	College	Type[1]	Percentage of level two students	Total students
1	Telford College of Arts and Technology	GFEC	69.6%	29,679
2	Selby College	GFEC	63.2%	4,967
3	Darlington College	GFEC	60.6%	11,913
4	Norton Radstock College	GFEC	60.3%	4,727
5	Stephenson College	GFEC	60.2%	9,343
6	North East Surrey College of Technology	GFEC	56.8%	9,931
7	Eastleigh College	GFEC	56.1%	18,132
8	Bexley College	GFEC	55.5%	3,564
9	Dudley College of Technology	GFEC	55.0%	13,949
10	Swindon College	GFEC	54.1%	9,140
11	Stourbridge College	GFEC	53.6%	15,634
12	Shrewsbury College of Arts and Technology	GFEC	53.3%	9,922
13	Huntingdonshire Regional College	GFEC	52.7%	6,275
14	West Nottinghamshire College	GFEC	51.7%	24,192
15	Bishop Auckland College	GFEC	51.1%	7,582
16	Accrington and Rossendale College	GFEC	51.1%	9,420
17	Otley College of Agriculture and Horticulture	SC	51.0%	4,603
18	Brooksby Melton College, Melton Mowbray	SC	51.0%	3,124
19	Weston College	GFEC	50.8%	13,096
20	Gateshead College	GFEC	50.7%	21,021

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

8.3.3.4: Level three

Table 8.12 shows how the percentage of level three students breaks down over the administrative types. Sixth form colleges are 0% in the bottom four boxes, whereas general FE colleges are 17.8% and specialist colleges 50.0% in the bottom two boxes. Furthermore, in the case of general FE colleges, 39 of the 40 colleges are in the higher box a trend not replicated by specialist colleges, demonstrating that each of the college types differs substantially in their average percentage of level three students. However, it is in the sixth form college group where we see the highest degree of specialisation in this level category with 45 colleges enrolling at least 90% of their students on level three courses, proportionally the highest degree of specialisation at any of the levels of study. Moreover, the mean percentage of level three students at sixth form colleges is 82.4% compared to 28.2% at general FE colleges and 18.3% at specialist colleges, confirming that level three students have a much stronger presence in sixth form colleges than other college types.

Table 8.12 - Distribution of college types by percentage of level three students

Percentage studying at level three[1]	Sixth form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
100	9	9.6%				
95-99	18	19.1%				
90-94	18	19.1%				
80-89	18	19.1%	1	0.4%		
70-79	12	12.8%	1	0.4%		
60-69	6	6.4%	1	0.4%		
50-59	4	4.3%	2	0.9%	1	2.5%
40-49	6	6.4%	18	8.0%	2	5.0%
35-39	2	2.1%	17	7.6%		
30-34	1	1.1%	35	15.6%	9	22.5%
25-29			56	25.0%	6	15.0%
20-24			53	23.7%	2	5.0%
10-19			39	17.4%	2	5.0%
0-9			1	0.4%	18	45.0%

[1]*Percentage studying rounded down*

Table 8.13 shows the 20 colleges with the lowest percentage of level three students, 11 have no students at this level but the remaining nine vary substantially ranging from 2.7% up to 10.9%. This demonstrates the high proportion of level three students within the FE sector and that very few colleges enrol low proportions of their students at this level. Of these 20 colleges, all those with zero students at this level are specialist colleges with the exception of Kensington and Chelsea College (16th) and Richmond Adult Community College (20th) both of which are general FE colleges. The sixth form college with the lowest percentage of level three students is Totton College with 33.6% (208th lowest), below St Vincent College with the next lowest at 38.2% (235th lowest).

Table 8.13 - The 20 colleges with the lowest percentage of level three students

Rank	College	Type[1]	Percentage of level three students	Total students
1	Bridge College	SC	0%	83
2	The David Lewis Centre	SC	0%	84
3	Pengwern College	SC	0%	31
4	Nash College	SC	0%	78
5	The Congregation of the Daughters of the Cross of Liege	SC	0%	35
6	Orchard Hill College of Further Education	SC	0%	335
7	Hinwick Hall College	SC	0%	39
8	Lufton College of Further Education	SC	0%	109
9	Derwen College	SC	0%	202
10	Beaumont College - A Scope College	SC	0%	94
11	West of England College	SC	0%	11
12	The City Literary Institute	SC	2.7%	29,334
13	Working Men's College Corporation	SC	3.0%	4,591
14	Ruskin College	SC	3.2%	1,183
15	Mary Ward Settlement	SC	4.5%	4,827
16	Kensington and Chelsea College	GFEC	5.7%	15,951
17	Morley College Limited	SC	6.3%	13,166
18	Workers' Educational Association	SC	7.8%	62,021
19	Northern College for Residential Adult Education Limited (The)	SC	8.3%	3,871
20	Richmond Adult Community College	GFEC	10.9%	7,897

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.14 shows the 20 colleges with the highest percentage of students on level three courses. All of which are sixth form colleges confirming that such colleges are substantially more likely to have high percentages of level three students.

The above points all demonstrate that the relatively high numbers of students studying at this level allow for a wide dispersion as well as substantial diversity. Furthermore, as noted earlier Table 8.14 demonstrates the high degree of specialisation at this level by sixth form colleges.

Table 8.14 - The 20 colleges with the highest percentage of level three students

Rank	College	Type[1]	Percentage of level three students	Total students
1	St Dominic's Sixth Form College	SFC	100.0%	930
2	King Edward Vi College Stourbridge	SFC	100.0%	1,616
3	Holy Cross College	SFC	100.0%	1,982
4	Wyggeston and Queen Elizabeth I College	SFC	100.0%	2,238
5	Winstanley College	SFC	100.0%	1,913
6	The Sixth Form College, Solihull	SFC	100.0%	2,519
7	Greenhead College	SFC	100.0%	1,978

Table 8.14 continued				
Rank	**College**	**Type[1]**	**Percentage of level three students**	**Total students**
8	Cadbury Sixth Form College	SFC	100.0%	1,182
9	The Rochdale Sixth Form College	SFC	100.0%	853
10	Bilborough College	SFC	100.0%	1,894
11	Shrewsbury Sixth Form College	SFC	99.5%	1,471
12	The Sixth Form College Colchester	SFC	99.4%	3,156
13	King George V College	SFC	99.4%	1,601
14	Woodhouse College	SFC	99.3%	1,189
15	The Sixth Form College Farnborough	SFC	99.0%	3,299
16	The Blackpool Sixth Form College	SFC	97.7%	2,075
17	King Edward Vi College Nuneaton	SFC	97.7%	1,138
18	Notre Dame Catholic Sixth Form College	SFC	97.5%	1,678
19	Carmel College	SFC	97.2%	1,831
20	Oldham Sixth Form College	SFC	97.1%	2,416

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

8.3.3.5: Level four

Table 8.15 shows how the percentage of level four students breaks down over the administrative types. Sixth form colleges are 100.0% in the bottom box, general FE colleges 86.6% and specialist colleges 82.5% (96.9% and 87.5% respectively in the bottom two boxes). This is largely a reflection of the lower numbers of level four students in the system generally. However, it does show a small number of colleges that have separated themselves out from the pack on this variable. Indeed, in the specialist college group there is a small number of colleges where we see the highest degree of specialisation in this level category. While relatively small in terms of percentage compared to the non-HE levels of study more commonly associated with the FE system, it is still exceptionally high for the system. Furthermore, the mean percentage of level four students at sixth form colleges is 0.3% compared to 3.0% at general FE colleges and 3.7% at specialist colleges. These low means illustrate quite how exceptional those colleges with high percentages of level four study are when compared to the system average.

Table 8.15 - Distribution of college types by percentage of level four students

Percentage studying at level four[1]	**Sixth form**		**General FE**		**Specialist**	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
20+					4	10.0%
15-19					1	2.5%
10-14			7	3.1%		
5-9			23	10.3%	2	5.0%
0-4	94	100.0%	194	86.6%	33	82.5%

[1]*Percentage studying rounded down*

There are 95 colleges who do not enrol a single student at level four: comprising 73 sixth form colleges, two general FE colleges and 20 specialist colleges. In addition, there are 43 colleges with less than 1% of students at level four.

Table 8.16 shows the 20 colleges with the highest percentage of students on level four courses. Within this list are 14 general FE colleges and six specialist colleges suggesting that while proportionally specialist colleges are more likely to have high percentages of level four students, general FE colleges are also a strong presence at this level. Indeed, closer inspection illustrates the point made above that the top five specialist colleges have substantially (in relative terms) higher percentages than any other college showing a high degree of specialisation at this level.

The above points all demonstrate that despite the relatively low total numbers of students at this level, there is still some diversity of colleges regarding level four students.

Table 8.16 - The 20 colleges with the highest percentage of level four students

Rank	College	Type[1]	Percentage of level four students	Total students
1	Cleveland College of Art and Design	SC	29.4%	1,196
2	Plymouth College of Art	SC	25.2%	1,984
3	Hereford College of Arts	SC	22.7%	1,059
4	Hadlow College	SC	20.3%	2,922
5	Bishop Burton College	SC	19.6%	3,825
6	Farnborough College of Technology	GFEC	13.7%	5,785
7	Blackburn College	GFEC	13.5%	14,960
8	Worcester College of Technology	GFEC	13.4%	13,759
9	Loughborough College	GFEC	12.1%	9,594
10	Somerset College of Arts and Technology	GFEC	11.9%	5,915
11	South Tyneside College	GFEC	11.4%	9,552
12	Northbrook College, Sussex	GFEC	10.3%	10,674
13	Blackpool and The Fylde College	GFEC	9.8%	22,315
14	Doncaster College	GFEC	9.7%	11,958
15	New College, Durham	GFEC	9.6%	13,350
16	Moulton College	SC	8.3%	6,428
17	Guildford College of Further and Higher Education	GFEC	8.3%	12,240
18	Grimsby Institute of Further and Higher Education	GFEC	8.1%	20,040
19	St Helens College	GFEC	7.7%	10,123
20	Havering College of Further and Higher Education	GFEC	7.6%	13,286

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

8.3.3.6: Level five

Table 8.17 shows how the percentage of level five students breaks down over the administrative types. Sixth form colleges and specialist colleges are 100.0% in the bottom box,

although general FE colleges have one college in the second box. This result is an indication of the very small numbers of students involved at level five in the FE sector so it tells us very little and is therefore only included for completeness. This is confirmed by the mean percentage of level five students at all college types with sixth form colleges at 0.03% compared to 0.2% at general FE colleges and 0.1% at specialist colleges, confirming that level five students have only a tiny presence in all of the college types.

There are 200 colleges who do not enrol a single student at level five: comprising 91 sixth form colleges, 80 general FE colleges and 29 specialist colleges. In addition, there are 142 colleges with less than 1% of students at level five leaving only 16 colleges with more than 1% of their students enrolled on level five courses. This again reflects the miniscule amount of students enrolled at level five in the FE sector.

Table 8.17 - Distribution of college types by percentage of level five students

Percentage studying at level five[1]	Sixth form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
2-5			1	0.4%		
0-2	94	100.0%	223	99.6%	40	100.0%

[1]*Percentage studying rounded down*

Table 8.18 shows the 20 colleges with the highest percentage of students on level five courses. Within this list are one sixth form college, 16 general FE colleges and three specialist colleges. There is little that can be concluded from such low numbers of students with the majority of diversity on this variable being related to the presence or absence of students at level five rather than the percentages involved.

Table 8.18 - The 20 colleges with the highest percentage of level five students

Rank	College	Type[1]	Percentage of level five students	Total students
1	Doncaster College	GFEC	3.6%	11,958
2	Ludlow College	SFC	1.5%	1,878
3	Fareham College	GFEC	1.3%	4,285
4	North East Surrey College of Technology	GFEC	1.3%	9,931
5	Croydon College	GFEC	1.2%	10,900
6	Plymouth College of Art	SC	1.2%	1,984
7	Herefordshire College of Technology	GFEC	1.2%	5,875
8	Newbury College	GFEC	1.1%	3,334
9	Farnborough College of Technology	GFEC	1.1%	5,785
10	City College, Coventry	GFEC	1.1%	8,011
11	Chesterfield College	GFEC	1.1%	11,746
12	Yeovil College	GFEC	1.1%	5,395
13	Bexley College	GFEC	1.1%	3,564
14	Somerset College of Arts and Technology	GFEC	1.0%	5,915
15	Rotherham College of Arts and Technology	GFEC	1.0%	11,025

Table 8.18 continued				
Rank	**College**	**Type[1]**	**Percentage of level five students**	**Total students**
16	Kingston Maurward College	SC	1.0%	3,569
17	Amersham and Wycombe College	GFEC	1.0%	4,867
18	Leeds College of Building	GFEC	0.9%	7,094
19	Brooklands Technical College	GFEC	0.9%	7,261
20	Bishop Burton College	SC	0.8%	3,825

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

8.3.3.7: Higher level

Table 8.19 shows how the percentage of higher level students breaks down over the administrative types. Sixth form colleges are 100.0% in the bottom box, general FE colleges 96.9% and specialist colleges 87.5% (100.0% and 92.5% respectively in the bottom two boxes). This is largely a reflection of the low numbers of higher level students in the system generally. However, it does show a very small number of colleges that have separated themselves out from the pack on this variable (though this is less distinct than at level four). Indeed, in the specialist college group there is a very small number of colleges where we see the highest degree of specialisation in this level category. While relatively small in terms of percentage compared to the non-HE levels of study more commonly associated with the FE system, it is still exceptionally high for the system. This is confirmed by the low mean percentages of higher level students at sixth form colleges of 0.1% compared to 0.7% at general FE colleges and 1.4% at specialist colleges. These low means illustrate quite how exceptional those few colleges with high percentages of higher level students are when compared to the system average.

Table 8.19 - Distribution of college types by percentage of higher level students

Percentage studying at higher level[1]	**Sixth Form**		**General FE**		**Specialist**	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
10+					3	7.5%
5-9			7	3.1%	2	5.0%
0-4	94	100.0%	217	96.9%	35	87.5%

[1]*Percentage studying rounded down*

There are 210 colleges who do not enrol a single student at higher level: comprising 87 sixth form colleges, 91 general FE colleges and 32 specialist colleges. In addition, there are a further 89 colleges with less than 1% of students at higher level.

Table 8.20 shows the 20 colleges with the highest percentage of students on higher level courses. Within this list are one sixth form college, 14 general FE colleges and five specialist colleges suggesting that general FE colleges and specialist colleges are both more likely to have higher percentages of higher level students. However, closer inspection illustrates the point made above that the top three specialist colleges have substantially higher (relative) percentages than any other college showing a high degree of specialisation in these colleges at this level.

The above points all demonstrate that despite the relatively low total numbers of students at this level, there is still some diversity of colleges regarding higher level students.

Table 8.20 - The 20 colleges with the highest percentage of higher level students

Rank	College	Type[1]	Percentage of higher level students	Total students
1	Plymouth College of Art	SC	16.5%	1,984
2	Hereford College of Arts	SC	14.2%	1,059
3	Cleveland College of Art and Design	SC	13.2%	1,196
4	Bradford College	GFEC	9.2%	24,941
5	Macclesfield College	GFEC	9.0%	6,264
6	Blackburn College	GFEC	8.7%	14,960
7	Farnborough College of Technology	GFEC	6.3%	5,785
8	North Lindsey College	GFEC	6.0%	6,488
9	Bishop Burton College	SC	5.6%	3,825
10	Blackpool and the Fylde College	GFEC	5.4%	22,315
11	Sparsholt College Hampshire	SC	5.3%	8,454
12	Stockport College of Further and Higher Education	GFEC	5.3%	11,917
13	South Cheshire College	GFEC	4.3%	6,948
14	St Helens College	GFEC	4.1%	10,123
15	Mid-Cheshire College of Further Education	GFEC	4.1%	6,802
16	Kendal College	GFEC	3.5%	4,355
17	Grimsby Institute of Further and Higher Education	GFEC	3.3%	20,040
18	Richard Huish College, Taunton	SFC	3.3%	2,527
19	Carlisle College	GFEC	2.9%	3,820
20	Warwickshire College, Royal Leamington Spa, Rugby and Moreton Morrell	GFEC	2.9%	18,373

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

8.3.3.8: Not specified level

Not specified level is a recognised category in the ILR's qualifications database, the LARA. It includes all qualifications that do not fit on any of the qualifications frameworks. Usually this means that it is a skills training course that does not lead to a recognised qualification but does provide the student with useful skills. Whilst it is not completely identical in concept to the qualification levels it does provide a useful function to the ILR and thus is analysed here in the same way as the recognised qualification levels. Table 8.21 shows how the percentage of not specified level students breaks down over the administrative types. Sixth form colleges are 86.2% in the bottom two boxes, general FE colleges 56.2% and specialist colleges 55.0%. However, in the case of general FE colleges, the 126 colleges are roughly evenly distributed between the two boxes, a trend not replicated by sixth form or specialist colleges. Furthermore, it is in the specialist college group where we see the highest degree of specialisation in this level category with four colleges enrolling at least 60% of their students on not specified level courses. Moreover, the mean percentage of not specified level students at sixth form colleges is 4.0% compared to 10.6% at general FE colleges and 17.6% at specialist

colleges, showing that not specified level students have a much stronger presence in specialist colleges than other college types.

There are 64 colleges who do not enrol a single student at a not specified level comprising 48 sixth form colleges, four general FE colleges and 12 specialist colleges. In addition, there are 35 colleges with less than 1% of students at a not specified level.

Table 8.21 - Distribution of college types by percentage of not specified level students

Percentage studying at a non specified level[1]	Sixth form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
95-100					2	5.0%
60-79					2	5.0%
40-59	1	1.1%	2	0.9%		
30-39	2	2.1%	9	4.0%	1	2.5%
20-29	4	4.3%	18	8.0%	8	20.0%
15-19	3	3.2%	23	10.3%	3	7.5%
10-14	3	3.2%	46	20.5%	2	5.0%
5-9	6	6.4%	57	25.4%	6	15.0%
0-4	75	79.8%	69	30.8%	16	40.0%

[1]*Percentage studying rounded down*

Table 8.22 shows the 20 colleges with the highest percentage of students on not specified level courses. Within this list are three sixth form colleges, 11 general FE colleges and six specialist colleges suggesting that both general FE colleges and specialist colleges are more likely to have high percentages of not specified level students. Though specialist colleges head the table there is not as big a gap between the specialist college with the lowest percentage and the next highest college. However, the top two colleges do have a substantially higher percentage than any other college. This shows the presence of a high degree of specialisation in courses at a not specified level for a small minority of colleges.

The above points all demonstrate that despite the relatively low total numbers of students at this level, there is still substantial diversity of colleges regarding not specified level students.

Table 8.22 - The 20 colleges with the highest percentage of not specified level students

Rank	College	Type[1]	Percentage of not specified level students	Total students
1	Bridge College	SC	100.0%	83
2	Derwen College	SC	97.0%	202
3	The City Literary Institute	SC	77.8%	29,334
4	Mary Ward Settlement	SC	61.2%	4,827
5	Sir John Deane's College	SFC	57.2%	3,271
6	East Surrey College	GFEC	52.8%	8,241
7	South Worcestershire College	GFEC	46.45	3,416
8	Bracknell and Wokingham College	GFEC	39.1%	7,611
9	Cornwall College	GFEC	37.05	27,500

Table 8.22 continued				
Rank	**College**	**Type[1]**	**Percentage of not specified level students**	**Total students**
10	Hills Road Sixth Form College	SFC	36.2%	4,425
11	Blackpool and The Fylde College	GFEC	35.45	22,315
12	South Tyneside College	GFEC	34.1%	9,552
13	Sussex Coast College Hastings	GFEC	33.2%	7,677
14	St Vincent College	SFC	32.45	2,865
15	Ruskin College	SC	32.3%	1,183
16	Richmond Adult Community College	GFEC	31.9%	7,897
17	North Nottinghamshire College	GFEC	31.85	8,308
18	Mid-Cheshire College of Further Education	GFEC	31.2%	6,802
19	Stroud College of Further Education	GFEC	30.4%	7,173
20	Northern College for Residential Adult Education Limited (The)	SC	28.2%	3,871

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

8.4: Subject of study

This section provides an overview of the subject of study in the college sector firstly at the system level and then at the institutional level. Furthermore, it presents results on how much variation there is within the current administrative types on their subject foci. Finally, there is a summary of the current administrative types' subject profiles and how many colleges fall within these descriptors. It must be noted that subject is the only variable examined at the aims rather than student level. This is because a single student may be studying more than one subject (for further details see Chapter Seven on the methodology).

8.4.1: Subject of study at the system Level

There are 8,033,128 aims taught in the FE sector by the colleges under study and Table 8.23 shows how these are broken down between the administrative types.

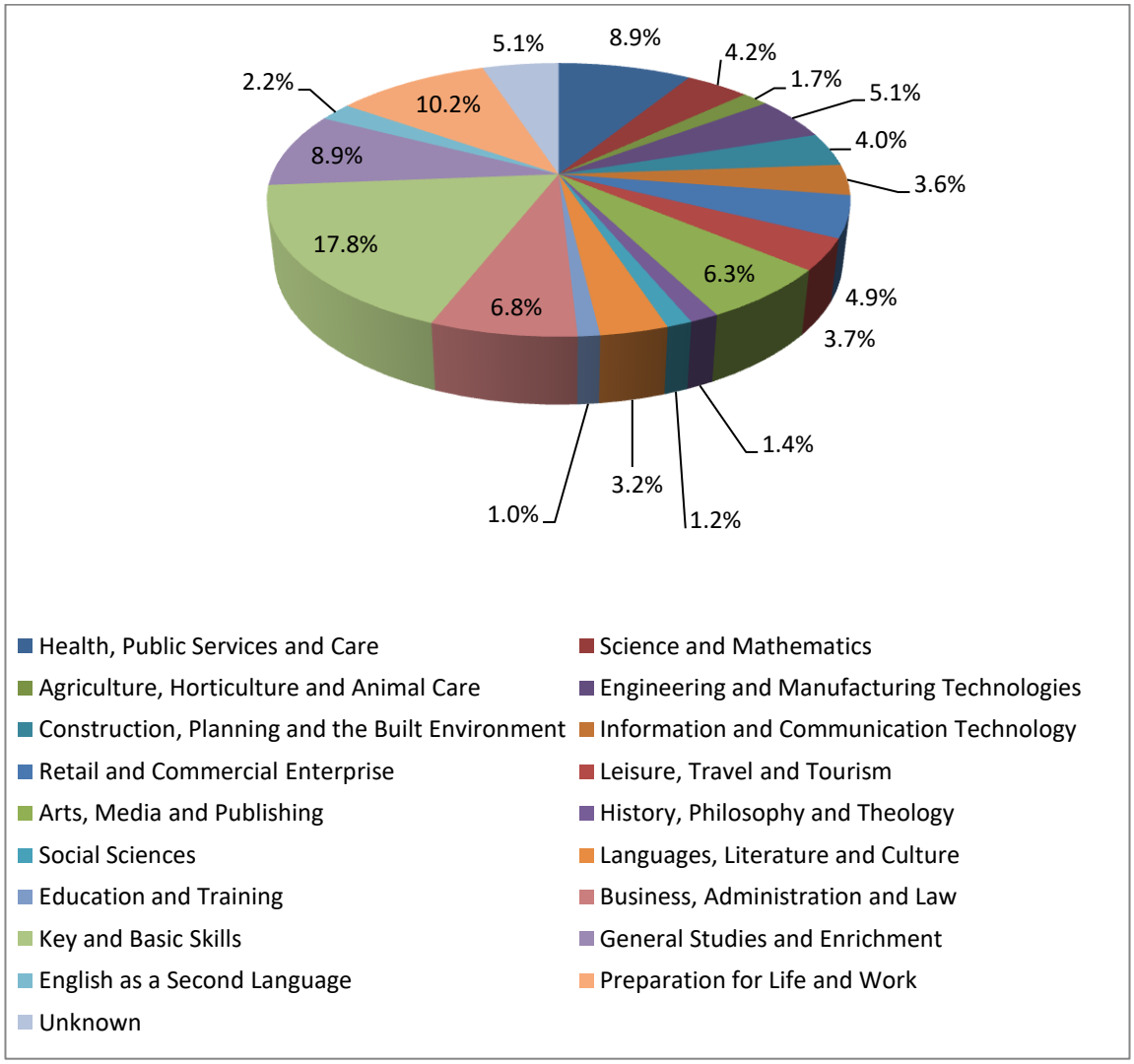
Table 8.23 - Student aims breakdown

College Type	Number of colleges		Total aims	
	Number	**Percent**	**Number**	**Percent**
General FE college	224	62.6%	6,668,858	83.0%
Sixth form college	94	26.3%	948,941	11.8%
Specialist college (all types)	40	11.2%	415,329	5.2%
Total	**358**	**100.0%**	**8,033,128**	**100.0%**

Table 8.23 continued				
Specialist college type	Number of colleges		Total aims	
	Number	Percent	Number	Percent
Special college	11	3.1%	3,134	0.0%
Agricultural college	16	4.5%	178,771	2.2%
Specialist designated college	10	2.8%	226,515	2.8%
Special college - art, design and performing arts	3	0.8%	6,909	0.1%

Figure 8.23 (on the next page) shows how much of each subject is currently taught in the whole system by showing the percentage of aims undertaken in each of the subject areas. This Figure includes all aims (not student numbers) irrespective of level, as a percentage of the total number of aims. This is not a representation of the time allocated to each of the subject areas in teaching hours as an individual aim may be anything from a very short course (1 hour or less) to a full-time full-year course. Ideally, this would be included but such data were not available. Nonetheless, the mode of study is taken into account in relation to subject in Chapter 10. Further breakdown of how the respective administrative types fit into this can be found in the last section of the subject analysis section.

Figure 8.23 - Subject of study by percentage of aims of each subject



8.4.2: Subject of study at the institutional level

Table 8.24 provides a summary of the depth of engagement colleges have with each of the subject groups. Firstly it states how many of the 358 colleges offer at least one aim in the subject group and then each subsequent column provide a statistic for each subject group. The mean provides the overall engagement colleges have with each subject group. This may be different from the percentage of aims in the system level section as it is calculated based on the percentage of aims at each college, rather than as a percentage of the total aims in the system and as such this number is subject to the size of colleges, whereas the system level number is not. The standard deviation provides an indication of the dispersion patterns and thus the expected scope for institutional diversity within the subject group. Finally, the range provides the extent to which there is specialisation in a particular subject group by at least one college; for example the Preparation for Life and Work subject group has at least one college that offers only that type of aim (i.e. a highly specialised college). In contrast in the Information and Communication Technology group the highest level of specialisation is 13.1% indicating no real specialist college in this subject group.

Table 8.24 - Descriptive statistics for the colleges on the subject group of study

Subject group	Colleges		Aims in subject group		
	Number	Percent	Mean	Standard deviation	Range
Health, Public Services and Care (HPSC)	343	95.8%	7.9%	5.2%	34.7%
Science and Mathematics (SM)	327	91.3%	6.7%	8.4%	35.0%
Agriculture, Horticulture and Animal Care (AHAC)	234	65.4%	2.3%	7.6%	53.8%
Engineering and Manufacturing Technologies (EMT)	313	87.4%	4.1%	4.5%	41.7%
Construction, Planning and the Built Environment (CPBE)	232	64.8%	2.9%	4.2%	51.6%
Information and Communication Technology (ICT)	338	94.4%	3.1%	2.4%	13.1%
Retail and Commercial Enterprise (RCE)	274	76.5%	3.8%	3.4%	18.2%
Leisure, Travel and Tourism (LTT)	337	94.1%	3.8%	3.5%	40.4%
Arts, Media and Publishing (AMP)	343	95.8%	7.2%	9.1%	87.0%
History, Philosophy and Theology (HPT)	297	83.0%	2.1%	4.3%	29.9%
Social Sciences (SS)	287	80.2%	2.0%	2.7%	13.2%
Language, Literature and Culture (LLC)	331	92.5%	4.0%	4.1%	29.1%
Education and Training (ET)	273	76.3%	1.0%	1.4%	16.3%
Business, Administration and Law (BAL)	344	96.1%	6.3%	3.6%	40.1%
Key and Basic Skills (KBS)	332	92.7%	14.8%	9.2%	36.7%

Table 8.24 continued					
Subject group	Colleges		Aims in subject group		
	Number	Percent	Mean	Standard deviation	Range
General Studies and Enrichment Programmes (GSEP)	281	78.5%	10.8%	10.0%	45.4%
English as a Second Language (ESL)	247	69.0%	1.9%	3.4%	29.7%
Preparation for Life and Work (PLW)	354	98.9%	10.8%	13.9%	100.0%
Unknown or Not Classified	273	76.3%	4.4%	6.5%	94.3%

The following sub-sections give details for each individual subject group. However Unknown or Not Classified is not analysed in detail. Unlike in level of study this group does not cover a specific course type or group and thus analysing it would lead to no meaningful conclusions being drawn.

8.4.2.1: Health, Public Services and Care

Figure 8.24, shows the distribution of the 711,093 aims in the Health, Public Services and Care (HPSC) subject group at all colleges. There are only a small number of colleges (27) that offer none or very little HPSC provision (under 1%) and the wide distribution indicates substantial diversity in colleges running HPSC courses. This indication is further reinforced by those colleges that differ substantially from the mean in running HPSC courses (both those that run none or very little provision in this subject group and those that run a substantially higher than average amount of HPSC provision).

Of the 20 colleges with the lowest HPSC aims percentage, 14 have no aims in this subject area and the remaining six are all under 0.6%. Within the 14 colleges with zero aims there are four sixth form colleges and 10 specialist colleges. The general FE college with the lowest percentage of HPSC aims is Richmond upon Thames College with 1.4% (38th lowest), below Dudley College of Technology with the next lowest at 2.7% (69th lowest).

Figure 8.24 - Distribution of the percentage of aims in Health, Public Services and Care over all colleges

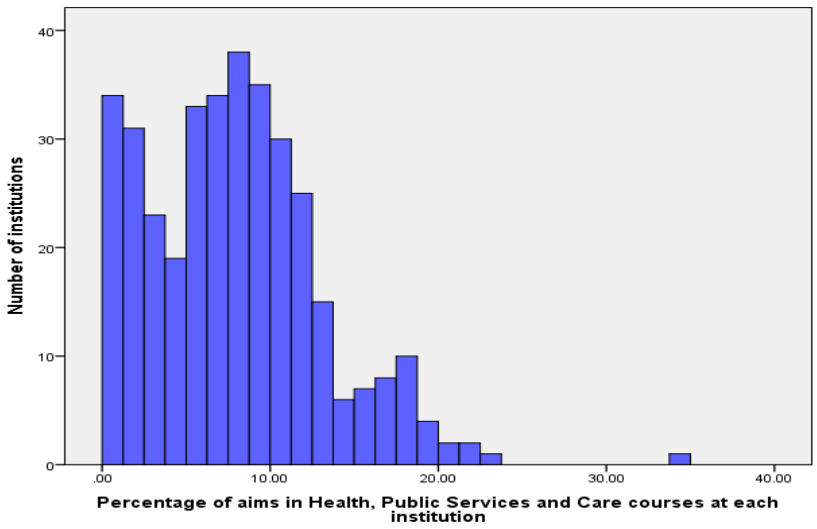


Table 8.25 shows the 20 colleges with the highest HPSC aim percentage (along with the total aims in all subjects at the college). Within this list are three sixth form colleges, 16 general FE colleges and one specialist college suggesting that general FE colleges are more likely to have high percentages of HPSC aims.

Table 8.26 shows how the percentage of HPSC aims break down over the administrative types. Sixth form colleges are 94.7% in the bottom two boxes, general FE colleges 55.4% and specialist colleges 85.0%. However, in the case of the 124 general FE colleges, in the bottom two boxes, 114 (91.9%) are in the higher box, a trend not replicated by sixth form or specialist colleges. Moreover, the mean percentage of HPSC aims at sixth form colleges is 3.7% compared to 10.3% at general FE colleges and 4.4% at specialist colleges, confirming that HPSC aims have a much stronger presence in general FE colleges than other college types. Furthermore, it indicates that although a sixth form college has the highest percentage of HPSC aims, this is not indicative of the administrative type as a whole and is very much an exception.

Table 8.25 - The 20 colleges with the highest percentage of Health, Public Services and Care aims

Rank	College	Type[1]	Percentage of HPSC aims	Total aims
1	Ludlow College	SFC	34.7%	4,581
2	Newbury College	GFEC	23.3%	8,153
3	North East Surrey College of Technology	GFEC	21.9%	18,880
4	Peterborough Regional College	GFEC	21.7%	24,605
5	Stephenson College	GFEC	21.1%	20,846
6	Sandwell College	GFEC	21.0%	19,097
7	Huddersfield New College	SFC	19.5%	12,550
8	City of Westminster College	GFEC	19.5%	19,512
9	Norton Radstock College	GFEC	19.3%	8,400
10	Chelmsford College	GFEC	19.0%	17,501
11	Hinwick Hall College	SC	18.4%	223
12	Greenwich Community College	GFEC	18.3%	13,697
13	Stroud College of Further Education	GFEC	18.1%	15,655
14	Rotherham College of Arts and Technology	GFEC	18.1%	20,326
15	North East Worcestershire College	GFEC	18.0%	15,133
16	The College of West Anglia	GFEC	18.0%	35,626
17	Weston College	GFEC	18.0%	39,305
18	Ashton Sixth Form College	SFC	17.7%	11,071
19	Fareham College	GFEC	17.65	15,870
20	Walsall College	GFEC	17.5%	27,617

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.26 - Distribution of college types by percentage of Health, Public Services and Care aims

Percentage studying HPSC[1]	Sixth form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
25+	1	1.1%				
20-24			5	2.2%		
15-19	2	2.1%	26	11.6%	1	2.5%
10-14	2	2.1%	69	30.8%	5	12.5%
5-9	17	18.1%	114	50.9%	9	22.5%
0-4	72	76.6%	10	4.5%	25	62.5%

[1]*Percentage studying rounded down*

8.4.2.2: Science and Mathematics

Figure 8.25 shows the distribution of the 338,549 aims in the Science and Mathematics (SM) subject group at all colleges. A relatively large number of colleges (95) offer none or very little SM provision (under 1%); however those that do tend, to have a relatively high proportion of their aims in this subject group.

There are 27 colleges who do not offer a single SM aim, comprising six general FE colleges and 21 specialist colleges. The sixth form college with the lowest percentage of SM aims is John Ruskin College with 1.8% (144th lowest), substantially lower than the next lowest which is St Vincent College with 6.4% (235th lowest).

Table 8.27 shows the 20 colleges with the highest SM aim percentage. Within this list are 19 sixth form colleges and one general FE college, suggesting that sixth form colleges are much more likely to have high percentages of SM aims.

Figure 8.25 - Distribution of the percentage of aims in Science and Mathematics over all colleges

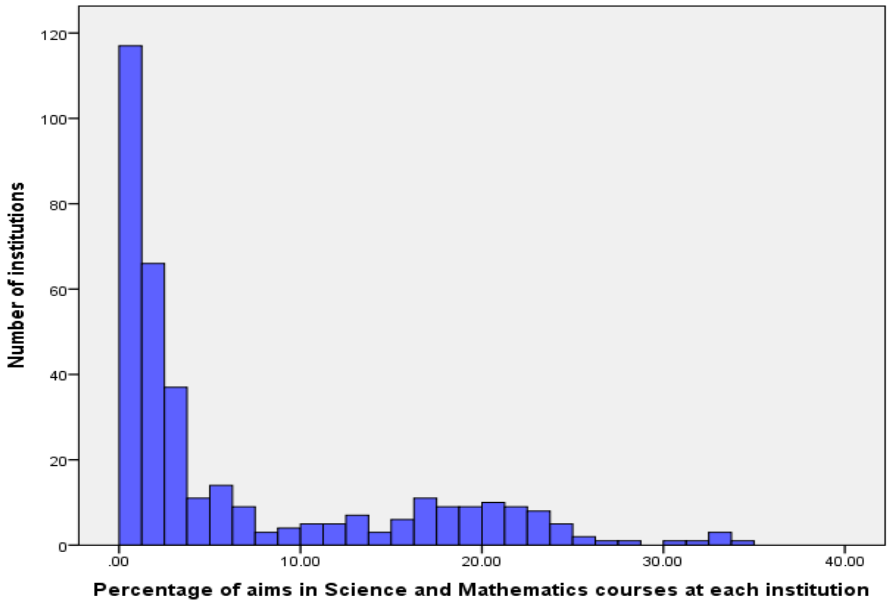


Table 8.28 shows how the percentage of SM aims breaks down over the administrative types. Sixth form colleges are 4.3% in the bottom two boxes, general FE colleges 96.9% and specialist

colleges 100%. Moreover, the mean percentage of SM aims at sixth form colleges is 19.2% compared to 2.6% at general FE colleges and 0.6% at specialist colleges, confirming that SM aims have a much stronger presence in sixth form colleges than other college types. Furthermore, it indicates that although a general FE college (Worthing College) appears in the top 20 highest percentage of SM aims this is not indicative of the administrative type as a whole and is very much an exception.

Table 8.27 - The 20 colleges with the highest percentage of Science and Mathematics aims

Rank	College	Type[1]	Percentage of SM aims	Total aims
1	St Dominic's Sixth Form College	SFC	35.0%	4,781
2	Havant College	SFC	33.2%	5,180
3	Winstanley College	SFC	32.7%	9,960
4	Woodhouse College	SFC	32.5%	5,488
5	City of Stoke-On-Trent Sixth Form College	SFC	32.3%	5,748
6	Lowestoft Sixth Form College	SFC	31.25	1,432
7	King George V College	SFC	27.8%	6,171
8	Bilborough College	SFC	27.2%	8,575
9	Greenhead College	SFC	26.1%	12,868
10	Carmel College	SFC	25.3%	9,894
11	John Leggott Sixth Form College	SFC	24.8%	12,336
12	Joseph Chamberlain Sixth Form College	SFC	24.7%	9,425
13	Cadbury Sixth Form College	SFC	24.5%	6,344
14	The Brooke House Sixth Form College	SFC	24.5%	4,344
15	Oldham Sixth Form College	SFC	24.2%	13,471
16	Worthing College	GFEC	23.7%	8,516
17	Barrow-In-Furness Sixth Form College	SFC	23.6%	5,375
18	The Rochdale Sixth Form College	SFC	23.5%	4,285
19	King Edward VI College Nuneaton	SFC	23.5%	5,677
20	Scarborough Sixth Form College	SFC	23.4%	5,646

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.28 - Distribution of college types by percentage of Science and Mathematics aims

Percentage studying SM[1]	Sixth form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
30+	6	6.4%				
25-29	4	4.3%				
20-24	31	33.0%	1	0.4%		
15-19	34	36.2%	1	0.4%		
10-14	15	16.0%	5	2.2%		
5-9	3	3.2%	26	11.6%	1	2.5%
0-4	1	1.1%	191	85.3%	39	97.5%

[1] *Percentage studying rounded down*

8.4.2.3: Agriculture, Horticulture and Animal Care

Figure 8.26, shows the distribution of the 140,441 aims in the Agriculture, Horticulture and Animal Care (AHAC) subject group at all colleges. The vast majority of colleges (279) offer none or very little AHAC provision (under 1%) and the majority of provision in this area is provided by a small number of colleges that specialise in this subject group.

There are 121 colleges who do not offer a single AHAC aim: comprising 64 sixth form colleges, 39 general FE colleges and 18 specialist colleges. In addition, there are 150 colleges with less than 1% of aims in AHAC, further demonstrating the specialist nature of this subject area.

Table 8.29 shows the 20 colleges with the highest AHAC aim percentage. Within this list are four general FE colleges and 16 specialist colleges (all specialist agricultural colleges), suggesting that the specialist colleges in this area provide much of the provision (as expected) and are much more likely to have high percentages of AHAC aims. The sixth form college with the highest percentage of AHAC aims is Hereford Sixth Form College with 6.2% of aims in AHAC courses (25th highest), substantially higher than Cirencester Tertiary College (administrative type SFC) with 1.9% (50th highest) indicating that Hereford is an exception in this subject group.

Figure 8.26 - Distribution of the percentage of aims in Agriculture, Horticulture and Animal Care over all colleges

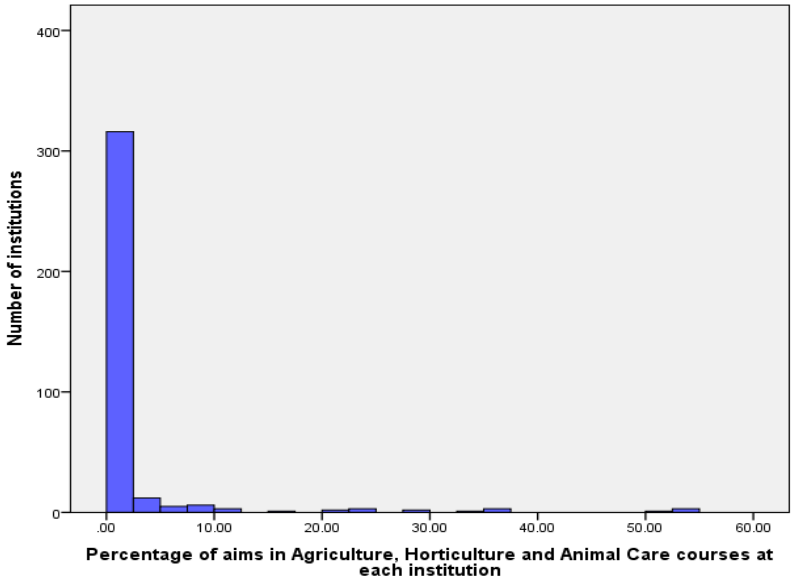


Table 8.29 - The 20 colleges with the highest percentage of Agriculture, Horticulture and Animal Care aims

Rank	College	Type[1]	Percentage of AHAC aims	Total aims
1	Capel Manor College	SC	53.8%	6,782
2	Askham Bryan College	SC	53.6%	13,625
3	Plumpton College	SC	53.5%	7,075
4	Berkshire College of Agriculture	SC	52.5%	3,209
5	Hadlow College	SC	37.5%	9,524
6	Bicton College	SC	37.2%	5,632
7	Bishop Burton College	SC	35.3%	7,368

Table 8.29 continued				
Rank	**College**	**Type[1]**	**Percentage of AHAC aims**	**Total aims**
8	Myerscough College	SC	34.0%	19,955
9	Easton College	SC	29.54	6,015
10	Kingston Maurward College	SC	28.4%	8,568
11	Reaseheath College	SC	24.8%	12,951
12	Moulton College	SC	24.0%	23,961
13	Sparsholt College Hampshire	SC	23.4%	24,840
14	Hartpury College	SC	20.9%	9,777
15	Cornwall College	GFEC	20.9%	67,192
16	Otley College of Agriculture and Horticulture	SC	15.3%	10,601
17	Warwickshire College, Royal Leamington Spa, Rugby and Moreton Morrell	GFEC	12.1%	35,972
18	Walford and North Shropshire College	GFEC	11.5%	13,586
19	Brooksby Melton College, Melton Mowbray	SC	11.0%	8,888
20	South Staffordshire College	GFEC	9.6%	30,310

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.30 shows how the percentage of AHAC aims breaks down over the administrative types. Sixth form colleges are 100% in the bottom two boxes, general FE colleges 98.7% and specialist colleges 60.0%. Moreover, the mean percentage of AHAC aims at sixth form colleges is 0.2% compared to 1.1% at general FE colleges and 13.5% at specialist colleges, confirming that AHAC aims have a much stronger presence in specialist colleges than other college types. Furthermore, though there are a small number of general FE colleges that offer more than 5% of their provision in this subject area, it is the exception and it is only 6.0% (13 colleges) of general FE colleges that do so.

Table 8.30 - Distribution of college types by percentage of Agriculture, Horticulture and Animal Care aims

Percentage studying AHAC[1]	**Sixth Form**		**General FE**		**Specialist**	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
50+					4	10.0%
30-49					4	10.0%
25-29					2	5.0%
20-24			1	0.4%	4	10.0%
15-19					1	2.5%
10-14			2	0.9%	1	2.5%
5-9	1	1.1%	10	4.5%		
0-4	93	98.9%	211	94.2%	24	60.0%

[1]*Percentage studying rounded down*

8.4.2.4: Engineering and Manufacturing Technologies

Figure 8.27, shows the distribution of the 407,423 aims within the Engineering and Manufacturing Technologies (EMT) group at all colleges. There is a large number of colleges (107) that offer none or very little EMT provision (under 1%); with a few exceptions the

remaining colleges are clustered around the mean. However, there are also a small number of colleges that have a very high percentage of their aims in EMT courses suggesting the presence of diversity in the college sector for this subject group.

There are 44 colleges who do not offer a single EMT aim: comprising 23 sixth form colleges, two general FE colleges and 19 specialist colleges, suggesting that general FE colleges may be more likely to have higher percentages of aims within this subject area.

Table 8.31 shows the 20 colleges with the highest EMT aim percentage. Within this list are 19 general FE colleges and one specialist college suggesting that general FE colleges are indeed much more likely to have high percentages of EMT aims. The sixth form college with the highest percentage EMT aims is The College of Richard Collyer in Horsham with 2.5% (192nd highest) only slightly ahead of John Leggott Sixth Form College with 2.3% (202nd highest) and initiating a grouping of sixth form colleges. Therefore, it is reasonable to conclude that this subject area is dominated by general FE colleges, though it is present in small numbers in the majority of sixth form colleges (71 of 94).

Figure 8.27 - Distribution of the percentage of aims in Engineering and Manufacturing Technologies over all colleges

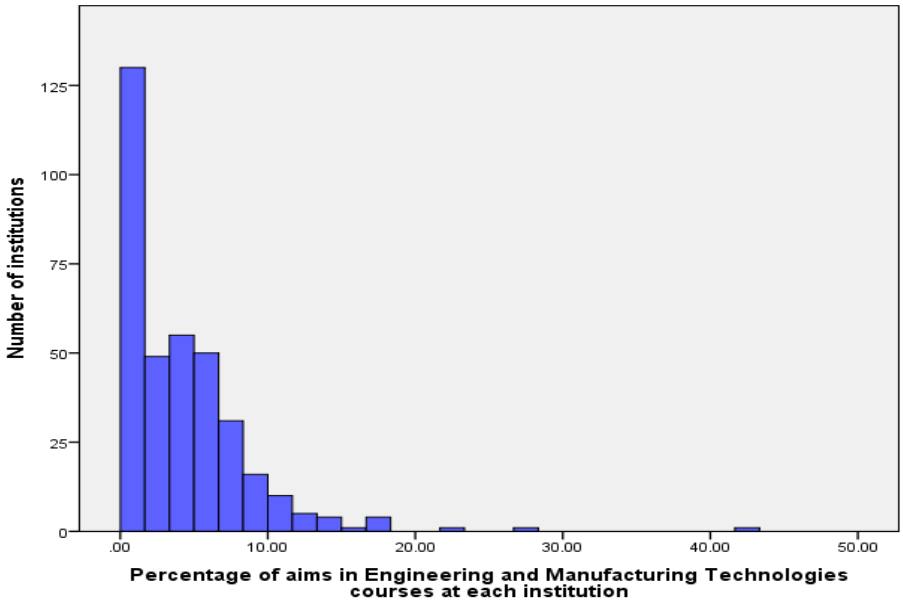


Table 8.31 - The 20 colleges with the highest percentage of Engineering and Manufacturing Technologies aims

Rank	College	Type[1]	Percentage of EMT aims	Total aims
1	South Tyneside College	GFEC	41.7%	21,858
2	Lowestoft College	GFEC	27.5%	17,306
3	Blackpool and The Fylde College	GFEC	21.85	50,495
4	Telford College of Arts and Technology	GFEC	18.0%	57,480
5	Furness College	GFEC	17.6%	8,909
6	Hartlepool College of Further Education	GFEC	17.4%	13,850
7	Leek College of Further Education and School of Art	GFEC	17.0%	3,572

Table 8.31 continued				
Rank	**College**	**Type[1]**	**Percentage of EMT aims**	**Total aims**
8	College of North West London	GFEC	16.2%	24,792
9	North Nottinghamshire College	GFEC	15.0%	21,496
10	Carshalton College	GFEC	14.4%	15,125
11	Gateshead College	GFEC	14.4%	50,049
12	North Lindsey College	GFEC	13.6%	17,450
13	East Riding College	GFEC	12.9%	16,595
14	Grimsby Institute of Further and Higher Education	GFEC	12.8%	44,174
15	Loughborough College	GFEC	12.3%	18,499
16	Stoke on Trent College	GFEC	11.7%	40,544
17	Brooksby Melton College, Melton Mowbray	SC	11.7%	8,888
18	Dudley College of Technology	GFEC	11.6%	43,532
19	Eastleigh College	GFEC	10.9%	44,259
20	Uxbridge College	GFEC	10.8%	26,006

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.32 shows how the percentage of EMT aims breaks down over the administrative types. Sixth form colleges are 100% in the bottom two boxes, general FE colleges 88.4% and specialist colleges 97.5%. However, of the 191 general FE colleges in the bottom two boxes, 95 (48.0%) are in the higher box, a trend not replicated by sixth form or specialist colleges. Moreover, the mean percentage of EMT aims at sixth form colleges is 0.7% compared to 6.1% at general FE colleges and 1.5% at specialist colleges, confirming that EMT aims have a much stronger presence in general FE colleges than other college types.

Table 8.32 - Distribution of college types by percentage of Engineering and Manufacturing Technologies aims

Percentage studying EMT[1]	Sixth Form		General FE		Specialist	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
30+			1	0.4%		
25-29			1	0.4%		
20-24			1	0.4%		
15-19			5	2.2%		
10-14			18	8.0%	1	2.5%
5-9			95	42.4%	2	5.0%
0-4	94	100.00%	103	46.0%	37	92.5%

[1]*Percentage studying rounded down*

8.4.2.5: Construction, Planning and the Built Environment

Figure 8.28 shows the distribution of the 317,624 aims in the Construction, Planning and the Built Environment (CPBE) subject group at all colleges. There are a large number of colleges (155) that offer none or very little CPBE provision (under 1%) and the majority of remaining colleges are clustered around the mean. However, there are a small number of colleges that differ substantially from the mean which suggests some diversity in this subject group.

There are 123 colleges who do not offer a single CPBE aim comprising 89 sixth form colleges, 11 general FE colleges and 23 specialist colleges.

Table 8.33 shows the 20 colleges with the highest CPBE aim percentage. Within this list are 18 general FE colleges and two specialist colleges, suggesting that general FE colleges are much more likely to have high percentages of CPBE aims. There are only four sixth form colleges with any CPBE aims and the highest of these is only at 0.5% of aims (St Vincent College), this clearly demonstrates sixth form colleges' lack of engagement in this subject area.

Table 8.34 shows how the percentage of CPBE aims breaks down over the administrative types. Sixth form colleges are 100% in the bottom two boxes (all in the bottom box), general FE colleges 95.1% and specialist colleges 97.5%. Moreover, the mean percentage of CPBE aims at sixth form colleges is 0.01% compared to 4.5% at general FE colleges and 0.9% at specialist colleges, confirming that CPBE aims have a much stronger presence in general FE colleges than other college types. Furthermore, it indicates that although a specialist college is third on the highest percentage of CPBE aims, this is not indicative of the administrative type as a whole and is very much an exception.

Figure 8.28 - Distribution of the percentage of aims in Construction, Planning and the Built Environment over all colleges

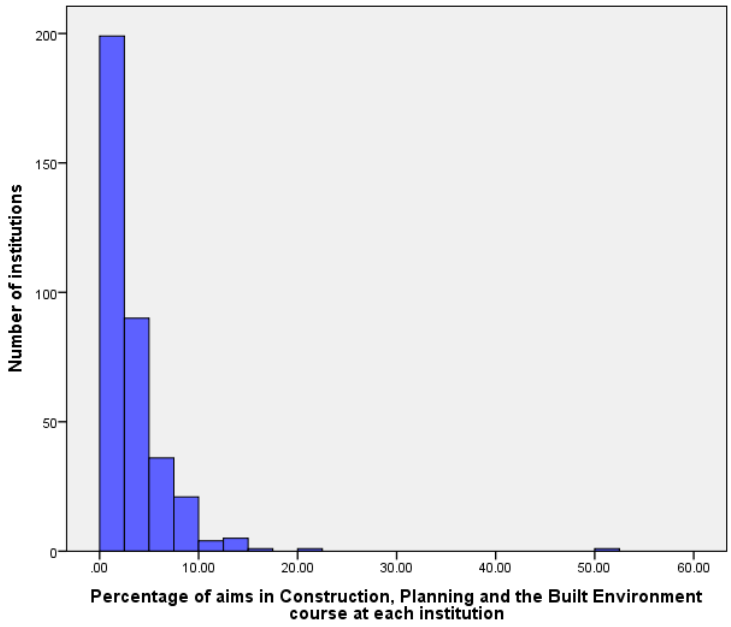


Table 8.33 - The 20 colleges with the highest percentage of Construction, Planning and the Built Environment aims

Rank	College	Type[1]	Percentage of CPBE aims	Total aims
1	Leeds College of Building	GFEC	51.6%	14,255
2	Redcar and Cleveland College	GFEC	22.5%	9,697
3	Moulton College	SC	17.2%	23,961
4	Shrewsbury College of Arts and Technology	GFEC	14.9%	21,069
5	Stourbridge College	GFEC	14.3%	37,031
6	South Birmingham College	GFEC	14.1%	38,160
7	Eastleigh College	GFEC	14.1%	44,259
8	Stephenson College	GFEC	13.5%	20,846
9	North East Surrey College of Technology	GFEC	12.3%	18,880
10	Strode College	GFEC	11.0%	32,014
11	Swindon College	GFEC	10.9%	21,552
12	Bexley College	GFEC	10.1%	8,060
13	Calderdale College	GFEC	9.7%	25,445
14	City College, Plymouth	GFEC	9.6%	25,543
15	Barnfield College	GFEC	9.5%	22,076
16	Preston College	GFEC	9.1%	44,175
17	Central Sussex College	GFEC	9.0%	29,069
18	The Manchester College	GFEC	8.9%	335,564
19	Hartlepool College of Further Education	GFEC	8.9%	13,850
20	Otley College of Agriculture and Horticulture	SC	8.8%	10,601

[1]*GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.34 - Distribution of college types by percentage of Construction, Planning and the Built Environment aims

Percentage studying CPBE[1]	Sixth Form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
25+			1	0.4%		
20-24			1	0.4%		
15-19					1	2.5%
10-14			9	4.0%		
5-9			56	25.0%	1	2.5%
0-4	94	100.00%	157	70.1%	38	95.0%

[1]*Percentage studying rounded down*

8.4.2.6: Information and Communication Technology

Figure 8.29, shows the distribution of the 290,397 aims in the Information and Communication Technology (ICT) subject group at all colleges. Whilst most colleges offer some ICT provision this is at a relatively low level for almost all colleges. Furthermore, even those colleges which do differ from the mean do not have such a high percentage of their aims as to be considered specialists in this subject, confirming that there is only limited diversity in this subject group.

Of the 20 colleges with the lowest ICT aims percentage, 19 have no aims in this subject area and the remaining one only has 0.2%. Within the 19 colleges with zero aims there is one general FE college and 18 specialist colleges and the one college with 0.2% is a general FE college. The sixth form college with the lowest percentage of ICT aims is Greenhead College with 0.78% (28th lowest), below Ludlow College with the next lowest at 0.79% (29th lowest).

Figure 8.29 - Distribution of the percentage of aims in Information and Communication Technology over all colleges

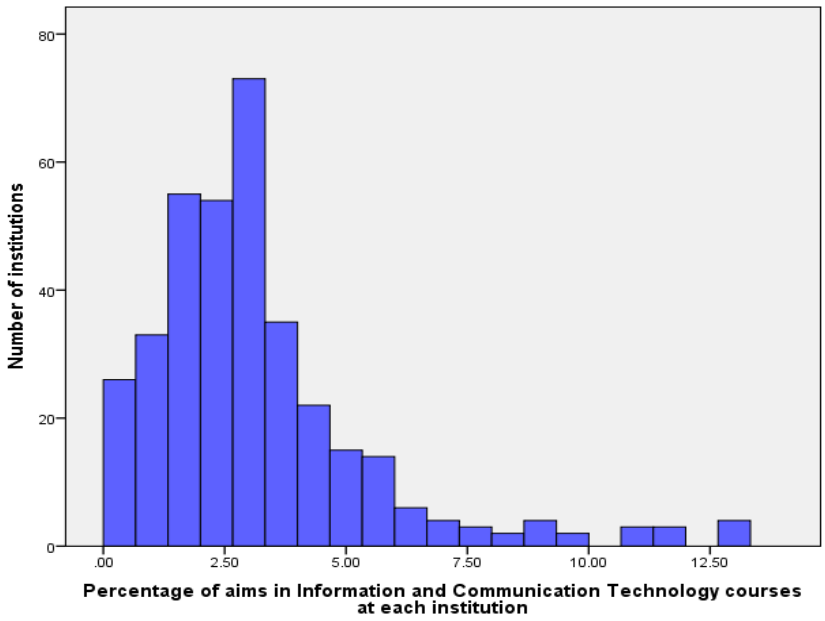


Table 8.35 shows the 20 colleges with the highest ICT aim percentage. Within this list are four sixth form colleges, 12 general FE colleges and four specialist colleges suggesting (together with the lowest 20 being predominantly specialist colleges) that almost all sixth form and general FE colleges contain some ICT provision (even if minimal in some cases) and that both are more likely to have a higher ICT provision than specialist colleges, despite the presence of four specialist colleges in the top 20.

Table 8.35 - The 20 colleges with the highest percentage of Information and Communication Technology aims

Rank	College	Type[1]	Percentage of ICT aims	Total aims
1	The Manchester College	GFEC	13.15	335,564
2	Hillcroft College (Incorporated) Limited	SC	13.0%	1,236
3	Highbury College, Portsmouth	GFEC	12.9%	27,370
4	Kensington and Chelsea College	GFEC	12.8%	36,988
5	Richmond Adult Community College	GFEC	11.8%	13,291
6	Strode College	GFEC	11.7%	32,014
7	Bedford College	GFEC	11.4%	39,298
8	Milton Keynes College	GFEC	11.2%	53,116
9	Fircroft College of Adult Education	SC	10.8%	1,450
10	St Vincent College	SFC	10.8%	8,529
11	Shrewsbury Sixth Form College	SFC	9.9%	8,515
12	Harlow College	GFEC	9.5%	28,201
13	Birkenhead Sixth Form College	SFC	9.3%	8,122
14	Otley College of Agriculture and Horticulture	SC	9.3%	10,601
15	Barnet and Southgate College	GFEC	9.1%	28,157
16	East Durham College	GFEC	8.8%	14,591
17	Shipley College	GFEC	8.6%	9,551
18	Kidderminster College	GFEC	8.0%	11,423
19	Mary Ward Settlement	SC	8.0%	9,751
20	East Norfolk Sixth Form College	SFC	8.0%	9,919

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.36 shows how the percentage of ICT aims breaks down over the administrative types. Sixth form colleges are 98.9% in the bottom two boxes, general FE colleges 96.9% and specialist colleges 95.0%. Moreover, the mean percentage of ICT aims at sixth form colleges is 3.2% compared to 3.3% at general FE colleges and 2.2% at specialist colleges, confirming that ICT aims have a slightly stronger presence in general FE colleges and sixth form colleges than in specialist colleges.

Table 8.36 - Distribution of college types by percentage of Information and Communication Technology aims

Percentage studying ICT[1]	Sixth Form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
10-14	1	1.1%	7	3.1%	2	5.0%
5-9	10	10.6%	25	11.2%	6	15.0%
0-4	83	88.3%	192	85.7%	32	80.0%

[1] *Percentage studying rounded down*

8.4.2.7: Retail and Commercial Enterprise

Figure 8.30, shows the distribution of the 393,713 aims within the Retail and Commercial Enterprise (RCE) subject group at all colleges. There is a large minority of colleges (115) that offer none or very little RCE provision (under 1%). Furthermore, there are no very large outliers suggesting that there are no colleges that specialise in this area and that provision is generally relatively small scale.

There are 82 colleges who do not offer a single RCE aim comprising 60 sixth form colleges, three general FE colleges and 19 specialist colleges.

Table 8.37 shows the 20 colleges with the highest RCE aim percentage, all of which are general FE colleges, suggesting that general FE colleges are much more likely to have high percentages of RCE aims.

Table 8.38 shows how the percentage of RCE aims breaks down over the administrative types. Sixth form colleges are 100% in the bottom two boxes, general FE colleges 93.3% and specialist colleges 100%. However, of the 209 general FE colleges in the bottom two boxes, 122 (58.4%) are in the higher box, a trend not replicated by sixth form or specialist colleges. Moreover, the mean percentage of RCE aims at sixth form colleges is 0.3% compared to 5.8% at general FE colleges and 0.8% at specialist colleges, confirming that RCE aims have a much stronger presence in general FE colleges than other college types.

Figure 8.30 - Distribution of the percentage of aims in Retail and Commercial Enterprise over all colleges

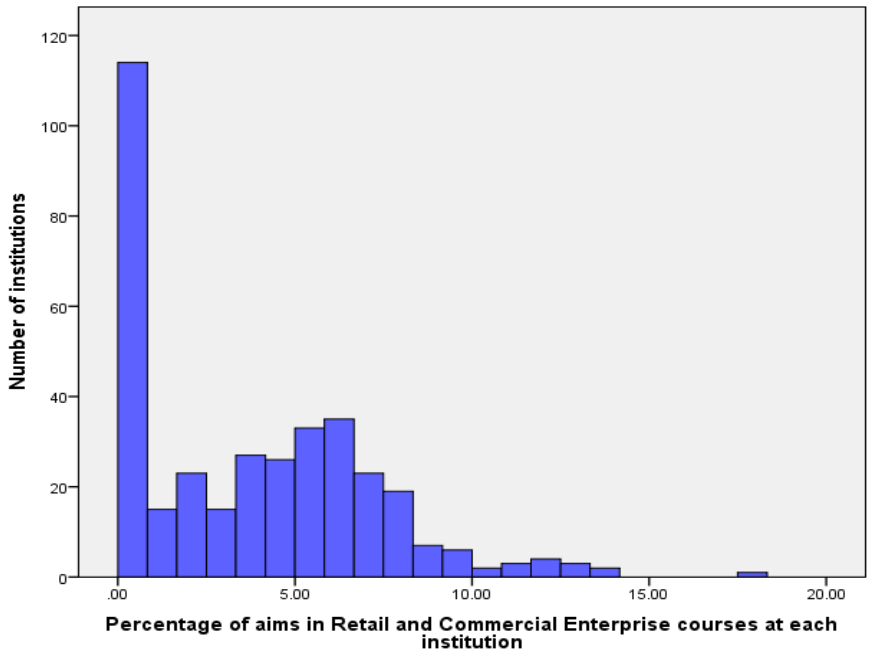


Table 8.37 - The 20 colleges with the highest percentage of Retail and Commercial Enterprise aims

Rank	College	Type[1]	Percentage of RCE aims	Total aims
1	Kendal College	GFEC	18.2%	10,357
2	Thanet College	GFEC	13.95	16,387
3	Darlington College	GFEC	13.65	41,943
4	Accrington and Rossendale College	GFEC	13.25	22,092
5	Havering College of Further and Higher Education	GFEC	12.8%	24,537
6	Nelson and Colne College	GFEC	12.6%	12,844
7	Leek College of Further Education and School of Art	GFEC	12.4%	3,572
8	Telford College of Arts and Technology	GFEC	11.9%	57,480
9	Great Yarmouth College	GFEC	11.9%	14,896
10	Fareham College	GFEC	11.8%	15,870
11	Redbridge College	GFEC	11.6%	12,955
12	South Thames College	GFEC	11.4%	39,199
13	Stafford College	GFEC	11.3%	12,929
14	West Cheshire College	GFEC	10.1%	32,965
15	City College, Plymouth	GFEC	10.1%	25,543
16	Strode College	GFEC	9.9%	32,014
17	East Riding College	GFEC	9.9%	16,595
18	Derby College	GFEC	9.8%	68,190
19	Westminster Kingsway College	GFEC	9.6%	36,114
20	City College, Norwich	GFEC	9.2%	31,590

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.38 - Distribution of college types by percentage of Retail and Commercial Enterprise aims

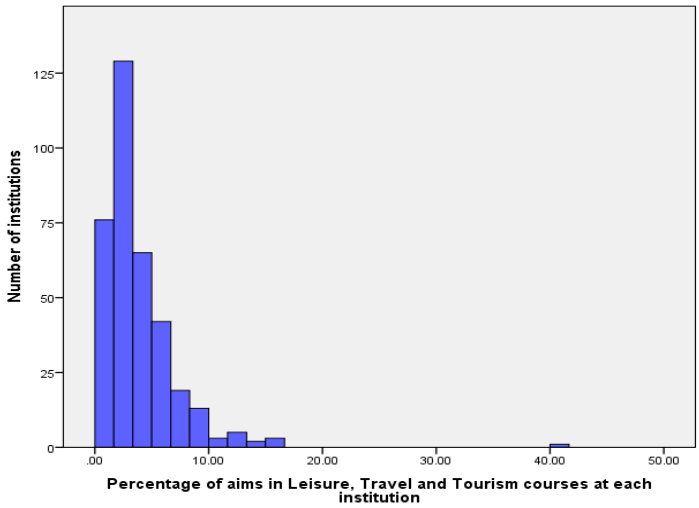
Percentage studying RCE[1]	Sixth Form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
15-19			1	0.4%		
10-14			14	6.3%		
5-9	1	1.1%	122	54.5%		
0-4	93	98.9%	87	38.8%	40	100.0%

[1]*Percentage studying rounded down*

8.4.2.8: Leisure, Travel and Tourism

Figure 8.31, shows the distribution of the 297,014 aims in the Leisure, Travel and Tourism (LTT) subject group at all colleges. As expected, the majority of colleges are clustered around the mean and that there is only limited variation in outliers. However, there are a very small number of colleges which have more than 10% of aims in LTT; though there is only one college which could be considered a specialist with 40.4% (no other college even comes close). Therefore there is only limited variation in this subject group.

Figure 8.31 - Distribution of the percentage of aims in Leisure, Travel and Tourism over all colleges



There are exactly 20 colleges which do not offer a single LTT aim. These comprise one sixth form college, one general FE college and 18 specialist colleges.

Table 8.39 shows the 20 colleges with the highest LTT aim percentage. Within this list are four sixth form colleges, 11 general FE colleges and five specialist colleges suggesting that specialist colleges are more likely to enrol a high percentage of LTT aims.

Table 8.39 - The 20 colleges with the highest percentage of Leisure, Travel and Tourism aims

Rank	College	Type[1]	Percentage of LTT aims	Total aims
1	Hartpury College	SC	40.4%	9,777
2	Macclesfield College	GFEC	16.5%	12,617
3	Itchen College	SFC	15.7%	9,696
4	Sir John Deane's College	SFC	15.3%	9,461
5	East Surrey College	GFEC	14.6%	15,964
6	Newcastle-Under-Lyme College	GFEC	14.5%	22,437
7	Loughborough College	GFEC	12.9%	18,499
8	Walford and North Shropshire College	GFEC	12.6%	13,586
9	Brockenhurst College	GFEC	12.0%	28,742
10	Easton College	SC	11.9%	6,015
11	Dearne Valley College	GFEC	11.9%	17,429
12	Mary Ward Settlement	SC	11.6%	9,751
13	South Downs College	GFEC	11.3%	27,089
14	Kingston Maurward College	SC	10.6%	8,568
15	Northbrook College, Sussex	GFEC	9.9%	27,356
16	Cheadle and Marple Sixth Form College	SFC	9.9%	16,363
17	Filton College	GFEC	9.8%	24,917
18	Moulton College	SC	9.7%	23,961
19	Accrington and Rossendale College	GFEC	9.6%	22,092
20	The Blackpool Sixth Form College	SFC	9.1%	11,669

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.40 shows how the percentage of LTT aims breaks down over the administrative types. Sixth form colleges are 97.8% in the bottom two boxes, general FE colleges 96.5% and specialist colleges 90.0%, though this would be expected for a subject with a low mean. Moreover, the mean percentage of LTT aims at sixth form colleges is 3.8% compared to 3.9% at general FE colleges and 3.6% at specialist colleges, confirming that LTT aims are not substantially stronger in any of the administrative types. The relatively low mean for specialist colleges appears to contradict the conclusion that specialist colleges are more likely to enrol high percentages of LTT aims. However, this implies that this is limited to only some of the specialist college types. Further inspection shows that it is, perhaps surprisingly, colleges of agriculture and horticulture that tend to have high percentages with a mean of 7.4%.

Table 8.40 - Distribution of college types by percentage of Leisure, Travel and Tourism aims

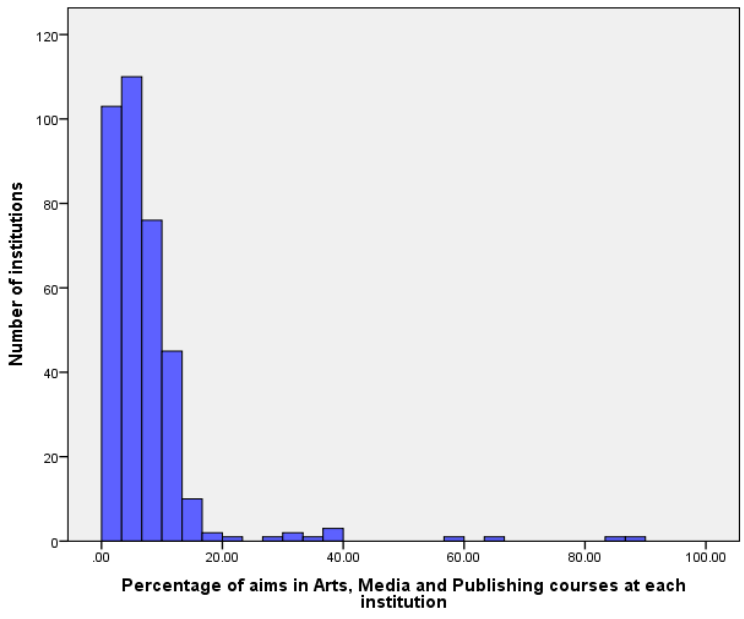
Percentage studying LTT[1]	Sixth Form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
20+					1	2.5%
15-19	2	2.1%	1	0.4%		
10-14			7	3.1%	3	7.5%
5-9	18	19.1%	49	21.9%	7	17.5%
0-4	74	78.7%	167	74.6%	29	72.5%

[1]*Percentage studying rounded down*

8.4.2.9: Arts, Media and Publishing

Figure 8.32, shows the distribution of the 508,485 aims in the Arts, Media and Publishing (AMP) subject group at all colleges. The vast majority of colleges are evenly spread between 0% and 17%. However, there are a small number of colleges (4) which have a very high percentage of their aims in AMP subjects and a slightly larger group (8 colleges) that also have a smaller but still high percentage of AMP aims.

Figure 8.32 - Distribution of the percentage of aims in Arts, Media and Publishing over all colleges



Of the 20 colleges with the lowest AMP aims percentage, 15 have no aims in this subject area and the remaining five are all under 0.4%. Within the 15 colleges with zero aims there is one general FE college and 14 specialist colleges. Of the remaining five, two are general FE colleges and three are specialist colleges. The sixth form college with the lowest percentage of AMP aims is John Ruskin College with 2.3% (59th lowest), below St Dominic's Sixth Form College with the next lowest at 2.7% (74th lowest).

Table 8.41 shows the 20 colleges with the highest AMP aim percentage. Within this list are five sixth form colleges, seven general FE colleges and eight specialist colleges, suggesting that general FE colleges are less likely to have high percentages of AMP aims.

Table 8.41 - The 20 colleges with the highest percentage of Arts, Media and Publishing aims

Rank	College	Type[1]	Percentage of AMP aims	Total aims
1	Plymouth College of Art	SC	87.0%	2,897
2	Cleveland College of Art and Design	SC	86.5%	2,059
3	Hereford College of Arts	SC	63.3%	1,953
4	Morley College Limited	SC	58.0%	26,946
5	South Worcestershire College	GFEC	39.5%	7,839
6	The City Literary Institute	SC	37.9%	56,240
7	Working Men's College Corporation	SC	36.7%	9,245
8	Mary Ward Settlement	SC	35.0%	9,751
9	Workers' Educational Association	SC	32.3%	113,538
10	Richmond Adult Community College	GFEC	30.9%	13,291
11	Strode's College	SFC	27.8%	10,314
12	East Surrey College	GFEC	22.8%	15,964
13	Lowestoft Sixth Form College	SFC	17.3%	1,432
14	City of Bath College	GFEC	16.7%	16,502
15	New College Telford	SFC	16.0%	7,306
16	Truro and Penwith College	GFEC	15.2%	35,940
17	Bilborough College	SFC	14.9%	8,575
18	Mid-Cheshire College of Further Education	GFEC	14.9%	17,205
19	Bracknell and Wokingham College	GFEC	14.2%	14,806
20	Long Road Sixth Form College	SFC	14.0%	10,074

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.42 shows how the percentage of AMP aims breaks down over the administrative types. Sixth form colleges are 55.3% in the bottom two boxes, general FE colleges 91.5% and specialist colleges 80.0%. However, of the 52 sixth form colleges in the bottom two boxes, 46 (88.5%) are in the higher box, a trend not replicated by general FE or specialist colleges. Moreover, the mean percentage of AMP aims at sixth form colleges is 9.6% compared to 5.4% at general FE colleges and 12.1% at specialist colleges, confirming that AMP aims have a much stronger presence in sixth form and specialist colleges than general FE colleges. However, the eight specialist colleges in the top 20 list are the only specialist colleges with a high percentages of AMP aims and thus the specialist college group is not fully descriptive of such colleges, nor is the specialist arts college sub-group within it.

Table 8.42 - Distribution of college types by percentage of Arts, Media and Publishing aims

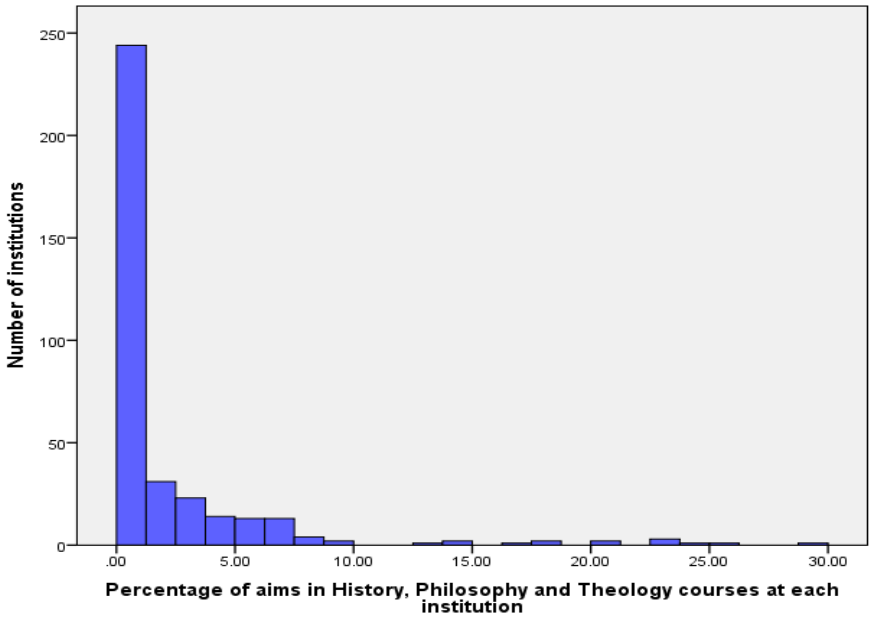
Percentage studying AMP[1]	Sixth Form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
40+					4	10.0%
30-39			2	0.9%	4	10.0%
20-29	1	1.1%	1	0.4%		
15-19	2	2.1%	2	0.9%		
10-14	39	41.5%	14	6.3%		
5-9	46	48.9%	71	31.7%	3	7.5%
0-4	6	6.4%	134	59.8%	29	72.5%

[1]*Percentage studying rounded down*

8.4.2.10: History, Philosophy and Theology

Figure 8.33, shows the distribution of the 109,542 aims in the History, Philosophy and Theology (HPT) subject group at all colleges. The large majority of colleges (238) offer none or very little HPT provision (under 1%) and the remaining colleges are, with a few exceptions, clustered around the mean. However, there are a small number of colleges which enrol a high percentage of aims in HPT and they show the presence of some diversity in the college sector for this subject group.

Figure 8.33 - Distribution of the percentage of aims in History, Philosophy and Theology over all colleges



There are 55 colleges who do not offer a single HPT aim: comprising one sixth form college (John Ruskin College), 27 general FE colleges and 27 specialist colleges. The sixth form college with the next lowest percentage of HPT aims is Gateway Sixth Form College with 0.1% (89th lowest), further illustrating the low levels of provision in this area.

Table 8.43 shows the 20 colleges with the highest HPT aim percentage. Within this list are 18 sixth form colleges and two specialist colleges suggesting that sixth form colleges are much more likely to have high percentages of HPT aims.

Table 8.43 - The 20 colleges with the highest percentage of History, Philosophy and Theology aims

Rank	College	Type[1]	Percentage of HPT aims	Total aims
1	St Francis Xavier Sixth Form College	SFC	29.9%	5,215
2	St Dominic's Sixth Form College	SFC	26.2%	4,781
3	St Mary's College, Blackburn	SFC	23.9%	6,170
4	St Charles Catholic Sixth Form College	SFC	23.5%	5,017
5	St John Rigby RC Sixth Form College	SFC	23.4%	7,072
6	Christ the King Sixth Form College	SFC	22.8%	10,747
7	Aquinas College	SFC	21.0%	14,884
8	Xaverian College	SFC	20.9%	10,443
9	Holy Cross College	SFC	18.5%	13,898
10	Notre Dame Catholic Sixth Form College	SFC	17.7%	9,951
11	St Brendan's Sixth Form College	SFC	17.25	12,282
12	West of England College	SC	14.2%	106
13	Loreto College	SFC	14.1%	16,081
14	Workers' Educational Association	SC	13.3%	113,538
15	Wyggeston and Queen Elizabeth I College	SFC	9.4%	17,076
16	Queen Elizabeth Sixth Form College	SFC	9.3%	12,176
17	The College of Richard Collyer in Horsham	SFC	8.8%	10,770
18	Cadbury Sixth Form College	SFC	8.2%	6,344
19	Havant College	SFC	8.1%	5,180
20	Woodhouse College	SFC	7.6%	5,488

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.44 shows how the percentage of HPT aims breaks down over the administrative types. Sixth form colleges are 87.2% in the bottom two boxes, general FE colleges 100% and specialist colleges 95.0%. Moreover, the mean percentage of HPT aims at sixth form colleges is 6.4% compared to 0.5% at general FE colleges and 1.1% at specialist colleges, confirming that HPT aims have a much stronger presence in sixth form colleges than other college types. Although there are two specialist colleges in the top 20 (12th and 14th) of HPT aims this is not indicative of the administrative type as a whole and are very much an exception.

Table 8.44 - Distribution of college types by percentage of History, Philosophy and Theology aims

Percentage studying HPT[1]	Sixth Form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
25-29	2	2.1%				
20-24	6	6.4%				
15-19	3	3.2%				
10-14	1	1.1%			2	5.0%
5-9	28	29.8%	2	0.9%	2	5.0%
0-4	54	57.4%	222	99.1%	36	90.0%

[1]*Percentage studying rounded d*own

8.4.2.11: Social Sciences

Figure 8.34, shows the distribution of the 95,691 aims in the Social Sciences (SS) subject group at all colleges. The large majority of colleges (217) offer none or very little SS provision (under 1%). However, there are a small number of colleges that enrol a larger percentage of their aims in SS but these are relatively few in number and are not a high enough percentage to be considered specialists in this subject. Nonetheless, their presence does show the existence of some limited diversity in the college sector for this subject group.

There are 65 colleges who do not offer a single SS aim comprising one sixth form college (John Ruskin College), 36 general FE colleges and 28 specialist colleges. The sixth form college with the next lowest percentage of SS aims is Portsmouth College with 2.2% (243rd lowest) making John Ruskin College very much an exception.

Table 8.45 shows the 20 colleges with the highest SS aim percentage. All are sixth form colleges strongly suggesting that sixth form colleges are much more likely to have high percentages of SS aims.

Table 8.46 shows how the percentage of SS aims breaks down over the administrative types. Sixth form colleges are 92.5% in the bottom two boxes, general FE colleges 100% and specialist colleges 100% (expected due to the low levels of overall provision). However, of the 87 sixth form colleges in the bottom two boxes, 52 (59.8%) are in the higher box, a trend not replicated by general FE or specialist colleges. Moreover, the mean percentage of SS aims at sixth form colleges is 6.0% compared to 0.6% at general FE colleges and 0.2% at specialist colleges, confirming that SS aims have a much stronger presence in sixth form colleges than other college types.

Figure 8.34 - Distribution of the percentage of aims in Social Sciences over all colleges

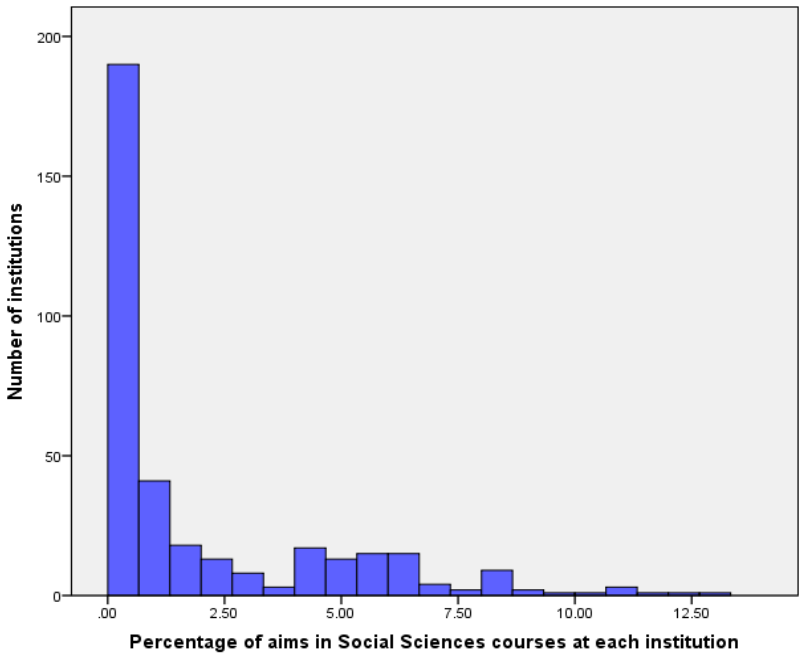


Table 8.45 - The 20 colleges with the highest percentage of Social Sciences aims

Rank	College	Type[1]	Percentage of SS aims	Total aims
1	Woodhouse College	SFC	13.2%	5,488
2	Lowestoft Sixth Form College	SFC	12.2%	1,432
3	St Francis Xavier Sixth Form College	SFC	11.9%	5,215
4	Hills Road Sixth Form College	SFC	11.2%	16,579
5	The Sixth Form College Colchester	SFC	11.0%	25,600
6	St Charles Catholic Sixth Form College	SFC	10.9%	5,017
7	St Dominic's Sixth Form College	SFC	10.0%	4,781
8	Havant College	SFC	9.5%	5,180
9	Esher College	SFC	9.1%	9,602
10	Sir George Monoux College	SFC	9.2%	8,212
11	Long Road Sixth Form College	SFC	8.6%	10,074
12	Shrewsbury Sixth Form College	SFC	8.4%	8,515
13	Christ the King Sixth Form College	SFC	8.4%	10,747
14	King George V College	SFC	8.3%	6,171
15	Bilborough College	SFC	8.3%	8,575
16	Godalming College	SFC	8.25	10,476
17	Notre Dame Catholic Sixth Form College	SFC	8.2%	9,951
18	King Edward Vi College Nuneaton	SFC	8.1%	5,677
19	Cadbury Sixth Form College	SFC	8.1%	6,344
20	The Sixth Form College, Solihull	SFC	7.8%	12,403

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.46 - Distribution of college types by percentage of Social Sciences aims

Percentage studying SS[1]	Sixth Form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
10-14	7	7.4%				
5-9	52	55.3%	1	0.4%		
0-4	35	37.2%	223	99.6%	40	100.0%

[1]*Percentage studying rounded down*

8.4.2.12: Languages, Literature and Culture

Figure 8.35, shows the distribution of the 255,072 aims in the Language, Literature and Culture (LLC) subject group at all colleges. A large number of colleges (109) offer none or very little LLC provision (under 1%) and only a small minority of colleges (30) have more than 10% of their aims in LLC courses (not including some basic skills qualifications). It is these colleges, which differ substantially from the mean in running LLC courses that show the presence of diversity in the college sector.

The 26 colleges with the lowest LLC aim percentage all have no aims in this subject area and comprise six general FE colleges and 20 specialist colleges. The sixth form college with the lowest percentage of LLC aims is John Ruskin College with 0.4% (61st lowest) substantially below Ludlow College with the next lowest at 3.0% (199th lowest).

Figure 8.35 - Distribution of the percentage of aims in Languages, Literature and Culture over all colleges

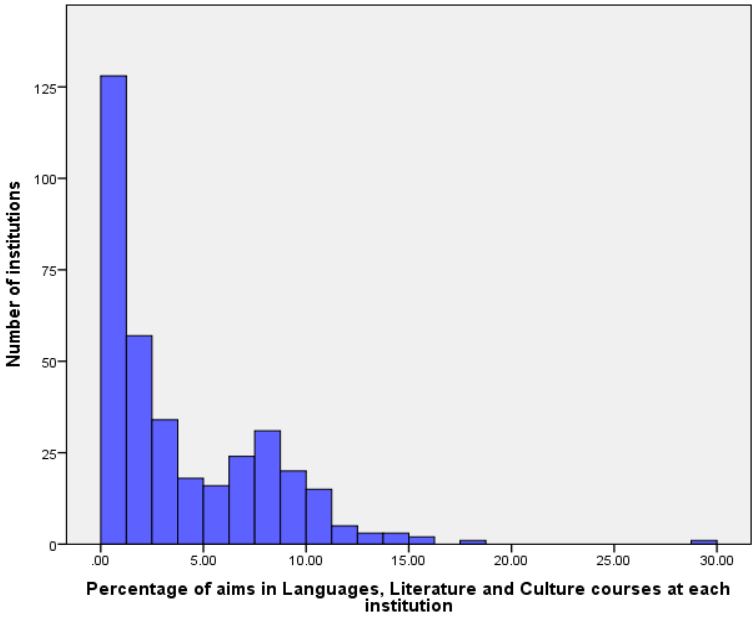


Table 8.47 shows the 20 colleges with the highest LLC aim percentage. Within this list are 15 sixth form colleges, one general FE college and four specialist colleges suggesting that sixth form colleges are much more likely to have high percentages of LLC aims.

Table 8.47 - The 20 colleges with the highest percentage of Language, Literature and Culture aims

Rank	College	Type[1]	Percentage of LLC aims	Total aims
1	The City Literary Institute	SC	29.1%	56,240
2	Hills Road Sixth Form College	SFC	17.7%	16,579
3	City of Stoke-On-Trent Sixth Form College	SFC	15.9%	5,748
4	Lowestoft Sixth Form College	SFC	15.5%	1,432
5	Mary Ward Settlement	SC	15.0%	9,751
6	Esher College	SFC	14.5%	9,602
7	King George V College	SFC	13.8%	6,171
8	Havant College	SFC	13.7%	5,180
9	Richmond Adult Community College	GFEC	12.7%	13,291
10	Leyton Sixth Form College	SFC	12.6%	10,615
11	Luton Sixth Form College	SFC	12.3%	11,928
12	Working Men's College Corporation	SC	12.3%	9,245
13	Woodhouse College	SFC	12.0%	5,488
14	Morley College Limited	SC	11.7%	26,946
15	Bilborough College	SFC	11.6%	8,575
16	Worcester Sixth Form College	SFC	11.1%	7,612
17	St Francis Xavier Sixth Form College	SFC	11.1%	5,215
18	St Charles Catholic Sixth Form College	SFC	11.0%	5,017
19	Strode's College	SFC	11.0%	10,314
20	King Edward VI College Nuneaton	SFC	10.9%	5,677

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.48 shows how the percentage of LLC aims breaks down over the administrative types. Sixth form colleges are 75.5% in the bottom two boxes, general FE colleges 98.7% and specialist colleges 90.0%. However, unusually, the 69 of the 71 sixth form colleges in the bottom two boxes are in fact in the higher box, this further reinforces the dominance of sixth form colleges for LLC aims. Moreover, the mean percentage of LLC aims at sixth form colleges is 8.8% compared to 2.2% at general FE colleges and 2.3% at specialist colleges, indicating that LLC aims have a much stronger presence in sixth form colleges than other college types. Furthermore, it indicates that although a specialist college has the highest percentage of LLC aims, this is not indicative of the administrative type as a whole and is an exception.

Table 8.48 - Distribution of college types by percentage of Language, Literature and Culture aims

Percentage studying LLC[1]	Sixth Form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
20+					1	2.5%
15-19	3	3.2%				
10-14	20	21.3%	3	1.3%	3	7.5%
5-9	69	73.4%	21	9.4%	1	2.5%
0-4	2	2.1%	200	89.3%	35	87.5%

[1]*Percentage studying rounded down*

8.4.2.13: Education and Training

Figure 8.36 shows the distribution of the 82,063 aims in the Education and Training (ET) subject group at all colleges. There is a majority of colleges (217) that offer none or very little ET provision (under 1%) and the majority of colleges are clustered around the mean. Indeed, the very small number of colleges (4) that enrol above 5% of aims in this subject, further reinforce the perception of a relatively small amount of provision in this area and even such colleges only demonstrate a very limited amount of diversity for this subject group.

There are 83 colleges who do not offer a single ET aim: comprising 66 sixth form colleges, one general FE college (Worthing College) and 16 specialist colleges. The general FE college with the next lowest percentage of ET aims is Richmond upon Thames College with 0.02% (84th lowest).

Table 8.49 shows the 20 colleges with the highest ET aim percentage. Within this list are three sixth form colleges, 12 general FE colleges and five specialist colleges suggesting that specialist colleges are more likely to have relatively high percentages of ET aims. However, due to the limited engagement in this subject area in the system as a whole, individual differences tend to reflect only a small proportion of an individual college's student population. Nonetheless, as the specialist colleges are all specialist designated colleges except Bicton College which is a specialist agricultural college, it does suggest that ET is more common in adult education.

Figure 8.36 - Distribution of the percentage of aims in Education and Training over all colleges

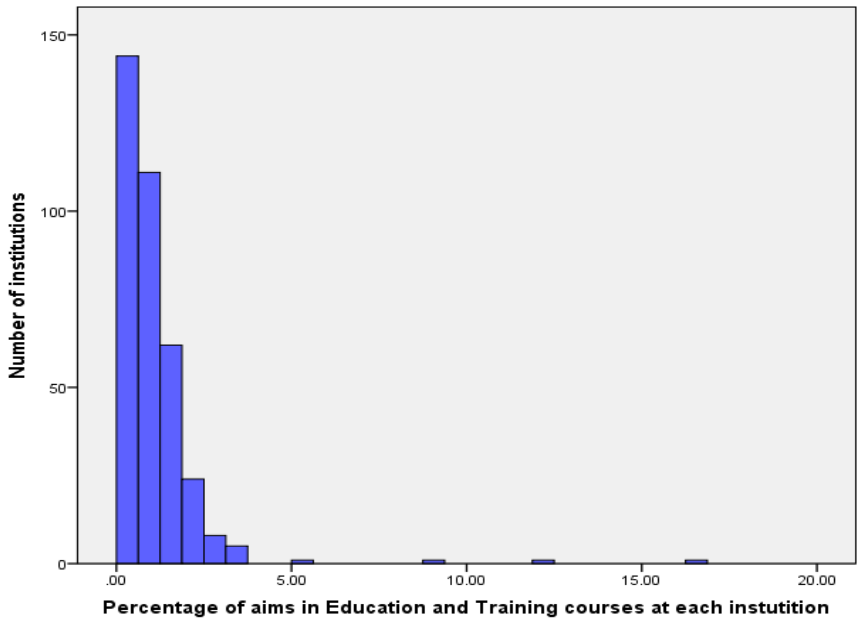


Table 8.49 - The 20 colleges with the highest percentage of Education and Training aims

Rank	College	Type[1]	Percentage of ET aims	Total aims
1	Hillcroft College (Incorporated) Limited	SC	16.3%	1,236
2	Fircroft College of Adult Education	SC	12.5%	1,450
3	Ruskin College	SC	9.2%	1,592
4	Northern College for Residential Adult Education Limited (The)	SC	5.0%	6,434
5	Loughborough College	GFEC	3.7%	18,499
6	Farnborough College of Technology	GFEC	3.4%	13,394
7	Macclesfield College	GFEC	3.3%	12,617
8	Bournville College of Further Education	GFEC	3.2%	28,162
9	The Henley College	SFC	3.2%	11,909
10	Guildford College of Further and Higher Education	GFEC	3.1%	34,188
11	Stockton Riverside College	GFEC	3.1%	14,104
12	Bicton College	SC	2.9%	5,632
13	City of Bath College	GFEC	2.89	16,502
14	Thanet College	GFEC	2.8%	16,387
15	Bradford College	GFEC	2.7%	50,747
16	St Vincent College	SFC	2.6%	8,529
17	South Leicestershire College	GFEC	2.5%	16,649
18	Southport College	GFEC	2.5%	12,679
19	Holy Cross College	SFC	2.5%	13,898
20	Accrington and Rossendale College	GFEC	2.4%	22,092

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.50 shows how the percentage of ET aims breaks down over the administrative types. Sixth form colleges and general FE colleges are 100% in the bottom two boxes and specialist colleges 95.0% (expected high numbers due to low overall amount of provision). However, the mean percentage of ET aims at sixth form colleges is 0.2% compared to 1.2% at general FE colleges and 1.5% at specialist colleges, confirming that ET aims have a much stronger presence in specialist and, to a slightly lesser extent, general FE colleges than sixth form colleges. However, due to the low overall numbers in this subject area this does not really tell us a great deal. Indeed, it is a subject area that is only found in substantial numbers in a relatively few colleges which may provide some basis for college differentiation.

Table 8.50 - Distribution of college types by percentage of Education and Training aims

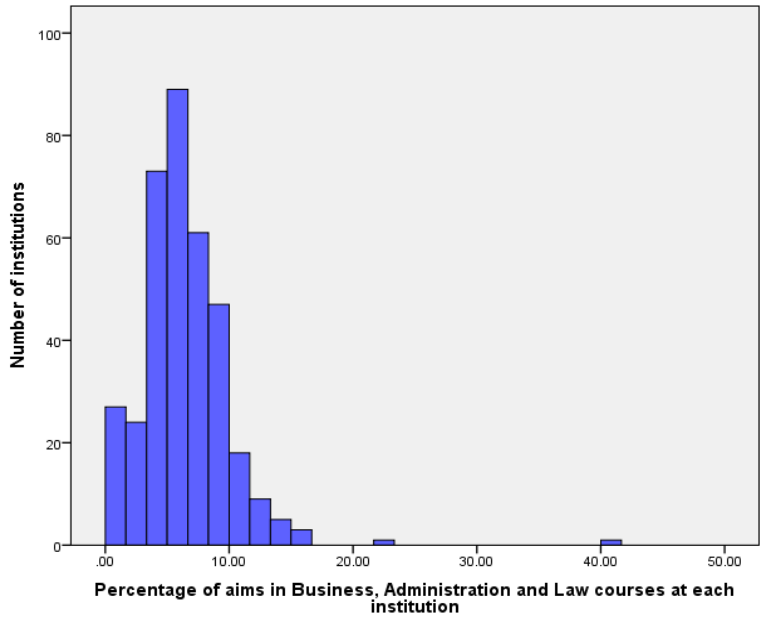
Percentage studying ET[1]	Sixth Form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
15-19					1	2.5%
10-14					1	2.5%
5-9					2	5.0%
0-4	94	100.0%	224	100.0%	36	90.0%

[1]*Percentage studying rounded down*

8.4.2.14: Business, Administration and Law

Figure 8.37 shows the distribution of the 548,908 aims in the Business, Administration and Law (BAL) subject group at all colleges. Only a small minority of colleges (22) offer none or very little BAL provision (under 1%) and the majority of colleges are clustered around the mean. The distribution is reasonably close to normal (though slightly peaky) and this shows some diversity on this variable, though there are also two significant outliers.

Figure 8.37 - Distribution of the percentage of aims in Business, Administration and Law over all colleges



Of the 20 colleges with the lowest BAL aims percentage, 13 (all specialist colleges) have no aims in this subject area and the remaining seven are all under 0.9%. These seven comprise

five specialist colleges, one sixth form college (Hills Road Sixth Form College, 20th, 0.9%) and one general FE college (Leeds College of Building, 18th, 0.3%).

Table 8.51 shows the 20 colleges with the highest BAL aim percentage. Within this list are five sixth form colleges, 12 general FE colleges and three specialist colleges.

Table 8.51 - The 20 colleges with the highest percentage of Business, Administration and Law aims

Rank	College	Type[1]	Percentage of BAL aims	Total aims
1	Ruskin College	SC	40.1%	1,592
2	Northern College for Residential Adult Education Limited (The)	SC	22.1%	6,434
3	Greenhead College	SFC	16.2%	12,868
4	King George V College	SFC	15.9%	6,171
5	Fircroft College of Adult Education	SC	15.4%	1,450
6	Stanmore College	GFEC	14.9%	9,738
7	Newcastle College	GFEC	14.2%	182,418
8	Wirral Metropolitan College	GFEC	13.9%	25,896
9	Calderdale College	GFEC	13.5%	25,445
10	North Lindsey College	GFEC	13.4%	17,450
11	Kingston College	GFEC	13.0%	18,643
12	St Mary's College, Blackburn	SFC	13.0%	6,170
13	Warrington Collegiate	GFEC	12.6%	26,902
14	Central Bedfordshire College	GFEC	12.5%	7,891
15	Westminster Kingsway College	GFEC	12.3%	36,114
16	Woking College	SFC	12.3%	7,476
17	The College Of Haringey, Enfield and North East London	GFEC	12.1%	46,287
18	Worcester College of Technology	GFEC	11.9%	33,506
19	Palmer's College	SFC	11.9%	9,009
20	Leeds City College	GFEC	11.3%	122,875

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.52 shows how the percentage of BAL aims breaks down over the administrative types. Sixth form colleges are 91.5% in the bottom two boxes, general FE colleges 88.8% and specialist colleges 89.0%. However, of 86 sixth form and 199 general FE colleges in the bottom two boxes, 59 (68.6%) and 136 (68.3%) respectively are in the higher box, a trend not replicated by specialist colleges. Moreover, the mean percentage of BAL aims at sixth form colleges is 6.6% compared to 6.7% at general FE colleges and 3.5% at specialist colleges, confirming that BAL aims have a much stronger presence in general FE colleges and sixth form colleges than specialist colleges. Furthermore, it indicates that although three specialist colleges appear in the top 20 colleges for BAL aims, this is not indicative of the administrative group as a whole.

Table 8.52 - Distribution of college types by percentage of Business, Administration and Law aims

Percentage studying BAL[1]	Sixth Form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
25+					1	2.5%
20-24					1	2.5%
15-19	2	2.1%			1	2.5%
10-14	6	6.4%	25	11.2%	1	2.5%
5-9	59	62.8%	136	60.7%	2	5.0%
0-4	27	28.7%	63	28.1%	34	85.0%

[1]*Percentage studying rounded down*

8.4.2.15: Key and Basic Skills

Figure 8.38, shows the distribution of the 1,426,674 aims within the Key and Basic Skills (KBS) subject group at all colleges. There is a small minority of colleges (40) that offer none or very little KBS provision (under 1%) and the majority of colleges are relatively widely spread around the mean. However, those colleges that differ substantially from the mean in running KBS courses (both those that run none or very little provision in this area and those that run a substantially higher than average amount of provision) show the presence of diversity in the college sector for this subject area.

There are 26 colleges who do not offer a single KBS aim: comprising 21 sixth form colleges and five specialist colleges. The general FE college with the lowest percentage of KBS aims is Halesowen College with 1.7% (55th lowest), substantially lower than the next lowest which is Worthing College with 3.4% (71st lowest) (note the large jump in the percentage over a small change in rank).

Figure 8.38 - Distribution of the percentage of aims in Key and Basic Skills over all colleges

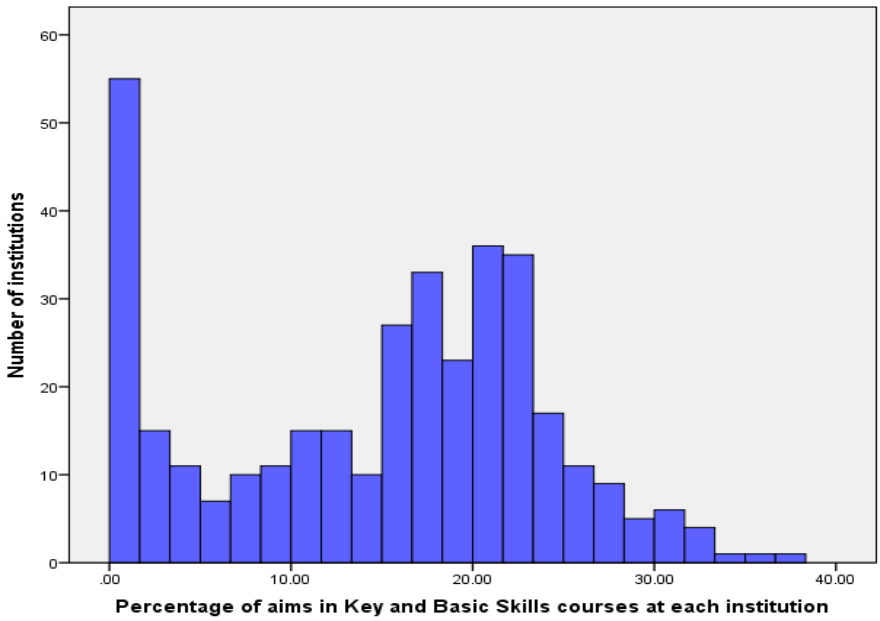


Table 8.53 shows the 20 colleges with the highest KBS aims percentage. Within this list are two sixth form colleges, 15 general FE colleges and three specialist colleges suggesting that general FE colleges are more likely to have high percentages of KBS aims.

Table 8.53 - The 20 colleges with the highest percentage of Key and Basic Skills aims

Rank	College	Type[1]	Percentage of KBS Aims	Total aims
1	Derwentside College	GFEC	36.7%	24,292
2	Colchester Institute	GFEC	36.1%	27,231
3	John Ruskin College	SFC	33.9%	3,910
4	Carshalton College	GFEC	32.9%	15,125
5	Hereford College of Arts	SC	32.8%	1,953
6	Henley College Coventry	GFEC	32.4%	14,596
7	Dudley College of Technology	GFEC	31.7%	43,532
8	Reaseheath College	SC	31.1%	12,951
9	Newcastle College	GFEC	31.0%	182,418
10	Waltham Forest College	GFEC	30.6%	20,017
11	Hereward College of Further Education	GFEC	30.5%	2,011
12	South Essex College of Further and Higher Education	GFEC	30.3%	58,575
13	Lewisham College	GFEC	30.2%	44,319
14	Hugh Baird College	GFEC	29.5%	17,060
15	West Herts College	GFEC	29.4%	22,445
16	Herefordshire College of Technology	GFEC	29.1%	12,266
17	Moulton College	SC	28.8%	23,961
18	Southwark College	GFEC	28.5%	12,712
19	St Vincent College	SFC	28.1%	8,529
20	Telford College of Arts and Technology	GFEC	27.8%	57,480

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.54 shows how the percentage of KBS aims breaks down over the administrative types. Sixth form colleges are 84.1% in the bottom two boxes, general FE colleges 5.8% and specialist colleges 42.5%. Furthermore, of the 13 general FE colleges in the bottom two boxes, 11 (84.6%) are in the higher box, a trend not replicated by sixth form or specialist colleges. Moreover, the mean percentage of KBS aims at sixth form colleges is 4.7% compared to 19.4% at general FE colleges and 12.5% at specialist colleges, confirming that KBS aims have a much stronger presence in general FE colleges than other college types (though with substantial provision also in specialist colleges). Furthermore, it indicates that although there are two sixth form colleges in the top twenty colleges providing KBS aims (Table 8.54), this is not indicative of the administrative type as a whole.

Table 8.54 - Distribution of college types by percentage of Key and Basic Skills aims

Percentage studying KBS[1]	Sixth Form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
35+			2	0.9%		
30-34	1	1.1%	8	3.6%	2	5.0%
25-29	1	1.1%	21	9.4%	3	7.5%
20-24	6	6.4%	78	34.8%	4	10.0%
15-19			77	34.4%	6	15.0%
10-14	7	7.4%	25	11.2%	8	20.0%
5-9	12	12.8%	11	4.9%	5	12.5%
0-4	67	71.3%	2	0.9%	12	30.0%

[1]*Percentage studying rounded down*

8.4.2.16: General Studies and Enrichment Programmes

Figure 8.39, shows the distribution of the 711,024 aims in the General Studies and Enrichment Programmes (GSEP) subject group at all colleges. There is a large minority of colleges (96) that offer none or very little GSEP provision (under 1%) and the majority of colleges are broadly spread around the mean. Indeed, those colleges that differ substantially from the mean in running GSEP courses (both those that run none or very little provision in this area and those that run a substantially higher than average amount of provision) show the presence of diversity in the college sector for this subject group.

There are 73 colleges who do not offer a single GSEP aim: comprising four sixth form colleges, 40 general FE colleges and 29 specialist colleges.

Table 8.55 shows the 20 colleges with the highest GSEP aim percentage, which are all sixth form colleges. This suggests that sixth form colleges are much more likely to have high percentages of GSEP aims than other college types. The general FE college with the highest GSEP aim percentage is Richmond upon Thames College with 24.2% (45th) with Seevic College just behind with 23.7% (48th). The specialist college with the highest GSEP aim percentage is Hadlow College with 20.5% (71st highest) followed by Myerscough College with 18.4% (80th highest). Both these specialist colleges are agricultural and horticultural colleges, with all other types of specialist college much further down the list (no higher than 258th)

Table 8.56 shows how the percentage of GSEP aims breaks down over the administrative types. Sixth form colleges are 14.9% in the bottom two boxes, general FE colleges 62.9% and specialist colleges 90.0%. Furthermore, the mean percentage of GSEP aims at sixth form colleges is 22.1% compared to 7.6% at general FE colleges and 2.3% at specialist colleges, confirming that GSEP aims have a much stronger presence in sixth form colleges than other college types. Sixth form colleges are well represented in the 20%-29% range while general FE colleges are even more heavily represented in the bottom three boxes.

Figure 8.39 - Distribution of the percentage of aims in General Studies and Enrichment over all colleges

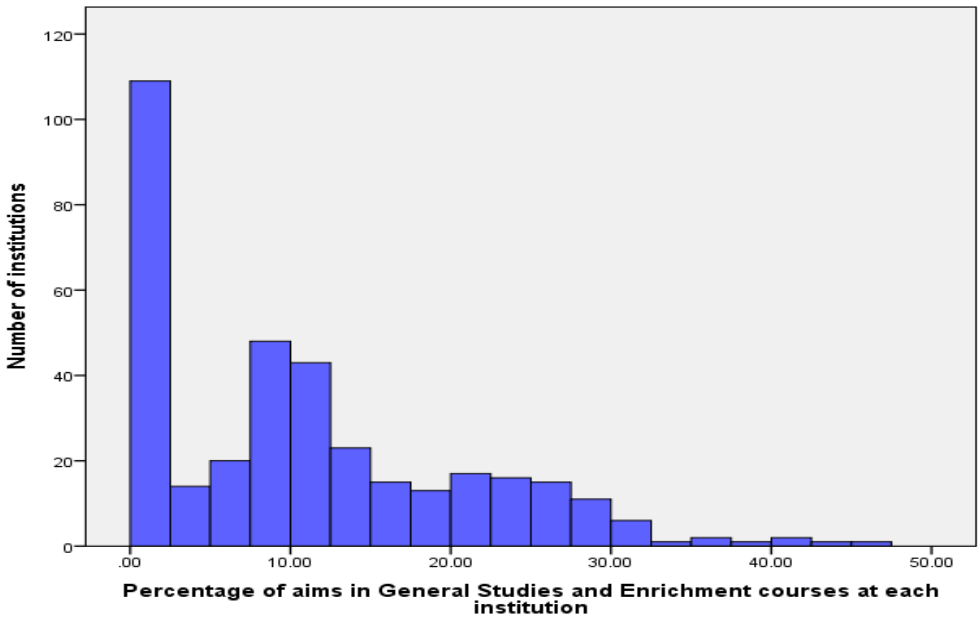


Table 8.55 - The 20 colleges with the highest percentage of General Studies and Enrichment aims

Rank	College	Type[1]	Percentage of GSEP aims	Total aims
1	Thomas Rotherham College	SFC	45.4%	10,089
2	The Sixth Form College Farnborough	SFC	42.8%	23,652
3	Loreto College	SFC	42.3%	16,081
4	Wyke Sixth Form College	SFC	41.5%	8,383
5	Wilberforce College	SFC	39.0%	8,977
6	Havering Sixth Form College	SFC	36.7%	16,978
7	King Edward Vi College Stourbridge	SFC	35.4%	12,022
8	Wyggeston and Queen Elizabeth I College	SFC	33.4%	17,076
9	Woking College	SFC	32.1%	7,476
10	Long Road Sixth Form College	SFC	31.7%	10,074
11	The Sixth Form College Colchester	SFC	31.3%	25,600
12	The Blackpool Sixth Form College	SFC	30.9%	11,669
13	Cheadle and Marple Sixth Form College	SFC	30.3%	16,363
14	Oldham Sixth Form College	SFC	30.0%	13,471
15	Leyton Sixth Form College	SFC	29.7%	10,615
16	Cardinal Newman College	SFC	29.5%	13,812
17	Carmel College	SFC	29.4%	9,894
18	Greenhead College	SFC	29.0%	12,868
19	Scarborough Sixth Form College	SFC	28.8%	5,646
20	Birkenhead Sixth Form College	SFC	28.7%	8,122

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.56 - Distribution of college types by percentage of General Studies and Enrichment aims

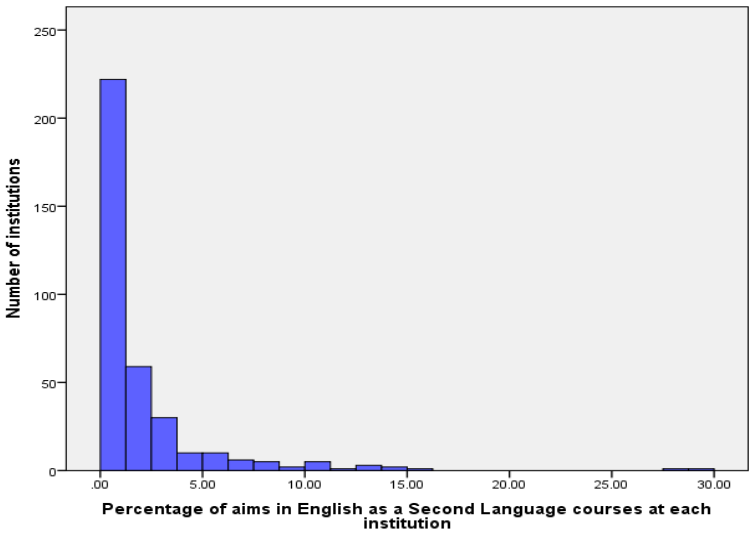
Percentage studying GSEP[1]	Sixth Form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
40+	4	4.3%				
35-39	3	3.2%				
30-34	7	7.4%				
25-29	26	27.7%				
20-24	26	27.7%	6	2.7%	1	2.5%
15-19	12	12.8%	15	6.7%	1	2.5%
10-14	2	2.1%	62	27.7%	2	5.0%
5-9	4	4.3%	61	27.2%	3	7.5%
0-4	10	10.6%	80	35.7%	33	82.5%

[1]*Percentage studying rounded down*

8.4.2.17: English as a Second Language

Figure 8.40, shows the distribution of the 174,309 aims in the English as a Second Language (ESL) subject group at all colleges. The majority of colleges (204) offer none or very little ESL provision (under 1%) and the majority of the remaining colleges are clustered around the mean. However, there are a very small number of colleges that enrol more than 5% of their aims in this subject area, showing a limited degree of diversity.

Figure 8.40 - Distribution of the percentage of aims in English as a Second Language over all colleges



There are 105 colleges who do not offer a single ESL aim: comprising 62 sixth form colleges, 15 general FE colleges and 28 specialist colleges.

Table 8.57 shows the 20 colleges with the highest ESL aim percentage. Within this list there are one sixth form college, 17 general FE colleges and two specialist colleges suggesting that general FE colleges are much more likely to have high percentages of ESL aims.

Table 8.57 - The 20 colleges with the highest percentage of English as a Second Language aims

Rank	College	Type[1]	Percentage of ESL aims	Total aims
1	Working Men's College Corporation	SC	29.7%	9,245
2	City College, Birmingham	GFEC	28.2%	14,408
3	Waltham Forest College	GFEC	15.8%	20,017
4	Mary Ward Settlement	SC	14.1%	9,751
5	College of North West London	GFEC	14.0%	24,792
6	Barnet and Southgate College	GFEC	13.6%	28,157
7	Tower Hamlets College	GFEC	13.4%	18,467
8	Leicester College	GFEC	12.9%	66,505
9	Greenwich Community College	GFEC	12.1%	13,697
10	East Berkshire College	GFEC	10.7%	17,220
11	Westminster Kingsway College	GFEC	10.7%	36,114
12	Southwark College	GFEC	10.5%	12,712
13	Ealing, Hammersmith & West London College	GFEC	10.2%	44,315
14	Lambeth College	GFEC	10.2%	26,474
15	Woking College	SFC	9.9%	7,476
16	Hackney Community College	GFEC	9.0%	21,629
17	Sandwell College	GFEC	8.5%	19,097
18	Redbridge College	GFEC	8.5%	12,955
19	City and Islington College	GFEC	8.4%	31,792
20	Harrow College	GFEC	8.2%	23,339

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.58 shows how the percentage of ESL aims breaks down over the administrative types. Sixth form colleges are 100% in the bottom two FE colleges 94.6% and specialist colleges 95.0%. Furthermore, the mean percentage of ESL aims at sixth form colleges is 0.5% compared to 2.5% at general FE colleges and 1.5% at specialist colleges, confirming that ESL aims have a much stronger presence in general FE colleges than other college types. Although a sixth form college is 15th in the top 20 highest percentage of ESL aims this is not indicative of the administrative type as a whole and is very much an exception. Similarly the two specialist colleges that appear in the top 20 (1st and 4th) also appear to be exceptional rather than indicative for their category.

Table 8.58 - Distribution of college types by percentage of English as a Second Language aims

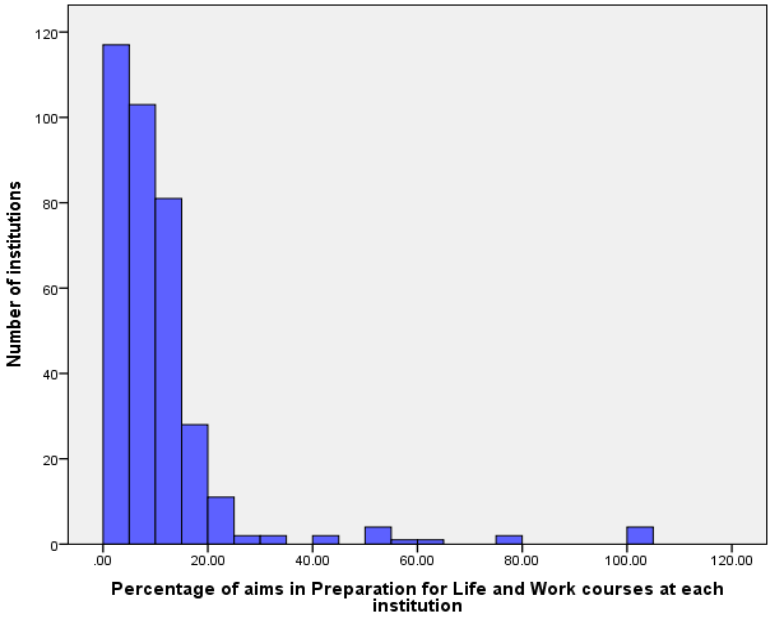
Percentage studying ESL[1]	Sixth Form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
20+			1	0.4%	1	2.5%
15-19			1	0.4%		
10-14			10	4.5%	1	2.5%
5-9	1	1.1%	20	8.9%	2	5.0%
0-4	93	98.9%	192	85.7%	36	90.0%

[1] *Percentage studying rounded down*

8.4.2.18: Preparation for Life and Work

Figure 8.41, shows the distribution of the 818,206 aims within the Preparation for Life and Work (PLW) subject group at all colleges. The majority of colleges are relatively widely spread around the mean. However, there are also a small number of colleges that differ substantially from the mean in running PLW courses (16 colleges above 30%), showing the presence of considerable diversity in the college sector for this subject group.

Figure 8.41 - Distribution of the percentage of aims in Preparation for Life and Work over all colleges



Of the 20 colleges with the lowest PLW aims percentage, four have no aims in this subject area and the remaining 16 all have under 0.8%. Of the four colleges with no aims there are two sixth form colleges and two specialist colleges, the remaining 16 colleges comprise 15 sixth form colleges and one specialist college. The general FE college with the lowest percentage of PLW aims is Richmond upon Thames College with 1.75% (46th lowest), below Mid-Cheshire College of Further Education with the next lowest at 1.84% (48th lowest).

Table 8.59 shows the 20 colleges with the highest PLW aim percentage. Within this list are six general FE colleges and 14 specialist colleges, suggesting that specialist colleges are much more likely to have high percentages of PLW aims. The sixth form college with the highest percentage of PLW aims is Reigate College with 22.2% (24th highest) ahead of Varndean College with 16.6% (47th highest)

Table 8.60 shows how the percentage of PLW aims breaks down over the administrative types. Sixth form colleges are 91.5% in the bottom two boxes, general FE colleges 49.5% and specialist colleges 57.5%. It also shows that there is significant diversity of provision within both general FE and specialist colleges. Furthermore, the mean percentage of PLW aims at sixth form colleges is 3.6% compared to 10.7% at general FE colleges and 27.6% at specialist colleges, confirming that PLW aims have a much stronger presence in specialist colleges than other college types.

Table 8.59 - The 20 colleges with the highest percentage of Preparation for Life and Work aims

Rank	College	Type[1]	Percentage of PLW aims	Total aims
1	Bridge College	SC	100.0%	83
2	Pengwern College	SC	100.0%	31
3	The Congregation of the Daughters of the Cross of Liege	SC	100.0%	70
4	Orchard Hill College of Further Education	SC	100.0%	336
5	The David Lewis Centre	SC	77.4%	309
6	Nash College	SC	75.2%	315
7	Beaumont College - A Scope College	SC	63.5%	449
8	Northern College for Residential Adult Education Limited (The)	SC	59.8%	6,434
9	Hinwick Hall College	SC	54.7%	223
10	Lufton College of Further Education	SC	54.4%	377
11	Fircroft College of Adult Education	SC	50.2%	1,450
12	West of England College	SC	50.0%	106
13	Hereward College of Further Education	GFEC	43.3%	2,011
14	Farleigh Further Education College - Frome	SC	40.3%	496
15	Newham College of Further Education	GFEC	32.0%	47,625
16	Hillcroft College (Incorporated) Limited	SC	31.7%	1,236
17	Halesowen College	GFEC	27.2%	19,034
18	Darlington College	GFEC	25.3%	41,943
19	Northumberland College	GFEC	24.2%	20,323
20	The Oldham College	GFEC	24.1%	41,078

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 8.60 - Distribution of college types by percentage of Preparation for Life and Work aims

Percentage studying PLW[1]	Sixth Form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
100					4	10.0%
70-99					2	5.0%
60-69					1	2.5%
50-59					5	12.5%
40-49			1	0.4%	1	2.5%
30-39			1	0.4%	1	2.5%
25-29			2	0.9%		
20-24	1	1.1%	9	4.0%	1	2.5%
15-19	1	1.1%	27	12.1%		
10-14	6	6.4%	73	32.6%	2	5.0%
5-9	13	13.8%	80	35.7%	10	25.0%
0-4	73	77.7%	31	13.8%	13	32.5%

[1] *Percentage studying rounded down*

8.4.2.19: Summary of college administrative types on subject groups

Figure 8.42 shows the percentage of colleges with at least one aim in each of the subject areas. As expected, the specialist colleges show the greatest variation and specialisation in subject areas with 15 of the 18 subject areas offered at below 60% of all specialist colleges, confirming that specialist colleges are indeed both highly specialised and that there are several specialities within the SC group. General FE colleges on the other hand are, as expected, highly generalised with 14 of the 18 subject areas offered at over 90% of all colleges with the remaining four subjects at over 80% of all colleges. Though this does not indicate the amount (number of aims) of such provision it does suggest that general FE colleges are indeed very generalist in their provision. 11 of the 18 subject areas are offered at over 90% of sixth form colleges with two of the remaining seven at over 70%. AHAC, RCE, ET and ESL are all offered at roughly 30% of sixth form colleges and CPBE is at roughly 5%, demonstrating the low engagement sixth form colleges have with these five subject areas.

The above sections detail the subjects commonly found in each of the administrative types and the strength of that presence. This data allows us to consider the profile of each administrative type. Table 8.61 shows the mean percentage for each subject area in all of the administrative types. The numbers in bold and highlighted in colour are areas that are substantially higher than in the other types of college. The exception is the bold on AMP for sixth form colleges which despite being marginally lower than that for SCs was deemed to be an important feature for sixth form colleges as well as for SCs. These bold numbers largely reflect the administrative types' representation on the tables on top twenty highest percentages for each subject group.

From Table 8.61 it is possible to create a profile for sixth form colleges, which tend to have higher than average SM, AMP, HPT, SS, LLC and GSEP. In contrast, general FE colleges can be described as having higher than average HPSC, EMT, CPBE, RCE and KBS. However, specialist colleges may not be described from this table in such a way as the group is made up from four different types of specialist colleges and thus will be examined in more detail later.

When these profiles are checked against the values for all sixth form colleges and general FE colleges, the sixth form colleges profile matches 53 colleges (57.0%) that are in the sixth form colleges administrative group on all six criteria (and so do three general FE colleges) and 86 (92.5%) match on five or six (including nine general FE colleges). The importance of the individual subject groups to their respective administrative types can be measured to an extent by the standard deviation of the subject group for that type. For example, SM is a subject group with both a high percentage for sixth form colleges and a standard deviation that is relatively low compared to the mean, indicating that most sixth form colleges enrol a substantial percentage of their students on SM courses. However, the HPT subject group, while still selected as an important subject group for sixth form colleges, has a mean and standard deviation both at 6.4%. This indicates a wide spread around the mean suggesting that this subject group may not be as important in defining sixth form colleges as it first appears. Similarly, such examples can be found for general FE colleges with KBS possessing similar characteristics as SM does for sixth form colleges and CPBE is comparable to HPT.

Figure 8.42 - Percentage of colleges of each type engaged with each subject area

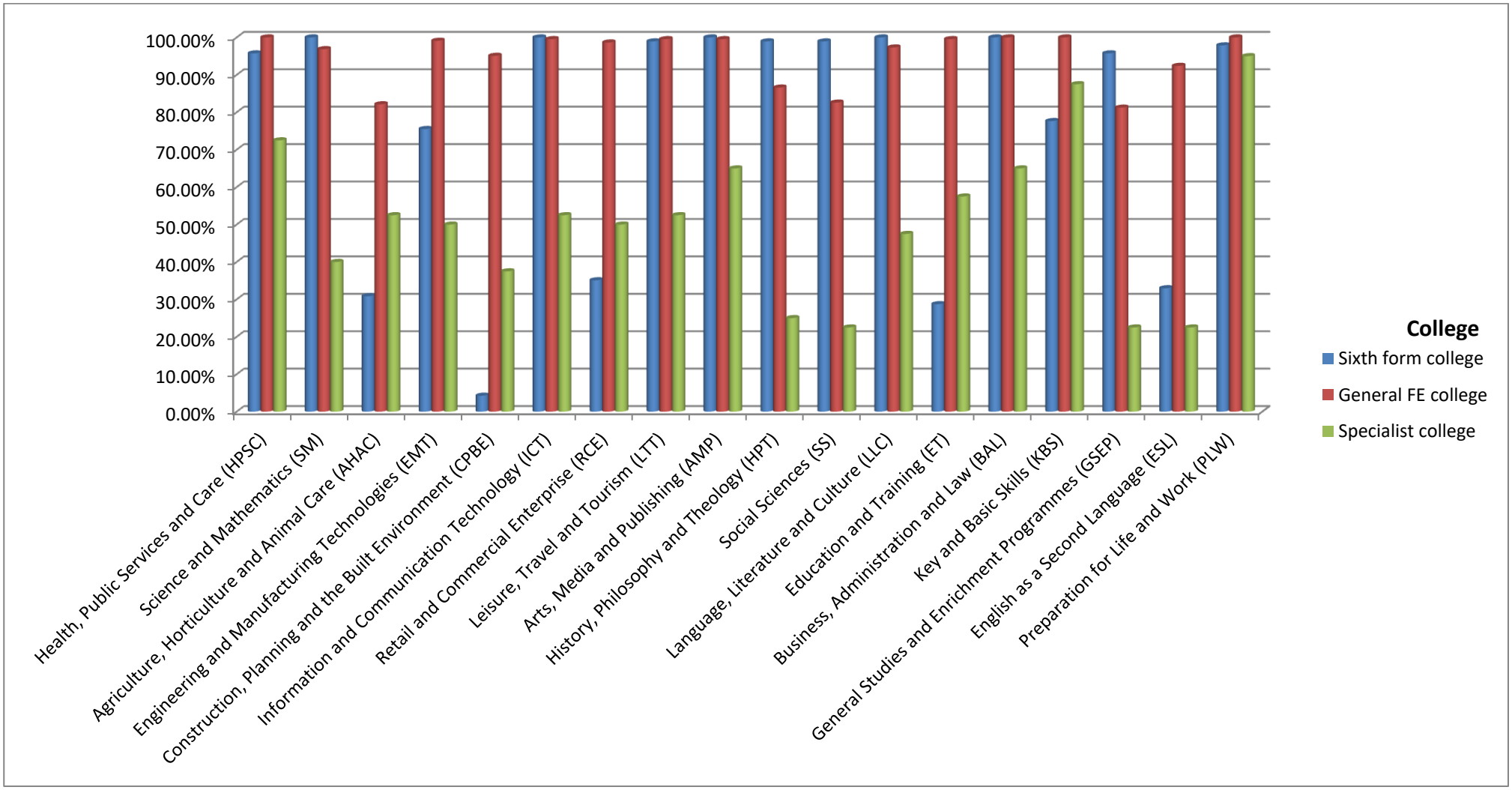


Table 8.61 - Prevalence of provision in each administrative type

Subject Group	Sixth form college		General FE college		Specialist college	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Health, Public Services and Care (HPSC)	3.7%	4.6%	**10.3%**	4.0%	4.4%	4.6%
Science and Mathematics (SM)	**19.2%**	5.8%	2.6%	2.9%	0.6%	1.3%
Agriculture, Horticulture and Animal Care (AHAC)	0.2%	0.7%	1.1%	2.4%	**13.5%**	18.6%
Engineering and Manufacturing Technologies (EMT)	0.7%	0.6%	**6.1%**	4.5%	1.5%	2.5%
Construction, Planning and the Built Environment (CPBE)	0.0%[1]	0.1%	**4.5%**	4.5%	0.8%	3.0%
Information and Communication Technology (ICT)	3.2%	1.8%	3.3%	2.3%	2.2%	3.4%
Retail and Commercial Enterprise (RCE)	0.3%	0.8%	**5.8%**	2.8%	0.8%	1.1%
Leisure, Travel and Tourism (LTT)	3.8%	2.7%	3.9%	2.8%	3.6%	7.0%
Arts, Media and Publishing (AMP)	**9.6%**	3.5%	5.4%	4.4%	**12.1%**	23.7%
History, Philosophy and Theology (HPT)	**6.4%**	6.4%	0.5%	0.8%	1.1%	3.3%
Social Sciences (SS)	**6.0%**	2.4%	0.6%	0.8%	0.2%	0.5%
Language, Literature and Culture (LLC)	**8.8%**	2.6%	2.2%	2.2%	2.3%	5.7%
Education and Training (ET)	0.2%	0.6%	1.2%	0.7%	1.5%	3.4%
Business, Administration and Law (BAL)	6.6%	2.7%	6.7%	2.6%	3.5%	7.5%
Key and Basic Skills (KBS)	4.7%	7.1%	**19.4%**	5.8%	12.5%	9.4%
General Studies and Enrichment Programmes (GSEP)	**22.1%**	10.4%	7.6%	5.9%	2.3%	5.4%
English as a Second Language (ESL)	0.5%	1.3%	2.4%	3.4%	1.5%	5.3%
Preparation for Life and Work (PLW)	3.6%	4.1%	10.7%	5.7%	**27.6%**	33.5%

[1] *This figure is 0.01% before rounding.*

Furthermore, the three subject groups that were separated out during the initial data management stage do help to reveal additional diversity in the sector. These three groups are Key and Basic Skills, General Studies and Enrichment, English as a Second Language. The first two of these were extracted from Preparation for Life and Work and English as a Second Language came from LLC (see Section 6.5.4).

There is substantial provision in GSEP in sixth form colleges but relatively little Preparation for Life and Work. It is the other way round in general FE colleges, thus the separation allowed the results to highlight this difference. In contrast, KBS is fairly similar to the parent Preparation for Life and Work in sixth form colleges but are not major areas. However, both are big players in general FE colleges but KBS has nearly double the percentage of students compared to Preparation for Life and Work. In SCs it is the other way round with the major role taken by Preparation for Life and Work (their biggest single area). Having GSEP, KBS and PLW as one group would disguise this diversity.

Similarly ESL barely registers in sixth form colleges but the parent LLC group is one of their major subject groups at 8.8%. However, ESL is almost identical in student percentage in general FE colleges as is the parent LLC group, with SCs also maintaining a similar split. Thus, in this case, while the most substantive difference is in the sixth form college group only, diversity is demonstrated by this separation.

Table 8.62 shows the number and percentage of colleges that do not match the 'higher than average' criterion in the sixth form colleges administrative group for each of the six subject areas. This shows that almost all colleges met the criterion for SM, SS and LLC subject groups and that where colleges struggled to meet the criterion was in AMP, HPT and GSEP. The AMP was the most difficult criterion to meet as the sector has a generally high AMP presence (i.e. in contrast to other subject groups, the AMP group is not as proportionally high in sixth form colleges when compared to other college types) and thus being higher than average in this area is more difficult to achieve than in some other subjects. Nonetheless, it is a reasonably solid and accurate profile for the sixth form colleges. This suggests that the current administrative type is reasonably homogeneous so far as subject is concerned, though there are some outliers.

Table 8.62 - Subject group analysis for sixth form colleges

Subject Area	Colleges that did not meet at least five out of six of the criteria	
	Number	Percent
Science and Mathematics	2	2.1%
Arts, Media and Publishing	20	21.3%
History, Philosophy and Theology	14	14.9%
Social Sciences	1	1.1%
Language, Literature and Culture	2	2.1%
General Studies and Enrichment Programmes	15	16.0%

Table 8.63 shows similar criteria for general FE colleges and it indicates a much less precise description of general FE colleges from the five strong indicators from Table 8.61. The number and percentage of colleges that do not meet the expected criteria is much higher for general

FE colleges than for sixth form colleges. However, this is partially to be expected as the number of general FE colleges in the system is over double that of sixth form colleges and therefore general FE colleges would have substantially more influence on the average percentage of aims. Nonetheless, when tested against the higher than the 'all colleges average' criterion, only 57 general FE colleges (25.4%) matched the criteria for all five subjects and 137 (61.2%) matched the criteria for four out of five. This indicates that although there are a number of similar colleges within the general FE colleges administrative type, this lack of homogeneity means that the administrative category does not offer a complete description of all the colleges within the group on subject. This suggests that a new typology would allow for a better description of the 224 colleges currently labelled general FE colleges.

Table 8.63 - Subject group analysis for general FE colleges

Subject Area	Number of colleges that did not match the criteria	
	Number	Percent
Health, Public Services and Care	66	29.5%
Engineering and Manufacturing Technologies	77	34.4%
Construction, Planning and the Build Environment	81	36.2%
Retail and Commercial Enterprise	48	21.4%
Key and Basic Skills	37	16.5%

The specialist college group is actually made up of four different administrative types of specialist college and thus the highlighting of three key areas (AHAC, AMP and PLW) in Table 8.61 is somewhat misleading. For example, this group includes the administrative types for agricultural colleges and arts colleges, leading to the high numbers in these subject areas which are not actually offered by all specialist colleges. Indeed, examining Figure 8.42 reveals that provision in specialist colleges is not consistent in any subject area. Therefore, it is necessary to broadly describe the four separate administrative types individually.

Special colleges generally have very high PLW but the rest of the provision offered by such colleges varies between the different subject groups with only KBS offering high numbers in most colleges. Therefore, this group can be reasonably described as PLW specialists. The exception is Derwen College which reports 94.3% of its aims as not applicable and therefore cannot be realistically classified.

The group specialist college - agricultural and horticultural can be defined as having strong to very strong engagement with AHAC and medium to strong with KBS. However, there are some exceptions within this group with Brooksby Melton College of Melton Mowbray only offering 11.0% of its aims in AHAC. Indeed, with the group's general engagement with AHAC being highly varied, it is arguable that this designation does not fully describe all the colleges within this administrative group.

Specialist designated colleges contains colleges that are very strong in PLW, similar to special colleges. It also contains others that are strong in LLC and AMP and another very strong in BAL. Therefore, there is little similarity within this group between most colleges on subject.

Finally, the specialist arts colleges offer a very strong commitment to AMP, though one also has a strong commitment to key skills.

Chapter 9: Single variable analysis: Student characteristics

This chapter provides the second part of the descriptive statistical analysis of the seven variables under study. It covers the age, gender and ethnicity of students attending the colleges under study. As in Chapter Eight, each of these variables are described in its own section, initially at a system level and then at the institutional level. Again, each of the current administrative types are analysed using each of the variables and where appropriate, the scope for institutional diversity is discussed.

9.1: Student age

This section looks at the average age of students across all colleges and provides an analysis of the distribution over the sector. It discusses the exceptional colleges and groups of colleges that provide the diversity within this sector. It also examines different aspects of the age of students including under-16 students, mature students and the distribution and range of ages across the system. Finally, it analyses the current administrative types for similarities and differences on this variable.

There are two ways of calculating the average age of students. One is at the system level where it is simply the standard arithmetic average. Alternatively, there is the institutional level where the average age at each college is calculated and then the average of those values is taken. This second value is not weighted for college size and thus can be substantially different to the overall system mean. For example, if you have five colleges with 1000 students all 20 years old and five colleges with 10000 students all 40 years old.

- The system average would be ((10000*40*5)+(1000*20*5))/55000=38.2
- The colleges overall average age would be ((20*5)+(40*5))/10=30

This simple example is intended to illustrate the differences in the calculation only, as in reality the numbers would differ substantially less.

9.1.1: Age at the system level

The average age of all students in the sector is 29.9 years with a standard deviation of 14.5 years. However, as Table 9.1 demonstrates this varies considerably within and between the various administrative types. The general FE college type accounts for roughly 85% of students and, unsurprisingly their average age and standard deviation are very close to the overall system values. Nonetheless, it is of note that the standard deviation of ages in all administrative types is reasonably high. In most college types this would be expected due to the wide variety of age groups catered for in the FE sector. However for sixth form colleges, which traditionally have catered for the 16-18 age group, the high standard deviation is perhaps surprising.

Table 9.1 - Average age by administrative type

College type	Number	Percent	Average age	Standard deviation
General FE college	224	62.6%	29.8	13.8
Sixth form college	94	26.3%	20.7	10.8
Specialist college (all types)	40	11.2%	40.7	19.1
All colleges	**358**	**100.0**	**29.9**	**14.5**
Specialist college type	**Number**	**Percent**	**Average age**	**Standard deviation**
Special college	11	3.1%	23.0	8.7
Agricultural college	16	4.5%	27.9	13.9
Specialist designated college	10	2.8%	48.6	17.5
Special college - art, design and performing arts	3	0.8%	24.4	12.1

Mature students

The percentage of mature students (age 23 and older) in the FE college sector is 55.0%. Similar to average age, Table 9.2 shows that this varies considerably by administrative type with sixth form colleges enrolling the lowest percentage of mature students at 15.1%. Specialist designated colleges are at the opposite end of the spectrum with 96.5% of their students classified as mature.

Table 9.2 - Percentage of mature students by college type

College type	Percentage of mature students (23 and over)
General FE college	56.4%
Sixth form college	15.1%
Specialist college (all types)	76.9%
Specialist college type	**Percentage of mature students (23 and over)**
Special college	19.0%
Agricultural college	45.8%
Specialist designated college	96.5%
Special college - art, design and performing arts	28.7%
All colleges	**55.0%**

Age group distribution

Table 9.3 and the accompanying Figures 9.1 and 9.2 show how students are distributed by age group over the various administrative types. Some administrative types have a fairly general profile with a wide dispersion of students across all age groups, for example general FE colleges and agricultural colleges. However, others have a distinct profile; for example, the sixth form colleges focus on the 16-18 age group and the specialist designated colleges focus on the older age groups with exceptionally high percentages of 60+ students.

Table 9.3 - Age group distribution by administrative type

College type	Under-16s	16-18	19-20	21-24	25-34	35-44	45-59	60+	N/A	Total Students
General FE college	1.8%	27.6%	8.4%	10.6%	18.8%	15.1%	14.7%	2.9%	0.0%	2,645,354
Sixth form college	0.2%	81.6%	2.1%	1.9%	4.1%	3.6%	4.4%	2.1%	0.0%	197,243
Specialist college (all types)	1.2%	14.1%	4.6%	6.3%	17.9%	16.1%	18.7%	20.9%	0.3%	192,677
Specialist college type	**Under-16s**	**16-18**	**19-20**	**21-24**	**25-34**	**35-44**	**45-59**	**60+**	**N/A**	**Total Students**
Special college	0.0%	11.3%	43.4%	29.9%	6.1%	3.0%	5.6%	0.6%	0.0%	1,098
Agricultural college	3.3%	36.9%	8.7%	8.7%	13.3%	12.2%	13.5%	2.8%	0.6%	67,142
Specialist designated college	0.0%	0.4%	1.3%	4.5%	20.9%	18.8%	22.1%	31.8%	0.2%	120,198
Special college - art, design and performing arts	0.3%	39.2%	22.6%	13.5%	9.0%	5.0%	7.8%	2.7%	0.0%	4,239
Total	1.7%	30.3%	7.8%	9.8%	17.8%	14.4%	14.3%	4.0%	0.1%	3,035,274

Figure 9.1: Student age distribution in main college types

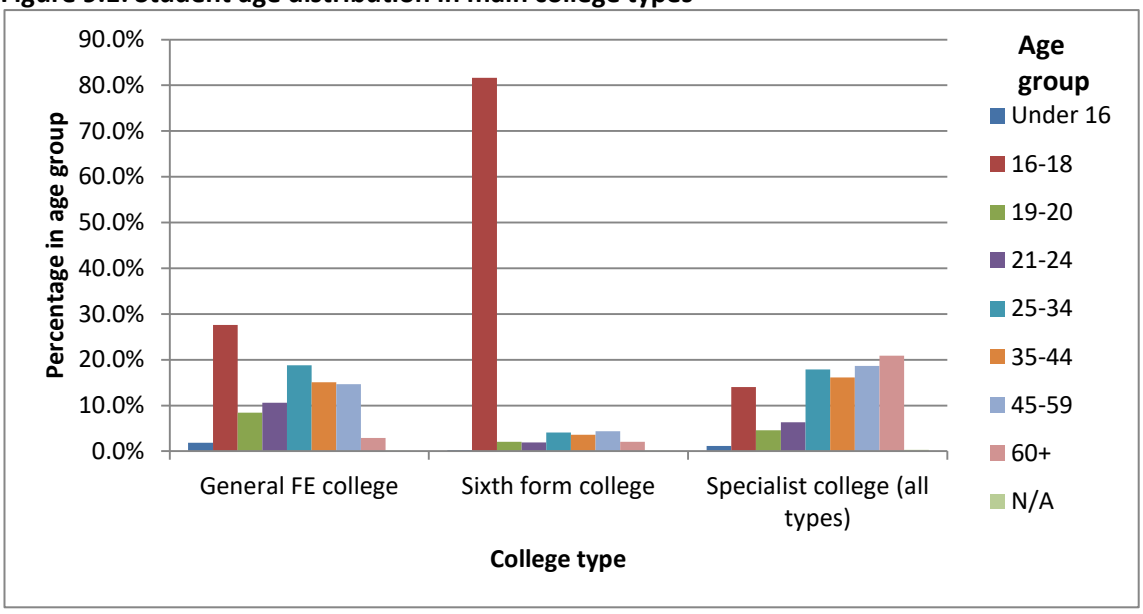
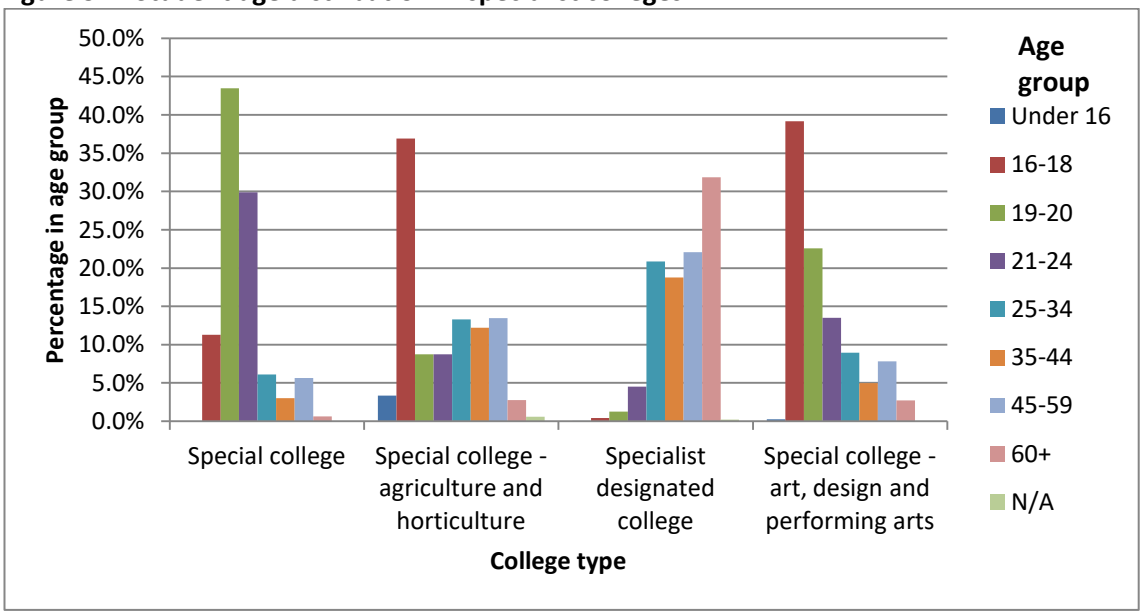


Figure 9.2: Student age distribution in specialist colleges

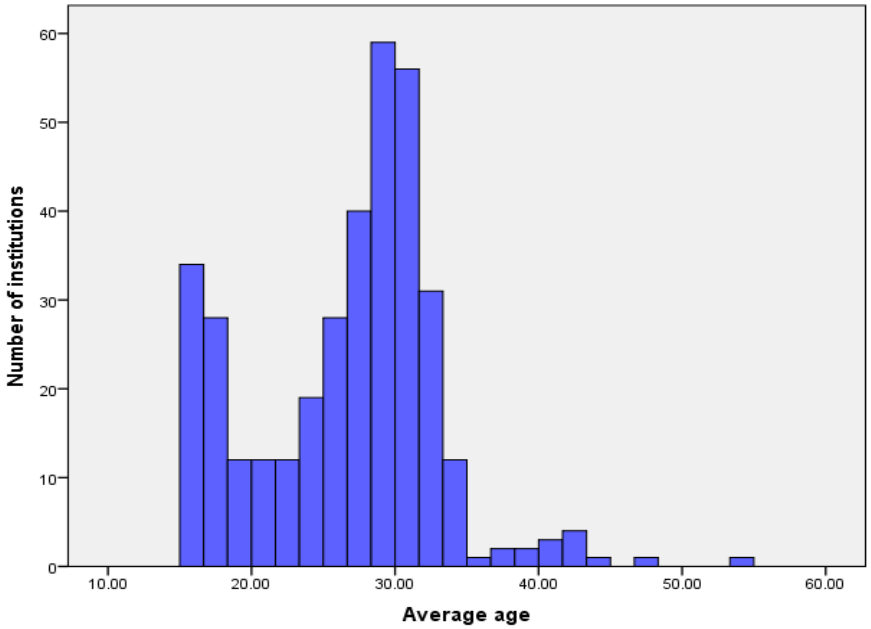


9.1.2: Age of student at the institutional level

The mean of each colleges average age of students in the sector is 26.7 (standard deviation = 6.4) indicating that, as this is lower than the overall system average student age, there are numerous colleges that specialise in teaching younger students (though these colleges may not be particularly large in size).

This can be confirmed by the histogram below (Figure 9.3) which shows the distribution of average age of students across all colleges in the sector. The graph clearly shows a bi-modal distribution with numerous colleges with an average age of roughly 16 or 17 years old as well as the larger number of colleges with an average of roughly 30 years old.

Figure 9.3 - The distribution of average age of all students at all colleges



The 20 colleges with the lowest average age are separated by just over 0.1 years and are, as you would expect, all sixth form colleges. The college with the lowest average age is Godalming College at 16.4 years. Although it is reasonable to conclude that the small differences between such colleges may be explained by random variation, it is worth noting that some colleges (including Godalming College) also register some students under the age of 16. Indeed, Godalming College enrolled 117 students (6.1% of their total) who were 14 or 15 years old, the highest percentage of any sixth form college.

Two thirds of sixth form colleges (62 out of 94) enrol under-16 students. However, only 11 of the 20 colleges with the lowest average age enrol students less than 16 years old. While this does appear to indicate some diversity in sixth form colleges regarding age of intake, the numbers of under-16 students are low in such colleges. Indeed, only 480 students (0.2% of 197,243) under-16 attend sixth form colleges with only 12 of the 62 sixth form colleges enrolling more than ten students under-16 and only six enrolling more than 20 (only Henley College, the second highest, also manages over 50 with 52 (1.7% of their total)). Therefore, while there is some variability in this area, under-16 student numbers are small and the impact is limited.

The number of general FE colleges that enrol students under the age of 16 is 218 (or 97.3%) and the number of specialist colleges is 23 (57.5%). General FE colleges enrol 48,643 students under-16 (1.8% of 2,645,354) with 190 colleges enrolling 10 or more such students and 177 enrolling 20 or more. Therefore, while under-16 students are a small part of the general FE colleges remit, they are a notable minority, and are perhaps a greater sub-division of general FE colleges than first indicated by the total number of colleges (97.7%) enrolling under-16 students.

Specialist colleges enrol 2,266 students under-16 (1.2% of 192,677) with 16 colleges enrolling over 10 such students and 13 enrolling over 20. Table 9.4 shows the 20 colleges with the highest number of under-16 students enrolled. These 20 comprise 18 general FE colleges and two specialist agricultural colleges (12th and 14th) with the highest sixth form college (Godalming College) in 118th position.

Table 9.4 - Total numbers of under-16 students

Rank	College	Type[1]	No. of students
1	Cambridge Regional College	GFEC	1,875
2	Bedford College	GFEC	1,443
3	South Staffordshire College	GFEC	1,408
4	Hertford Regional College	GFEC	1,353
5	Newcastle College	GFEC	1,191
6	Hull College	GFEC	1,101
7	Canterbury College	GFEC	943
8=	North Warwickshire and Hinckley College	GFEC	839
8=	The Manchester College	GFEC	839
10	Derby College	GFEC	787
11	Bridgwater College	GFEC	780
12	Moulton College	SC	760
13	Gloucestershire College	GFEC	754
14	Sparsholt College Hampshire	SC	677
15	South Devon College	GFEC	664
16	Lowestoft College	GFEC	661
17	Great Yarmouth College	GFEC	631
18	Northampton College	GFEC	602
19	Central Sussex College	GFEC	597
20	Bradford College	GFEC	596

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

The 20 colleges with the highest average age are separated by 19.5 years as shown in Table 9.5. The Worker's Educational Association, which is categorised as a specialist designated college, is the only college to have an average student age of more than 50 (53.9). Within the 20 colleges there are nine general FE colleges, 10 specialist colleges (of which one is a specialist agricultural college (Capel Manor College, rank 17) and the rest specialist designated colleges) and one sixth form college. The latter is Sir John Deane's College with an average age of 37.0, unexpectedly high for a sixth form college.

Table 9.6 shows how the average age of each of the colleges is separated over the three administrative types. For both general FE colleges and sixth form colleges there is relatively little diversity with 87.1% of general FE colleges in the 25-34 age brackets and 87.2% of sixth form colleges in the 15-24 range. Nonetheless, there are a small number of colleges of both types that are either comparatively high or low for their type, suggesting that there may be some scope for better describing such college types on the age variable. It is also possible that there may be some colleges that are currently classified as one type that better fit another; a possibility which is further investigated once all variables are examined together and institutional profiles are formed.

Table 9.5 – The 20 colleges with the highest average age

Rank	College	Type[1]	Average age
1	Workers' Educational Association	SC	53.9
2	Mary Ward Settlement	SC	47.8
3	Northern College For Residential Adult Education Limited (The)	SC	43.6
4	Morley College Limited	SC	43.2
5	Richmond Adult Community College	GFEC	42.9
6	Ruskin College	SC	42.9
7	The City Literary Institute	SC	42.8
8	East Surrey College	GFEC	41.0
9	South Worcestershire College	GFEC	40.9
10	Hillcroft College (Incorporated) Limited	SC	40.2
11	Fircroft College of Adult Education	SC	39.9
12	Working Men's College Corporation	SC	39.9
13	Bracknell and Wokingham College	GFEC	37.6
14	Sir John Deane's College	SFC	37.0
15	Telford College of Arts and Technology	GFEC	36.0
16	Eastleigh College	GFEC	34.8
17	Capel Manor College	SC	34.8
18	Macclesfield College	GFEC	34.7
19	Stroud College of Further Education	GFEC	34.7
20	Norton Radstock College	GFEC	34.4

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 9.6 - Distribution by age over the administrative types

Average age (years)[1]	Number of colleges by type		
	Sixth form	General FE	Specialist
50-54			1
45-49			1
40-44		3	5
35-39	1	2	2
30-34	3	91	5
25-29	8	104	10
20-24	16	22	10
15-19	66	2	6

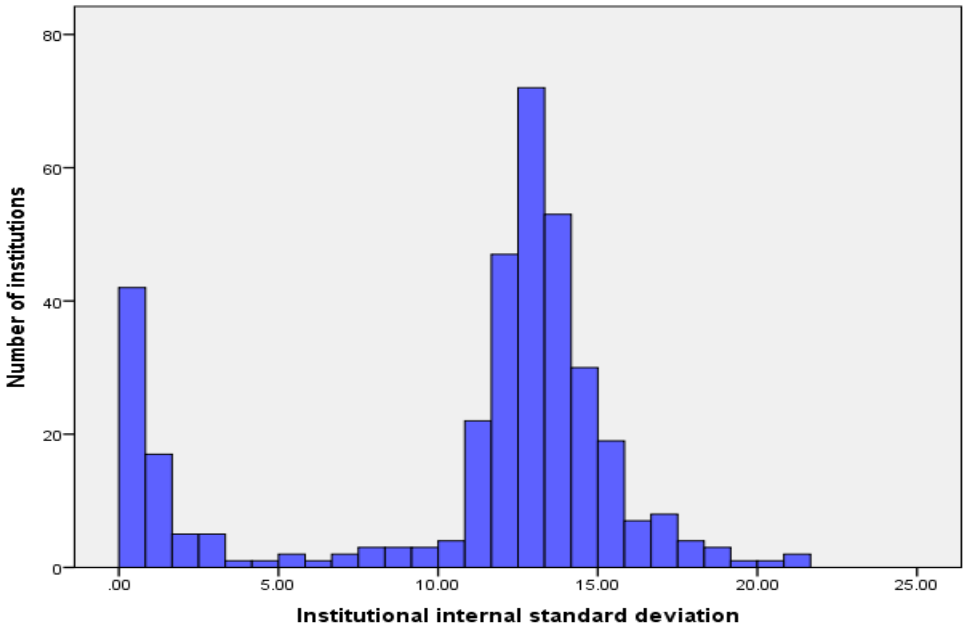
[1] *Average age rounded down*

Conversely, while the specialist colleges show some tendency towards the lower age brackets (65.0% within the bottom three age brackets, 15-29), there is a greater diversity in the specialist college category. Furthermore, the sub-categories of the specialist college type do not fully define this variation with some of the sub-categories still having significant variation within them. For example, the specialist designated college category contains one college (Bridge College) with a relatively low average age of 19.9; whereas the rest of the colleges within that group vary between 39.9 and 53.9. Similarly, the Orchard Hill College of Further Education is assigned to the special college category but with an average age of 30.4 compared to the rest of the colleges which average between 17.5 and 20.3, it also does not really fit into its assigned category on this variable. Therefore, it is reasonable to conclude that there is scope for re-classification on the average age variable of all three of the college types,

potentially including some transition between categories with colleges described as sixth form colleges being in groups with specialist or general FE colleges.

Figure 9.4 shows the distribution of the standard deviations of colleges in the FE sector. There is variation as indicated by a strongly bi-modal distribution similar in shape to that of average age. The majority of colleges have a standard deviation of between 11 and 15. However, there is a minority of colleges that are highly clustered about their internal mean with standard deviations under one (49 or 13.7%) or two (a further 13 or 3.6%), suggesting that they enrol a very specific age group of students. There is also a smaller (but not insubstantial) number of colleges with standard deviations over 15 (44 or 12.7%), with the highest being East Surrey College at 21.4. Such colleges have a highly internally diverse student population by age.

Figure 9.4 - Distribution of standard deviation of age within all colleges



The distribution is even more strongly clustered around two points with very few colleges falling outside the two major ranges. Therefore, colleges generally fall into two categories: those colleges which enrol a very specific age bracket and those colleges which are more generalist. There are only 15 colleges (4.2%) which could be described as being borderline one or the other with standard deviations (SDs) greater than four and under 10, from Seevic College at 4.3 SD to North West Kent College of Technology at 9.9 SD. Therefore, there are 70 colleges (19.6%) which can be regarded as enrolling a specific age bracket (defined here as a standard deviation of under 4) and 273 colleges (76.3%) regarded as not enrolling a specific age range (defined here as standard deviation of 10 or over).

These two groups can be further refined by indentifying the college's administrative type as shown in Table 9.7.

Table 9.7 - Distribution of age-specific enrolments by college type

	Sixth form	General FE	Specialist
Specific age group	58	1	11
Non-specific age group	25	220	28
Borderline	11	3	1

Table 9.7 clearly shows that general FE colleges, as you would expect do not, on the whole, enrol a specific age range and instead on this measure are highly age generalist colleges with 220 of the 224 colleges not enrolling a specific age demographic. However, there are numerous sixth form colleges which are much more generalist than you would expect with only 58 colleges (61.7%) enrolling a specific age range. Similarly, special colleges make up 10 of the 11 specific age group specialist colleges with only one specialist designated college enrolling a specific age range (though one special college of art design and performing arts is on the borderline). Furthermore, the standard deviations are strongly positively correlated (r_s=.857, p<.001) with the average age, which indicates that it is likely (confirmed by examining the data) that there are only colleges specifically enrolling young students and no colleges enrolling a specific group of adults (e.g. 25-30 or 35-40 year olds). Nonetheless, when combined with the average age values and under-16 student analysis, it clearly demonstrates that there is variation on the age variable within the college administrative categories and that there is potential scope for reclassification.

9.2: Student gender

This section examines the percentage of male and female students in both the system overall and at the institutional level, including reports on the exceptional colleges at each end of the scale. In so doing, conclusions are drawn about the diversity of colleges on this variable.

9.2.1: Gender at the system level

The percentages of male and female students in the FE college system are 50.2% and 49.8% respectively. Table 9.8 shows the system level variability of colleges of the different administrative types. It demonstrates that all of the specialist college types show a substantially greater percentage of one of the genders; two of the four specialist types enrol males at substantially higher percentages than females, while the opposite is true of the other two types. Furthermore, both the two administrative types with the largest number of colleges, the general FE and sixth form colleges, enrol more strongly in different genders: female for sixth form colleges and males (though only by a small margin) for general FE colleges.

Table 9.8 - Percentage of male and female students by college type

College type	Percentage of male students	Percentage of female students
General FE college	51.6%	48.4%
Sixth form college	43.2%	56.8%
Specialist college (all types)	38.6%	61.4%
Specialist college type	**Percentage of male students**	**Percentage of female students**
Special college	61.3%	38.7%
Agricultural college	56.9%	43.1%
Specialist designated college	28.3%	71.7%
Special college - art, design and performing arts	34.9%	65.1%
All colleges	**50.2%**	**49.8%**

9.2.2: Gender at the institutional level

The mean of the percentage of male students in individual colleges in the sector is 48.3%, indicating a slight bias towards majority female colleges (not an unexpected state in the current educational climate). Figure 9.5 shows the distribution of the percentage of male students over the college sector indicating a relatively normal distribution which is slightly skewed to the left (0.3), showing a slight bias towards female learners and with a slightly too large kurtosis for a normal distribution (3.5), indicating that there is a slightly emphasised clustering around the mean.

Figure 9.5 - Distribution of colleges by their percentage of male learners

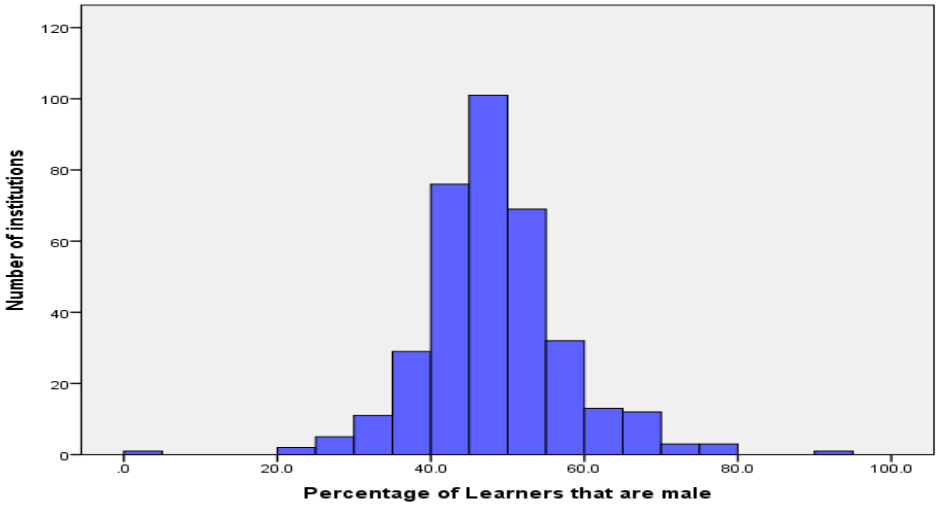


Table 9.9 shows the number of colleges in various brackets; it demonstrates that sixth form colleges tend to have a greater percentage of female students with only 7 of the 94 (7.4%) colleges having more male students than female. Whereas, general FE colleges only have a slight female bias with 104 out of 224 (46.4%) colleges having more men than women. Specialist colleges go slightly the other way with 22 out of 40 colleges (55.0%) having more men than women.

Table 9.9 - Distribution of college types by percentage of male students

Percentage male[1]	College type		
	Sixth form	General FE	Specialist
80+%		1	
70-79%		3	3
60-69%		18	7
50-59%	7	82	12
40-49%	72	96	9
30-39%	13	23	4
20-29%	2	1	4
0-19%			1

[1]*Percentage male rounded down*

Table 9.10 shows the 20 colleges with the highest percentage of male students (along with the total students of both genders at the college). The clear standout is the Leeds College of Building with 93.2% male students (of 7,094 total students) which is currently designated as a

general FE college. (With 51.6% of their aims in Construction, Planning and the Built Environment (Chapter Eight), this is perhaps unsurprising. (See Chapter 10 for details on this relationship)). Moreover, there are 12 general FE colleges in the top 20 and eight specialist colleges which are largely distributed between two of the specialist college types with three special colleges and four agricultural colleges though there is also one specialist designated college.

Table 9.10 – The 20 colleges with the highest percentage of male students

Rank	College	Type[1]	Percent male	Total students
1	Leeds College of Building	GFEC	93.2%	7,094
2	Farleigh Further Education College - Frome	SC	77.5%	80
3	The Manchester College	GFEC	76.7%	88,695
4	Hartpury College	SC	75.6%	4,911
5	Gateshead College	GFEC	72.6%	21,021
6	Milton Keynes College	GFEC	70.1%	20,670
7	Moulton College	SC	70.0%	6,428
8	South Tyneside College	GFEC	69.9%	9,552
9	Dudley College of Technology	GFEC	69.5%	13,949
10	Kensington and Chelsea College	GFEC	69.5%	15,951
11	Strode College	GFEC	69.3%	10,183
12	Stourbridge College	GFEC	69.3%	15,634
13	Lufton College of Further Education	SC	68.8%	109
14	Lowestoft College	GFEC	66.9%	6,793
15	Redcar and Cleveland College	GFEC	66.9%	4,281
16	Myerscough College	SC	66.7%	6,343
17	Darlington College	GFEC	66.6%	11,913
18	Ruskin College	SC	66.4%	1,183
19	Orchard Hill College of Further Education	SC	65.4%	335
20	Easton College	SC	64.6%	2,393

[1]*GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 9.11 shows the 20 colleges with the lowest percentage of male students. These are sub-divided into eight general FE colleges, five sixth form colleges and seven specialist colleges (six specialist designated colleges and one performing arts college) with the specialist college, Hillcroft College (incorporated) Limited being the exceptional stand out with no male students at all (489 total students) with the rest of the colleges being within no more than three percentage points of at least one other college.

Table 9.11 – The 20 colleges with the lowest percentage of male students

Rank	College	Type[1]	Percent male	Total students
1	Hillcroft College (incorporated) Limited	SC	0.0%	489
2	Mary Ward Settlement	SC	24.4%	4,827
3	Ludlow College	SFC	24.6%	1,878
4	Workers' Educational Association	SC	25.5%	62,021
5	Morley College Limited	SC	28.2%	13,166
6	Richmond Adult Community College	GFEC	28.8%	7,897
7	Cleveland College of Art and Design	SC	29.6%	1,196
8	Joseph Chamberlain Sixth Form College	SFC	29.7%	2,676
9	The City Literary Institute	SC	30.4%	29,334
10	Working Men's College Corporation	SC	30.8%	4,591
11	Southwark College	GFEC	32.6%	6,376
12	Redbridge College	GFEC	32.9%	5,102
13	Greenwich Community College	GFEC	33.4%	7,161
14	Sir John Deane's College	SFC	33.4%	3,271
15	Leek College of Further Education and School of Art	GFEC	33.7%	1,924
16	Nelson and Colne College	GFEC	34.1%	4,364
17	St Vincent College	SFC	34.5%	2,865
18	Peter Symonds College	SFC	34.9%	5,524
19	East Surrey College	GFEC	34.9%	8,241
20	South Worcestershire College	GFEC	35.0%	3,416

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

9.3: Student ethnicity

This section analyses the breakdown of student ethnicity at each college first by broad group (White, Asian, Black, Other) and then by the sub-groups within each of these categories, first at the system and then at the institutional level. Finally, it considers how these numbers are reflected by the current administrative categories of colleges.

9.3.1: Ethnicity at the system level

Figure 9.6 shows that in the system population, students are largely White (78.1%), though there are several other significant minority groups represented. Table 9.12 shows how these broad groups are sub-divided at a system level. The percentages in the table represent the proportion of the respective ethnic group that is represented by the sub-group. For example, 91.2% of White students are British rather than 91.2% of all students are British (other ethnic groups do not distinguish British descent).

Figure 9.6 - Ethnicity demographics of student population

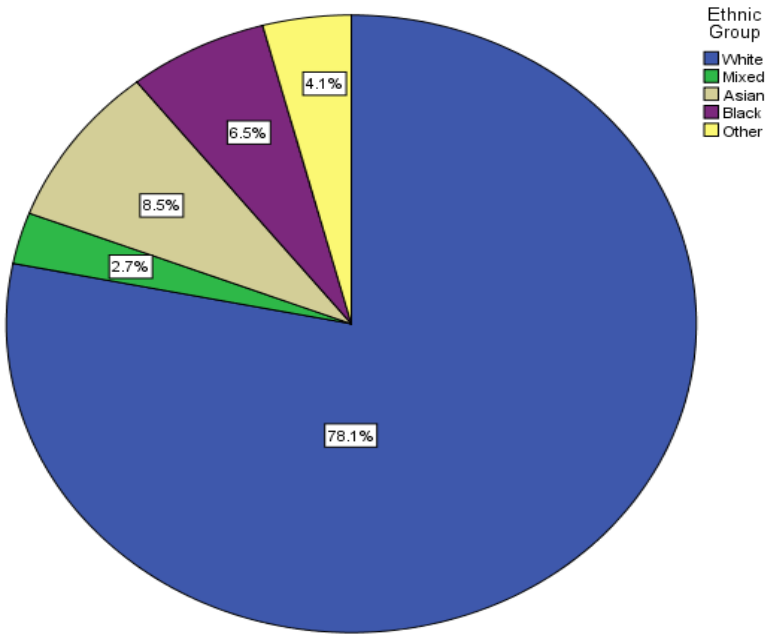


Table 9.12 - Ethnic sub-groups at system level

White sub-group	Total students	Percent	Mixed ethnicity sub-group	Total students	Percent
British	2,161,943	91.2%	White & Black Caribbean	31,949	39.1%
Irish	16,153	0.7%	White & Black African	14,085	17.2%
Gypsy/Irish Traveller	2,014	0.1%	White & Asian	15,642	19.1%
Other White	191,593	8.1%	Other mixed ethnicity	20,032	24.5%
Total	**2,371,703**	**100.0%**		**81,708**	**100.0%**
Asian sub-group	**Total students**	**Percent**	**Black sub-group**	**Total students**	**Percent**
Indian	63,671	24.7%	African	116,740	58.8%
Pakistani	86,567	33.6%	Caribbean	57,049	28.7%
Bangladeshi	35,730	13.9%	Other Black	24,669	12.4%
Chinese	15,001	5.8%			
Other Asian	56,758	22.0%			
Total	**257,727**	**100.0%**	**Total**	**198,458**	**100.0%**

Other sub-group	Total students	Percent
Arab	11,239	8.9%
All other backgrounds	50,317	40.0%
Not declared	64,122	51.0%
Total	**125,678**	**100.0%**

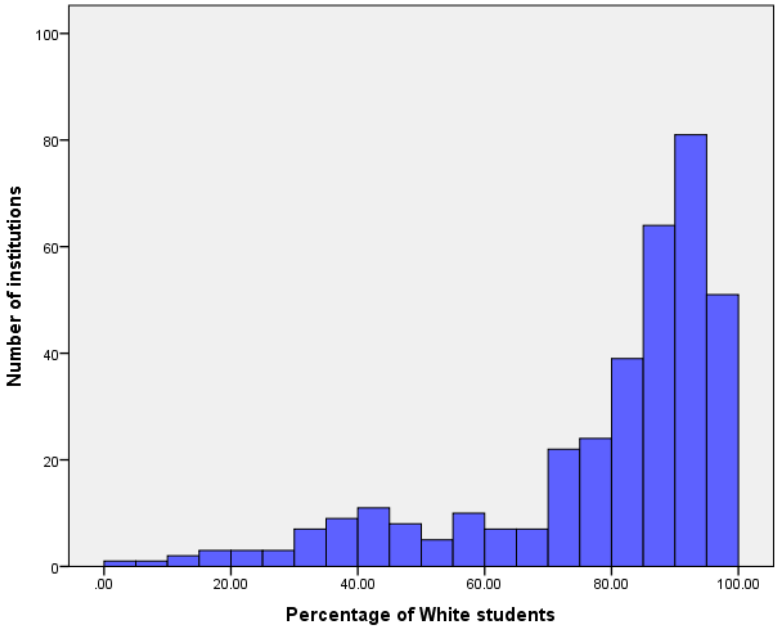
9.3.2: Institutional level

White students at the institution level

There are two ways of calculating the mean percentage of students in each ethnic group. One is to average the percentage of students of that ethnic group (White in this case) in each college without weighting for college size and the other is the overall FE system mean as given in Figure 9.6. The former will be used in this and following sections as it shows how far individual colleges depart from the notional mean college.

The mean of the percentage of White students from any background in all colleges is 78.6% (c.f. 78.1% system mean in Figure 9.6). However, the range (97.4%) and standard deviation (20.5%) are relatively large suggesting substantial diversity on this variable. Figure 9.7, which shows the distribution of White students at all colleges, clearly demonstrates that while the majority of colleges are heavily dominated by White students, there are still numerous colleges that have a more diverse student population and that there is a minority of colleges (48) that have less than 50% of their students from a White background.

Figure 9.7 - Distribution of the percentage of White students at colleges



The 20 colleges with the highest White student percentage show very little variation with colleges ranging from 96.8% White students at the East Norfolk Sixth Form College in 20th position, to Kingston Maurward College (a specialist college) with the highest percentage of White students at 99.2%. Within this list there are seven sixth form colleges, seven general FE colleges and six specialist colleges. However, with the 20 colleges with the lowest White student percentage we see considerably more variation as presented in Table 9.13 (along with the total students of all ethnicities at the college), with the percentage of White students ranging from just 1.8% in Joseph Chamberlain Sixth Form College to Luton Sixth Form College with 34.2% (this would be expected from the lower density of colleges with a low percentage of White students as seen in Figure 9.7). Table 9.13 also shows that the 20 colleges with the lowest percentage of White students are primarily sixth form colleges with 14 of the 20

(including the top nine) with the lowest White percentage being from that group, with the rest being general FE colleges.

Table 9.13 – The 20 colleges with the lowest percentage of White students

Rank	College	Type[1]	Percentage of White students	Total students
1	Joseph Chamberlain Sixth Form College	SFC	1.8%	2,676
2	St Francis Xavier Sixth Form College	SFC	9.1%	1,357
3	Newham Sixth Form College	SFC	12.1%	2,713
4	St Charles Catholic Sixth Form College	SFC	14.2%	1,143
5	Leyton Sixth Form College	SFC	15.8%	2,163
6	Sir George Monoux College	SFC	18.4%	2,083
7	The Brooke House Sixth Form College	SFC	19.6%	1,539
8	Christ the King Sixth Form College	SFC	20.6%	2,151
9	Gateway Sixth Form College	SFC	22.2%	1,433
10	Tower Hamlets College	GFEC	22.3%	7,609
11	City College, Birmingham	GFEC	25.6%	6,676
12	John Ruskin College	SFC	27.0%	944
13	Stanmore College	GFEC	27.9%	4,403
14	Regent College	SFC	30.6%	1,400
15	City and Islington College	GFEC	31.3%	14,894
16	Wyggeston and Queen Elizabeth I College	SFC	31.8%	2,238
17	Harrow College	GFEC	33.4%	8,700
18	Hackney Community College	GFEC	33.4%	8,090
19	Coulsdon Sixth Form College	SFC	33.5%	1,475
20	Luton Sixth Form College	SFC	34.2%	2,467

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 9.14 shows how the percentage of White students breaks down over the administrative types. Sixth form colleges are shown to be 64.9% in the top two boxes, general FE colleges 64.8% and specialist colleges 72.5%, all of which are relatively similar. However, the mean percentage of White students at sixth form colleges is 73.8% compared to 79.5% at general FE colleges and 85.2% at specialist colleges, indicating that ethnic minorities have a slightly stronger presence in sixth form colleges than in other college types (much stronger than in specialist colleges). This is best highlighted by sixth form colleges being the only type to have any colleges in the bottom two boxes (though only seven colleges). Indeed, 21.3% of sixth form colleges have less than 50% of White students compared with 12.1% of general FE colleges and just 2.5% of specialist colleges.

White British is the only ethnic sub-group of any ethnicity to be represented in every college, though almost all other ethnic sub-groups are represented by at least one student in roughly 95% of colleges with the exception of the Gypsy/Irish traveller sub-group which is represented in 62.0% of colleges and Arabs in 74.3% of colleges. Because of this consistency, this minimal representation aspect is not analysed further in any of the subsequent ethnic sections (though this data can be found in Annex Three).

Table 9.14 - Distribution of college types by percentage of White students

Percentage White[1]	Sixth form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
90+	31	33.0%	77	34.4%	24	60.0%
80-89	30	31.9%	68	30.4%	5	12.5%
70-79	7	7.4%	35	15.6%	4	10.0%
60-69	1	1.1%	10	4.5%	3	7.5%
50-59	5	5.3%	7	3.1%	3	7.5%
40-49	4	4.3%	14	6.3%	1	2.5%
30-39	6	6.4%	10	4.5%		
20-29	3	3.2%	3	1.3%		
10-19	5	5.3%				
0-9	2	2.1%				

[1]*Percentage White rounded down*

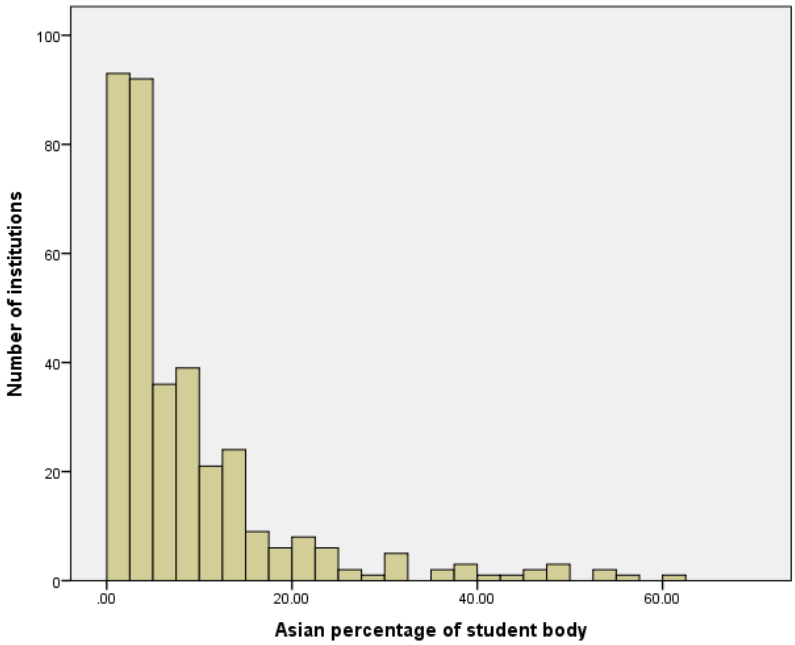
Furthermore, while there is some variation in the origin of White students within individual colleges, all of the colleges seen in Table 9.13 have White British as the dominant White sub-group. Nonetheless, there are a small number of colleges with a high percentage of Irish students, the St Dominic's sixth form college with 17.7% of its White population being from the Irish sub-group and the Mary Ward Settlement with 14.0%. Due to the small number of Gypsy/Irish traveller students in the system, no college enrols a substantial percentage of its White students from this ethnic sub-group with the Mary Ward Settlement again being the highest with only 1.6% of their student body being from this ethnic sub-group.

There are no colleges that have White Irish or White Gypsy/Irish Traveller as the largest White sub-group. However, there are seven colleges that have a greater proportion of White students from any other background than they do White British students. Five of them are sixth form colleges, one is a general FE college and the last is a specialist designated college; they are Leyton Sixth Form College (74.9% of White students from other backgrounds), The Brooke House Sixth Form College (72.2%), Sir George Monoux College (66.4%), St Francis Xavier Sixth Form College (56.1%), Southgate College (the general FE college at 52.6%), Newham Sixth Form College (51.7%), and the Working Men's College Corporation (48.3%).

Asian students at the institutional level

The mean of the percentage of Asian students from any background in colleges is 8.7% (c.f. 8.5% system mean in Figure 9.6). However, the range (61.3%) and standard deviation (10.5%) are relatively large for a minority group suggesting the potential for diversity on this variable. Figure 9.8, which shows the distribution of Asian students at all colleges, demonstrates that while only slightly under half of colleges (173) enrol more than 5% of their student population from an Asian background, there is nonetheless a small number of colleges with a relatively large percentage of their student population from an Asian background (21 colleges enrolling over 30% Asian students).

Figure 9.8 - Distribution of the percentage of Asian students at colleges



The 20 colleges with the highest Asian student percentage can be seen in Table 9.15. They comprise 14 sixth form colleges and six general FE colleges, suggesting that there is a stronger presence of Asian students in sixth form colleges. The final column in the table shows the majority sub-group at each individual college and the percentage of the Asian students made up by that sub-group. The majority of the colleges (11 out of the 20) with a high Asian population are dominated by Pakistani students. However, there are two colleges with Bangladeshi as the largest Asian group and six with Indian and one with other Asian nationalities as the largest group, though there is none with Chinese (not unexpected due to the small Chinese population in the FE system). The 20 colleges with the lowest Asian student percentage are all under 1%, though only one college enrols no Asian students at all (The Congregation of the Daughters of the Cross of Liege). The lowest 20 contains two sixth form colleges, eight general FE colleges and ten specialist colleges and ranges in percentage from 0.0% to 0.7%.

Table 9.16 shows how the percentage of Asian students breaks down over the administrative types over the whole system. Sixth form colleges are shown to be 78.7% in the bottom two boxes, general FE colleges 92.0% and specialist colleges 100.0%. Furthermore, the mean percentage of Asian students at sixth form colleges is 12.8% compared to 7.8% at general FE colleges and 4.4% at specialist colleges which together show that Asian students have a stronger presence in sixth form colleges than other college types (much stronger than in specialist colleges).

Table 9.15 – The 20 colleges with the highest percentage of Asian students

Rank	College	Type[1]	Percent Asian students	Total students (all ethnicities)	Majority sub-group[2] and percent
1	Joseph Chamberlain Sixth Form College	SFC	61.3%	2,676	Pak - 60.6%
2	Wyggeston and Queen Elizabeth I College	SFC	55.1%	2,238	Ind - 82.6%
3	Newham Sixth Form College	SFC	53.7%	2,713	Ban - 43.4%
4	Gateway Sixth Form College	SFC	53.5%	1,433	Ind - 79.7%
5	Tower Hamlets College	GFEC	50.0%	7,609	Ban - 87.2%
6	Leyton Sixth Form College	SFC	48.1%	2,163	Pak - 37.2%
7	The Rochdale Sixth Form College	SFC	47.8%	853	Pak - 78.4%
8	Luton Sixth Form College	SFC	46.7%	2,467	Pak - 53.7%
9	Regent College	SFC	46.2%	1,400	Ind - 65.1%
10	City College, Birmingham	GFEC	44.1%	6,676	Pak - 57.9%
11	St Dominic's Sixth Form College	SFC	41.7%	930	Ind - 56.4%
12	St Mary's College, Blackburn	SFC	39.3%	1,492	Pak - 49.2%
13	Oldham Sixth Form College	SFC	38.9%	2,416	Pak - 53.3%
14	Bolton Sixth Form College	SFC	38.6%	1,828	Ind - 51.6%
15	Stanmore College	GFEC	37.4%	4,403	Ind - 49.0%
16	Sir George Monoux College	SFC	37.4%	2,083	Pak - 52.4%
17	Bradford College	GFEC	32.3%	24,941	Pak - 79.7%
18	Harrow College	GFEC	32.1%	8,700	Oth - 44.1%
19	Sandwell College	GFEC	31.8%	6,709	Pak - 44.1%
20	Cadbury Sixth Form College	SFC	31.0%	1,182	Pak - 56.3%

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*
[2] *Ind =Indian, Pak = Pakistani, Ban = Bangladeshi, Oth = Other Asian ethnicity*

Table 9.16 - Distribution of college types by percentage of Asian students

Percent Asian[1]	Sixth form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
60% +	1	1.1%				
50-59%	3	3.2%				
40-49%	5	5.3%	2	0.9%		
30-39%	5	5.3%	5	2.2%		
20-29%	6	6.4%	11	4.9%		
10-19%	13	13.8%	41	18.3%	6	15.0%
0-9%	61	64.9%	165	73.7%	34	85.0%

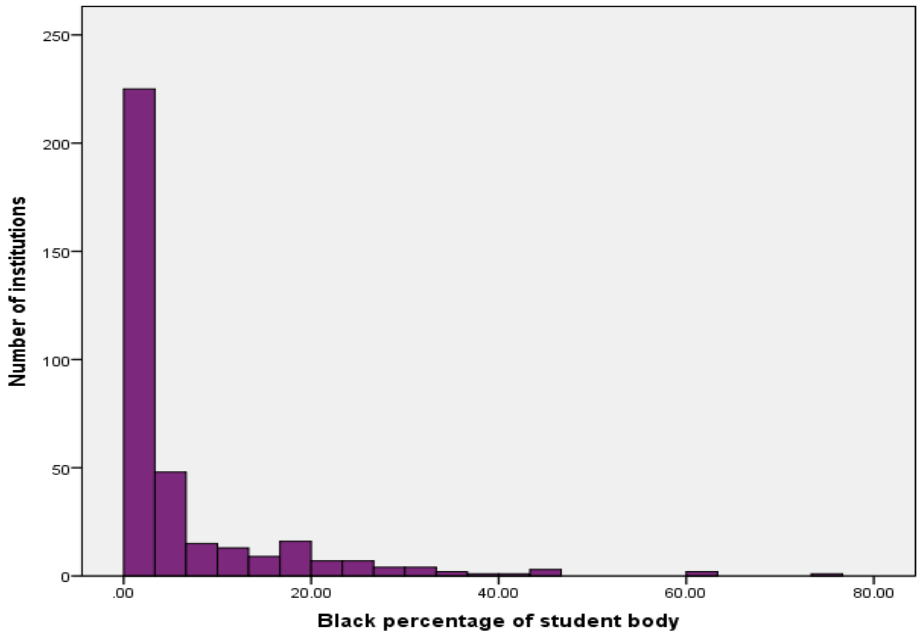
[1] *Percentage Asian rounded down*

Black students at the institutional level

The mean of the percentage of Black students from any background in colleges is 6.4% (c.f. 6.5% system mean in Figure 9.6). Similar to Asian students, the range (74.3%) and standard

deviation (10.1%) are relatively large for a minority group suggesting the potential for significant diversity on this variable. Figure 9.9, which shows the distribution of Black students at all colleges, indicates that there are substantially more colleges with zero or close to zero Black students than is the case for Asian students. Indeed, only 105 colleges enrol more than 5% of their students from a Black background (compared to 173 for Asian students).

Figure 9.9 - Distribution of the percentage of Black students at colleges



The 20 colleges with the highest Black student percentage can be seen in Table 9.17. Within this list there are eight sixth form colleges, 10 general FE colleges and two specialist colleges. However, in examining the mean for each college, sixth form colleges have a mean of 7.5% Black students, general FE colleges 6.2% and specialist colleges only 4.7%, this illustrates that a greater ratio of sixth form colleges enrol a higher percentage of Black students. Nonetheless, this is only a relatively minor difference compared to that of Asian students and in particular the gap between specialist colleges and sixth form colleges is substantially smaller for Black students. The final column in Table 9.17 shows the majority sub-group at each individual college and the percentage of the Black students that are made up by that subgroup. Almost all of the colleges (19 out of the 20) with a high Black population are dominated by Black African students. The only college with a majority Black Caribbean population (of the Black students only) is Coulsdon Sixth Form College at which 58.0% of their Black students are of Caribbean extraction.

The 20 colleges with the lowest Black student percentage are all under 0.3%, with five colleges enrolling no Black students at all - Paston Sixth Form College, Beaumont College, the David Lewis Centre, Pengwern College and The West of England College. The lowest 20 contains seven sixth form colleges, five general FE colleges and eight specialist colleges and ranges in percentage from 0.0% to just over 0.2%.

Table 9.17 – The 20 colleges with the highest percentage of Black students

Rank	College	Type[1]	Percent Black students	Total students (all ethnicities)	Majority sub-group[2] and percent
1	St Francis Xavier Sixth Form College	SFC	74.3%	1,357	Afr - 69.3%
2	Christ the King Sixth Form College	SFC	62.1%	2,151	Afr - 71.9%
3	St Charles Catholic Sixth Form College	SFC	61.2%	1,143	Afr - 63.0%
4	The Brooke House Sixth Form College	SFC	45.4%	1,539	Afr - 70.2%
5	Lambeth College	GFEC	43.7%	14,918	Afr - 54.4%
6	Coulsdon Sixth Form College	SFC	43.5%	1,475	Car - 58.0%
7	John Ruskin College	SFC	40.3%	944	Afr - 54.5%
8	Hackney Community College	GFEC	37.2%	8,090	Afr - 56.0%
9	Lewisham College	GFEC	35.4%	18,510	Afr - 52.2%
10	Southwark College	GFEC	33.4%	6,376	Afr - 69.7%
11	Sir George Monoux College	SFC	33.1%	2,083	Afr - 64.9%
12	City and Islington College	GFEC	31.4%	14,894	Afr - 60.9%
13	The College of Haringey, Enfield and North East London	GFEC	31.0%	23,091	Afr - 55.6%
14	Greenwich Community College	GFEC	30.1%	7,161	Afr - 66.9%
15	Leyton Sixth Form College	SFC	28.2%	2,163	Afr - 64.5%
16	Newham College of Further Education	GFEC	28.1%	20,757	Afr - 74.6%
17	Hillcroft College (Incorporated) Limited	SC	27.0%	489	Afr - 49.2%
18	Nash College	SC	26.9%	78	Afr - 61.9%
19	Waltham Forest College	GFEC	26.1%	10,000	Afr - 55.2%
20	Croydon College	GFEC	25.7%	10,900	Afr - 52.3%

1 GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College
2 Afr =African, Car = Caribbean

Table 9.18 shows how the percentage of Black students breaks down over the administrative types over the whole system. Sixth form colleges are shown to be 90.4% in the bottom two boxes, general FE colleges 91.1% and specialist colleges 92.5%, all of which are similar. Therefore, despite the reported mean percentages above there is only a limited difference in the percentage of colleges with a low Black student percentage between the administrative types. However, there is still a small minority of colleges that enrol a significant percentage of their students from a Black background. Indeed, although there are four colleges that enrol an exceptionally high percentage (i.e. over 50%) of Asian students, compared to only three that enrol over 50% Black students, the highest percentage of a minority ethnicity at any individual college is St Francis Xavier Sixth Form College with 74.3% of their students from a Black background.

Table 9.18 - Distribution of college types by percentage of Black students

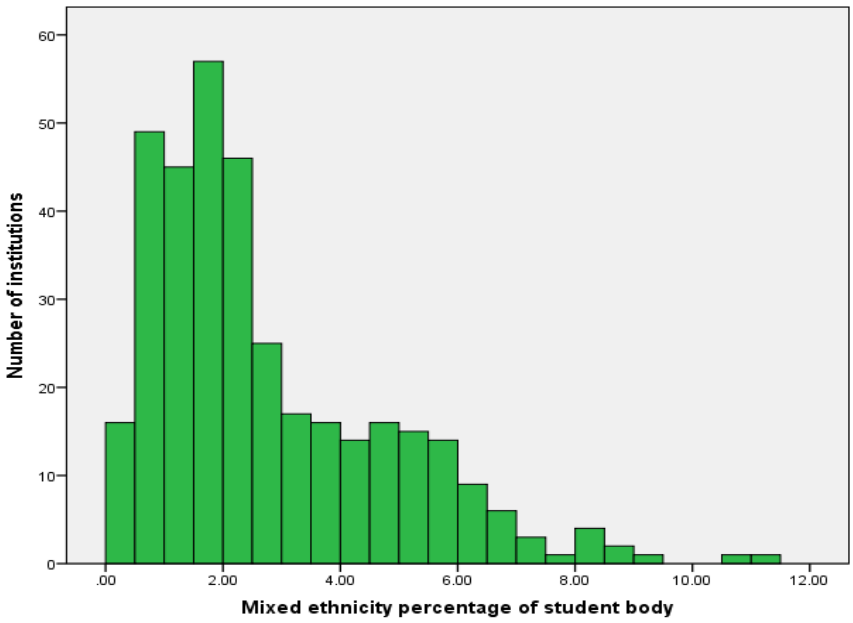
Percentage Black[1]	Sixth form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
70-79	1	1.1%				
60-69	2	2.1%				
50-59						
40-49	3	3.2%	1	0.4%		
30-39	1	1.1%	6	2.7%		
20-29	2	2.1%	13	5.8%	3	7.5%
10-19	13	13.8%	22	9.8%	3	7.5%
0-9	72	76.6%	182	81.3%	34	85.0%

[1] *Percentage Black rounded down*

Mixed ethnicity students at an institutional level

The mean of the percentage of mixed ethnicity students from any background in colleges is 2.8% (c.f. 2.7% system mean in Figure.9.6). However, the range (11.2%) and standard deviation (2.0%) are relatively small compared to larger minority groups in the data (Black and Asian) suggesting less potential for diversity on this variable. Figure 9.10, which shows the distribution of mixed ethnicity students at all colleges, demonstrates that not only is there a substantial number of colleges with very few mixed ethnicity students(65 under 1% and 167 under 2%), there is also only a small minority of colleges (57) that enrol even 5% of their student population from an ethnically mixed background.

Figure 9.10 - Distribution of the percentage of mixed ethnicity students at colleges



The 20 colleges with the highest mixed ethnicity student percentage can be seen in Table 9.19. Within this list there are eight sixth form colleges, nine general FE colleges and three specialist colleges. The final column in the table shows the majority sub-group at each individual college and the percentage of the mixed ethnicity students that are made up by that subgroup. The majority of the colleges (16 out of the 20) with a high mixed ethnicity population are

dominated by White and Black Caribbean mixed ethnicity students. However, there is also one college with White and Black African as the largest mixed ethnicity group and three with 'any other mixed ethnicity background' as the largest group. The 20 colleges with the lowest mixed ethnicity student percentage are all under 0.6%, though only two colleges enrol no mixed ethnicity students at all (Pengwern College and the West of England College). The lowest 20 contains one sixth form colleges, 13 general FE colleges and six specialist colleges and ranges in percentage from 0% to 0.6%.

Table 9.19 – The 20 colleges with the highest percentage of mixed ethnicity students

Rank	College	Type[1]	Percent mixed ethnicity students	Total students (all ethnicities)	Majority sub-group[2] and percent
1	Woodhouse College	SFC	11.2%	1,189	AOM - 38.9%
2	Southgate College	GFEC	10.8%	5,725	WBC - 34.6%
3	Richmond upon Thames College	GFEC	9.2%	5,560	WBC - 35.4%
4	Barnet and Southgate College	GFEC	8.8%	14,922	WBA - 36.9%
5	Loreto College	SFC	8.6%	2,305	WBC - 49.2%
6	Coulsdon Sixth Form College	SFC	8.3%	1,475	WBC - 42.6%
7	Hillcroft College (Incorporated) Limited	SC	8.2%	489	WBC - 32.5%
8	John Ruskin College	SFC	8.2%	944	WBC - 48.0%
9	Kingston College	GFEC	8.1%	7,713	WBC - 34.3%
10	Cadbury Sixth Form College	SFC	7.7%	1,182	WBC - 53.9%
11	St Charles Catholic Sixth Form College	SFC	7.4%	1,143	WBC - 34.2%
12	Kensington and Chelsea College	GFEC	7.4%	15,951	WBC - 44.1%
13	Xaverian College	SFC	7.0%	1,951	WBC - 38.7%
14	Working Men's College Corporation	SC	7.0%	4,591	AOM - 21.9%
15	City of Westminster College	GFEC	6.9%	8,675	AOM - 42.3%
16	St Francis Xavier Sixth Form College	SFC	6.8%	1,357	WBC - 41.4%
17	Epping Forest College	GFEC	6.6%	3,925	WBC - 32.3%
18	Hackney Community College	GFEC	6.6%	8,090	WBC - 50.6%
19	Orchard Hill College of Further Education	SC	6.6%	335	WBC - 45.5%
20	Carshalton College	GFEC	6.4%	4,923	WBC - 48.8%

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*
[2] *WBC = White and Black Caribbean, WBA = White and Black African, AOM = Any Other Mixed ethnicity background*

Table 9.20 shows how the percentage of mixed ethnicity students breaks down over the administrative types over the whole system. The results are not comparable with the Asian and Black equivalent tables due to the different scale being used in order to show variation. If the same scale was used all colleges would be in the bottom box except for Woodhouse College and Southgate College which would be in the second box. In Table 9.20 sixth form colleges are shown to be 67.0% in the bottom two boxes, general FE colleges 79.0% and

specialist colleges 77.5%. Furthermore, the mean percentage of mixed ethnicity students at sixth form colleges is 3.3% compared to 2.6% at general FE colleges and 2.6% at specialist colleges which together show that mixed ethnicity student percentage is not very different in each of the college types. There are no colleges that enrol mixed ethnicity students as a high percentage of their total.

Table 9.20 - Distribution of college types by percentage of mixed ethnicity students

Percentage mixed ethnicity [1]	Sixth form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
10-11	1	1.1%	1	0.4%		
8-9	3	3.2%	3	1.3%	1	2.5%
6-7	5	5.3%	10	4.5%	4	10.0%
4-5	22	23.4%	33	14.7%	4	10.0%
2-3	31	33.0%	63	28.1%	10	25.0%
0-1	32	34.0%	114	50.9%	21	52.5%

[1] *Percentage mixed ethnicity rounded down*

Other ethnicity students at an institutional level

Students of Arabic descent in the original data set have been merged with the 'other' sub-group due to their small number and therefore join students that do not belong to any of the other listed backgrounds and those students who did not declare their ethnicity in this category. This lack of detail means that this category could not be used to differentiate colleges and is included only for the sake of completeness. The mean of the percentage of students from any other background in colleges is 3.5% (c.f. 4.1% system mean in Figure 9.6). However, the range (23.7%) is reasonably large suggesting there may be a small minority of colleges that recruit substantial numbers of students from other backgrounds. Nonetheless, the standard deviation (3.7%) is still relatively small compared to larger minority groups in the data (Black and Asian) suggesting only a small potential for diversity on this variable. Figure 9.11, which shows the distribution of students from other backgrounds at all colleges, demonstrates that not only is there a substantial number of colleges with none or very few students from other backgrounds (178 colleges under 1% and 266 colleges under 2%), there is only a small minority of colleges (30) that enrol more than 5% of their student population from other backgrounds.

The 20 colleges with the highest student from other backgrounds percentage can be seen in Table 9.21. Within this list there are three sixth form colleges, 15 general FE colleges and two specialist colleges. There is no column denoting the dominant sub-group of the other ethnicities as this does not provide any additional information. The 20 colleges with the lowest other ethnicities student percentage are all under 0.2%, with eight colleges enrolling no students from other backgrounds at all. The lowest 20 contains nine sixth form colleges, three general FE colleges and eight specialist colleges and ranges in percentage from 0% to 0.2%.

Figure 9.11 - Distribution of the percentage of all other ethnicities at colleges

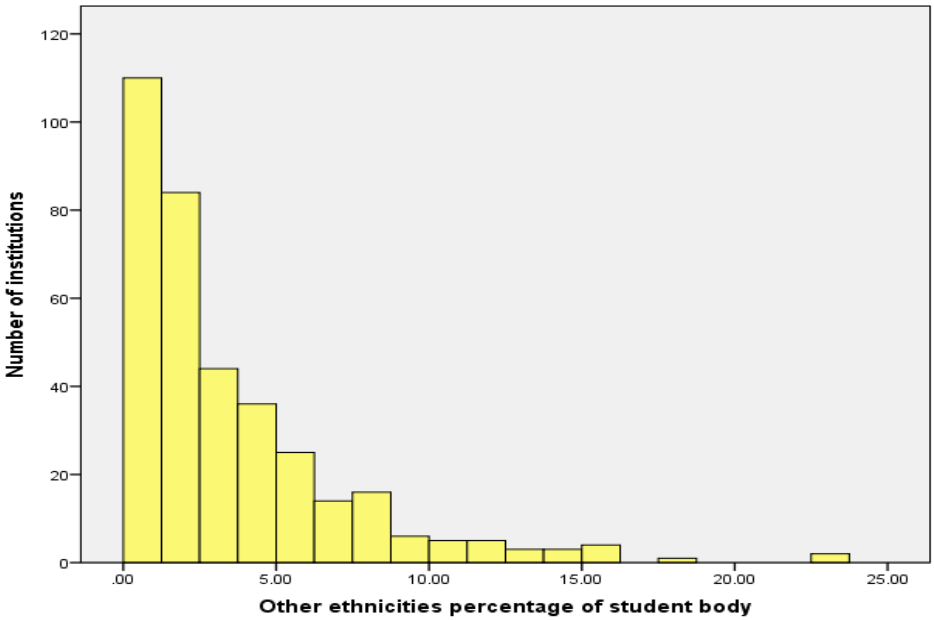


Table 9.21 – The 20 colleges with the highest percentage of students from other ethnic backgrounds

Rank	College	Type[1]	Percentage of students from other ethnic backgrounds	Total students (all ethnicities)
1	Truro and Penwith College	GFEC	23.7%	11,921
2	Kensington and Chelsea College	GFEC	22.5%	15,951
3	Strode College	GFEC	18.4%	10,183
4	Havering College of Further and Higher Education	GFEC	16.2%	13,286
5	Ealing, Hammersmith & West London College	GFEC	15.5%	25,522
6	Greenwich Community College	GFEC	15.4%	7,161
7	College of North West London	GFEC	15.2%	11,079
8	City and Islington College	GFEC	14.8%	14,894
9	City College, Brighton and Hove	GFEC	14.5%	7,388
10	Stroud College of Further Education	GFEC	14.2%	7,173
11	Mary Ward Settlement	SC	13.1%	4,827
12	Joseph Chamberlain Sixth Form College	SFC	12.7%	2,676
13	Hillcroft College (Incorporated) Limited	SC	12.7%	489
14	Harrow College	GFEC	12.1%	8,700
15	Godalming College	SFC	11.9%	1,917
16	Barnet and Southgate College	GFEC	11.8%	14,922
17	Hills Road Sixth Form College	SFC	11.8%	4,425
18	South Thames College	GFEC	11.7%	21,243
19	Westminster Kingsway College	GFEC	10.85	16,046
20	Hackney Community College	GFEC	10.65	8,090

[1] *GFEC = General FE College, SFC = Sixth Form College, SC = Specialist College*

Table 9.22 shows how the percentage of other ethnicities students breaks down over the administrative types over the whole system. Similar to mixed ethnicity students, the results are not comparable with the Asian and Black equivalent tables due to the different scale being used in order to show variation. If the same scale was used all colleges would be in the bottom two boxes except for two general FE colleges. In Table 9.22 sixth form colleges are shown to be 96.8% in the bottom two boxes, general FE colleges 92.0% and specialist colleges 95.0%. Furthermore, the mean percentage of students from other ethnic backgrounds at sixth form colleges is 2.5% compared to 4.0% at general FE colleges and 3.1% at specialist colleges which together show that the percentage of students from other ethnic backgrounds is not very different in each of the college types, though unusually sixth form college percentage is the lowest. It is only really Truro and Penwith College at 23.7% and Kensington and Chelsea College at 22.5% that can be considered to enrol a large proportion of their students from other ethnic backgrounds.

Table 9.22 - Distribution of college types by percentage of students from other ethnic groups

Percentage from other ethnic backgrounds[1]	Sixth form		General FE		Specialist	
	Number	Percent	Number	Percent	Number	Percent
20-24			2	0.9%		
15-19			5	2.2%		
10-14	3	3.2%	11	4.9%	2	5.0%
5-9	12	12.8%	43	19.2%	6	15.0%
0-4	79	84.0%	163	72.8%	32	80.0%

[1] *Percentage from other ethnic backgrounds rounded down*

Chapter 10: Two-way variable analysis

Chapter 10 examines whether or not each pair of variables are related and if so, how they interact with each other. Size is excluded from this analysis because, unlike all the other variables, it is not represented as a categorical variable in the ILR data set and thus does not have multiple components at the system level. For each pair of variables a test to establish the presence of a relationship is reported along with *a post-hoc* test to determine the strength of any relationship. The associations are reported in descending order of the strength of the respective relationships. Finally, each two way association includes graphs to examine the nature of any association.

The chi-square test (as detailed in Chapter Seven, Section 7.2.2) using the course aims data set[7] was conducted in order to establish if the variables are related, with a non significant result indicating no relationship. In all cases the *post-hoc* test conducted was Cramer's V[8], which was selected as it gives the most accurate results for variables with more than two categories (Field, 2009). These results demonstrate whether and how strongly the variables in each pair are related.

Examining the patterns of association between each category within the variables on the graphs and/or tables reveals the relationships involved. These relationships were examined in both directions (e.g. level with mode and mode with level) and any substantial divergences are reported. This illustrates the differing levels of engagement that one category of a variable may have with all categories of another variable. For example, it demonstrates if the patterns of engagement in the various modes of study are different at level one and level two (or any other level).

The chapter is divided into two parts and numerous sub-sections. The first part contains the reports on the moderate associations identified by the Cramer's V test (V value between 0.3 and 0.5) and the second part contains the reports on the weak associations (V value between 0.1 and 0.3). The very weak associations (V value below 0.1) are reported on in Annex Four but as limited meaning can be drawn from such weak associations, they are not included in the main text.

Each sub-section, in both parts, provides the number of aims involved in the percentages shown in the graph labels. However, due to the number of subjects this was not possible on the subject graphs. Therefore, Table 10.1 shows the number of aims in each subject group (the relative contribution each subject makes is shown in Chapter Eight).

[7] This was done so all data would be at the same level, as subject data must be examined at the aims level.

[8] Cramér's V (sometimes referred to as Cramér's phi and denoted as V or ϕ_c) is a measure of association between two nominal variables, giving a value between 0 and +1 (inclusive). It is based on Pearson's chi-squared statistic (Cramer, 1946).

Table 10.1 - Subject of study aims totals

Subject group	Total aims
Health, Public Services and Care	711,093
Science and Mathematics	338,549
Agriculture, Horticulture and Animal Care	140,441
Engineering and Manufacturing Technologies	407,423
Construction, Planning and the Built Environment	317,624
Information and Communication Technology	290,397
Retail and Commercial Enterprise	393,713
Leisure, Travel and Tourism	297,014
Arts, Media and Publishing	508,485
History, Philosophy and Theology	109,542
Social Sciences	95,691
Language, Literature and Culture	255,072
Education and Training	82,063
Business, Administration and Law	548,908
Key and Basic Skills	1,426,674
General Studies and Enrichment Programmes	711,024
English as a Second Language	174,309
Preparation for Life and Work	818,206
Unknown or Not Classified	406,900

10.1: Moderate associations

10.1.1: Subject and level of study

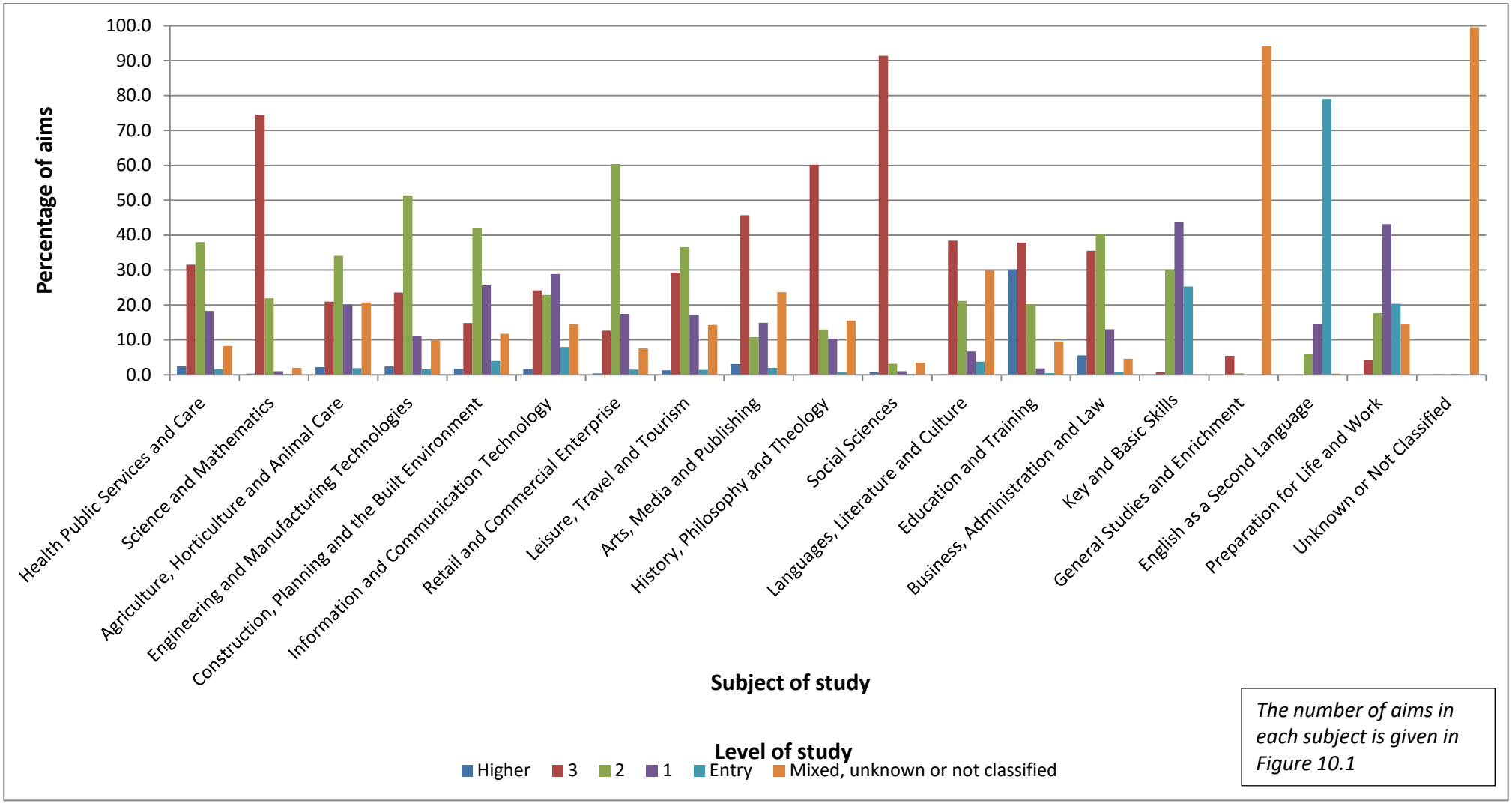
The chi-square test of an association between subject and level of study indicates that there is a statistically significant moderate to strong association (χ^2 (95) = 9,433,686.2, $p < .001$, V = .485, $p < .001$). Figure 10.1 shows the dispersion of each of the level of study for courses in each of the subjects of study and Figure 10.2 shows the reciprocal relationship.

Figure 10.1 reveals clearly that subject has a relationship with level of study. There are some subject groups which have similar characteristics to other subject groups such as Engineering and Manufacturing Technologies and Construction, Planning and the Built Environment. However, no two subject groups share an identical level profile and many differ quite dramatically. For example, the Social Sciences subject group has 91.4% of its aims at level three, whereas, Retail and Commercial Enterprise has only 12.6% of its aims at that level. Indeed, Retail and Commercial Enterprise's highest level percentage is at level two with 60.4%, the highest of any subject group. These limited examples by no means define the scope of the variation within all the subject groups and their level dispersion and shape. Moreover, all subjects are different from all other subjects on at least one aspect of their profile. This clearly demonstrates a wide range of approaches in course design and certification in each of the subject areas.

Similarly, in examining the subject profile of each level of study in Figure 10.2 it is clear that each level of study has a small number of subjects that dominate. These subjects are summarised in Table 10.2. It should be noted that due to the differing numbers of aims in each subject, this table only truly represents the highly populated subjects. For the complete picture of less populous subjects consideration of both graphs is recommended. The most noticeable aspect of both the graph and the table is that lower level work is substantially less diverse, focusing on two or three subject groups only. Levels two and three contain a much more diverse selection of subject groups but even their shape is not similar. For example, there are much higher percentages at level three for Science and Mathematics and Arts, Media and Publishing (as illustrated in Table 10.2) than are present at level two. Equally, though there are similarities between the profiles of levels one and entry, there are still significant differences in shape even beyond the dominant groups listed in the table e.g. the much stronger presence of Health, Public Services and Care aims at level one.

However, the higher level aims, while still more diverse than at entry level and level one, are nonetheless specialised in two areas. Of particular interest is the high percentage of Education and Training courses (20.9%), which are not present at any significant percentage at any other level. Nevertheless, this is not to say that all Education and Training courses are at level four and above due to the different numbers of aims attempted at each level. However, it does show that both the subject diversity at each level varies and that some subjects are much more commonly attempted at some levels than others; it also shows the links between subject and level.

Figure 10.1 - Percentage of aims at each level of study by subject of study



The number of aims in each subject is given in Figure 10.1

Figure 10.2 - Percentage of aims in each subject of study by level of study

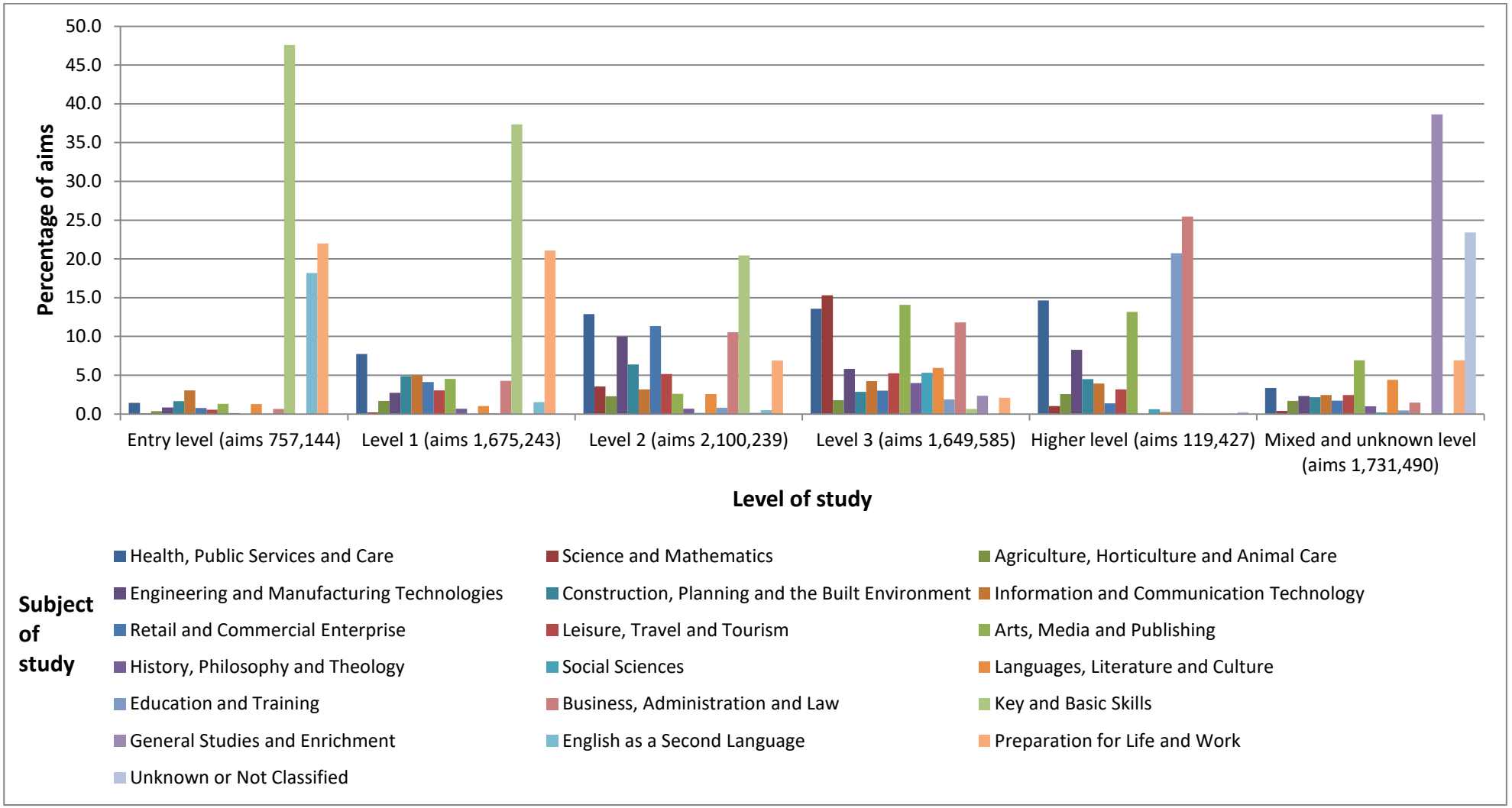


Table 10.2 - High percentage subjects by level of study

Level of study	High percentage subject area	Number of aims	Percent of level
Entry	Key and Basic Skills	360,432	47.6%
	Preparation for Life and Work	166,449	22.0%
	English as a Second Language	137,683	18.2%
One	Key and Basic Skills	625,602	37.3%
	Preparation for Life and Work	353,075	21.1%
Two	Key and Basic Skills	429,290	20.4%
	Health, Public Services and Care	270,297	12.9%
	Retail and Commercial Enterprises	237,778	11.3%
	Business, Administration and Law	221,678	10.6%
	Engineering and Manufacturing Technologies	209,409	10.0%
Three	Science and Mathematics	252,330	15.3%
	Arts, Media and Publishing	232,295	14.1%
	Health, Public Services and Care	224,103	14.6%
	Business, Administration and Law	195,007	11.8%
Higher	Business, Administration and Law	30,385	25.4%
	Education and Training	24,753	20.7%
	Health, Public Services and Care	17,483	14.6%
	Arts, Media and Publishing	15,728	13.2%
Unknown, Mixed and N/A	General Studies and Enrichment	669,238	38.7%
	Unknown or Not Classified Subjects	405,099	23.4%

10.1.2: Subject of study and gender

The chi-square test of an association between subject and level of study indicates that there is a statistically significant moderate association (χ^2 (19) = 837,780.6, $p < .001$, V = .323, $p < .001$). Figure 10.3 shows the dispersion of each of the levels of study for courses in each of the subjects of study and Figure 10.4 shows the reciprocal relationship.

Figure 10.3 shows the percentage of male and female students for each subject group. It is sorted into order of highest to lowest percentage of males as a visual aid, and it can be clearly seen that with two exceptions all the subjects are between 28.8% and 64.3% of male students undertaking the aims. Furthermore, it is a relatively linear progression from the lowest to the highest with a reasonably even spacing between each point of increase. The two exceptions to this are Engineering and Manufacturing Technologies (90.7%) and Construction, Planning and the Built Environment (96.8%), which both have extremely high percentages of male students. This figure, in showing the gender balance of each subject, demonstrates that subject has an association with gender, with some subjects being markedly more popular with a specific gender.

Figure 10.3 - Percentage of aims for male and female students by subject of study

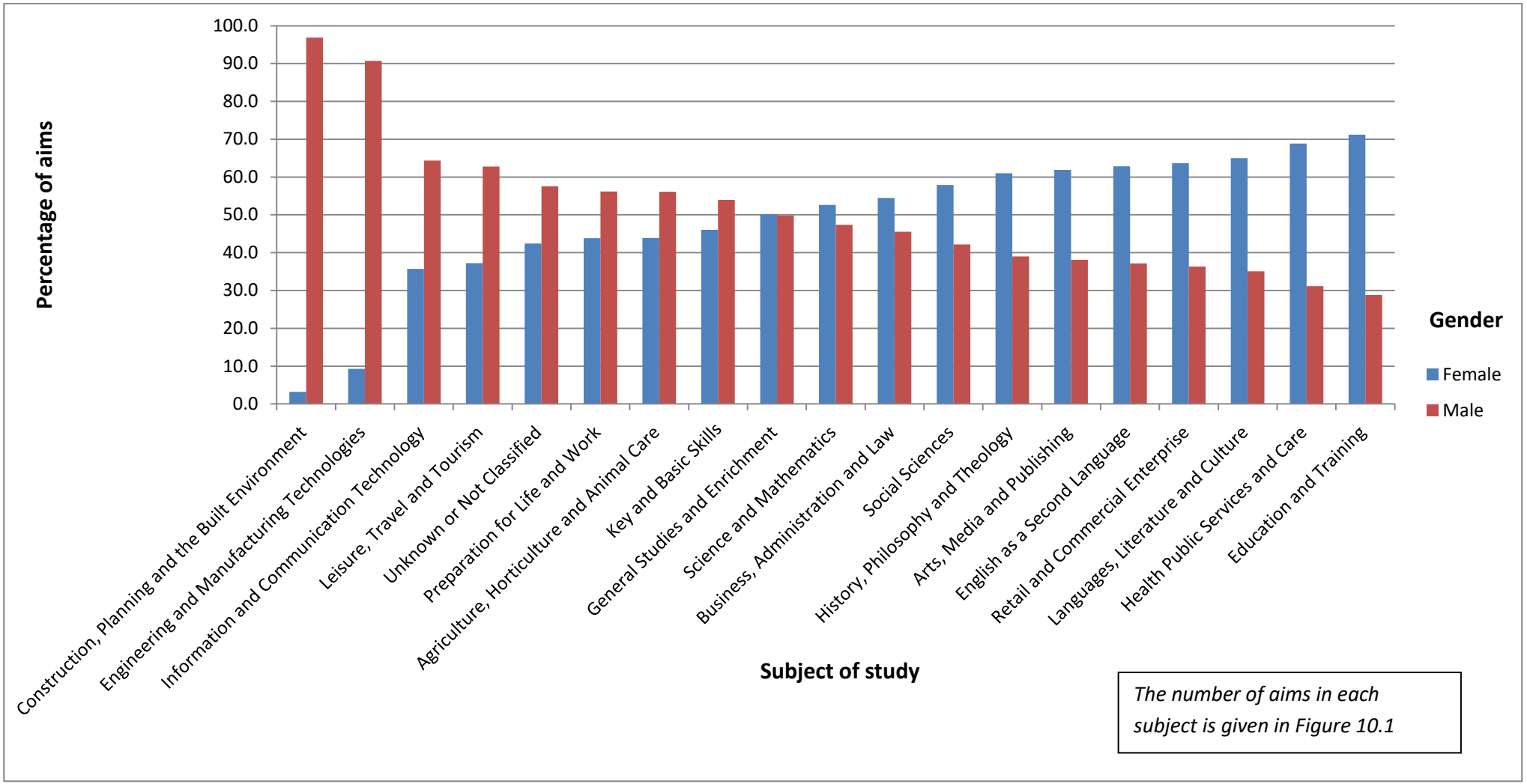
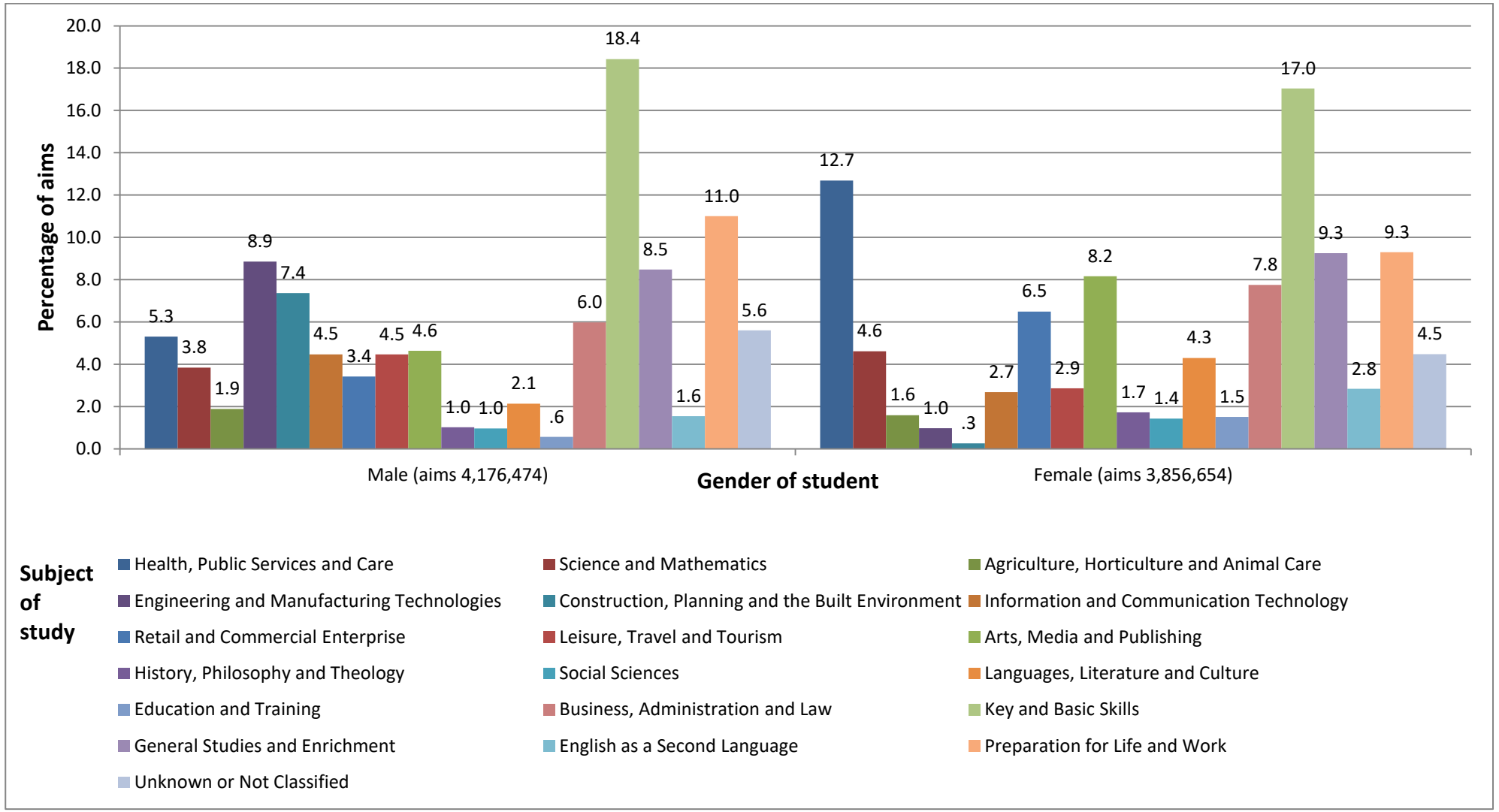


Figure 10.4 - Percentage of aims in each subject of study by gender of student



It is perhaps in the subject of study where the biggest gender differences are found. Figure 10.4 shows the percentage of aims attempted by each gender in each subject of study, e.g. 1.9% of aims that are being attempted by male students are in Agriculture, Horticulture and Animal Care. In some subject areas the percentage of aims for each gender is roughly similar and no obvious effect for gender is noticeable. However, in some subjects such as Health, Public Services and Care, Engineering and Manufacturing Technologies, and Construction Planning and the Built Environment, there are significant gender differences. Table 10.3 summarises the subjects with such differences between the genders, showing the percentage of the total aims attempted by each gender. The table and figure are not intended to show the gender balance of each subject, but it is intended to show the relative dispersion of each subject for each gender. In conclusion, the shape of each graph is noticeably different and it is clear that gender does have an impact on the subject of study; indeed it is on subject that gender has its biggest influence.

Table 10.3 - Subjects which are studied by a greater percentage of one gender

Strong subject groups	No. of aims by males	Percent of total aims by males	No. of aims by females	Percent of total aims by females
Engineering and Manufacturing Technologies	369,688	8.90%	37,735	1.00%
Construction, Planning and the Built Environment	307,564	7.40%	10,060	0.30%
Information and Communication Technology	186,802	4.50%	103,595	2.70%
Leisure, Travel and Tourism	186,482	4.50%	110,532	2.90%
Languages, Literature and Culture	89,397	2.10%	165,675	4.30%
Retail and Commercial Enterprise	143,138	3.40%	250,575	6.50%
Arts, Media and Publishing	193,725	4.60%	314,760	8.20%
Health, Public Services and Care	221,628	5.30%	489,465	12.70%

10.2: Weak associations

10.2.1: Mode of study and age of student

The chi-square test of an association between mode and age group of student indicates that there is a statistically significant weak to moderate association (χ^2 (42) = 3,979,190.9, $p < .001$, V = .287, $p < .001$). Figure 10.5 shows the dispersion of each age group for courses attended using each of the modes of study and Figure 10.6 shows the reciprocal relationship.

Firstly, in examining the average age by each mode of study in Table 10.4 it is clear that there is a very strong impact from only one mode of study, full-time full-year. This mode has a markedly lower average age than do all the other modes; thus, if you have an institution with a high percentage of full-time full-year study, you would also expect them to have a low average age. In contrast all the part-time modes of study have an average age of above 32. Indeed it is only evening and distance learning that slightly stands out from the rest with 37.1 and 37.6

respectively. Furthermore, with full-time part-year having an average age of 29.3 it is closer in profile to the various part-time study options. Therefore, it is reasonable to conclude that which type of part-time study being used does not have a big impact on the average age; indeed it is only whether or not the aims are studied as part of a full-time full-year programme that does.

Table 10.4 - Average age of student by mode of study

Mode of study	Total aims in mode of study	Average age (years)
Full-time full-year	3,618,302	18.1
Full-time part-year	424,175	29.3
Part-time - other including e-learning	3,470,566	32.2
Part-time - open	27,961	34.2
Part-time - distance learning	120,692	37.6
Part-time - evening	346,998	37.1
Unknown or not applicable mode	24,434	30.1
Overall	8,033,128	26.0

This conclusion is further supported by examining Figure 10.5, though it shows that the reason for the slightly higher average ages for distance learning and evening mode aims is the lower percentages of 16-18 year old students taking those aims. Moreover, this leads to increased percentages in 45-59 year olds in distance learning and 25-34 and 60+ for evening classes. Indeed, evening classes attract a higher percentage of its aims in the 60+ age group than does any other mode of study.

Figure 10.6 shows that the percentage of full-time full-year study gets lower the older the student age group gets (with the exception of under-16s) and that the overall mode profile of the age groups covering the ages 21-59 are almost identical with only small variations in the percentages of the two major modes of study. The only exception to this is the elevated percentage of evening and part-time other including e-learning modes of study for the 60+ age group leading to reduced percentages in all other modes of study. However, it is in the under-16 and 16-18 groups that the major differences are found. The under-16 group is the exception to the rule that the older the age group the higher the percentage of part-time other including e-learning mode of study. This group maintains a 16.6% to 74.3% split between the two major modes of study full-time full-year and part-time other including e-learning and very little engagement with any other mode of study except full-time part-year (only 1.2% in evening classes). This unusual pattern could be explained by the presence of young students in colleges being in association with a school where they take the bulk of their lessons, attending classes in only one subject that is not currently offered by their local school. However, this is beyond the data and tracking the student's presence in other types of education is beyond the bounds of this study.

The 16-18 age group has by far the highest percentage of full-time full-year aims at 80.3% (more than double the next highest at 35.8%). This is of course not unexpected with many students at this age group undertaking A-levels (or equivalent). Nonetheless, this distinct profile from all other modes of study is further reinforced by the reduced engagement with all other modes of study with only a total of 2.8% of students outside the main two modes.

Figure 10.5 - Percentage of aims in each age group of student by mode of study

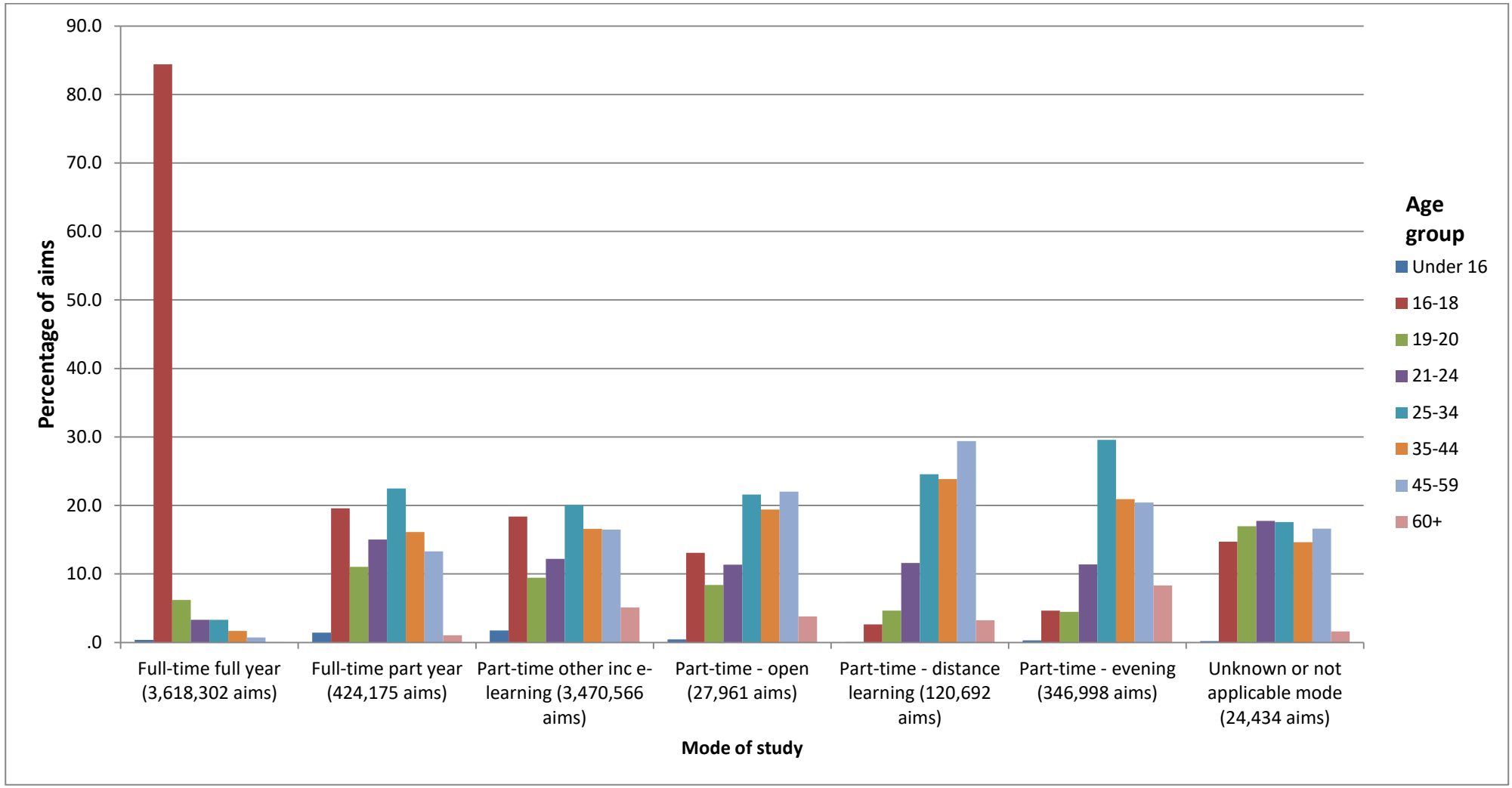
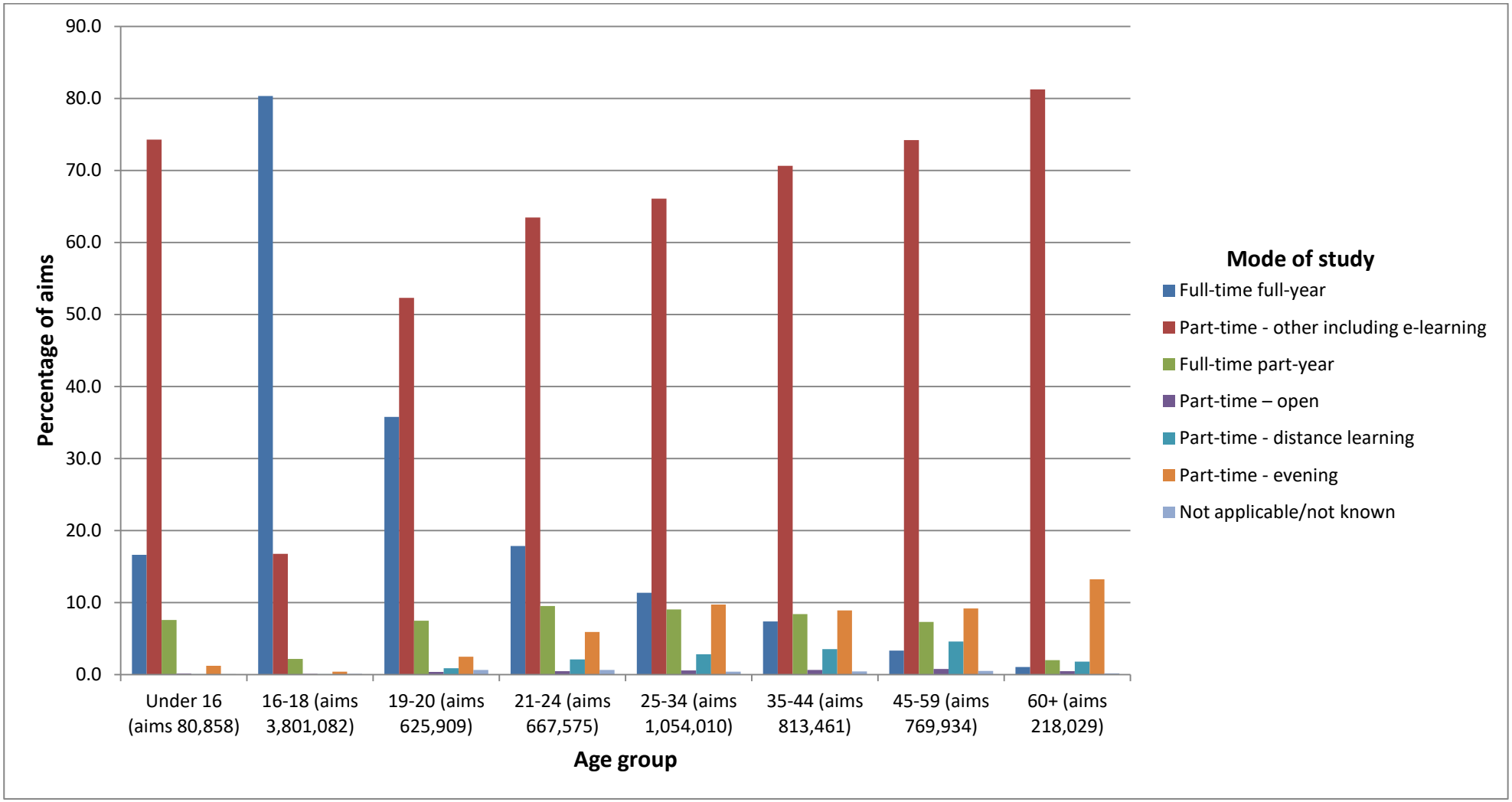


Figure 10.6 - Percentage of aims in each mode of study by age group of student



10.2.2: Subject and mode of study

The chi-square test of an association between subject and mode of study indicates that there is a statistically significant weak association (χ^2 (114) = 2,471,560.7, p < .001, V = .226, p <.001). Figure 10.7 shows the dispersion of each of the modes of study for courses in each of the subjects of study and Figure 10.8 shows the reciprocal relationship.

Figure 10.7 makes it clear that there are a wide variety of engagements with each mode of study. However, as there are 18 subject groups (plus Unknown subject) the analysis of subject interactions is necessarily more complex than for other variables. Thus analysis is broken down into two key stages, firstly comparison of the two key (i.e. majority) modes of study and secondly exception reporting of the minority modes of study for each subject. In comparing subjects on the two most common modes of study (full-time full-year and part-time other including e-learning) it is clear that there is a wide range of utilisation of both modes of study (Figure 10.7). Furthermore, as these are by far the most common modes of study, it tends to follow that if one goes up the other comes down rather than the percentage going into other modes of study (though this is not always the case and exceptions will be highlighted later).

Therefore, Table 10.5 highlights the sets of subject groups that can reasonably be described as high full-time full-year and low part-time other including e-learning, the opposite (percentages more than 15% apart with the higher score being the dominant mode) and a balanced approach (percentages within 15% of each other). This is intended as a simple summary to aid understanding of the graph and some subjects are on the border between the two groups e.g. Health, Public Services and Care, of which the percentages are 14.5% apart with part-time other including e-learning being the higher mode.

As mentioned previously, some subject groups also have exceptionally high percentages in some of the less common modes of study. This further demonstrates the diversity of approaches between the different subject groups and these are summarised in Table 10.6. This is a summary intended for ease of understanding and there are again characteristics or subjects that are close to the border and could arguably have been included. For example, both Education and Training and Information and Communication Technology have elevated levels of part-time open but this was not included due to the low percentages involved.

In conclusion the association between subject and mode is quite dramatic with wide variation across a number of the modes of study. Whilst, the mode of study profiles of subjects also vary widely illustrating the diversity of approaches to mode of study between subject groups.

Table 10.5 - Dominant common mode of study for each subject group

Dominant mode of study	Subject group	Percent F-T F-Y[1]	Percent P-TOe[2]
High full-time full-year low part-time other including e-learning	Science and Mathematics	89.1%	6.5%
	Arts, Media and Publishing	54.3%	32.1%
	History, Philosophy and Theology	74.4%	21.3%
	Social Sciences	90.9%	6.8%
	Languages, Literature and Culture	55.2%	24.2%
	General Studies and Enrichment	92.1%	6.7%
Balanced	Health Public Services and Care	33.9%	48.4%
	Agriculture, Horticulture and Animal Care	44.5%	47.7%
	Information and Communication Technology	32.9%	46.3%
	Leisure, Travel and Tourism	48.0%	40.1%
	Key and Basic Skills	39.9%	53.1%
	Preparation for Life and Work	46.4%	34.4%
High part-time other including e-learning and low full-time full-year	Engineering and Manufacturing Technologies	25.6%	64.7%
	Construction, Planning and the Built Environment	28.3%	57.5%
	Retail and Commercial Enterprise	34.2%	52.3%
	Education and Training	5.9%	69.0%
	Business, Administration and Law	30.6%	54.1%
	English as a Second Language	17.3%	57.1%
	Unknown or Not Classified	13.3%	82.7%

[1] F-T F-Y = full-time full-year, [2] P-TOe = part-time other including e-learning

Table 10.6 - Unusual mode characteristics by subject

Unusual mode characteristic	Subject group	Aims in subject group in this mode	
		Number	Percent
High part-time distance learning	Health Public Services and Care	54,668	7.7%
High part-time evening	Languages, Literature and Culture	43,916	17.2%
	Education and Training	14,780	18.0%
	English as a Second Language	30,293	17.4%
High full-time part-year	Construction, Planning and the Built Environment	29,557	9.3%
	Information and Communication Technology	31,767	10.9%
	Preparation for Life and Work	115,574	14.1%

In examining the subject profile of each of the modes of study in Figure 10.8, it is clear that there are distinct differences between each of the modes of study. This is highlighted by the high spike of different subjects within each mode profile. However, as some subjects are more popular than others and thus have different numbers of aims associated with them, the differences between percentages can be less obvious in some cases. Nonetheless, Table 10.7 summarises the subject areas with the highest engagement with each of the modes of study. This does not represent the most popular modes of study for a particular subject area (see Figure 10.7). Rather, it emphasises the difference in the subject profiles of each mode of study.

Figure 10.7 - Percentage of aims in each mode of study by subject of study

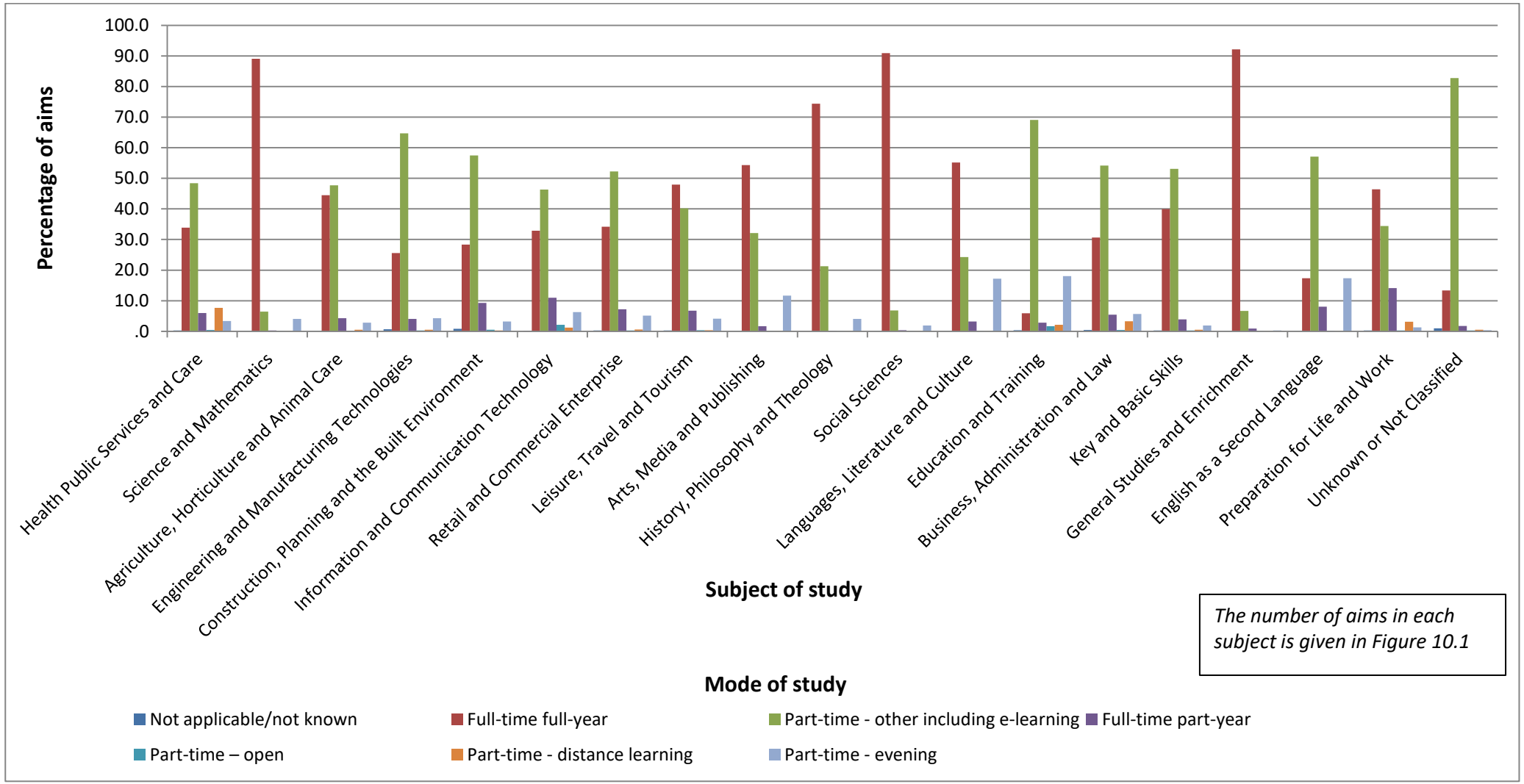
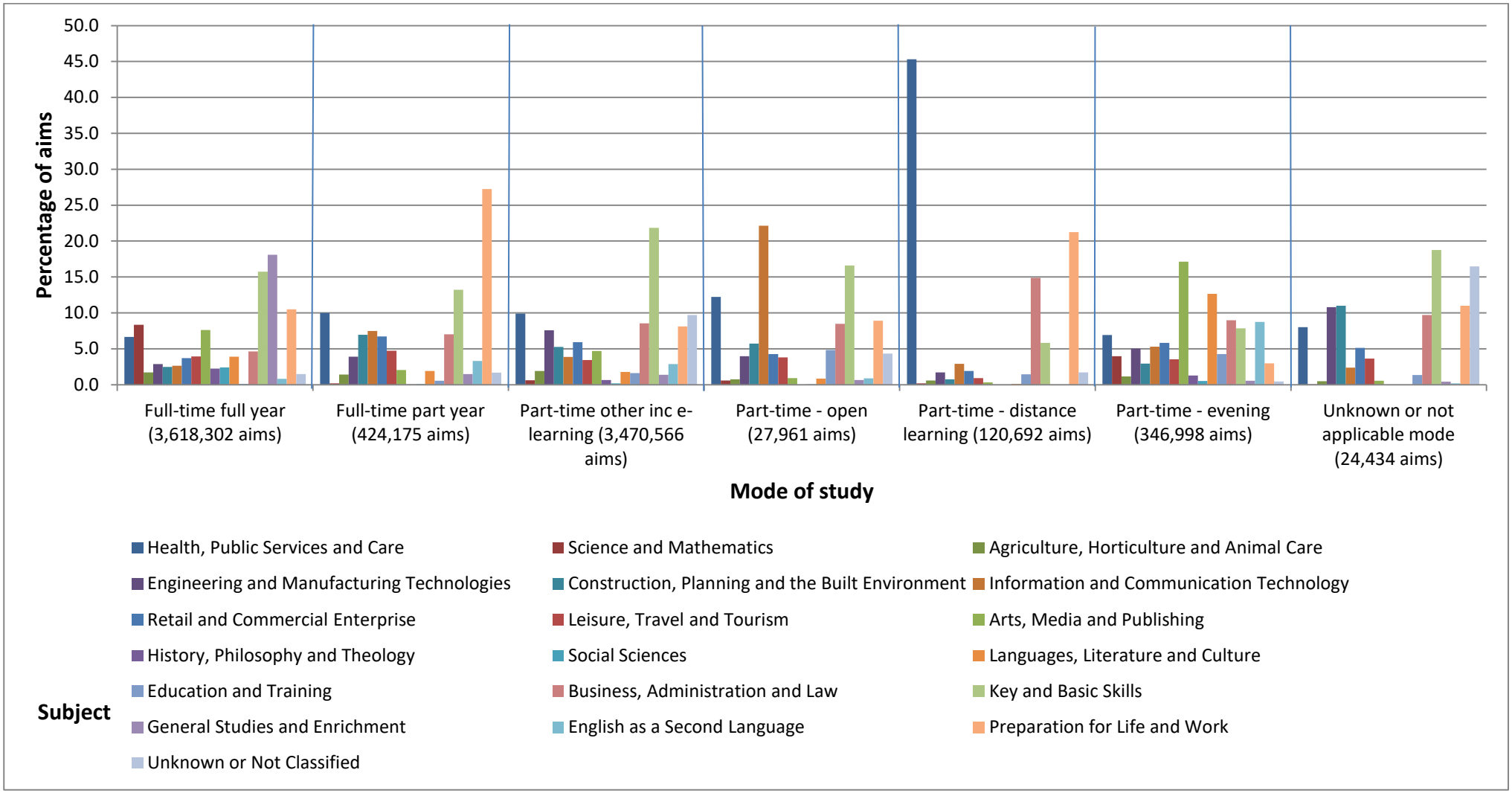


Figure 10.8 - Percentage of aims in each subject by mode of study



In addition to the high engagement areas identified above, the overall shape of each graph also varies across each of the modes of study for many of the other subjects. For example, for full-time full-year the Arts, Media and Publishing subject group represents a higher percentage of aims than does Leisure, Travel and Tourism, but in three of the other modes of study this is not the case. Such variations illustrate the ways in which mode of study and subject of study have an effect on each other.

Table 10.7 - High percentage subjects by mode of study

Mode of study	High percentage subject area	Number of aims	Percent
Full-time full-year	Science and Mathematics	298,765	89.2%
	General Studies and Enrichment	644,412	92.2%
Full-time part-year	Preparation for Life and Work	113,546	14.1%
	Leisure, Travel and Tourism	19,679	6.8%
Part-time - other including e-learning	Key and Basic Skills	747,116	53.5%
	Agriculture, Horticulture and Animal Care	65,336	48.0%
Part-time - open	Information and Communication Technology	5,936	2.1%
	Education and Training	1,137	1.7%
Part-time - distance learning	Health, Public Services and Care	53,263	7.6%
	Business, Administration and Law	17,847	3.3%
Part-time - evening	Arts, Media and Publishing,	57,514	11.6%
	Languages, Literature and Culture	42,847	17.0%
Unknown or not applicable	Unknown or Not Classified Aims	3,991	1.0%
	Engineering and Manufacturing Technologies	2,621	0.7%
	Construction, Planning and the Built Environment	2,684	0.9%

10.2.3: Subject of study and age of student

The chi-square test of an association between subject of study and the age group of students indicates that there is a statistically significant weak association (χ^2 (133) = 1,890,183.8, p < .001, V = .183, p <.001). Figure 10.9 shows the dispersion of each of the age groups of students for courses in each of the subjects of study and Figure 10.10 shows the reciprocal relationship.

In addition to the association between the age group of students and the subject of study, it is possible to examine the relationship between subject group and age by comparing the average age of students in each subject group. Table 10.8 shows the average age of students in each subject group and it can be clearly seen that there are three broad groups. Firstly, there are three subjects with an average age of around 17 or 18. Combined with the relatively low standard deviations for these subject groups, this suggest that there are relatively few mature students attending courses in these subject areas (56,842 out of 1,145,251 aims). Secondly, there is a group of 13 subjects with an average age between 24.9 and 29.9 which fall in the middle of the spectrum; as these subject groups also have relatively high standard deviations; this indicates that there is a range of both younger students and older students in these subject areas. Finally, there is a second group of three subjects with an average age of

between 32.4 and 36.1. Therefore, these subject groups would have a much higher engagement of mature students than for any of the other subject groups.

Table 10.8 - Average age of students in each subject group

Subject group	Number of aims where age is known[1]	Average age	Standard deviation
General Studies and Enrichment	711,023	17.5	3.5
Social Sciences	95,690	18.2	7.4
Science and Mathematics	338,538	18.2	6.3
Preparation for Life and Work	817,999	24.9	12.0
Key and Basic Skills	1,426,483	25.6	11.8
Leisure, Travel and Tourism	296,973	25.7	15.8
Unknown or Not Classified	406,890	26.0	11.7
Agriculture, Horticulture and Animal Care	140,048	26.9	14.2
Retail and Commercial Enterprise	393,614	27.1	12.6
Construction, Planning and the Built Environment	317,526	27.1	12.1
History, Philosophy and Theology	109,521	27.4	20.2
Engineering and Manufacturing Technologies	407,380	27.5	12.6
Languages, Literature and Culture	255,039	27.5	16.9
Business, Administration and Law	548,703	27.9	12.5
Health Public Services and Care	710,727	28.6	13.3
Arts, Media and Publishing	508,256	29.9	18.9
Information and Communication Technology	290,154	32.4	16.5
English as a Second Language	174,279	32.4	10.9
Education and Training	82,015	36.1	11.7

[1] *There is 2,064 aims where the age of the student is unknown so the total aims in each subject group are slightly different to those in Figure 10.1.*

Figure 10.9 clearly shows that the defining characteristic of almost all subject areas is the percentage of students in the age range 16 to 18 that the subject attracts. The three subjects identified above with average ages of 17-18 are each characterised as you would expect by very high percentages of 16-18 year olds. However, the middle group of subjects is perhaps the most interesting, with a range of dispersion patterns shown for the various subject groups. For example, the History, Philosophy and Theology group has a very high percentage of 16-18 year olds (68.4%) and then, with one exception, relatively few in all the rest of the groups with none higher than 3.9%; the exception being 15.5% in the 60+ age group.

Similarly the Arts, Media and Publishing group has a reasonably high percentage of 16-18 year olds (51.6% of the aims – see Table 10.8) and relatively few students in the middle age groups but relatively high percentages in the later two age groups of 45-59 (10.4%) and 60+ (12.5%). In contrast, Construction, Planning and the Built Environment has a relatively low percentage of 16-18 year olds (31.5%) and a relatively even dispersion over all other age groups with the exception of 60+ which is only 1.4%. Equally, the subjects in the third group highlighted above do not all follow a similar pattern. Both Education and Training and English as a Second

Language have a very low percentage of 16-18 year olds (4.7% and 9.8% respectively). Education and Training is relatively evenly distributed between the three groups covering ages 25-59. However, English as a Second Language is dominated by the 25-34 age group (36.1%), though also with a relatively high percentage in the 35-44 age group (24.0%). In contrast to this the other high average age subject, Information and Communication Technology (ICT) has a much higher percentage both of 16-18 year olds than both of the former (31.0%). However, ICT also maintains a much more even dispersion between all the other age groups, including a 7.6% from the 60+ age group, substantially higher than the other high average age group members (1.5% and 1.3% respectively).

Figure 10.10 shows that for some subject groups there is a fairly consistent presence in the percentage of students in that age group. For example, Key Skills is consistently between 16% and 22% for all groups except for under-16 and 60+. Similarly, Preparation for Life and Work is consistently between 9.7% and 11.5% for all age groups except under-16 and 60+. However, the percentage of under-16's studying Key Skills is lower than for most groups (10.3%, whereas, for Preparation for Life and Work the percentage is higher (20.2%). Nonetheless, the most significant differences are between the 16-18 age group and all other groups. This age group has, as you would expect, much higher percentages in the common A-level subjects than does any other age group and therefore, lower percentages in many other areas (though the raw student numbers may still be greater). The mature student age groups are on the whole very similar with the odd subject area standing out in some cases (e.g. the percentage of ICT getting steadily higher as the age group gets older) but in general patterns of all the age groups covering 19-59 are highly similar.

Moreover, the under-16 and 60+ age groups present different behaviour patterns. Of these the under-16 group is the most similar to the 19-59 groups. It is likely to include many students attempting subjects not covered by their schools such as practical subjects like Construction, Planning and the Built Environment or Engineering and Manufacturing Technologies. However, as these are also subjects attempted by many adults seeking to gain employment or improve skills, there is still a high degree of similarity. Indeed, it is only in subjects like Business, Administration and Law (which has a substantially lower percentage than the 19-59 age range) and Agriculture, Horticulture and Animal Care (substantially higher) that any differences can be identified.

The other group with the most substantial differences between it and the other groups is the 60+ age group. This group contains many individuals who have retired and therefore courses they attempt are often for life enrichment rather than to further careers or to seek employment. This is evidenced by the high percentages of aims in History, Philosophy and Theology (7.8%), ICT (10.1%), Languages, Literature and Culture (10.5%) and most substantially, in Arts, Media and Publishing (29.2%). These percentages are roughly double those of any other age group with the highest being more than four times larger. These clearly reflect substantially different subject selection patterns in the 60+ age group.

Figure 10.9 - Percentage of aims in each age group of student by subject of study

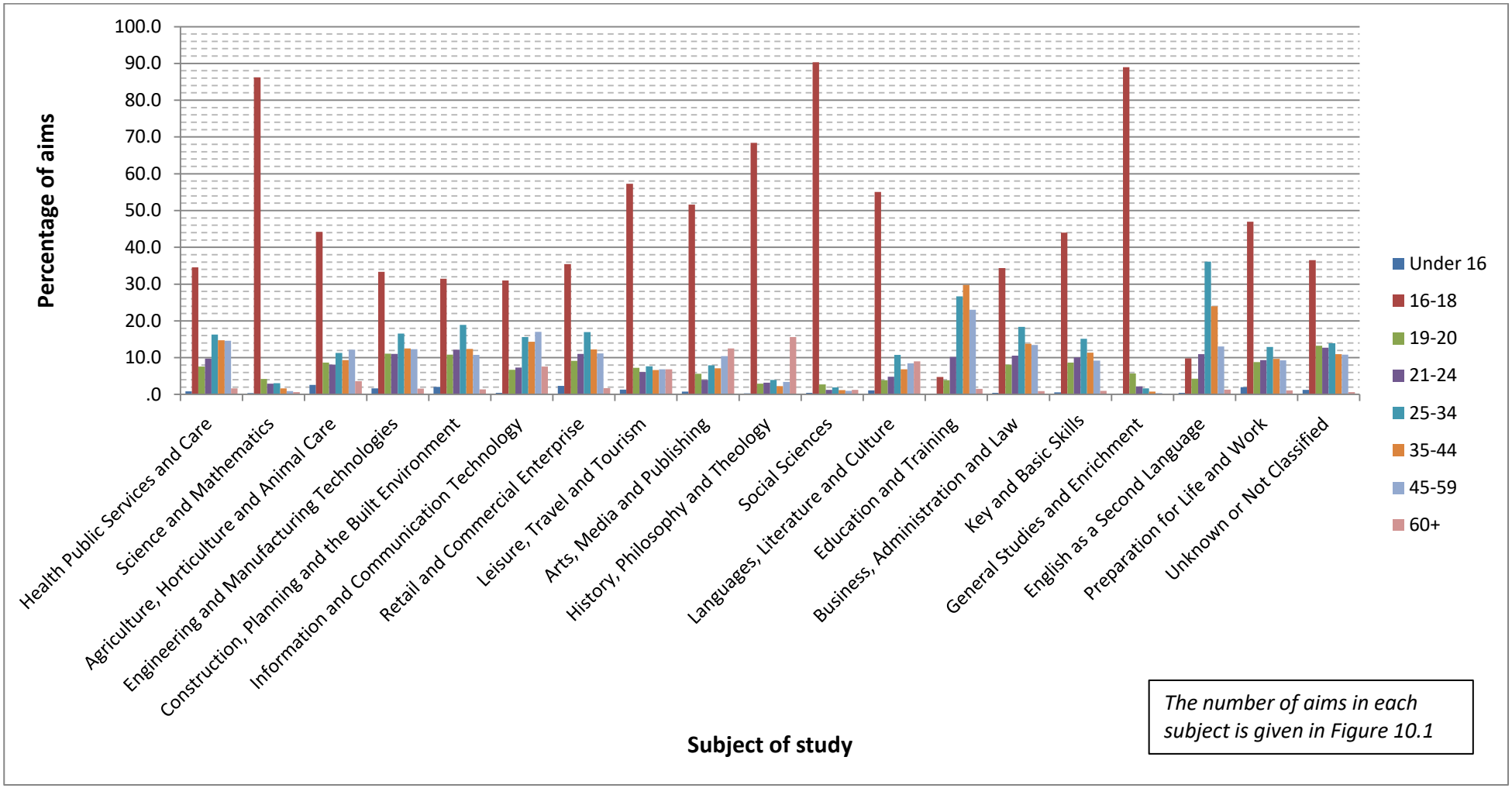
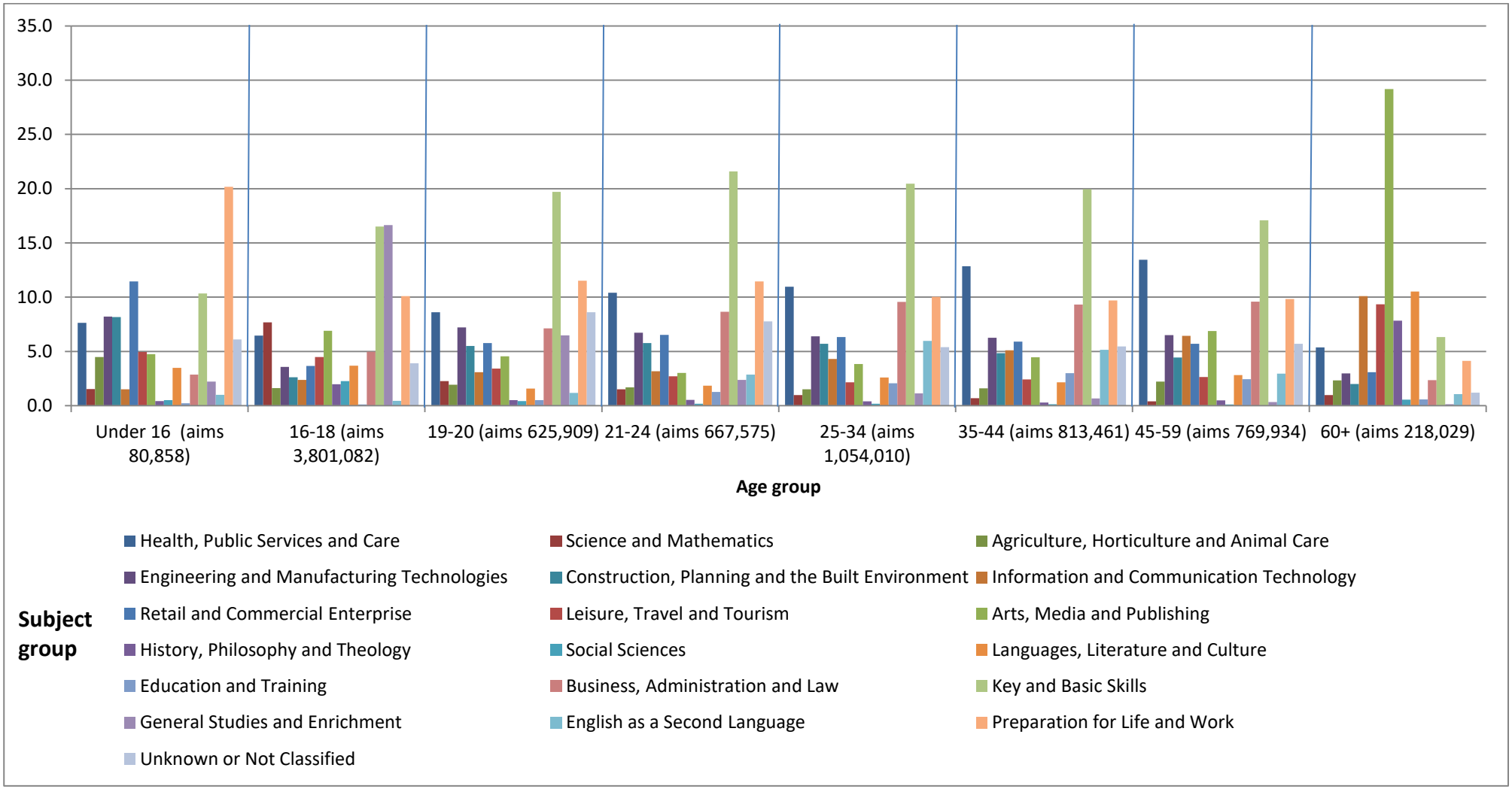


Figure 10.10 - Percentage of aims in each subject of study by age of student



10.2.4: Level of study and mode of study

The chi-square test of an association between level and mode indicates that there is a statistically significant weak association (χ^2 (30) = 997,744.6, p < .001, V = .158, p <.001). Figure 10.11 shows the dispersion of each of the modes of study for courses attended at each of the levels of study and Figure 10.12 shows the reciprocal relationship.

Figure 10.12 demonstrates that each mode of study has a distinctly different profile (represented by the shape of the distribution), though some differences are smaller than others. However, it should be noted that each of the modes of study represent substantially different numbers of aims e.g. full-time full-year and part-time other including e-learning represent roughly 3.5 million aims each, whereas, the other five modes of study represent less than one million aims between them. Nonetheless, the shape of each graph represents the profile of each individual mode of study and not the number of aims in that mode of study. While each mode of study is distinctly different from every other mode, this difference is not always represented at the same level. For example:

- Full-time full-year has a substantially higher percentage of level three aims than any other mode of study (32.7%, with 17.5% the next highest). However, it also has a relatively similar percentage of aims at entry level as do four of the other modes of study but it is much higher at this level than for part-time distance learning or unknown or not applicable mode.
- In addition the distinct difference in shape between full-time full-year and full-time part-year is also apparent with (as noted above) the focus of full-time full-year being on level three, whereas in contrast there is very little study at level three in full-time part-year where the focus is very much at levels one and two. This shows that even the two modes of full-time study are distinctly different.
- The two modes of study with the most similar profiles are part-time other including e-learning and part-time open. Their shape and percentage values are very similar with only the relative values of mixed and unknown level being slightly higher than level one study in the former and the reverse for the latter.
- In contrast, the very clear difference between part-time distance learning and all other modes of study is its focus on level two learning. Furthermore, part-time distance learning has the highest percentage of level three learning of any of the part-time modes of study. This demonstrates that despite the similarities between two of the part-time modes of study, there are also great differences between some of the other part-time modes of study.

These variations in shape show how the level of study relates to the mode of study and confirms the nature of the weak association identified by the chi-square test, though this is not necessarily a causal relationship.

Similarly, Figure 10.11 shows that the primary shape of each level of study when examining mode of study is largely dominated by the balance between full-time full-year and part-time other including e-learning (which for convenient reference have been placed next to each other in this graph). Interestingly, the percentage of full-time full-year study decreases as students progress up the levels with one notable exception, that of level three.

Figure 10.11 - Percentage of aims in each mode of study by level of study

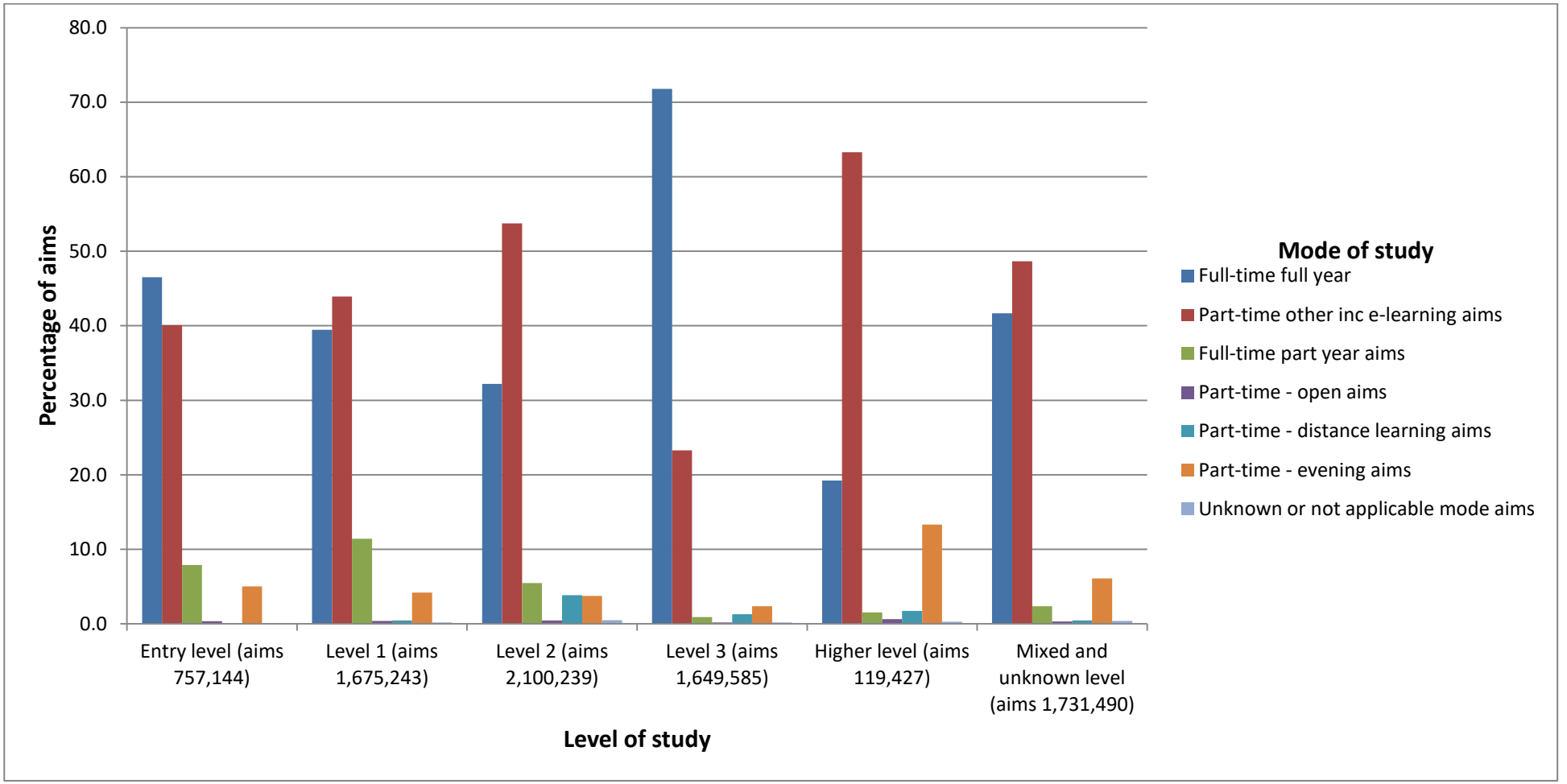
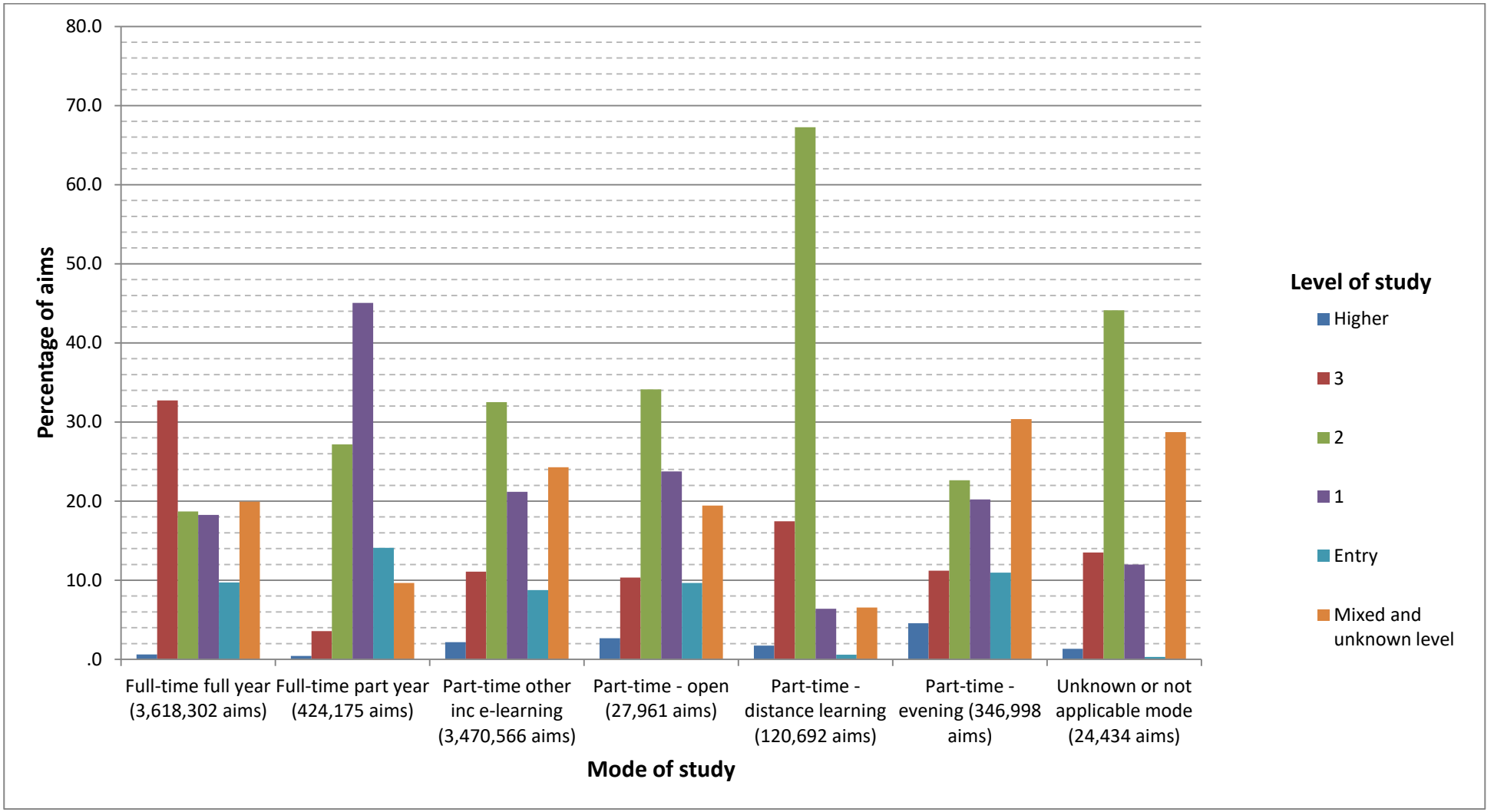


Figure 10.12 - Percentage of aims at each level of study by mode of study



This high percentage of level three full-time full-year students would, of course, be expected from the large numbers of A-level students undertaking multiple aims at level three. Nonetheless, this pattern is the major distinction for shape regarding the modes of study at each level.

However, even within the less common modes of study there is still marked variation in shape and percentage between each level on some of the modes of study. The main exception to this is that of the part-time open mode of study which accounts for a negligible percentage of aims over all levels of study. Each of the other modes of study has one or two levels that are more commonly utilised than at other levels. For example, at higher level learning the part-time evening mode of study is utilised in 13.3% of aims, more than double any other level. Similarly full-time part-year is utilised in 11.4% of aims at level one, roughly 50% more than at any other level; part-time distance learning is utilised in 3.9% of aims at level two, roughly 125% higher than at any other level of study. Indeed, because of these variations none of the five levels of study or the mixed and unknown category have the same or even a particularly similar shape.

10.2.5: Level of study and age of student

The chi-square test of an association between level and gender indicates that there is a statistically significant weak association (χ^2 (35) = 758,742.8, p < .001, V = .137, p <.001). Figures 10.13 shows the dispersion of each age group for courses attended at each of the levels of study and Figure 10.14 shows the reciprocal relationship.

Table 10.9 shows that level of study has only a limited link to the average age of the student (similar to mode). However, there are two levels of study that appear to differ substantially from the rest, the two highest levels. Level three has a substantially lower average age than the other levels of study, though interestingly with less impact than full-time full-year mode of study (see Section 10.1.3 on mode of study and age). In contrast, higher level aims have a slightly higher average age than do the main cluster of levels and much higher than that of level three.

Table 10.9 - Average age of students attempting aims at each level

Level of study	Total aims	Average age
Entry	757,144	26.4
1	1,675,243	26.0
2	2,100,239	27.5
3	1,649,585	21.1
Higher	119,427	30.9
Unknown, Mixed and N/A	1,731,490	28.2
Total/overall average	8,033,128	26.0

Figure 10.13 shows that each level's engagement with the different age groups varies very little at the lower levels (entry, one and two) showing similar dispersion patterns to match the similar averages. It also shows that the much lower average age of level three study comes, as you would expect, from a much higher percentage of aims attempted by 16-18 age group

students. Similarly, the higher average age of higher level study comes from a substantially lower percentage of aims attempted by 16-18 age group students than at any other level; though this is also influenced by the slightly greater proportion of the older age group students (covering 35-59). Finally, while the aims attempted at a mixed and unknown level follow a largely similar pattern to levels entry, one and two, there is also a substantial engagement with the 60+ age group with a much higher percentage of students in this category from that age group (7.0% compared to the next higher of level one at 2.2%). This suggests that although the association is limited, there is some connection to the age of students at each level of study, though this is specific to certain levels.

Figure 10.13 - Percentage of aims in each age group of student by level of study

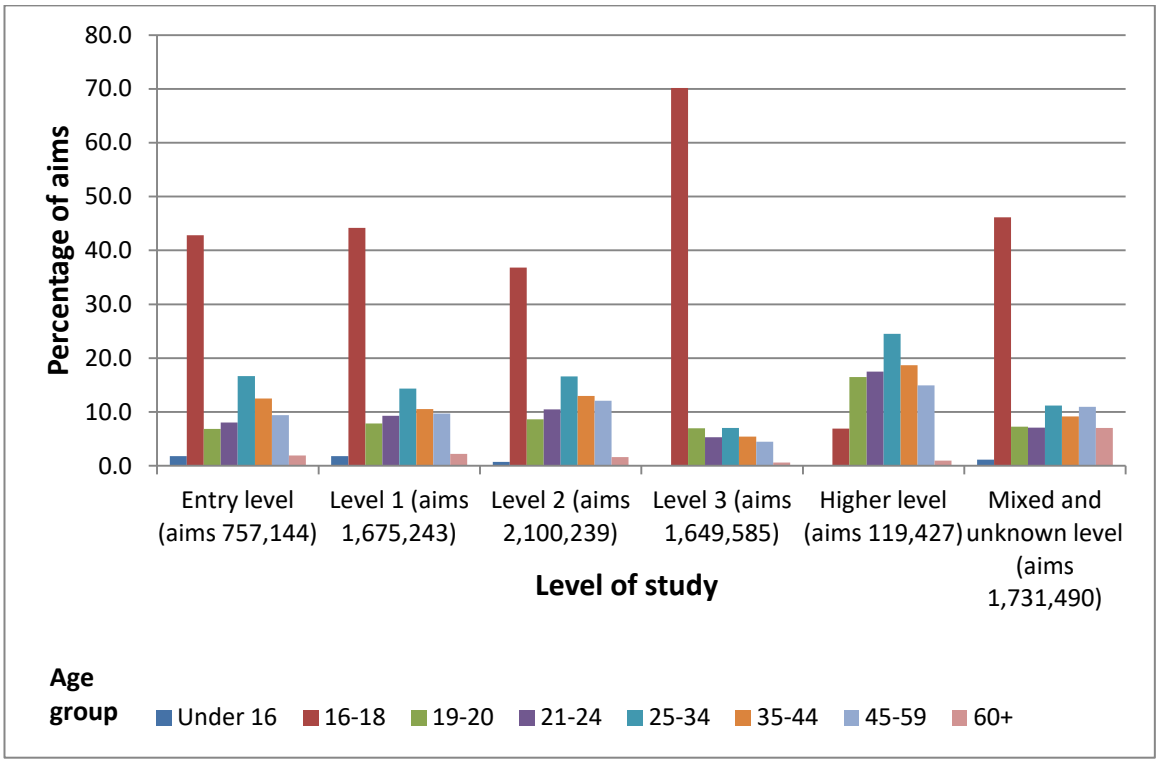
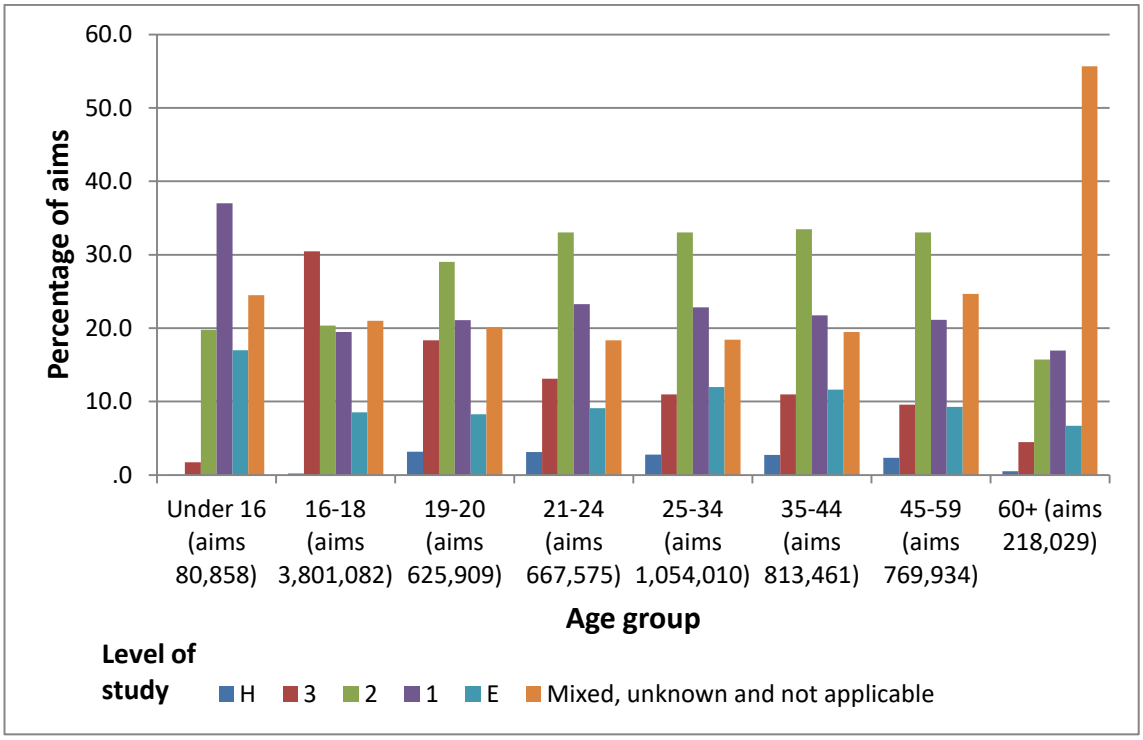


Figure 10.14 shows that the percentage of aims attempted at level three goes down as age groups get older, other than for the under-16s age group. Moreover, the engagement with the various levels changes only slightly between the groups other than the three exceptional groups discussed above (under-16, 16-18 and 60+). It is again in the three exceptional groups where the most obvious differences are found. An exceptionally high percentage of under-16 students are attempting level one aims (37.0%, 13.7% higher than any other) as well as to a lesser extent entry level (17.0%, 5.0% higher than any other). This is, of course, in part due to the fact students at this age have not progressed far enough through their education cycle to have reached level three study and as such the percentage of this age group involved in level three study is very low at 1.8% (next lowest 60+ at 4.5%). Nonetheless, this clearly demonstrates the differing needs of this age group of students in terms of level of study.

The 16-18 age group has two exceptional characteristics; it has a very high percentage of level three study compared to all other age groups (12.0 percentage points higher) and though not that dissimilar to the other two exceptional groups, it has relatively low percentages of level two study (20.3%) compared to the groups covering the ages of 19-59 (average 32.4%). Finally, the 60+ age group has one stand out exception and a second more minor difference.

The percentage of 60+ students involved in study at a mixed, unknown or not applicable level is more than double that of any other age group at 55.7% compared to the next highest of 24.7%. The 60+ age group also has a lower percentage in level three study (4.5%) than all other groups (next lowest 9.6%) except the under-16s (1.7%).

Figure 10.14 - Percentage of aims at each level of study by age group of student



10.2.6: Subject of study and ethnicity of student

The chi-square test of an association between subject of study and the age group of students indicates that there is a statistically significant weak association (χ^2 (114) = 837840.7, $p < .001$, V = .132, $p < .001$). Figure 10.15 shows the dispersion of each of the ethnic groups of students for courses in each of the subjects of study and Figure 10.16 shows the reciprocal relationship.

Figure 10.15 shows, as expected for England, almost all subjects are largely defined by the percentage of White British students attempting aims with a range of between 64.3% and 91.0%. The exception is, of course, English as a Second Language, though the data records 1.9% under White British. Nonetheless, there is still a substantial range in the percentage of White British students between all the other courses of 26.7%. At 91.0% Agriculture, Horticulture and Animal Care aims are 8.6% higher than any other subject area (not counting unknown subjects) suggesting that this subject area lacks appeal to students from minority backgrounds, though the reasons for this may be complicated. Of the minority ethnicities only really the Asian group have a discernible pattern with visibly higher percentages in four subject groups (all of which are common A-level subjects or ICT). However, with these notable exceptions, it is reasonable to conclude that the ethnically-related diversity in most subjects is relatively consistent and that differences are relatively small scale.

This is further supported by the examination of Figure 10.16, which, while showing a small number of exceptions, illustrates the proportions of each ethnicity in most subjects, remains reasonably consistent (the exception being English as a Second Language). Such notable

exceptions are similar to those described above, for example, the higher percentage of Asian students attempting Science and Mathematics aims, but also includes others such as the relatively high percentage of Black students attempting aims in Health, Public Services and Care subjects. While such differences are not large, they presumably account for the weak association between ethnicity and subject.

10.2.7: Mode of study and gender of student

The chi-square test of an association between level and gender indicates that there is a statistically significant weak association (χ^2 (6) = 134,813.4, p < .001, V = .130, p <.001). Figure 10.17 shows the breakdown of the mode of study by the gender of the student and Table 10.10 shows the reciprocal relationship.

Table 10.10 shows that both of the two most popular modes of study are relatively close together in terms of aims with only 2.0% separating them in terms of gender split. The other modes of study are much lower in terms of aims but there is a high degree of variation in the gender split with a range of 46.5 percentage points separating the highest from the lowest. Full-time part-year courses have 70.0% male students and part-time distance learning has only 23.5%. However, it is not possible to establish whether this relationship is through the levels and subjects of courses offered through these modes of study (see other sections) or through the different modes of study fitting better with different gender's lifestyles.

Table 10.10 - Percentage of aims by gender of students for each mode of study

Mode of study	Total aims	Percentage male	Percentage female
Full-time full-year	3,618,302	51.2%	48.8%
Full-time part-year	424,175	70.0%	30.0%
Part-time - other including e-learning	3,470,566	53.2%	46.8%
Part-time - open	27,961	45.8%	54.2%
Part-time - distance learning	120,692	23.5%	76.5%
Part-time - evening	346,998	36.1%	63.9%
Unknown or not applicable mode	24,434	66.0%	34.0%
Total/overall average	8,033,128	52.0%	48.0%

Figure 10.15 - Percentage of aims for each ethnicity of student by subject of study

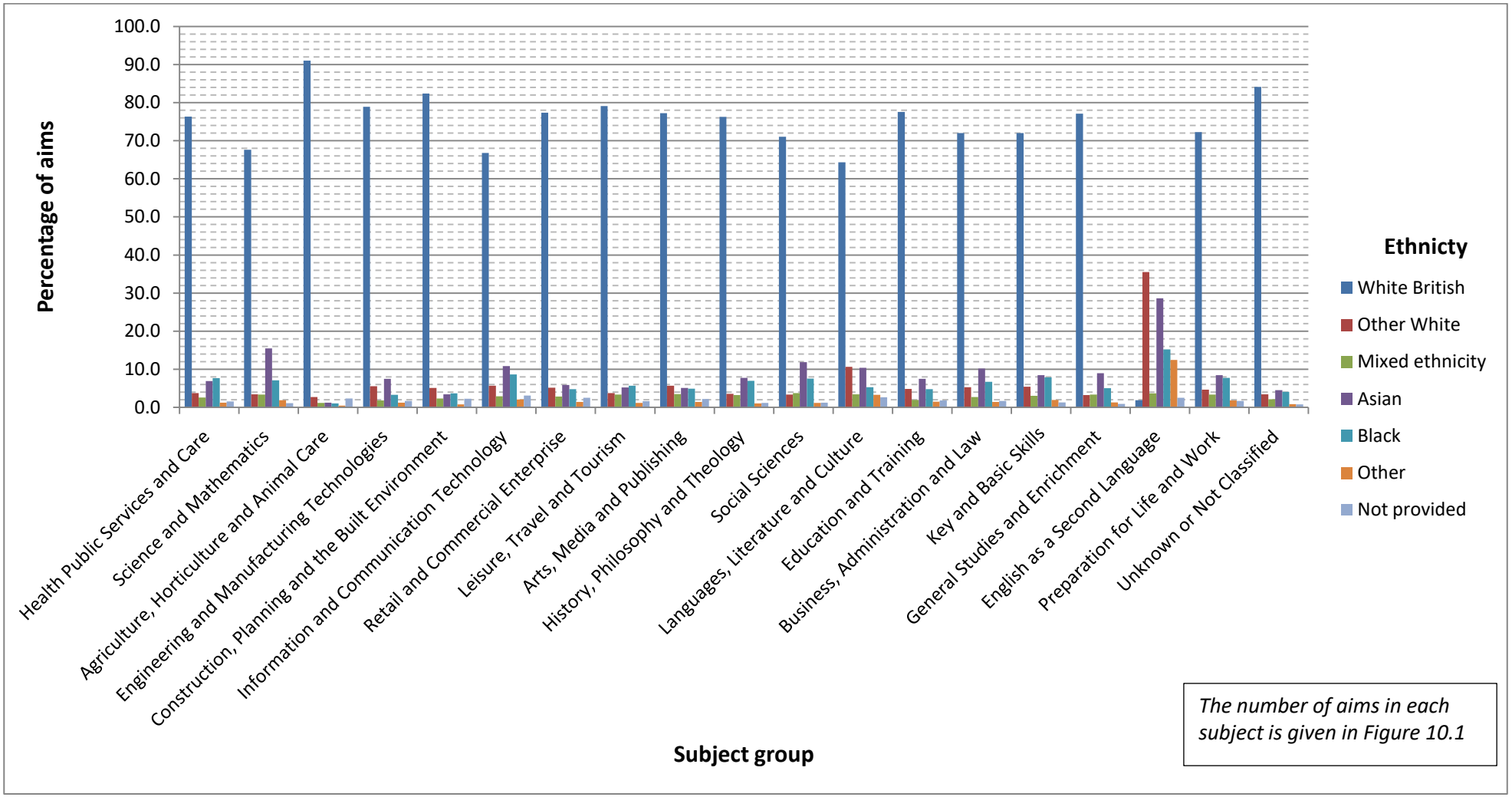


Figure 10.16 - Percentage of aims in each subject of study by ethnicity of student

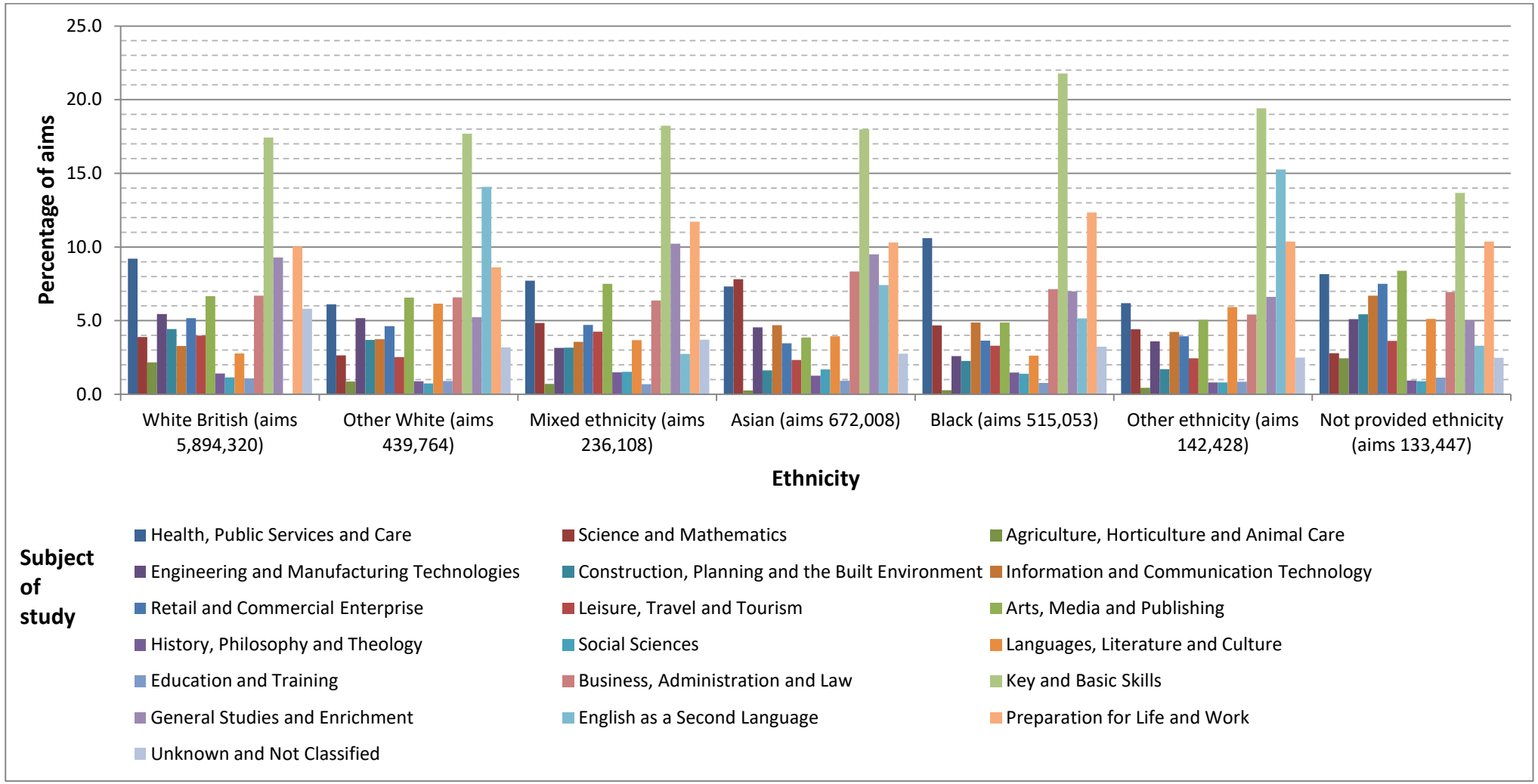
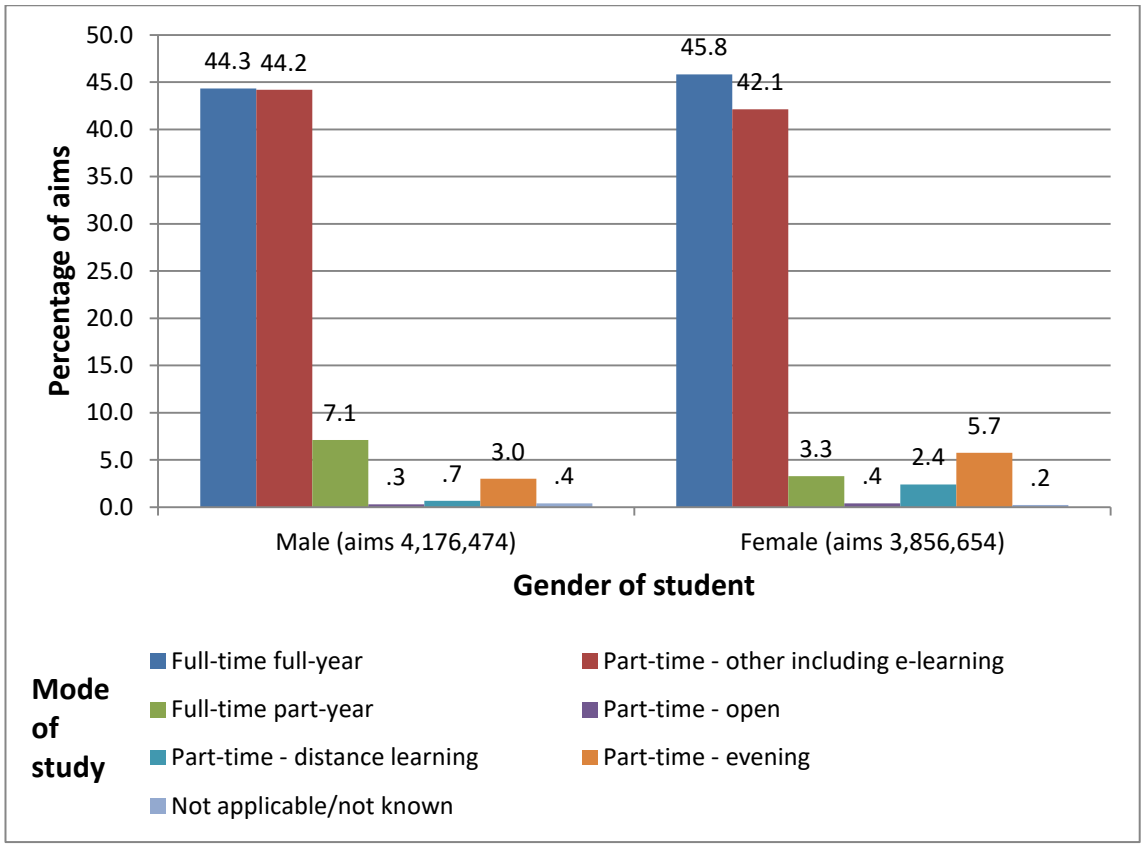


Figure 10.17 shows the breakdown of the mode of study of aims by the gender of the student attempting that aim. There are only very marginal differences between the two genders in the two most commonly utilised modes of study, full-time full-year and part-time part-year. However, in the less common modes of study we see slightly larger differences. For example, 7.1% of males attempt aims using the full-time part-year mode of study compared to only 3.3% of females. Furthermore, there is more than three times the percentage of females (2.4%) utilising the distance learning mode of study compared to that of males (0.7%). Though the overall percentages are low in both these examples it does indicate that some modes of study are more popular with one gender over the other. The overall effect on the shape of the graph shows that gender does affect the mode of study though it does not have a big impact particularly in the more common modes of study.

Figure 10.17 - Percentage of aims in each mode of study by gender of student



Chapter 11: The course characteristics cluster analysis

Chapter 11 presents the results of the detailed cluster analysis on size and course characteristics and an overview of the nature and extent of diversity that the analysis demonstrates. This is initially presented by an analysis of the membership of each of the clusters within the individual variables and a description of which characteristics are represented by the respective cluster; followed by a breakdown of all the clusters identified by the cluster analysis and what this means for the diversity of the sector. Furthermore, it then discusses how the original administrative types are reflected in the cluster analysis and how much diversity is present within each administrative type.

Chapter 12 presents a similar analysis for size and the student characteristics: age, gender and ethnicity. Furthermore, Chapter 13 presents a coarser grained analysis of both the course and student characteristics of colleges. Together, these chapters present substantial evidence relating to a possible review of the current administrative types.

11.1: Single variable clusters

Each of the following four short sections, details the results of a cluster analysis on a single variable. The first two (size and mode of study) are relatively straightforward and are simply described in terms of the borders on a single characteristic (number of students and percentage of full-time students respectively). However, for level and subject of study a more detailed approach was necessary and thus the characteristics of each cluster are described. Furthermore, for subject of study the descriptions can be very complicated with up to 19 subject groups involved and thus diagrams are utilised to further enhance understanding.

11.1.1: Size

Size was subdivided into four separate clusters by the analysis and these have been termed small (under 4,221 students), medium (4,221 - 8,939), large (8,940 - 13,699) and very large (13,700+). Within these groups there are a small number of extreme examples at both ends of the spectrum (i.e. the nine colleges with fewer than 100 students or the three colleges with more than 50,000 students). Such examples do demonstrate even greater diversity in the system but have not been included as separate groups in this part of the analysis in order to keep the overall results manageable. Within these groups there are 132 small colleges, 95 medium colleges, 67 large colleges and 64 very large colleges.

11.1.2: Dominant mode

The mode clustering was based on a simplified version of the modes of study representing the full-time percentage at an individual college and was subdivided by the cluster analysis to represent three groups, high part-time (under 33% full-time), balanced (between 33 and 67% full-time) and high full-time (over 67% full-time). Though this appears to represent roughly even thirds of the percentage it was not pre-selected and was arrived at by the cluster analysis. There are 132 colleges with a relatively even balance between part and full-time mode of study, 134 with a high part-time contingent and 92 with a high full-time student body.

11.1.3: Level characteristics

The level analysis attempted to develop clusters based on the percentage of students at each level of study and group colleges based on similar level characteristics. There were five cluster groups identified. The first three comprised a generalist category with relatively high proportions in multiple levels of study, where there was no apparent focus (144 colleges); a cluster which had at least 60% of students focused on level three study (84 colleges) and a cluster which had a focus on level two study wherein colleges had at least 32% of students studying at this level (112 colleges). The fourth cluster contained colleges with high proportions of low level learning (i.e. entry level or level one) with a combined total at either of these levels of at least 50% (12 colleges). The final cluster contained colleges with high proportions (at least 52%) of unclassified level learning (six colleges).

11.1.4: Subject characteristics

The subject clustering developed clusters based on the percentage of aims in each subject group. There were eight clusters identified (boundaries are in brackets for the first five groups):

1. Arts, Media and Publishing (22.8% to 87.0%) and Language, Literature and Culture (0.0% to 29.07%) - 12 colleges
2. Construction, Planning and the Built Environment (10.1% to 51.6%), Health, Public Services and Care (8.9% to 21.0%) and Key and Basic Skills (15.9% to 27.6%) - nine colleges
3. Business, Administration and Law (10.9% to 40.1%) and Key and Basic Skills (9.9% to 36.7%) - three colleges
4. Agriculture, Horticulture and Animal Care (20.9% to 53.8%) - 15 colleges
5. Preparation for Life and Work (0.0% to 100.0%) and Unknown subject (0.0% to 94.31%) - 13 colleges*
6. Moderate to high levels of Science and Mathematics, General Studies and Enrichment, Arts, Media and Publishing, History, Philosophy and Theology, Social Sciences, Language, Literature and Culture and Business, Administration and Law - 86 colleges**
7. Highly general colleges with moderate levels in almost all subjects, though relatively low Agriculture, Horticulture and Animal Care, History, Philosophy and Theology and Social Sciences - 86 colleges**
8. High levels of Health, Public Services and Care, Key and Basic Skills and Preparation for Life and Work, moderate Retail and Commercial Enterprise, Engineering and Manufacturing Technologies, Construction, Planning and the Built Environment, Business, Administration and Law - 134 colleges**

**Colleges in this group will have very high percentages in one or both of the stated subjects.*

***Groups six, seven and eight list numerous subject groups in which the colleges in the respective groups have a very high total proportion of their provision. Further details of these complex groups are provided below and also in Annex Five which gives cluster subject group boundaries.*

Of these groups, the first five are simply derived from the subjects in which colleges specialise, which is derived from them having a much higher than average percentage of aims in the respective groups (engagement with other subject groups may vary within a cluster). However, groups six, seven and eight all provide a wider variety of education with less specialism and more emphasis on a general approach. Each of these three generalist groups has different characteristics. Figures 11.1-11.3 show the average subject profile of each of these groups with a higher bar representing a greater percentage of aims in that subject category. The colour coding is consistent across the figures with the same colour representing the same subject group on each graph. However, it is difficult to compare between subjects on such graphs as each subject has differing levels of participation in that subject group in the FE sector overall (likely partly through interest levels in the population and the way the subject groups are arranged). Therefore, a particularly high number in one area may not appear high when compared to a more popular subject area (e.g. 19.9% in Science and Mathematics is very high but so is 6.1% in Social Sciences).

Each graph demonstrates the differences between the three general groups but also shows where they are similar. For example, each of the three groups contains relatively similar percentages in Business Administration and Law and Information and Communication Technology. Furthermore, because of the large number of subject groups involved there is some room for debate into which group a college should be placed. For example, The Brooke House Sixth Form College has a subject profile very close to that of group six but offers 0% of its aims in General Studies and Enrichment programs rather than the average of 23.5% for that group and is thus placed in group seven. Similarly, Hartlepool Sixth Form College also has a very similar profile to group six but also offers 24.4% of its aims in Key and Basic Skills compared to the 2.7% average of group six and again is therefore placed in group seven. It could be argued that such colleges, as they differ on only one subject group, should be placed in group six anyway. However, it can equally be argued that both these examples show a measure of diversification and this should be highlighted by the cluster analysis and therefore the colleges remained in the group to which they were mathematically assigned.

All three groups are characterised by so many subjects that it makes reference to all subject areas each time the group is mentioned impossible. Therefore, each group will be characterised thus: group six consists of colleges offering Liberal Arts and Sciences subjects and will be known hereafter as LAS. Group seven offers almost all subject groups and will therefore be known as Broad Subject Mix and finally group eight will hereafter be known as ASAS for Applied Subjects and Skills. All three of these shorthand names are for convenience only and are intended to represent all of the key characteristics in the group, not just the ones best described by the acronym.

Figure 11.1 - Group six subject characteristics

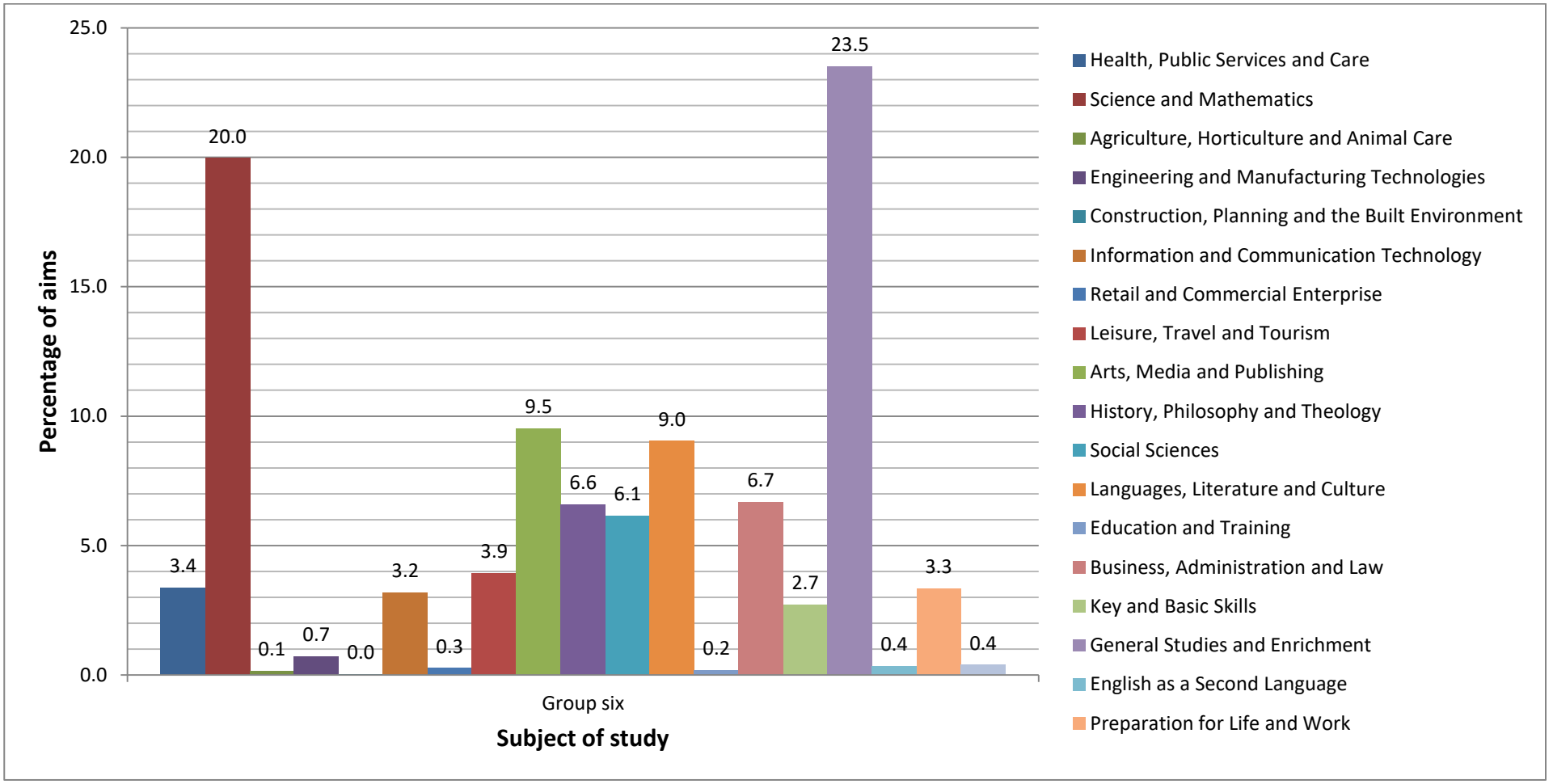


Figure 11.2 - Group seven subject characteristics

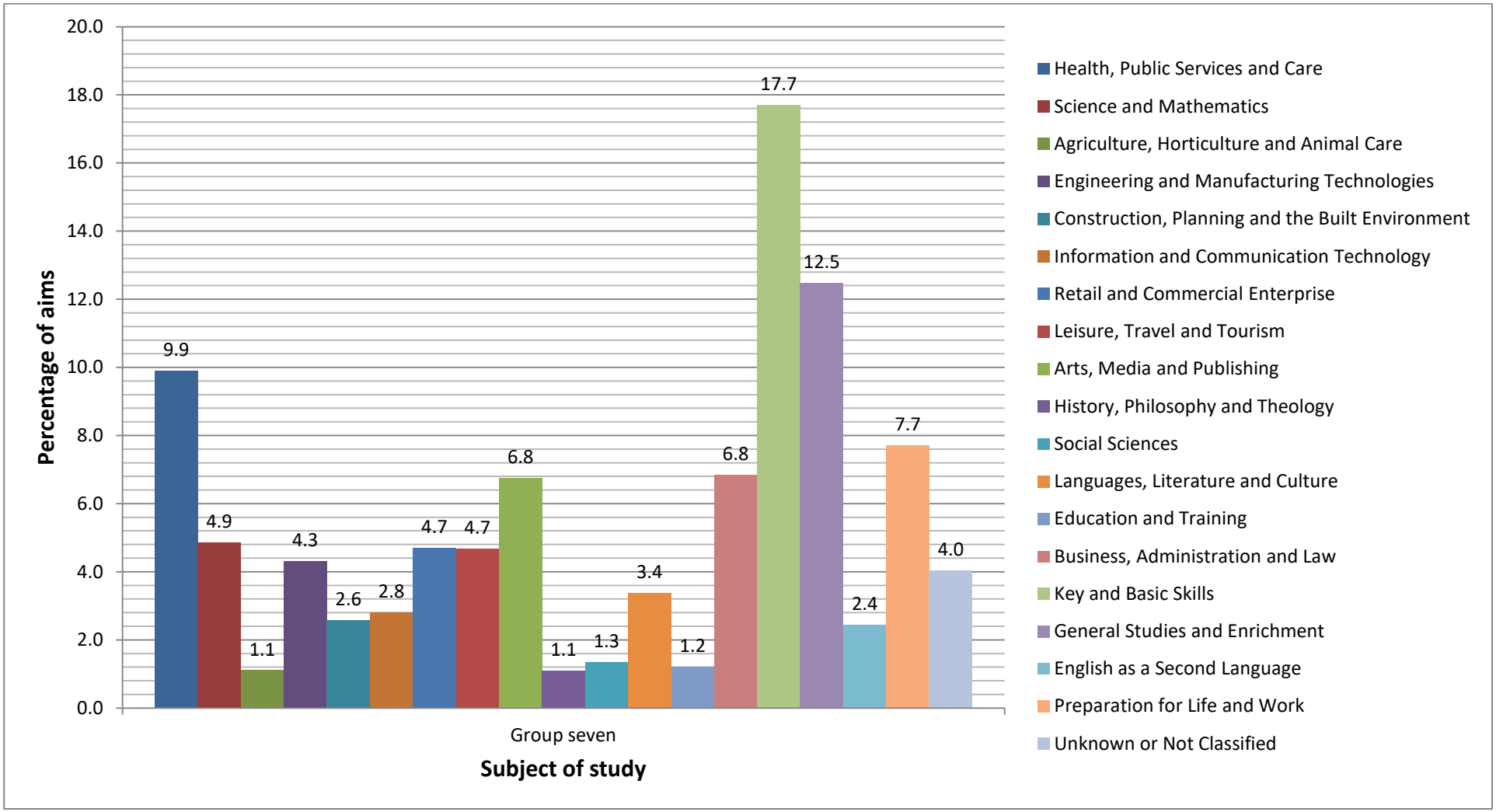
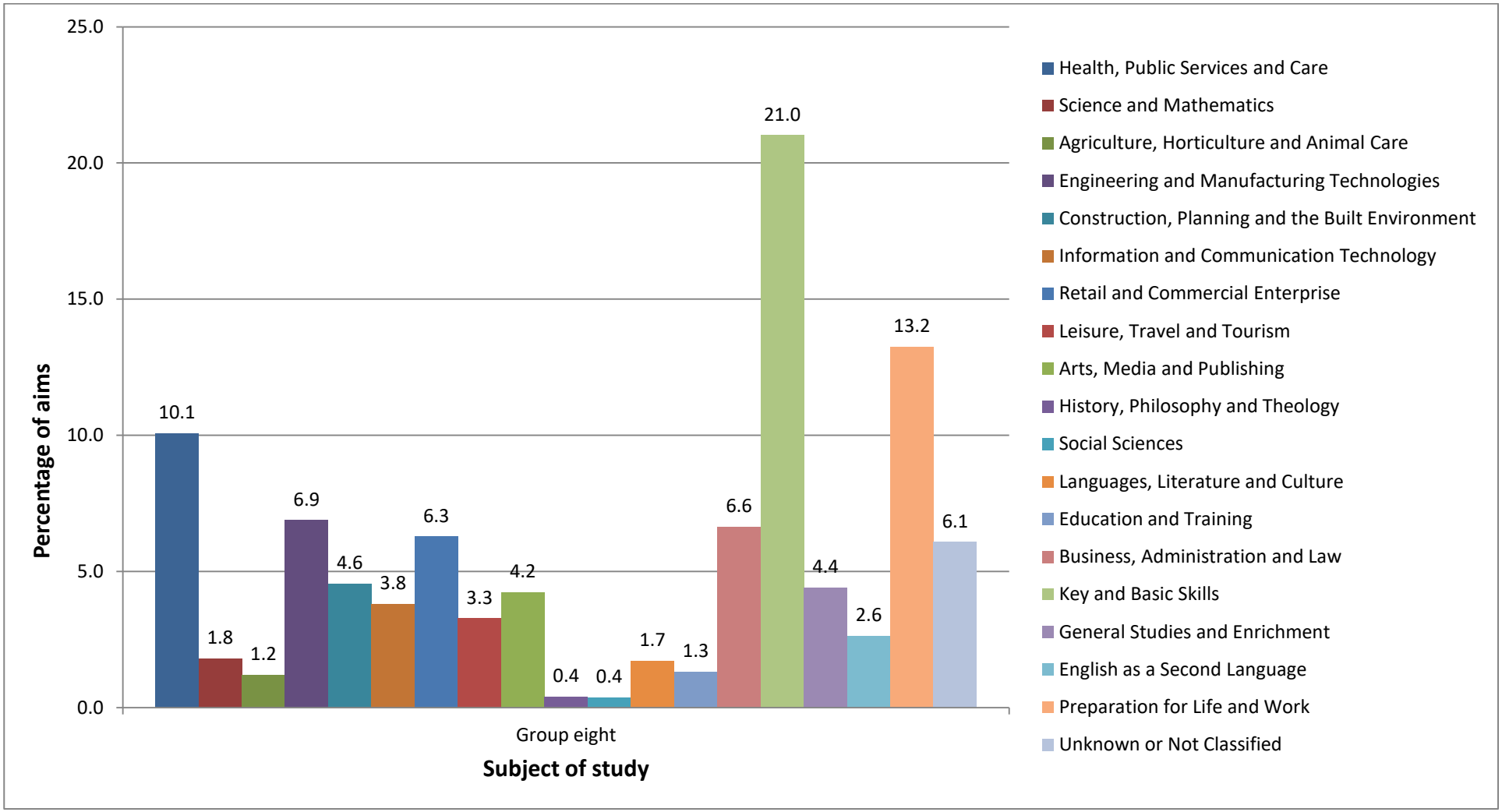


Figure 11.3 – Group eight subject characteristics



11.2: The combined cluster analysis

This section presents the results of a cluster analysis run on the four single variable clusters described in the previous section. Initially, an overview of the complete results is presented prior to a description of the clusters containing 10 or more colleges. This is followed by an analysis of the structure of the cluster results and the implications this has for the diversity of the sector. Finally a table is presented which shows a breakdown of the possible characteristics of clusters and how often they occur in both the clusters and the colleges to allow for comparison.

The complete results can be seen in Tables 11.1 to 11.4, which describe the characteristics of every combination present and the number of colleges with that profile. The clusters are sorted by the variables in the table from left to right, i.e. by size then mode then level and finally by subject. The colour coding (see the table key) is done by the third variable (level), in order to make patterns easier to see. Tables 11.1 to 11.4 show that there are 72 clusters in total for course characteristics which suggests a wide range of diversity in this area.

The individual college membership of each cluster is provided on the companion disk in 'Appendix 3 - College characteristics' in the worksheet entitled 'Fine grained cluster analysis'. This interactive tool provides a link to specific colleges and allows for further examination of the results for interested parties.

11.2.1: Clusters with 10 or more members

There are eight clusters with 10 or more colleges and the largest of these contains 73 colleges which are small in size, enrolling mainly full-time students, with the majority studying at level three in Liberal Arts and Sciences (cluster group CC-S13 in Table 11.1). This is a description commonly associated with sixth form colleges and indeed this group is made up almost entirely of sixth form colleges (71 of the 73 colleges). The exceptions are Seevic College and Worthing College both administratively classified as general FE colleges.

The second largest cluster (CC-M5) contains 21 colleges that are medium sized, enrolling a relatively even distribution between part-time and full-time students enrolled across multiple levels and with a Broad Subject Mix.

The third largest cluster contains 20 colleges that are very large in size, enrolling mainly part-time students, enrolled primarily at level two on courses focused on Applied Subjects and Skills.

The fourth largest cluster contains 16 colleges that are medium sized, enrolling mainly part-time students, enrolled primarily at level two on courses focused on Applied Subjects and Skills.

The fifth largest cluster contains 15 colleges that are large in size, enrolling mainly part-time students, enrolled primarily at level two on courses focused on Applied Subjects and Skills.

The sixth largest cluster contains 12 colleges that are large in size, enrolling mainly part-time students, enrolled across multiple levels but focused on Applied Subjects and Skills.

The seventh largest cluster contains 11 colleges that are large in size, enrolling a relatively even distribution between part-time and full-time students enrolled across multiple levels and with a Broad Subject Mix.

The eighth largest cluster contains 10 colleges that are large in size, enrolling a relatively even distribution between part-time and full-time students enrolled across multiple levels but focused on Applied Subjects and Skills.

11.3: Analysis of cluster structure

The dispersion of colleges between groups in this analysis is not equal; this is particularly highlighted by the number of single college clusters, totalling 28 in the course characteristics analysis. While this number of unique colleges suggests a high level of diversity through specialisation, differences can be relatively small if there were some colleges close to the border of any of the larger groups. However, closer inspection of the single college groups confirmed that none of the colleges identified for the single college groups were actually close to the border of any of the other groups. Thus, while some colleges may only be different from their peers on one aspect they do tend to be substantially different and therefore this does indeed confirm the presence of diversity through specialisation in at least one area.

Table 11.1 - Course characteristics: cluster membership breakdown of small colleges by mode, level and subject of study

Cluster number and size	Number of colleges	Dominant mode	Level characteristic	Subject characteristic [1,2,3,4]
CC-S1	3	Balanced	High Level three	Liberal Arts and Sciences
CC-S2	1	Balanced	High low level learning (entry and one)	Preparation for Life and Work
CC-S3	1	Balanced	High unclassified level learning	Liberal Arts and Sciences
CC-S4	5	Balanced	Moderate levels in multiple groups	Agriculture, Horticulture and Animal Care
CC-S5	5	Balanced	Moderate levels in multiple groups	Applied Subjects and Skills
CC-S6	2	Balanced	Moderate levels in multiple groups	Arts and Languages
CC-S7	5	Balanced	Moderate levels in multiple groups	Broad Subject Mix
CC-S8	2	Balanced	Moderate levels in multiple groups	Liberal Arts and Sciences
CC-S9	1	Balanced	Moderately high level two	Applied Subjects and Skills
CC-S10	1	Balanced	Moderately high level two	Broad Subject Mix
CC-S11	1	Balanced	Moderately high level two	Construction, Public Services and Key Skills
CC-S12	5	Full-time	High Level three	Broad Subject Mix
CC-S13	73	Full-time	High Level three	Liberal Arts and Sciences
CC-S14	7	Full-time	High low level learning (entry and one)	Preparation for Life and Work
CC-S15	2	Full-time	High unclassified level learning	Preparation for Life and Work
CC-S16	1	Full-time	Moderate levels in multiple groups	Applied Subjects and Skills
CC-S17	2	Full-time	Moderate levels in multiple groups	Arts and Languages
CC-S18	1	Full-time	Moderate levels in multiple groups	Broad Subject Mix
CC-S19	1	Full-time	Moderate levels in multiple groups	Liberal Arts and Sciences
CC-S20	1	Part-time	High low level learning (entry and one)	Preparation for Life and Work
CC-S21	1	Part-time	Moderate levels in multiple groups	Applied Subjects and Skills
CC-S22	1	Part-time	Moderate levels in multiple groups	Arts and Languages

Table 11.1 continued				
Cluster number and size	**Number of colleges**	**Dominant mode**	**Level characteristic**	**Subject characteristic [1,2,3,4]**
CC-S23	1	Part-time	Moderate levels in multiple groups	Business and Key Skills
CC-S24	1	Part-time	Moderate levels in multiple groups	Preparation for Life and Work
CC-S25	3	Part-time	Moderately high level two	Agriculture, Horticulture and Animal Care
CC-S26	2	Part-time	Moderately high level two	Applied Subjects and Skills
CC-S27	2	Part-time	Moderately high level two	Broad Subject Mix
CC-S28	1	Part-time	Moderately high level two	Preparation for Life and Work

[1]*Liberal Arts and Sciences subjects comprise Science and Mathematics, General Studies, Arts, Media and Publishing, History, Philosophy and Theology, Social Sciences, Language, Literature and Culture and Business, Administration and Law.*

[2]*Broad Subject Mix comprises moderate levels in almost all subjects, though relatively low Agriculture, Horticulture and Animal Care, History, Philosophy and Theology and Social Sciences.*

[3] *Applied Subjects and Skills comprises high levels of Health, Public Services and Care, Key Skills and Preparation for Life and Work together with moderate Retail and Commercial Enterprise, Engineering and Manufacturing Technologies, Construction, Planning and the Built Environment, Business, Administration and Law*.

[4] *Arts and Languages comprise Arts, Media and Publishing and Language, Literature and Culture*.

Colour coding on level characteristics

High low level learning (entry and one)
Moderate levels in multiple groups
Moderately high level two
High Level three
High unclassified level

Table 11.2 - Course characteristics: cluster membership breakdown of medium colleges by mode, level and subject of study

Cluster number and size	Number of colleges	Dominant mode	Level characteristic[1]	Subject characteristic[1]
CC-M1	3	Balanced	High Level three	Liberal Arts and Sciences
CC-M2	1	Balanced	High low level learning (entry and one)	Agriculture, Horticulture and Animal Care
CC-M3	3	Balanced	Moderate levels in multiple groups	Agriculture, Horticulture and Animal Care
CC-M4	8	Balanced	Moderate levels in multiple groups	Applied Subjects and Skills
CC-M5	21	Balanced	Moderate levels in multiple groups	Broad Subject Mix
CC-M6	1	Balanced	Moderate levels in multiple groups	Liberal Arts and Sciences
CC-M7	1	Balanced	Moderately high level two	Agriculture, Horticulture and Animal Care
CC-M8	6	Balanced	Moderately high level two	Applied Subjects and Skills
CC-M9	5	Balanced	Moderately high level two	Broad Subject Mix
CC-M10	1	Part-time	High low level learning (entry and one)	Arts and Languages
CC-M11	2	Part-time	High unclassified level learning	Arts and Languages
CC-M12	1	Part-time	Moderate levels in multiple groups	Agriculture, Horticulture and Animal Care
CC-M13	8	Part-time	Moderate levels in multiple groups	Applied Subjects and Skills
CC-M14	1	Part-time	Moderate levels in multiple groups	Arts and Languages
CC-M15	8	Part-time	Moderate levels in multiple groups	Broad Subject Mix
CC-M16	2	Part-time	Moderate levels in multiple groups	Construction, Public Services and Key Skills
CC-M17	16	Part-time	Moderately high level two	Applied Subjects and Skills
CC-M18	6	Part-time	Moderately high level two	Broad Subject Mix
CC-M19	1	Part-time	Moderately high level two	Business and Key Skills

[1] *As for Table 11.1*

Table 11.3 - Course characteristics: cluster membership breakdown of large colleges by mode, level and subject of study

Cluster number and size	Number of colleges	Dominant mode	Level characteristic[1]	Subject characteristic[1]
CC-L1	10	Balanced	Moderate levels in multiple groups	Applied Subjects and Skills
CC-L2	11	Balanced	Moderate levels in multiple groups	Broad Subject Mix
CC-L3	2	Balanced	Moderate levels in multiple groups	Liberal Arts and Sciences
CC-L4	7	Balanced	Moderately high level two	Applied Subjects and Skills
CC-L5	3	Balanced	Moderately high level two	Broad Subject Mix
CC-L6	1	Part-time	High low level learning (entry and one)	Arts and Languages
CC-L7	12	Part-time	Moderate levels in multiple groups	Applied Subjects and Skills
CC-L8	2	Part-time	Moderate levels in multiple groups	Broad Subject Mix
CC-L9	15	Part-time	Moderately high level two	Applied Subjects and Skills
CC-L10	1	Part-time	Moderately high level two	Broad Subject Mix
CC-L11	3	Part-time	Moderately high level two	Construction, Public Services and Key Skills

[1] *As for Table 11.1*

Table 11.4 - Course characteristics: cluster membership breakdown of very large colleges by mode, level and subject of study

Cluster number and size	Number of colleges	Dominant mode	Level characteristic[1]	Subject characteristic[1]
CC-VL1	7	Balanced	Moderate levels in multiple groups	Applied Subjects and Skills
CC-VL2	6	Balanced	Moderate levels in multiple groups	Broad Subject Mix
CC-VL3	7	Balanced	Moderately high level two	Applied Subjects and Skills
CC-VL4	2	Balanced	Moderately high level two	Broad Subject Mix
CC-VL5	1	Balanced	Moderately high level two	Construction, Public Services and Key Skills
CC-VL6	1	Part-time	High unclassified level learning	Arts and Languages
CC-VL7	1	Part-time	Moderate levels in multiple groups	Agriculture, Horticulture and Animal Care
CC-VL8	8	Part-time	Moderate levels in multiple groups	Applied Subjects and Skills
CC-VL9	1	Part-time	Moderate levels in multiple groups	Arts and Languages
CC-VL10	2	Part-time	Moderate levels in multiple groups	Broad Subject Mix
CC-VL11	1	Part-time	Moderate levels in multiple groups	Business and Key Skills
CC-VL12	20	Part-time	Moderately high level two	Applied Subjects and Skills
CC-VL13	5	Part-time	Moderately high level two	Broad Subject Mix
CC-VL14	2	Part-time	Moderately high level two	Construction, Public Services and Key Skills

[1] *As for Table 11.1*

Furthermore, there are 44 remaining groups for the 330 colleges left after considering the single college clusters, giving an average group membership of 7.5. However, 32 of these groups have fewer colleges than 7.5 with only 12 groups managing more than this figure, suggesting that a small number of clusters contain a substantial number of colleges.

This perception is confirmed by Table 11.5 which shows the frequency of the cluster sizes for the course characteristics including those already mentioned. The 12 groups with higher than average membership account for 58.5% of colleges with the remaining 41.5% contained in the 60 remaining groups (including the single college clusters).

Table 11.5 - Frequency of cluster sizes

Cluster size	Frequency	Cluster size	Frequency	Cluster size	Frequency
1	28	7	4	15	1
2	13	8	4	16	1
3	6	10	1	20	1
5	6	11	1	21	1
6	3	12	1	73	1
			Total		**72**

Table 11.6 shows the numbers and percentages of clusters and colleges, in each category of each variable. This shows the dispersion of clusters between each option as well as the dispersion of colleges for comparison. This enables us to identify areas where, while there is diversity, there are only limited amounts present. Perhaps the most important thing to note from this is the comparatively large number of clusters for the relatively small number of colleges for some of the subject groups and some of the level characteristics groups. For example, there are 12 colleges that have Arts and Languages as their dominant subject characteristic. However, this is the characteristic for nine clusters which indicates that such colleges have only the subjects studied at the college in common. Therefore, while this is an area of specialism for some colleges, very few have gone down this route and those that have are quite a diverse collection of colleges in their overall approach. The overall results confirm the presence of a substantial amount of diversity with a wide variation over most of the variables under study. However, the examples illustrate the scope for a more balanced dispersion of institutional profiles and the limits of the overall results.

11.3.1: The general FE colleges

The general FE colleges (GFECs) are the largest group from the original administrative types containing 224 of the total 358 colleges and are represented by the largest number of clusters in this analysis. However, they do not form a homogeneous or coherent group but instead exhibit substantial diversity. Indeed, they are represented in 43 different clusters. They have representatives in, or make up the entirety of a large percentage of medium, large and very large clusters. Table 11.7 shows the number of general FE colleges in each of the groups at each size category (details for which can be found in Tables 11.1-11.4 above). Each of these clusters contains 100% general FE colleges except where noted in brackets and includes eight of the 28 small clusters, 13 of the 19 medium clusters, 10 of the 11 large clusters and 12 of the 14 very large clusters.

Table 11.6 - Cluster profile percentages for all colleges

Variable	Variable category	Clusters		Colleges	
		Number	Percent	Number	Percent
Size	Small	28	38.9%	132	36.9%
	Medium	19	26.4%	95	26.5%
	Large	11	15.3%	67	18.7%
	Very large	14	19.4%	64	17.9%
Dominant mode of study	Part-time	35	48.0%	134	37.4%
	Balanced	30	41.1%	132	36.9%
	Full-time	8	11.0%	92	25.7%
Level of study character-istics	High level three	4	5.5%	84	23.5%
	Moderate levels in multiple groups	35	48.0%	144	40.2%
	Moderately high level two	23	31.5%	112	31.3%
	High low-level learning (entry and one)	7	9.6%	12	3.4%
	High unclassified level learning	4	5.5%	6	1.7%
Subject of study character-istics	Arts and Languages	9	12.3%	12	3.4%
	Construction, Public Services and Key Skills	4	5.5%	9	2.5%
	Business and Key Skills	3	4.1%	3	0.8%
	High Agricultural	8	11.0%	15	4.2%
	Preparation for Life and Work	6	8.2%	13	3.6%
	Liberal Arts and Sciences	8	11.0%	86	24.0%
	Broad Subject Mix	17	23.3%	86	24.0%
	Applied Subjects and Skills	18	24.7%	134	37.4%

Table 11.7 - Cluster membership of general FE colleges by size

Cluster numbers of clusters containing GFECs (Small)	Cluster numbers of clusters containing GFECs (Medium)	Cluster numbers of clusters containing GFECs (Large)	Cluster numbers of clusters containing GFECs (Very large)
CC-S5(4 of 5 colleges), CC-S7(3 of 5), CC-S9, CC-S10, CC-S11, CC-S13(2 of 73), CC-S22, CC-S26	CC-M1(1 of 3), CC-M4, CC-M5(19 of 21), CC-M8(5 of 6), CC-M9, CC-M11(1 of 2), CC-M13, CC-M14, CC-M15, CC-M16, CC-M17, CC-M18, CC-M19	CC-L1, CC-L2, CC-L3, CC-L4, CC-L5, CC-L7, CC-L8, CC-L9, CC-L10, CC-L11	CC-VL1, CC-VL2 CC-VL3, CC-VL4 CC-VL5, CC-VL7 CC-VL8, CC-VL10 CC-VL11, CC-VL12 CC-VL13, CC-VL14

GFEC = general FE college

A breakdown of the profiles of these clusters can be seen in Table 11.8 which shows the number and percentage representation of each of the available options by both clusters and colleges. It shows that general FE colleges tend to be medium or larger in size, with a

dominant mode of either part-time or a balanced approach, have level characteristics of either a very generalised approach or with a high percentage of level two enrolments and finally the subject profile is highly generalised either with a focus on ASAS or with a Broad Subject Mix. There are also a small number of more specialised colleges some of which share a profile with colleges from other administrative types (e.g. two colleges have the same profile as the traditional sixth form college) or specialise in subjects not covered by existing administrative types (e.g. construction). Indeed, only a small percentage of colleges are not represented by some combination of these characteristics. It is in subject where there is the greatest variation but even here only 8.9% of colleges are not represented by two major groups. Therefore, while there appears to be a high level of diversity, the dispersion pattern of colleges between the various groups suggests that it is substantially less than it first appears amongst general FE colleges. Nonetheless, with the various combinations of each of the major options, there remains a substantial diversity of approaches within this administrative type.

Table 11.8 - Cluster profile percentages for general FE colleges

Variable	Variable category	Clusters		Colleges	
		Number	Percent	Number	Percent
Size	Small	8	18.6%	15	6.7%
	Medium	13	30.2%	81	36.2%
	Large	10	23.3%	66	29.5%
	Very large	12	27.9%	62	27.7%
Dominant mode of study	Part-time	22	51.2%	118	52.7%
	Balanced	20	46.5%	104	46.4%
	Full-time	1	2.3%	2	0.9%
Level of study characteristics	High level three	2	4.7	3	1.3%
	Moderate levels in multiple groups	20	46.5	116	51.8%
	Moderately high level two	20	46.5	104	46.4%
	High unclassified level learning	1	2.3	1	0.4%
Subject of study characteristics	Arts and Languages	3	7.0	3	1.3%
	Liberal Arts and Sciences	3	7.0	5	2.2%
	Broad Subject Mix	14	32.6	74	33.0%
	Applied Subjects and Skills	15	34.9	130	58.0%
	Construction, Public Services and Key Skills	5	11.6	9	4.0%
	Business and Key Skills	2	4.7	2	0.9%
	High Agricultural	1	2.3	1	0.4%

11.3.2: The sixth form colleges

As noted above 71 of the 94 sixth form colleges are in the CC-S13 cluster, which in terms of these variables, is the stereotypical sixth form college model of small size, full-time, level three and Liberal Arts and Sciences. However, the remaining 23 are scattered through 13 other groups as shown in Table 11.9 below. This table also shows how similar each of the clusters is to the stereotypical sixth form model by noting which attributes of its members are the same

as in the stereotypical sixth form college group. For example, cluster CC-S12 contains colleges which are also small with a full-time focus at level three. However, they are not limited to the liberal arts and sciences subjects normally offered by sixth form colleges and may have diversified to offer other courses and subjects or specialised to offer a more limited number of subject areas. The other column in the table shows the percentage of the cluster that is made up of sixth form colleges, showing that some sixth form colleges have more in common with other types of college than they do with the stereotypical sixth form college model.

Table 11.9 - Sixth form college cluster membership and their similarities to the stereotypical sixth form college model

Cluster number	Total number of colleges	Number of sixth form colleges	Percentage of cluster	Cluster variables in common with group CC-S13
CC-S13	73	71	97.3%	Not applicable[1]
CC-S12	5	5	100.0%	Size, mode and level
CC-S1	3	3	100.0%	Size, level and subject
CC-S19	1	1	100.0%	Size, mode and subject
CC-S8	2	2	100.0%	Size and subject
CC-M1	3	2	66.7%	Level and subject
CC-S3	1	1	100.0%	Size and subject
CC-S18	1	1	100.0%	Size and mode
CC-S7	5	2	40.0%	Size
CC-M6	1	1	100.0%	Subject
CC-S5	5	1	20.0%	Size
CC-S27	1	1	100.0%	Size
CC-S6	2	1	50.0%	Size
CC-M5	17	2	11.8%	None

[1] *Cluster CC-S12 corresponds to the stereotypical sixth form college model*

Table 11.10 summarises the attributes of the 23 sixth form college clusters in Table 11.9 that do not fully meet the stereotypical sixth form college model of cluster CC-S13. It shows the percentage of each attribute and the overall percentage of the member colleges that adhere to each of the stereotypical attributes.

Table 11.10 along with Table 11.11, which shows the alternative profiles that the clusters belong to by variable, illustrates that most sixth form colleges that do not fit the stereotypical model have simply diversified their provision and have thus moved one rung away from this stereotypical model. For example, small colleges have enlarged to become medium, full-time mode becomes a more balanced approach, high level three becomes a more generalist level approach with more options (for example, sixth form colleges that offer more second chance education with GCSE retakes etc) and a focus on LAS becomes more broad including a greater selection of subject areas. However, there are a small number of exceptions in mode, level and subject as single colleges have taken radically different approaches from the stereotypical sixth form college model, i.e. a part-time approach, high unclassified level learning and the two differing subject approaches. Of these the arts and languages approach could still be considered similar to that of a stereotypical sixth form college approach as both arts and languages are stereotypical subject groups and are therefore simply specialism in these

specific subject areas. However, the sixth form college that has a subject profile which has a low involvement in the traditional A-level subjects is far removed from the expected sixth form college profile and thus it is questionable whether this college should be considered a sixth form college.

Table 11.10 - Adherence to the stereotypical model by cluster group

Stereotypical sixth form college attribute	Groups with this attribute[1]		Colleges with this attribute[1]	
	Number	Percent	Number	Percent
Small size	10	76.9%	18	78.3%
Full-time	3	23.1%	7	30.4%
High level three	3	23.1%	10	43.5%
Liberal Arts and Sciences	6	46.2%	10	43.5%

[1] *Not including cluster CC-S13 that represents the stereotypical model*

Table 11.11 - The alternative cluster descriptions for sixth form colleges

Variable	Alternative area	Percentage of the clusters in this area	Colleges in this area	
			Number	Percent
Size	Medium	100.0%	5	100.0%
Mode	Balanced	90.0%	15	92.3%
	Part-time	10.0%	1	6.3%
Level	Moderate levels in multiple groups	90.0%	12	92.3%
	High unclassified	10.0%	1	7.7%
Subject	Broad Subject Mix	71.4%	11	84.6%
	Arts and Languages	14.3%	1	7.7%
	Applied Subjects and Skills	14.3%	1	7.7%

11.3.3: The specialist colleges

This section considers how each of the specialist colleges groups from the original administrative types has been classified.

Agricultural colleges

Unlike sixth form colleges there is not a stereotype for agricultural colleges beyond their subject of study, with no particular expectation for size, mode of study or level of study and indeed these results reinforce these perceptions to a degree. The 16 colleges designated as agricultural colleges by the original administrative type are split between eight groups as shown in Table 11.12 below. The most notable groups in the table are clusters CC-S27 and CC-M8 both of which contain a single college that does not fit into the subject category of having a high percentage of agricultural enrolments (only 11.0% and 15.3% respectively). This suggests that these colleges have diversified their provision and perhaps now better fit the profile of a more general FE college, albeit with a strong agricultural department.

Table 11.12 - Cluster membership of agricultural colleges

Cluster number	Number of colleges	Size	Mode	Level	Subject
CC-S4	5	Small	Balanced	Moderate levels in multiple groups	AHAC
CC-S25	3	Small	Part-time	Moderately high level two	AHAC
CC-S27	1	Small	Part-time	Moderately high level two	Broad Subject Mix
CC-M2	1	Medium	Balanced	High low level learning (entry and one)	AHAC
CC-M3	3	Medium	Balanced	Moderate levels in multiple groups	AHAC
CC-M7	1	Medium	Balanced	Moderately high level two	AHAC
CC-M8	1	Medium	Balanced	Moderately high level two	Applied Subjects and Skills
CC-M12	1	Medium	Part-time	Moderate levels in multiple groups	AHAC

AHAC = Agriculture, Horticulture and Animal Care

Table 11.13 shows the percentages of each present cluster option for both the clusters and the percentages of the number of colleges included in these clusters compared to the total number of agricultural colleges in the original administrative type. It shows that there are two overall models for agricultural colleges at both small and medium sizes. These colleges either have a balanced or part-time mode profile and either focus at level two or are more generalist when it comes to level as well as having high Agriculture, Horticulture and Animal Care. However, there are two notable exceptions - one in level and the other in subject. While this does not provide a conclusive model for agricultural colleges it does suggest that there is some similarity between these colleges. Nonetheless, it also shows that even within this limited number of colleges there are suggestions of diversification.

Table 11.13 - Cluster profile percentages for agricultural colleges

Variable	Variable category	Clusters in this area		Colleges in this area	
		Number	Percent	Number	Percent
Size	Small	3	37.5%	9	56.3%
	Medium	5	62.5%	7	43.8%
Mode	Balanced	3	37.5%	11	68.8%
	Part-time	5	62.5%	5	31.3%
Level	Moderately high level two	4	50.0%	6	37.5%
	High low level learning (entry and one)	1	12.5%	1	6.3%
	Moderate levels in multiple groups	3	37.5%	9	56.3%
Subject	High Agricultural	6	75.0%	14	87.5%
	Applied Subjects and Skills	1	12.5%	1	6.3%
	Broad Subject Mix	1	12.5%	1	6.3%

Special colleges

The original administrative type of special college contained 11 colleges which have been grouped into four clusters as shown in Table 11.14. However, with seven of the 11 colleges classified in one group, it appears that special colleges do have a reasonably consistent type. Most special colleges are small, enrolling full-time students primarily on low level courses studying Preparation for Life and Work. There is some variation with small numbers of colleges diversifying away from this model in one or more areas though in the case of CC-S15 it is possible that this is simply an error in record keeping. It is only really the college in cluster CC-S16 that does not truly fit the profile of a special college. Though it remains small with a full-time student base, it has diversified into higher level courses on more varied subjects. Table 11.15 shows the percentage membership for each of the available options but it simply reinforces the perception of the special college model and is simply included for completeness.

Table 11.14 - Cluster membership of special colleges

Cluster number	Number of colleges	Size	Mode	Level	Subject
CC-S14	7	Small	Full-time	High low level learning (entry and one)	Preparation for Life and Work
CC-S15	1	Small	Full-time	High unclassified level learning	Preparation for Life and Work
CC-S20	1	Small	Part-time	High low level learning (entry and one)	Preparation for Life and Work
CC-S2	1	Small	Balanced	High low level learning (entry and one)	Preparation for Life and Work
CC-S16	1	Small	Full-time	Moderate levels in multiple groups	Applied Subjects and Skills

Table 11.15 - Cluster profile percentages for special colleges

Variable	Variable Category	Percentage of Clusters in this area	Percentage of colleges in this area
Size	Small	100%	100%
Mode	Full-time	60%	82%
	Balanced	20%	9%
	Part-time	20%	9%
Level	High unclassified level learning	20%	9%
	High low level learning (entry and one)	60%	82%
	Moderate levels in multiple groups	20%	9%
Subject	Preparation for Life and Work	80%	91%
	Applied Subjects and Skills	20%	9%

Specialist designated colleges

The original administrative type of specialist designated college contained 10 colleges and each of these colleges has been placed in a separate cluster as shown in Table 11.16. This clearly suggests that colleges in this administrative category are actually highly diverse and perhaps, in terms of size and course characteristics, grouping them together as a single administrative type is somewhat misleading. All four sizes are represented as are four of the five level categories and four of the eight subject categories. It is only really mode of study where there is any consistency with nine of the 10 colleges having a dominant mode of part-time. Table 11.17 shows the percentage breakdown of the profiles in each of the variables. This does confirm that there are some commonalities between the colleges, such as nine out of 10 of them tend towards part-time enrolments and there are also two sub-groups on the subject variable with an Arts and Languages group and a Preparation for Life and Work group. However, even within these sub-groups there is wide variation in level of study and size, so it is difficult to see the justification in clustering these colleges together in one group. Indeed, those colleges that are in the Preparation for Life and Work sub-group are closer in nature to those colleges that make up the special college group (though there is still some variation even within this group).

Table 11.16 - Cluster membership of specialist designated colleges

Cluster No.	No. of Colleges	Size	Dominant Mode	Level	Subject
CC-S15	1	Small	Full-time	High unclassified level learning	Preparation for Life and Work
CC-S21	1	Small	Part-time	Moderate levels in multiple groups	Applied Subjects and Skills
CC-S23	1	Small	Part-time	Moderate levels in multiple groups	Business and Key Skills
CC-S24	1	Small	Part-time	Moderate levels in multiple groups	Preparation for Life and Work
CC-S28	1	Small	Part-time	Moderately high level two	Preparation for Life and Work
CC-M10	1	Medium	Part-time	High low level learning (entry and one)	Arts and Languages
CC-M11	1	Medium	Part-time	High unclassified level learning	Arts and Languages
CC-L6	1	Large	Part-time	High low level learning (entry and level one)	Arts and Languages
CC-VL6	1	Very large	Part-time	High unclassified level learning	Arts and Languages
CC-VL9	1	Very large	Part-time	Moderate levels in multiple groups	Arts and Languages

Table 11.17 - Cluster profile percentages for specialist designated colleges

Variable	Variable Category	Percentage of Clusters in this area
Size	Small	50.0%
	Medium	20.0%
	Large	10.0%
	Very large	20.0%
Mode	Part-time	90.0%
	Full-time	10.0%
Level	High unclassified level learning	30.0%
	High low level learning (entry and one)	20.0%
	Moderate levels in multiple groups	40.0%
	Moderately high level two	10.0%
Subject	Arts and Languages	50.0%
	Preparation for Life and Work	30.0%
	Applied Subjects and Skills	10.0%
	Business and Key Skills	10.0%

Special college - art, design and performing arts

The original administrative type of special college - art, design and performing arts (referred to as arts colleges) only contained three colleges and they were separated into two highly similar groups as shown in Table 11.18. All three are small, enrolling students in multiple levels with a focus on Arts and Languages subjects. It is only on the dominant mode of study where they differ, though in this case by a fairly large margin with the college in cluster CC-S6 enrolling 51.1% more of its students on full-time courses compared to 69.7% and 88.7% for the two colleges in cluster CC-S17. Furthermore, cluster CC-S6 has two colleges in it, the other of which is Strode's College, which was mentioned earlier as a sixth form college with a particular specialism in the arts. Despite this, it is probably more reasonable to group the three arts colleges together as they are the only colleges with more than 60% of their students enrolled in arts subjects, though the difference in mode of study should be noted.

Table 11.18 - Cluster membership of special colleges - art, design and performing arts

Cluster number	Number of colleges	Size	Mode	Level	Subject
CC-S6	1	Small	Balanced	Moderate levels in multiple groups	Arts and Languages
CC-S17	2	Small	Full-time	Moderate levels in multiple groups	Arts and Languages

Chapter summary

This chapter has presented the results of the fine grained cluster analysis on size and course characteristics. It has highlighted the high levels of diversity within the sector, in particular in the general FE college administrative type. It has also indicated important results in individual variables such as the presence of three distinct types of general college in the subjects they offer. The following chapter presents a similar investigation of size and the student characteristics.

Chapter 12: Student characteristics cluster analysis

This chapter presents the results of the detailed cluster analysis on size and student characteristics and an overview of the nature and extent of diversity that the analysis demonstrates. It is structured in a very similar way to Chapter 11 and therefore initially presents an analysis of the membership of each of the clusters within the individual variables and a description of which characteristics are represented by the respective cluster. The exception to this is the size characteristic which is identical to that used in Chapter 11 and is therefore not repeated here. This is followed by a breakdown of all the clusters identified by the cluster analysis and what this means for the diversity of the sector. It then discusses how the original administrative types are reflected in the cluster analysis and how much diversity is present within each administrative type.

12.1: Single variable clusters

Following are three short sections each detailing the results of a cluster analysis on a single variable. The first two of which, age and gender, are relatively straight forward and are simply described in terms of the borders on a single characteristic (average age of students and percentage of male students respectively). However, similar to level and subject in the previous chapter, the ethnicity characteristics of a college are more complex and required a more detailed approach. This is presented in tabular form with the details of the relevant characteristics and their scope identified.

12.1.1: Age characteristics

The clustering on the age variable produced two categories which coincidently almost exactly mirrored the commonly accepted divide between young and mature students (under 23 and 23 or over respectively). In the 2011/2012 academic year the age at which a student was considered mature was age 23 and over. This has since been changed to up to 25 for learning-disadvantaged students but at the time of the data was the accepted boundary. Therefore, as this divide was identified by the cluster analysis it was decided to use that dividing line exactly. Thus, colleges were clustered based on whether the average age at the college was classified as mature (263) or young (95).

12.1.2: Gender characteristics

The clustering on gender was conducted to classify the percentage of students at the college that were male and three categories resulted: highly female (under 45.0% male), highly male (55.0% male or over) and a roughly balanced student population (between 45.0% and 54.9% male). These groups contain 122, 66 and 170 colleges respectively. There were two colleges on the border between highly male and balanced which to one decimal place had 55.0% male but were in fact just under this value. They were nonetheless included in the male cluster.

12.1.3: Ethnicity characteristics

The ethnicity clustering used all official categories listed in Section 6.5.7 and resulted in eight categories with the characteristics tabulated in Table 12.1:

Table 12.1 - Ethnic clustering group characteristics

Group No.	Characteristics	No. of Colleges
1	Very high White ethnic group (White British 82.0%+)	169
2	High White ethnic group (White British between 61.0% and 82.0%)	111
3	Moderate White British (between 31.0% and 61.0%), low/moderate Pakistani (between 0.0% and 38.0%), African (between 0.0% and 17.0%), Black Caribbean (between 0.0% and 13.0%), Indian (between 0.0% and 20.0%) and White other (between 0.0% and 20.0%)	34
4	Moderate African (between 3.0% and 24.0%) and other Whites (between 4.0% and 28.0%) and British White (between 16.0% and 41.0%)	30
5	Very low White (White British under 17.0%), high Black African (over 31.0%), moderate Black Caribbean (between 11.0% and 21.0%)	4
6	Moderate Pakistani (between 17.0% and 38.0%), Bangladeshi (between 5.0% and 24.0%) and African (between 13.0% and 22.0%)	5
7	High Indian (between 23.0% and 46.0%)	4
8	A single college with very high Bangladeshi (43.6%) and moderate African (13.4%)	1

Some of these groups are relatively simply defined as they describe one or two ethnic groups. However, some of the more complex groups, particularly group three still have quite a high range of differences within them, describing multiple ethnic characteristics. Some colleges within this group do not match all the requirements exactly, which explains the high ranges up from zero. For example, Bromley College of Further and Higher Education enrols the lowest percentage of Pakistani students of group three but fulfils all other criteria comfortably and thus is assigned to group three.

12.2: The combined cluster analysis

This section presents the results of a cluster analysis run on the three single variable clusters described in the previous section together with size. Initially an overview of the complete results is presented prior to a description of the clusters containing 10 or more colleges. This is followed by an analysis of the structure of the cluster results and the implications this has for the diversity of the sector. Finally a table is presented which shows a breakdown of the possible characteristics of clusters and how often they occur in both the clusters and the colleges to allow for comparison.

The complete results can be seen in Tables 12.2-12.5 which show the effect of an overall cluster analysis on the student characteristics, age, gender and ethnicity together with size of college. The individual college membership of each cluster is again provided on the companion disk in Appendix 3 - College characteristics in the worksheet entitled Fine grained cluster analysis.

As in Chapter 11, these tables show the nature and extent of diversity in the FE college sector, in this case, on student characteristics. The clusters are sorted by the variables in the table from left to right, i.e. by size then age then gender and finally by ethnicity. The colour coding

(as given in the table key) is done by the third variable (gender) in order to make patterns easier to see (the colours used in this chapter are similar to those used in Chapter 11, but there is no link across the two chapters). Tables 12.2-12.5 show that there are 68 clusters in total for student characteristics which suggests a wide range of diversity in this area.

12.2.1: Clusters with 10 or more members

There are 11 clusters with 10 or more colleges and the largest, cluster SC-S17, contains 29 colleges. The members of this cluster are small in size with focus on young students with a roughly even gender split with a very high majority of their students from a White background.

Cluster SC-M5 contains the second largest number of colleges with 22. The members of this cluster are medium in size with a focus on mature students but again with a roughly even gender split and a very high majority of students from a White background.

Cluster SC-VL1 contains the third largest number of colleges with 19. The members are very large in size with a focus on mature students, an even gender balance and with a high majority of their students from a White background.

Clusters SC-L4 and SC-S23 contain the joint fourth largest number of colleges with 16. Cluster SC-L4's members are large in size with a focus on mature students, have no dominant gender and a very high majority of their students from a White background. Cluster SC-S23's members are small in size with a focus on young students, have a female dominant gender and a very high majority of their students from a White background.

Clusters SC-M10 and cluster SC-L1 contain the joint sixth largest number of colleges with 14. Cluster SC-M10's members are medium in size with a focus on mature students, have a female dominant gender and a very high majority of their students from a White Background. Cluster SC-L1's members are large in size with a focus on mature students, have no dominant gender and a high majority of their students from a White background.

Cluster SC-M1 contains the eighth largest number of colleges with 12. The members are medium in size with a focus on mature students, have no dominant gender and a high majority of their students from a White background.

Clusters SC-S8 and SC-M14 contain the joint ninth largest number of colleges with 11. Cluster SC-S8's members are small in size with a focus on mature students with a female dominant gender and a very high majority of their students from a White background. Cluster SC-M14's members are medium in size with a focus on mature students, have a male dominant gender and a very high majority of their students from a White background.

Table 12.2 - Student characteristics: cluster membership breakdown of small colleges by age, gender and ethnicity

Cluster number and size	Number of colleges	Student age group	Dominant gender	Ethnic characteristic
SC-S1	5	Mature	Balanced	High White
SC-S2	1	Mature	Balanced	Moderate White British, low/moderate Pakistani, African, Black other, Indian, White other
SC-S3	8	Mature	Balanced	Very high White
SC-S4	1	Mature	Female	High Indian
SC-S5	7	Mature	Female	High White
SC-S6	1	Mature	Female	Moderate African and other Whites and British White
SC-S7	1	Mature	Female	Moderate White British, low/moderate Pakistani, African, Black other, Indian, White other
SC-S8	11	Mature	Female	Very high White
SC-S9	1	Mature	Male	High White
SC-S10	1	Mature	Male	Moderate White British, low/moderate Pakistani, African, Black other, Indian, White other
SC-S11	4	Mature	Male	Very high White
SC-S12	1	Young	Balanced	High Indian
SC-S13	8	Young	Balanced	High White
SC-S14	2	Young	Balanced	Moderate African and other Whites and British White
SC-S15	2	Young	Balanced	Moderate Pakistani, Bangladeshi and African
SC-S16	7	Young	Balanced	Moderate White British, low/moderate Pakistani, African, Black other, Indian, White other
SC-S17	29	Young	Balanced	Very high White
SC-S18	2	Young	Female	High Indian
SC-S19	5	Young	Female	High White
SC-S20	1	Young	Female	Moderate African and other Whites and British White
SC-S21	2	Young	Female	Moderate Pakistani, Bangladeshi and African
SC-S22	5	Young	Female	Moderate White British, low/moderate Pakistani, African, Black other, Indian, White other

Table 12.2 continued				
Cluster number and size	**Number of colleges**	**Student age group**	**Dominant gender**	**Ethnic characteristic**
SC-S23	16	Young	Female	Very high White
SC-S24	4	Young	Female	Very low White, high Black African, moderate Black Caribbean
SC-S25	1	Young	Male	High White
SC-S26	1	Young	Male	Moderate White British, low/moderate Pakistani, African, Black other, Indian, White other
SC-S27	5	Young	Male	Very high White

Colour coding based on gender

Female
Male
Balanced

Table 12.3 - Student characteristics: cluster membership breakdown of medium colleges by age, gender and ethnicity

Cluster number and size	Number of colleges	Student age group	Dominant gender	Ethnic characteristic
SC-M1	12	Mature	Balanced	High White
SC-M2	1	Mature	Balanced	Moderate African and other Whites and British White
SC-M3	1	Mature	Balanced	Moderate Pakistani, Bangladeshi and African
SC-M4	1	Mature	Balanced	Moderate White British, low/moderate Pakistani, African, Black other, Indian, White other
SC-M5	22	Mature	Balanced	Very high White
SC-M6	13	Mature	Female	High White
SC-M7	8	Mature	Female	Moderate African and other Whites and British White
SC-M8	3	Mature	Female	Moderate White British, low/moderate Pakistani, African, Black other, Indian, White other
SC-M9	1	Mature	Female	Very high Bangladeshi and moderate African
SC-M10	14	Mature	Female	Very high White
SC-M11	2	Mature	Male	High White
SC-M12	2	Mature	Male	Moderate African and other Whites and British White
SC-M13	1	Mature	Male	Moderate White British, low/moderate Pakistani, African, Black other, Indian, White other
SC-M14	11	Mature	Male	Very high White
SC-M15	1	Young	Balanced	Moderate African and other Whites and British White
SC-M16	2	Young	Balanced	Very high White

Colour coding based on gender

Female
Male
Balanced

Table 12.4 - Student characteristics: cluster membership breakdown of large colleges by age, gender and ethnicity

Cluster number and size	Number of colleges	Student age group	Dominant gender	Ethnic characteristic
SC-L1	14	Mature	Balanced	High White
SC-L2	2	Mature	Balanced	Moderate African and other Whites and British White
SC-L3	3	Mature	Balanced	Moderate White British, low/moderate Pakistani, African, Black other, Indian, White other
SC-L4	16	Mature	Balanced	Very high White
SC-L5	5	Mature	Female	High White
SC-L6	1	Mature	Female	Moderate African and other Whites and British White
SC-L7	3	Mature	Female	Moderate White British, low/moderate Pakistani, African, Black other, Indian, White other
SC-L8	6	Mature	Female	Very high White
SC-L9	7	Mature	Male	High White
SC-L10	1	Mature	Male	Moderate African and other Whites and British White
SC-L11	1	Mature	Male	Moderate White British, low/moderate Pakistani, African, Black other, Indian, White other
SC-L12	7	Mature	Male	Very high White
SC-L13	1	Young	Balanced	Very high White

Colour coding based on gender

Female
Male
Balanced

Table 12.5 - Student characteristics: cluster membership breakdown of very large colleges by age, gender and ethnicity

Cluster number and size	Number of colleges	Student age group	Dominant gender	Ethnic characteristic
SC-VL1	19	Mature	Balanced	High White
SC-VL2	3	Mature	Balanced	Moderate African and other Whites and British White
SC-VL3	2	Mature	Balanced	Moderate White British, low/moderate Pakistani, African, Black other, Indian, White other
SC-VL4	7	Mature	Balanced	Very high White
SC-VL5	4	Mature	Female	High White
SC-VL6	4	Mature	Female	Moderate African and other Whites and British White
SC-VL7	2	Mature	Female	Moderate White British, low/moderate Pakistani, African, Black other, Indian, White other
SC-VL8	2	Mature	Female	Very high White
SC-VL9	8	Mature	Male	High White
SC-VL10	3	Mature	Male	Moderate African and other Whites and British White
SC-VL11	2	Mature	Male	Moderate White British, low/moderate Pakistani, African, Black other, Indian, White other
SC-VL12	8	Mature	Male	Very high White

Colour coding based on gender

Female
Male
Balanced

12.3: Analysis of cluster structure

As in the course characteristics cluster analysis, the dispersion of colleges between groups in this analysis is not equal. This aspect can again be highlighted by the number of single college clusters, though at 20 this is a markedly smaller proportion than the 28 in Chapter 11. While this number of unique colleges suggests a high level of diversity through specialisation, differences can of course be relatively small if there were some colleges close to the border of any of the recognised groups. However, closer inspection of the single college groups again confirmed that none of the colleges identified for the single college groups was actually close to the border of any of the other groups. Therefore, while some colleges may only be different from their peers on one aspect it does tend to be substantially different and therefore does indeed confirm the presence of diversity through specialisation in at least one area.

Similarly to the course characteristics cluster analysis, after removing the single college we are left with an average cluster membership of 7.0. However, unlike the previous cluster analysis, the student characteristics cluster analysis has 21 of the remaining 48 clusters having average or above average membership (compared to 12 in the previous analysis). This suggests a much more even dispersion on student characteristics. This is highlighted by Table 12.6, which shows the frequency of cluster sizes, including those already mentioned, for the student characteristics cluster analysis.

Table 12.6 - Cluster size frequency for student characteristics

Cluster size	Frequency	Cluster size	Frequency	Cluster size	Frequency
1	20	7	5	16	2
2	12	8	5	19	1
3	5	11	2	22	1
4	4	12	1	29	1
5	5	13	1		
6	1	14	2		
			Total		**68**

Table 12.7 shows the numbers and percentages of clusters and colleges, in each category of each variable. This shows the dispersion of clusters between each option as well as the dispersion of colleges for comparison. Perhaps the most important thing to note from this is the comparatively large number of clusters (15) for the relatively small number of colleges (34) for an ethnic group. This shows that similar to the course characteristics cluster analysis, the number of clusters is slightly misleading in attempting to measure the amount of diversity. However, it still shows there is a substantial amount of diversity and a wide variation over most of the variables under study.

12.3.1: The General FE Colleges

The 224 general FE colleges are the largest group from the original administrative types but results in Chapters 8-11 and herein, all suggest that they do not form a homogeneous or coherent group but instead exhibit substantial diversity. Indeed, they are represented in 49

different clusters, even more than in the course characteristics cluster analysis. Table 12.8 shows the number of general FE colleges in each of the groups at each size category (details for which can be found in Tables 12.2-12.5 above). Each of these clusters contains 100% general FE colleges except where noted in brackets and represents eight of the 27 small clusters and all the medium, large and very large clusters.

A breakdown of the profiles of these clusters can be seen in Table 12.9 which shows the number and percentage representation of each of the available options by both clusters and colleges.

Table 12.7 - Cluster profile percentages for all colleges

Variable	Variable category	Clusters in this area		Colleges in this area	
		Number	Percent	Number	Percent
Size	Small	27	39.7%	132	36.9%
	Medium	16	23.5%	95	26.5%
	Large	13	19.1%	67	18.7%
	Very large	12	17.6%	64	17.9%
Dominant age group	Young	19	27.9%	95	26.5%
	Mature	49	72.1%	263	73.5%
Dominant gender	Female	25	36.8%	122	34.1%
	Balanced	25	36.8%	170	47.5%
	Male	18	26.5%	66	18.4%
Ethnic character-istics	Very high White	17	25.0%	169	47.2%
	Very low White, high Black African, moderate Black Caribbean	1	1.5%	4	1.1%
	Moderate Pakistani, Bangladeshi and African	3	4.4%	5	1.4%
	Moderate African and other Whites and British White	13	19.1%	30	8.4%
	Very high Bangladeshi and moderate African	1	1.5%	1	0.3%
	High Indian	3	4.4%	4	1.1%
	Moderate White British, low/moderate Pakistani, African and Black Caribbean, Indian and White other	15	22.1%	34	9.5%
	High White	15	22.1%	111	31.0%

Table 12.8 - Cluster membership of general FE colleges by size

Cluster numbers of clusters containing GFECs (Small)	Cluster numbers of clusters containing GFECs (Medium)	Cluster numbers of clusters containing GFECs (Large)	Cluster numbers of clusters containing GFECs (Very Large)
SC-S1(2 of 5 colleges), SC-S3(3 of 8), SC-S5(2 of 7) SC-S7, SC-S8(3 of 11), SC-S11(1 of 4), SC-S17(2 of 29) SC-S27(1 of 5)	SC-M1, SC-M2, SC-M3, SC-M4, SC-M5(17 of 22), SC-M6(12 of 13), SC-M7(6 of 8), SC-M8 SC-M9, SC-M10(11 of 14) SC-M11, SC-M12, SC-M13 SC-M14(8 of 11), SC-M15, SC-M16	SC-L1, SC-L2, SC-L3, SC-L4, SC-L5, SC-L6 SC-L7(2 of 3), SC-L8 SC-L9, SC-L10, SC-L11 SC-L12, SC-L13	SC-VL1, SC-VL2, SC-VL3, SC-VL4, SC-VL5(3 of 4), SC-VL6, SC-VL7(1 of 2), SC-VL8, SC-VL9, SC-VL10, SC-VL11, SC-VL12

GFEC = General FE college

The size data for number of colleges in Table 12.9 is the same as the previous cluster analysis and therefore it also shows that general FE colleges tend to be medium or larger in size with the vast majority having mature students as the dominant age group. However, general FE colleges are spread fairly evenly on the dominant gender variable with no apparent focus in this area, demonstrating a great deal of diversity on this variable. Finally, there is no obvious pattern, beyond the prevalence of White background ethnic groups, in the dominant ethnic group for general FE colleges with there being a reasonable representation of all the major groups. Therefore, while there are also a small number of more specialised colleges, some of which share a profile with colleges from other administrative types, the results show that the general FE college administrative type contains a fairly high degree of diversity, particularly on size and gender.

Table 12.9 - Cluster profile percentages for general FE colleges

Variable	Variable Category	Clusters in this area		Colleges in this area	
		Number	Percent	Number	Percent
Size	Small	8	16.3%	15	6.7%
	Medium	16	32.7%	81	36.2%
	Large	13	26.5%	66	29.5%
	Very large	12	24.5%	62	27.7%
Dominant age group	Mature	43	87.8%	217	96.9%
	Young	6	12.2%	7	3.1%
Dominant gender	Female	17	34.7%	63	28.1%
	Balanced	19	38.8%	109	48.7%
	Male	13	26.5%	52	23.2%

Table 12.9 continued					
Variable	**Variable Category**	**Clusters in this area**		**Colleges in this area**	
		Number	**Percent**	**Number**	**Percent**
Ethnic character-istics	Very high White	15	30.6%	95	42.4%
	Moderate Pakistani, Bangladeshi and African	1	2.0%	1	0.4%
	Moderate African and other Whites and British White	10	20.4%	24	10.7%
	Very high Bangladeshi and moderate African	1	2.0%	1	0.4%
	Moderate White British, low/moderate Pakistani, African and Black Caribbean, Indian and White other	11	22.4%	17	7.6%
	High White	11	22.4%	86	38.4%

12.3.2: The Sixth Form Colleges

The 94 sixth form colleges are separated into 21 different clusters in the student characteristics cluster analysis, showing substantially more variation than in the course characteristics (14 clusters). Table 12.10 shows the number of sixth form colleges in each of the groups in both the relevant size categories (details for which can be found in Tables 12.2-12.5 above).

It would be expected that sixth form colleges are small and have a focus on young students and in the current climate, probably with a female or balanced dominant gender. Table 12.11 shows the cluster membership for sixth form colleges on student characteristics and indeed this is confirmed with only a small minority of colleges that do not conform to this expected outcome. The number of sixth form colleges with a very high proportion of students from White ethnic background is slightly higher than the system average. Equally, the overall number of colleges with higher proportions of ethnic minority students is also higher than the system average. Therefore, the proportion of colleges with only a high proportion of White students is substantially lower. Sixth form colleges account for 34.6% of the ethnic minority colleges (27 out of 78) and only 26.3% of the total colleges suggesting a slight tendency for some sixth form colleges to be more ethnically diverse than other colleges.

Table 12.10 - Cluster membership of sixth form colleges by size

Cluster numbers of clusters containing sixth form colleges (Small)	Cluster numbers of clusters containing sixth form colleges (Medium)
SC-S1(1 of 5), SC-S3(1 of 8), SC-S4, SC-S5(5 of 7), SC-S8(5 of 11), SC-S12, SC-S13(7 of 8), SC-S14, SC-S15, SC-S16, SC-S17(23 of 29), SC-S18, SC-S19, SC-S20, SC-S21, SC-S22, SC-S23(15 of 16), SC-S24	SC-M5(1 of 22) SC-M6(1 of 13) SC-M10(3 of 14)

Table 12.11 - Cluster profile percentages for sixth form colleges

Variable	Variable category	Clusters in this area		Colleges in this area	
		Number	Percent	Number	Percent
Size	Small	18	85.7%	89	94.7%
	Medium	3	14.3%	5	5.3%
Dominant age group	Mature	8	38.1%	18	19.1%
	Young	11	52.4%	76	80.9%
Dominant gender	High female	12	57.1%	49	52.1%
	Balanced	9	42.9%	45	47.9%
Ethnic character-istics	Very high White	6	28.6%	48	51.1%
	High White	5	23.8%	19	20.2%
	Moderate African and other Whites and British White	2	9.5%	3	3.2%
	Moderate White British, low/moderate Pakistani, African and Black Caribbean, Indian and White other	2	9.5%	12	12.8%
	Very low White, high Black African, moderate Black Caribbean	1	4.7%	4	4.3%
	High Indian	3	14.3%	4	4.3%
	Moderate Pakistani, Bangladeshi and African	2	9.5%	4	4.3%

12.3.3: The specialist colleges

This section considers how each of the specialist colleges groups from the original administrative types has been classified.

Agricultural colleges

Traditionally, agricultural colleges would enrol mature students, who were male and White British. Indeed, of the 16 colleges designated as agricultural colleges by the original administrative type, all enrol primarily mature students and all except one college are in the very high White group and that one is in the high White with 10% other White background students. However, in the dominant gender variable, most notably SC-S8, there is some diversity and therefore variation from the historical expectations. Table 12.12 shows the descriptions of the agricultural college clusters.

Table 12.12 - Cluster membership of agricultural colleges

Cluster number	No. of colleges	Size	Student age group	Dominant gender	Ethnic characteristics
SC-S1	1	Small	Mature	Balanced	High White
SC-S3	4	Small	Mature	Balanced	Very high White
SC-S8	1	Small	Mature	Female	Very high White
SC-S11	3	Small	Mature	Male	Very high White
SC-M5	4	Medium	Mature	Balanced	Very high White
SC-M14	3	Medium	Mature	Male	Very high White

Table 12.13 shows the dispersion of these available options between the clusters and colleges clearly indicating a strong profile for agricultural colleges for age and ethnic characteristics. It is only in gender where there is some limited diversity. However, even more so than for the subject characteristics, the results suggest that agricultural college is a fairly well-defined group and that the administrative category is fairly reasonable.

Table 12.13 - Cluster profile percentages for agricultural colleges

Variable	Variable category	Clusters in this area		Colleges in this area	
		Number	Percent	Number	Percent
Size	Small	4	66.7%	8	57.1%
	Medium	2	33.3%	6	42.9%
Age	Mature	6	100.0%	14	100.0%
Dominant gender	Female	1	16.7%	1	7.1%
	Male	2	33.3%	5	35.7%
	Balanced	3	50.0%	8	57.1%
Ethnic character-istics	Very high White	5	83.3%	13	92.9%
	High White	1	16.7%	1	7.1%

Special colleges

The original administrative type of special college contained 11 colleges which have been grouped into five clusters as show in Table 12.14. However, with eight of the 11 colleges classified in two groups, special colleges represent a reasonably consistent type as these two groups differ on only one aspect, that of the dominant gender. Indeed, it is only the college in cluster SC-S10 that differs on two aspects (age and ethnicity) from the two main types.

Table 12.14 - Cluster membership of special colleges

Cluster number	No. of colleges	Size	Student age group	Dominant gender	Ethnic characteristics
SC-S17	4	Small	Young	Balanced	Very high White
SC-S27	4	Small	Young	High male	Very high White
SC-S10	1	Small	Mature	High male	Moderate White British, low/moderate Pakistani, African and Black Caribbean, Indian and White other
SC-S13	1	Small	Young	Balanced	High White
SC-S26	1	Small	Young	High male	Moderate White British, low/moderate Pakistani, African and Black Caribbean, Indian and White other

Table 12.15 shows the overall breakdown of institutional profiles in each area and it clearly demonstrates that the special college has a reasonably solid institutional profile with relatively minor differences except for the single college previously mentioned. Therefore, on student characteristics it is reasonable to conclude that the special college administrative group is an effective administrative type.

Table 12.15 - Cluster profile percentages for special colleges

Variable	Variable category	Clusters in this area		Colleges in this area	
		Number	Percent	Number	Percent
Size	Small	5	100.0%	11	100.0%
Age	Young	4	80.0%	10	90.9%
	Mature	1	20.0%	1	9.1%
Dominant gender	High male	3	60.0%	6	54.6%
	Balanced	2	40.0%	5	45.5%
Ethnic character-istics	Very high White	2	40.0%	8	72.7%
	High White	1	20.0%	1	9.1%
	Moderate White British, low/moderate Pakistani, African and Black Caribbean, Indian and White other	2	40.0%	2	18.2%

Specialist designated colleges

The original administrative type of specialist designated college contained 10 colleges and in concert with the course characteristics analysis, almost all of these colleges have been placed in a separate cluster as shown in Table 12.16. This clearly suggests that colleges in this administrative category are actually highly diverse and perhaps grouping them together as a single administrative type is somewhat misleading. Indeed, all four sizes are represented as are both of the age categories, all three of the gender categories and three of the eight ethnic characteristics categories.

Table 12.17 shows the percentage breakdown of the profiles in each of the variables. This shows that there is some commonalities between the colleges as nine out of 10 tend towards mature students. However, though there are six of the 10 colleges with a female dominant gender there are also two each for both of the other options in that variable, indicating diversity in this area for this type of college. Therefore, as in the course characteristics, it is difficult to justify grouping these colleges together in one administrative type.

Table 12.16 - Cluster membership of specialist designated colleges

Cluster number	No. of colleges	Size	Student age group	Dominant gender	Ethnic characteristics
SC-S25	1	Small	Young	Male	High White
SC-S1	1	Small	Mature	Balanced	High White
SC-VL5	1	Very large	Mature	Female	High White
SC-VL7	1	Very large	Mature	Female	Moderate White British, low/moderate Pakistani, African and Black Caribbean, Indian and White other
SC-S9	1	Small	Mature	Male	High White
SC-M7	2	Medium	Mature	Female	Moderate African and other Whites and British White
SC-L7	1	Large	Mature	Female	Moderate White British, low/moderate Pakistani, African and Black Caribbean, Indian and White other
SC-S2	1	Small	Mature	Balanced	Moderate White British, low/moderate Pakistani, African and Black Caribbean, Indian and White other
SC-S6	1	Small	Mature	Female	Moderate African and other Whites and British White

Table 12.17 - Cluster profile percentages for specialist designated colleges

Variable	Variable category	Clusters in this area		Colleges in this area	
		Number	Percent	Number	Percent
Size	Small	5	55.6%	5	50.0%
	Medium	1	11.1%	2	20.0%
	Large	1	11.1%	1	10.0%
	Very large	2	22.2%	2	20.0%
Age	Young	1	11.1%	1	10.0%
	Mature	8	88.9%	9	90.0%
Dominant gender	High male	2	22.2%	2	20.0%
	Balanced	2	22.2%	2	20.0%
	High female	5	55.6%	6	60.0%

Table 12.17 continued					
Variable	**Variable Category**	**Clusters in this area**		**Colleges in this area**	
		Number	**Percent**	**Number**	**Percent**
Ethnic character-istics	High White	4	44.4%	4	40.0%
	Moderate African and other Whites and British White	2	22.2%	3	30.0%
	Moderate White British, low/moderate Pakistani, African and Black Caribbean, Indian and White other	3	33.3%	3	30.0%

Special college - art, design and performing arts

The original administrative type of special college - art, design and performing arts only contained three colleges and on student characteristics, two were placed in the same group and the third in a very similar group showing only variety on the average age of students (see Table 12.18). However, there were nine other colleges of different types also in cluster SC-S8 and 15 others in cluster SC-S11. Therefore, while these colleges are clearly similar on student characteristics they do not sufficiently separate from other colleges to justify putting them in their own group (unlike on course characteristics).

Table 12.18 - Cluster membership of special colleges - art, design and performing arts

Cluster number	No. of colleges	Size	Student age group	Dominant gender	Ethnic characteristics
SC-S8	2	Small	Mature	High female	Very high White
SC-S11	1	Small	Young	High female	Very high White

Chapter summary

This chapter has presented the results of the fine grained cluster analysis on the size and student characteristics of colleges. It has highlighted key profiles in the age category of student characteristics and shown some diversity in both the gender and ethnicity profiles of institutions. It has also indicated differences in student profiles within each of the existing administrative types. The following chapter describes an alternative approach to the cluster analysis, which groups institutions more broadly than this and the previous chapter.

Chapter 13: Alternative cluster analysis

The results presented in Chapters 11 and 12 of this study demonstrate the nature and extent of institutional diversity in the FE sector. However, while 72 and 68 clusters in course and student characteristics respectively, demonstrate the high degree of diversity in the FE sector, these numbers may be considered too many to be manageable for some purposes. For example, aspects of policy work, other research and individual college management and/or management of the college system. Thus, this chapter discusses how these results can be reduced to produce a less detailed description of the sector for users that require a more concise description, while still grouping colleges together in groups that contain broadly similar institutions.

The first section discusses a method for reducing the number of clusters in the course characteristics analysis down from 72 to 14 and the relative merits this approach has when compared to that presented in Chapter 11. The same approach is then applied to the student characteristics clusters in Chapter 12 and the results of this are presented in the second part of this chapter.

13.1: Course characteristics

Initially, this section presents the steps required to reduce the number of clusters in the course characteristics analysis and the justifications for each of these steps; subsequently presenting the resulting analysis and finally comparing and contrasting the results with the original clusters presented in Chapter 11.

The first step in this process must be to consider the conceptual make up of the variables. Size stands out from the other three variables as it is positioned conceptually by Birnbaum (1983) as the only variable covering systemic diversity. Furthermore, the remaining three variables all describe various aspects of the course, i.e. how it is studied (part-time/full-time), at what level and in what subject. Thus it can be concluded that the course characteristics variables describe what a college does and the size variable describes the number of students for which it does this - conceptually distinctly different. Therefore, in order to dramatically reduce the number of clusters in this alternative analysis while still maintaining distinct groups, it was decided to remove the size of colleges from consideration due to the differences between the size variable and the others, both conceptually and in practice. Additionally, the current administrative types do not include size as a determining factor. It was therefore considered useful to present an alternative analysis excluding size, as a basis for developing an alternative to the current administrative types. Thus, it was concluded that an analysis based on institutional activities would be a better starting point for this discussion.

Initially, the effect of eliminating size from consideration reduces the number of clusters from 72 to 37. Though outside the scope of what this analysis is intended to achieve, an alternative would have been to include size but at a reduced level of detail, e.g. with simply small and large colleges which would merge together clusters two to four from Chapter 11. However, this would only have reduced the number of clusters to 49 rather than 37.

The next step in this process is to reduce the level of detail in the remaining variables in order to further reduce the number of clusters. Unfortunately, the mode of study element in this

study does not lend itself to further reduction as the three clusters that currently represent it (full-time, part-time or balanced approach) cannot be reduced without an unacceptable loss of detail.

The five cluster solution to level of study can be reduced to four simply by merging together the clusters describing lower level learning and unclassified level learning[9]. However, the cluster analysis algorithm would not consider this as an option because it does not know the variables are related. This could be solved by merging together the three variables describing the percentage of entry level, level one and unclassified level students prior to running the analysis. However, the solution in this case was to merge together these conceptually similar clusters describing the lower levels of study, accepting this small loss of detail.

Similarly, the eight cluster solution to the subject of study element of this study can also be reduced to four clusters. The three clusters describing a broad range of subjects[10] are already large and so must be left as they are to avoid an unacceptable loss of detail. However, the subject specialists[11] can be merged into one cluster, which describes the fact that they are colleges which specialise in a limited group of subjects without specifying which subjects they are.

When this solution is applied to the colleges sector it results in a 24 cluster solution, which is substantially fewer than the original 72 cluster solution. However, this could still be considered too many and because of the limited number of colleges in some clusters it is possible to further reduce this number. Indeed, the first 13 clusters describe 325 (90.8%) of the 358 colleges. Therefore, the remaining 33 colleges are spread out between 11 further clusters. Although these clusters demonstrate diversity, the dispersion of colleges into these clusters is limited and thus they can be merged to form one cluster of 'unusual approach' colleges. Though the characteristics of these colleges are fairly disparate they share in common the fact they have an unusual combination of characteristics that is not shared by many colleges. An alternative solution to this would have been to move most or all of these 33 colleges into the 'main' cluster that is closest to their characteristics. However, the unusual approach 14th cluster was selected as the appropriate solution in order to keep the main clusters as close to homogeneous as possible.

Table 13.1 shows the characteristics of the major clusters in this 14 cluster solution sorted by mode then level then subject. The majority of these clusters are highly similar to those listed in Chapter 11 as the largest clusters in the original analysis (if you exclude size). The colour coding is again based on level for consistency between this table and those in Chapter 11. Though this solution is less effective at demonstrating the full nature and extent of diversity in the FE sector, it does present a potentially viable starting point to use in a discussion on replacing the original administrative types discussed throughout this thesis. These results could be used for the purposes of identifying similar colleges for use in policy making,

[9] The remaining three clusters were described as having high proportions of level two or level three students or having a broad general approach with moderate levels in all groups.

[10] The original three clusters describing a broad range of subjects are Liberal Arts, Broad Subject Mix and Applied Subjects and Skills.

[11] The original clusters describing the special colleges are: Arts and Languages, Construction, Public Services and Key Skills, Preparation for Life and Work, Agriculture, Horticulture and Animal Care and Business and Key Skills specialists. Full details of both the broad and specialist clusters can be found in Chapter 11.

academic research or management of an individual college and/or management of the college system. Furthermore, due to the flexibility of the method used, it is possible to identify similar colleges based on any combination of characteristics and levels of detail. Thus, if a researcher or policy maker wished to analyse colleges with broadly similar characteristics on the elements under study, they could do so using these results while keeping the number of groups manageable. Alternatively, those wishing to take a more fine grained approach could use the original analysis presented in Chapter 11. Appendix 3 - College characteristics, worksheet Coarse grained cluster analysis on the companion disk, provides an interactive tool that would facilitate this work in the same way as for the fine grained cluster analysis in Chapters 11 and 12.

Table 13.1 - Course characteristics alternative analysis

Cluster number	Number of colleges in each cluster	Dominant mode	Level characteristic	Subject characteristic
1	30	Balanced	Moderate levels in multiple groups	Applied Subjects and Skills
2	43	Balanced	Moderate levels in multiple groups	Broad Subject Mix
3	10	Balanced	Moderate levels in multiple groups	Subject specialist
4	21	Balanced	Moderately high level two	Applied Subjects and Skills
5	11	Balanced	Moderately high level two	Broad Subject Mix
6	73	Full-time	High level three	Liberal Arts and Sciences
7	9	Full-time	High low level learning (entry, one or unclassified)	Subject specialist
8	29	Part-time	Moderate levels in multiple groups	Applied Subjects and Skills
9	12	Part-time	Moderate levels in multiple groups	Broad Subject Mix
10	10	Part-time	Moderate levels in multiple groups	Subject specialist
11	53	Part-time	Moderately high level two	Applied Subjects and Skills
12	14	Part-time	Moderately high level two	Broad Subject Mix
13	10	Part-time	Moderately high level two	Subject specialist
14	33	Mixed	Mixed	Mixed

Table 13.2 shows the numbers and percentages of both clusters and colleges for each possible profile for each variable. The unusual approach cluster is listed in this table (as in Table 13.1) for each element with 'mixed' for the variable category. This cluster represents roughly 9.2% of colleges and thus each of the other variable percentages for colleges total roughly 90.8% of colleges rather than 100%. This table and the above Table 13.1 demonstrate that cluster six possesses unique characteristics for the subject of study. Furthermore, both clusters six and

seven possess a unique characteristic for level of study and are between them the only full-time dominant clusters. All other characteristics are represented by a broad range of clusters.

Table 13.2 - Cluster profile percentages for the alternative analysis

Element under study	Variable category	Clusters		Colleges	
		Number	Percent	Number	Percent
		Within element		Within element	
Mode of study	Part-time	6	42.9%	128	35.8%
	Balanced	5	35.7%	115	32.1%
	Full-time	2	14.3%	82	22.9%
	Mixed	1	7.1%	33	9.2%
Level of study	Moderate levels in multiple groups	6	42.9%	134	37.4%
	High level three	1	7.1%	73	20.4%
	Moderately high level two	5	35.7%	109	30.4%
	High low level learning (entry, one or unclassified)	1	7.1%	9	2.5%
	Mixed	1	7.1%	33	9.2%
Subject of study	Subject specialist	4	28.6%	39	10.9%
	Liberal Arts and Sciences	1	7.1%	73	20.4%
	Broad Subject Mix	4	28.6%	80	22.3%
	Applied Subjects and Skills	4	28.6%	133	37.2%
	Mixed	1	7.1%	33	9.2%

Table 13.3 shows which clusters the current administrative types belong to. The most significant aspect of this is the range of clusters that represent general FE colleges with such colleges being present in 12 of the 14 clusters (though only in small numbers in some cases). This demonstrates the need for a better typology to describe general FE colleges as they are often quite different from each other. Furthermore, the sixth form colleges are confirmed as a largely homogeneous group, though a review of the status of a small number of colleges may be necessary. However, as you would expect some of the more specialist colleges are less well described by this analysis and further individual consideration of such colleges may be necessary if the results of this analysis were to be utilised for specialist colleges.

Finally, Table 13.4 shows the links this analysis has with that presented in Chapter 11. The codes used to indicate the clusters from Chapter 11 are the same as those used in Chapter 11. The CC in the code indicates it is from the course characteristics cluster analysis and the letter refers to the size of the member colleges (S = small, M = medium, L = large and VL = very large), finally the number simply refers to the cluster number within that size category (refer to Tables 11.1-11.4 in Chapter 11 for full details of the linked clusters). Table 13.4 shows the cluster number from this analysis and the corresponding codes of the clusters from Chapter 11 that contribute members to each cluster. It demonstrates that most clusters in this analysis link to four or fewer of the original clusters in Chapter 11 with only three clusters connecting to more. Of these, the 14th cluster containing unusual approach colleges would be expected to link to numerous clusters and indeed has the highest number of links with 21 original clusters contributing members to this cluster. The remaining two clusters with more than four links (10 and 13) are both clusters of colleges with subject specialisations. The remaining clusters all simply contain the different size options of the mode, level and subject profiles. However, some clusters contain less than four clusters from the original analysis, resulting from the fact that not all possible profiles were represented in all size categories.

Table 13.3 – Course characteristics: number and percentage of colleges in each cluster by original administrative type

Cluster number	Number of colleges	GFECs in cluster		SFCs in cluster		SCs in cluster		ACs in cluster		SDCs in cluster		SACs in cluster	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1	30	29	12.9%	1	1.1%								
2	43	39	17.4%	4	4.3%								
3	10			1	1.1%			8	50.0%			1	33.3%
4	21	20	8.9%					1	6.3%				
5	11	11	4.9%										
6	73	2	0.9%	71	75.5%								
7	9					8	72.7%			1	10.0%		
8	29	28	12.5%							1	10.0%		
9	12	12	5.4%										
10	10	6	2.7%					1	6.3%	3	30.0%		
11	53	53	23.7%										
12	14	12	5.4%	1	1.1%			1	6.3%				
13	10	6	2.7%					3	18.8%	1	10.0%		
14	33	6	2.7%	16	17.0%	3	27.3%	2	12.5%	4	40.0%	2	66.7%

GFEC = General FE College, SFC = Sixth Form College, SC = Special College, AC = Special College - Agriculture and Horticulture, SDC = Specialist Designated College, SAC = Special College - Art, Design and Performing Arts

Table 13.4 - Links between this analysis and that presented in Chapter 11

Cluster number	Members cluster in Chapter 11	Cluster number	Members cluster in Chapter 11
1	CC-S5, CC-M4, CC-L1, CC-VL1	8	CC-S21, CC-M13, CC-L7, CC-VL8
2	CC-S7, CC-M5, CC-L2, CC-VL2	9	CC-M15, CC-L8, CC-VL10
3	CC-S4, CC-S6, CC-M3	10	CC-S22, CC-S23, CC-S24, CC-M12, CC-M14, CC-M16, CC-VL7, CC-VL9, CC-VL11
4	CC-S9, CC-M8, CC-L4, CC-VL3	11	CC-S26, CC-M17, CC-L9, CC-VL12
5	CC-S10, CC-M9, CC-L5, CC-VL4	12	CC-S27, CC-M18, CC-L10, CC-VL13
6	CC-S13	13	CC-S25, CC-S28, CC-M19, CC-L11, CC-VL14
7	CC-S14, CC-S15	14	CC-S1, CC-S2, CC-S3, CC-S8, CC-S11, CC-S12, CC-S16, CC-S17, CC-S18, CC-S19, CC-S20, CC-M1, CC-M2, CC-M6, CC-M7, CC-M10, CC-M11, CC-L3, CC-L6, CC-VL5, CC-VL6

13.2: Student characteristics

Initially, this section presents the steps required to reduce the number of clusters in the student characteristics analysis and the justifications for each of these steps; subsequently presenting the resulting analysis and finally comparing and contrasting the results with the original analysis presented in Chapter 12.

Similar to the course characteristics, the size variable is removed from consideration with the same justification and ramifications. This initial step reduces the number of clusters down from 68 to 31. If a reduced size variable had been applied using the small and large derivation then the total number of clusters would have been 43.

Similar to mode of study, the age (young and mature) and gender of student (balanced, male and female) was already at the minimum number of clusters that was possible while still maintaining sensible distinctions. Therefore, the only way to reduce the number from 31 is to reduce the number of clusters used to describe ethnicity (originally eight). However, as no ethnicities can be reasonably grouped together because of similarity, only one possible approach remains. This required that the two clusters designating the high and very high percentages of White British students were merged together (clusters one and two from Chapter 12) and all other clusters were merged to form one cluster that contained colleges with a high proportion of students from a background other than White British (including all other White backgrounds)[12]. This reduces the number of clusters down to 12. Although an

[12] The original clusters were detailed as follows in Chapter 12, where full details including precise percentages can be found:

- Very low White, high Black African, moderate Black Caribbean
- Moderate Pakistani, Bangladeshi and African
- Moderate African and other Whites and British White
- Very high Bangladeshi and moderate African
- High Indian
- Moderate White British, low/moderate Pakistani, African and Black Caribbean, Indian and White other.

alternative would have been to keep the two clusters containing colleges with high percentages of White British students separate, resulting in 18 clusters, the loss of detail was considered acceptable.

The 12 cluster solution could have been further reduced to 11 by merging the two smallest clusters, but as the number was already reasonable it was left at 12. Table 13.5 presents the characteristics of each of the resulting clusters and their description on each variable. Unlike in the course characteristics all possible combinations of the cluster characteristics are present though some in far greater numbers than others. Table 13.6 shows the even spread of these characteristics between clusters but clearly illustrates that the dispersion of colleges is not even. The dispersion of colleges on age and gender has not changed from Chapter 12. However, for the ethnic categories the dispersion is, as expected, heavily towards the White British background.

Table 13.5 - Student characteristics alternative analysis

Cluster number	Number of cases in each cluster	Student age group	Dominant gender	Ethnic characteristic
1	14	Mature	Balanced	All others
2	103	Mature	Balanced	White British
3	25	Mature	Female	All others
4	62	Mature	Female	White British
5	11	Mature	Male	All others
6	48	Mature	Male	White British
7	13	Young	Balanced	All others
8	40	Young	Balanced	White British
9	14	Young	Female	All others
10	21	Young	Female	White British
11	1	Young	Male	All others
12	6	Young	Male	White British

Table 13.6 - Cluster profile percentages for the alternative analysis

Element under study	Variable category	Clusters		Colleges	
		Number	Percentage	Number	Percentage
		Within element		Within element	
Age	Mature	6	50.0%	263	73.5%
	Young	6	50.0%	95	26.5%
Gender	Balanced	4	33.3%	170	47.5%
	Female	4	33.3%	122	34.1%
	Male	4	33.3%	66	18.4%
Ethnicity	All others	6	50.0%	78	21.8%
	White British	6	50.0%	280	78.2%

Table 13.7 shows to which clusters the current administrative types belong. The most significant aspect of this is the range of clusters that represent general FE colleges with such

colleges being present in nine of the 12 clusters (though only in small numbers in some cases). Not only is this a lower proportion of clusters than in the course characteristics but in fact 78.1% of general FE colleges are represented by only three clusters. This suggests that the students in general FE colleges are more similar in terms of age, gender and ethnic background than the courses offered by colleges. However, with three large groups of general FE colleges and several smaller ones there is still scope for an improved typology than the current administrative types. Furthermore, again in contrast to the course characteristics, the sixth form colleges are shown to be far less homogeneous on the student characteristics with five groups representing relatively large numbers of sixth form colleges, suggesting that for sixth form colleges there is also scope for improving the administrative types. However, due to the small numbers of specialist colleges it is more difficult to draw conclusions for such colleges.

It is worth noting that with the exception of specialist designated colleges most specialist colleges are present in only a very limited number of clusters and, for the most part, the vast majority of colleges in each college type are represented in only two clusters. Similarly, the specialist designated colleges have one cluster which contains 50% of the colleges so categorised. However, the remaining 50% are spread between five other clusters with no other cluster containing more than a single college.

Finally, Table 13.8 shows the links this analysis has with that presented in Chapter 12. The codes used to indicate the clusters from Chapter 12 are the same as those used in Chapter 12. The SC in the code indicates it is from the student characteristics cluster analysis and the letter refers to the size of the member colleges (S = small, M = medium, L = large and VL = very large), finally the number simply refers to the cluster number within that size category (refer to Tables 12.2-12.5 in Chapter 12 for full details of the linked clusters). Table 13.8 shows the cluster number from this analysis and the corresponding codes of the clusters from Chapter 12 that contribute members to each cluster. It demonstrates that most clusters in this analysis link to at least four of the original clusters in Chapter 12 with only three clusters connecting to less. This indicates that, in contrast to the course characteristics alternative analysis where the removal of size was the biggest influence in cluster links, the changes to ethnicity in this analysis also had a substantial effect. The reduction of clusters has not changed the pattern of a roughly even distribution between total numbers of 'all others' clusters and those with a high White British student population with 50% of the clusters in this analysis in each category, compared to 47.1% high or very high White British in Chapter 12. It is only really clusters 10-12 that stand out as different as they only link to one or two clusters from the analysis from Chapter 12. In the case of clusters 11 and 12 this is due to the small number of colleges contained therein and thus the small number of links. However, cluster 10 contains 21 highly similar colleges with the only distinction in the analysis from Chapter 12 being either the high White British or very high White British. Such college characteristics were not replicated at larger college sizes.

Table 13.7 –Student characteristics: number and percentage of colleges in each cluster by original administrative type

Cluster number	Number of colleges	GFECs in cluster		SFCs in cluster		SCs in cluster		ACs in cluster		SDCs in cluster		SACs in cluster	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1	14	13	5.8%							1	10.0%		
2	103	90	40.2%	3	3.2%			9	56.3%	1	10.0%		
3	25	19	8.5%	1	1.1%					5	50.0%		
4	62	44	19.6%	14	14.9%			1	6.3%	1	10.0%	2	66.7%
5	11	10	4.5%			1	9.1%						
6	48	41	18.3%					6	37.5%	1	10.0%		
7	13	1	0.4%	12	12.8%								
8	40	5	2.2%	30	31.9%	5	45.5%						
9	14			14	14.9%								
10	21			20	21.3%							1	33.3%
11	1					1	9.1%						
12	6	1	0.4%			4	36.4%			1	10.0%		

GFEC = General FE College, SFC = Sixth Form College, SC = Special College, AC = Special College - Agriculture and Horticulture, SDC = Specialist Designated College, SAC = Special College - Art, Design and Performing Arts

Table 13.8 - Links between this analysis and that presented in Chapter 12

Cluster number	Members cluster in Chapter 12	Cluster number	Members cluster in Chapter 12
1	SC-S2, SC-M2, SC-M3, SC-M4, SC-L2, SC-L3, SC-VL2, SC-VL3	7	SC-S12, SC-S14, SC-S15, SC-S16, SC-M15
2	SC-S1, SC-S3, SC-M1, SC-M5, SC-L1, SC-L4, SC-VL1, SC-VL4	8	SC-S13, SC-S17, SC-M16, SC-L13
3	SC-S4, SC-S6, SC-S7, SC-M7, SC-M8, SC-M9, SC-L6, SC-L7, SC-VL6, SC-VL7	9	SC-S18, SC-S20, SC-S21, SC-S22, SC-S24
4	SC-S5, SC-S8, SC-M6, SC-M10, SC-L5, SC-L8, SC-VL5, SC-VL8	10	SC-S19, SC-S23
5	SC-S10, SC-M12, SC-M13, SC-L10, SC-L11, SC-VL10, SC-VL11	11	SC-S26
6	SC-S9, SC-S11, SC-M11, SC-M14, SC-L9, SC-L12, SC-VL9, SC-VL12	12	SC-S25, SC-S27

13.3: A seven variable analysis

Chapter Seven (Section 7.2.3) pinpointed the conceptual differences between the course and student sets of variables as the reason why they were analysed separately (i.e. the practical differences between what an institution does and for whom they do it). These conceptual differences are supported by Birnbaum's theoretical categories of external diversity (section 4.1). Section 7.2.3 also notes the high degree of variation that the analysis would need to describe if such theoretically and conceptually different variables were included in one analysis. Moreover, as part of the purpose of this thesis was to demonstrate whether or not a review of the current official classification is necessary (rather than attempt to replace it directly), it was considered more informative and achieved clearer results when the analysis was conducted with the course and student characteristics analysed separately. Nonetheless, for completeness, a single cluster analysis (for both fine and coarse grained) was examined and this section briefly comments on the results and although it is beyond the scope and purpose of this thesis, it describes how to use Appendix 3 to extract specific further information if required for other purposes.

A cluster analysis with all seven variables using the same methods presented in Chapters 11, 12 and 13, results in 206 clusters for the fine grained analysis and 73 clusters for the coarse grained analysis. This occurs because the larger clusters in one side of the analysis are split into many smaller clusters when combined with the other set of variables. For example, the largest cluster in the fine grained course characteristics analysis contains 73 institutions. When the student characteristics are taken into account this cluster becomes 13 separate clusters. Similarly, the largest cluster in the coarse grained student characteristics cluster analysis contains 103 institutions. When the course characteristics are also taken into account this cluster becomes 13 separate clusters (the maximum would have been 14). Although in principle this does demonstrate a high degree of diversity, the main cluster analysis presented in Chapters 11, 12 and 13 also highlights this same diversity, but it does so in a more theoretically sound manner.

Appendix 3, although not its primary purpose, can be used to examine a full picture of the results when including all seven variables. The appendix contains interactive spreadsheets presenting the results of both the fine and coarse grained cluster analyses presented in

Chapters 11, 12 and 13. It is possible to use these spreadsheets to examine the crossover between one, several or all of the individual clusters to see the other set of characteristics or clusters. For example, if cluster code two is selected in the student characteristics of the coarse grained cluster analysis sheet it will show all colleges that primarily enrol students that have the characteristics of mature, balanced gender and White British. The worksheet will also show the corresponding student characteristics for the member institutions of that cluster. Cluster code two is represented by 13 different combinations of course characteristics including all three mode categorisations, three of the four level categorisations and all four subject categorisations. The same process can be repeated for any combination of clusters for either the coarse or fine grained characteristics.

Chapter 14: Synthesis of findings

The purpose of this study was *to examine the nature and extent of institutional diversity among institutions in the FE sector in England* and this chapter summarises the key findings related to this concept. Furthermore, the study intended to examine three supporting research questions which were:

1. *What patterns can be identified?*
2. *Do official categorisations capture existing diversity?*
3. *Should these categorisations be reviewed and revised?*

This chapter addresses the findings related to the first two questions and the following chapter draws a conclusion for the final question. The synthesis presented in this chapter reflects on each of the three stages of analysis in this thesis. Firstly, the descriptive statistical analysis of the seven individual variables is considered. Secondly, the associations between these variables are summarised and finally, the results of both stages of the cluster analysis are presented and discussed. Many of the key findings presented in this chapter focus on the general FE college and the sixth form college administrative types, as they are the largest groups. However, where appropriate there is also some discussion of the four specialist college types.

14.1: The analysis of the seven individual variables

In examining the nature and extent of institutional diversity in the FE sector, this study analyses seven variables: size and the course characteristics of mode, level and subject of study and the student characteristics of age, gender and ethnicity. These variables were examined over the whole system and then at the institutional level. Birnbaum (1983) described the differences between institutions as external diversity and those within institutions as internal diversity and although it was on the former this study concentrated, some conclusions were also drawn about internal diversity. For example on gender, if a college has as many female students as male they would be considered internally diverse. However, if all colleges in a system were like this then the system would lack external diversity. Whereas two colleges, one with only male students and one with only female students would be considered to represent external diversity, though both colleges would lack internal diversity.

There is substantial institutional diversity, both internally and externally on all three course characteristics, with strong external institutional diversity also present on size. While there is still external diversity present for the student characteristics, this is to a lesser extent, particularly for ethnicity. Nonetheless, there is still a high degree of internal diversity for these variables at many colleges. The following short sub-sections briefly highlight the nature and extent of institutional diversity on each of these seven variables and discuss how well this diversity is captured by the various administrative types.

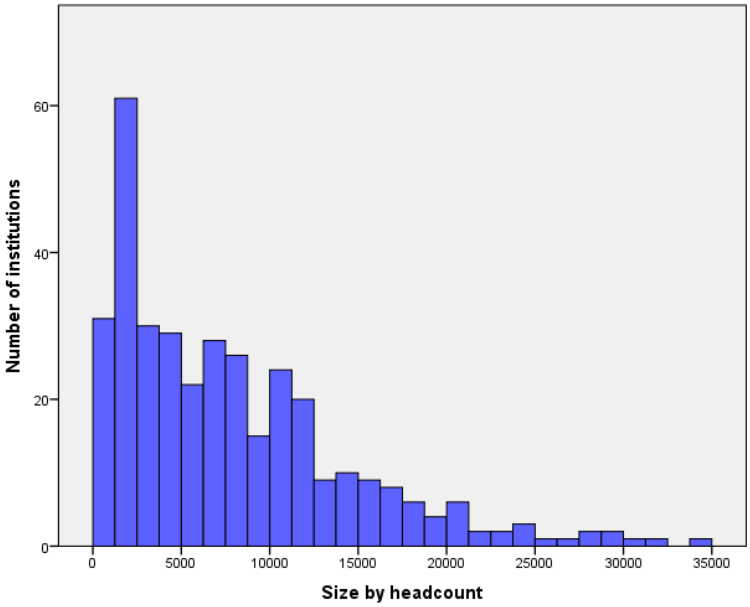
Variable: Size

Figure 14.1 illustrates the distribution of college sizes by headcount in the FE sector. Colleges are highly varied in terms of their headcount, ranging from extremely small numbers to very

large numbers of publically funded students. This figure excludes four extremely large colleges in order to provide a better visualisation of the sector diversity as a whole. With these colleges included in the figure the smaller colleges group together on the left side, visually suggesting very limited diversity, when in fact the opposite is true. However, these very large colleges should be noted separately as they indicate even greater diversity over and above that which Figure 14.1 suggests.

Table 14.1 indicates that this variation was reasonably well reflected in some college types with sixth form colleges and three of the four specialist college types (exception: specialist designated college) all maintaining size profiles that were largely homogeneous within their own administrative type, yet different from other administrative types. However, in contrast the general FE and specialist designated college administrative types both contain members that are highly diverse in terms of their headcounts, with general FE colleges in particular ranging from 510 up to 88,695 students.

Figure 14.1 - Distribution of size by headcount



Note
Graph excludes four outlier colleges of sizes between 35,000 and 89,000.

Table 14.1 - Descriptive statistics of size of administrative types

College type	Number	Minimum	Maximum	Mean	Standard deviation
General FE college	224	510	88,695	11,809.6	8,777.0
Sixth form college	94	441	5,524	2,098.3	876.6
Specialist college (all types)	40	11	62,021	4,816.9	10,561.3
Overall	**358**	**11**	**88,695**	**8,478.4**	**8,926.9**
Specialist college type	**Number**	**Minimum**	**Maximum**	**Mean**	**Standard deviation**
Special college	11	11	335	99.8	93.6
Agricultural college	16	1,843	8,454	4,196.4	1,788.0
Specialist designated college	10	83	62,021	12,019.8	19,712.1
Special college - Art, design and performing arts	3	1,059	1,984	1,413.0	499.2

Variable: Mode of study

The colleges in the FE sector have six distinct modes of study available to them with which to enrol students. However, as Table 14.2 indicates, only two of these modes are heavily utilised by colleges, having a combined total of 82.8% of students enrolled using these two methods. However, as these two modes of study represent full-time and part-time study, there is still substantial scope for institutional diversity.

Table 14.2 - Mode of study in all colleges

Study mode	Frequency	Percent
Full-time full-year	838,621	27.6%
Full-time part-year	175,104	5.8%
Part-time - other including e-learning	1,674,945	55.2%
Part-time - open	15,505	0.5%
Part-time - distance learning	97,914	3.2%
Part-time - evening	219,741	7.2%
Not applicable/not known	13,444	0.4%
Total	**3,035,274**	**100.0%**

Indeed, the institutional profiles of the mode of study of the students at an individual college varied greatly, with colleges spread between the two extremes. Some of this diversity is captured by the original administrative types with sixth form colleges maintaining a distinctly different profile to most other colleges, with the vast majority of their students studying full-time. Similarly, the specialist designated college type also maintained a distinct part-time profile (with the exception of Bridge College). In contrast, the other specialist college types were not homogenous, often encompassing substantial variation between colleges despite their small numbers. However, it was in the general FE college type that the greatest diversity was present. Although, the overall tendency within this administrative type was more towards part-time than full-time, there were representatives of this administrative type at both ends of the spectrum. A comparison of Figures 14.2 and 14.3, which show the distribution of full-time students in the general FE and sixth form college types respectively, indicates the wide range and dispersion of profiles in general FE colleges compared to the substantial majority of sixth form colleges maintaining their full-time profile.

Figure 14.2 - Distribution of full-time student percentage for general FE colleges

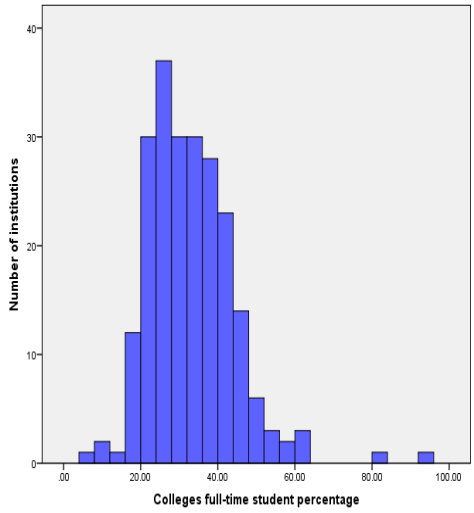
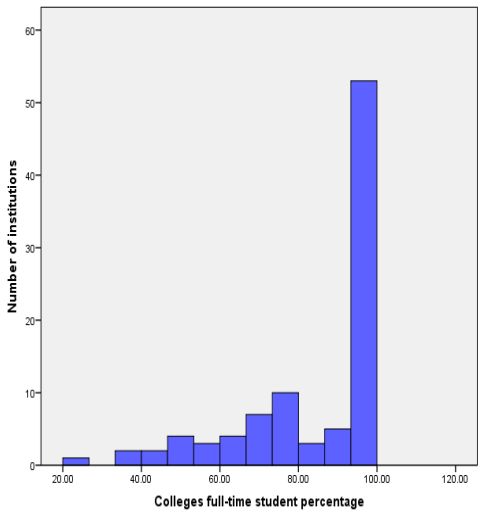


Figure 14.3 - Distribution of full-time student percentage for sixth form colleges

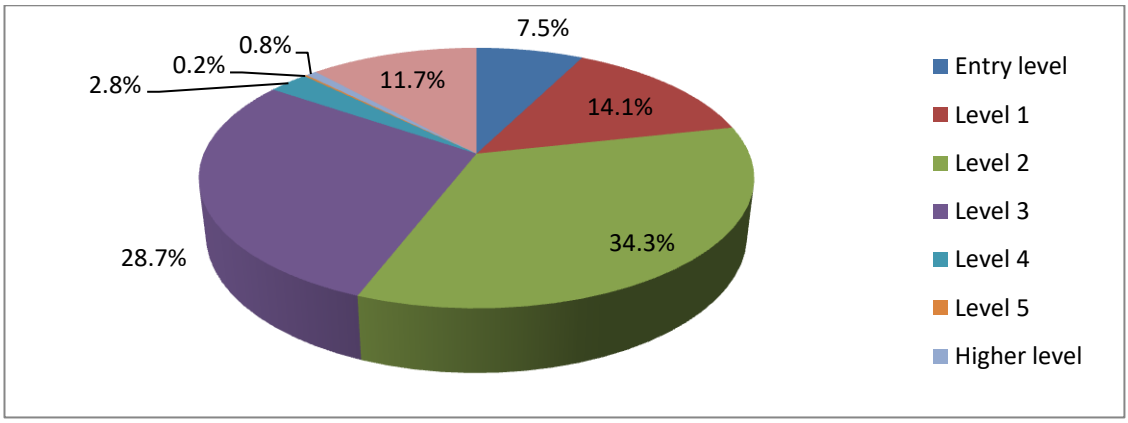


Variable: Level of study

The analysis illustrated the extent to which the FE sector offers courses across many levels of study from entry level qualifications up to higher education. This is indicated in Figure 14.4 which shows that although the majority of students are studying at levels two or three in the FE sector, there is still substantial provision for entry level and level one courses, as well as skills training courses that did not have a specified level.

This broad range allows scope for colleges to either specialise in certain levels of provision or to provide a very broad approach with a high degree of internal diversity in level (i.e. generalist). The current administrative types represent some of this specialist provision with sixth form colleges specialising in level three study and special colleges specialising in low level learning. Equally, the generalist approach was consistently present in the three arts colleges. However, the remaining administrative types did not maintain a consistent profile in the level of study of their students, although agricultural colleges were the closest, either specialising in level two or maintaining a broad approach. The general FE and specialist designated college administrative types contain members using all the specialist approaches and the generalist approach to level of study (the exception: no level three specialism for specialist designated colleges).

Figure 14.4 - Percentage of students at each level of study over the college system



These different approaches are illustrated by comparing the Figures 14.5 and 14.6 below. Figure 14.5 shows the distribution of general FE colleges in percentage ranges at each of the levels of study. Each bar represents the number of colleges that enrol that percentage of that level of students. For example, 40.2% (90 of 224) of general FE colleges have between zero and less than five percent of their students enrolled on entry level courses. None of the levels of study contain a large spike in the 40%+ category, which illustrates the generalist nature of FE colleges as there is no major specialism. The closest to a specialism is within level two study with 34.4% of colleges in the 40%+ category and such colleges do stand out as markedly different from their contemporaries. The highly diverse nature of the general FE colleges as a whole is shown by the wide range of levels of engagement with any one level of study i.e. none of the levels have a single large peak. The closest is level three but even that does not reach above 50%.

Figure 14.6 shows the same data for sixth form colleges. This college type has most of its colleges focused at one point in the graph indicating most colleges in the administrative category are very similar in their engagement at that particular level of study. There is some limited diversity shown in the level two category and also a small amount that is hidden by the 40+ category at level three. However, this indicates that the vast majority of sixth form colleges are very similar in level profile with only a small number of colleges that differ from the norm. This comparison both illustrates the differences between sixth form and general FE colleges and indicates the presence of a high degree of institutional diversity in the general FE college type.

Figure 14.5 - Distribution of level of study in general FE colleges

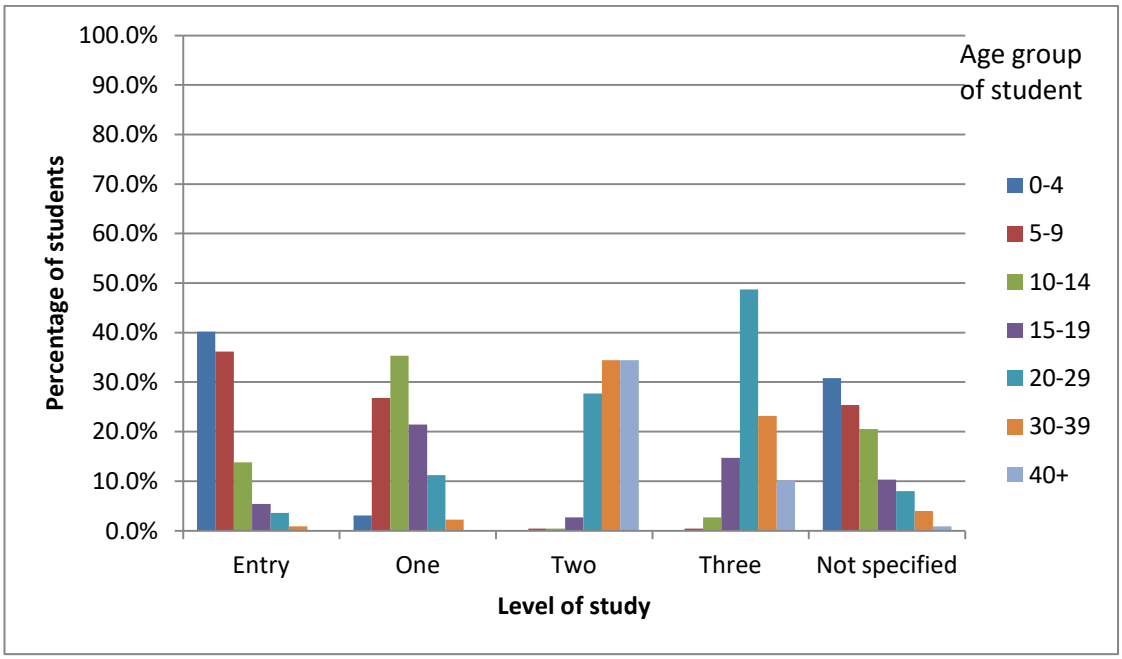
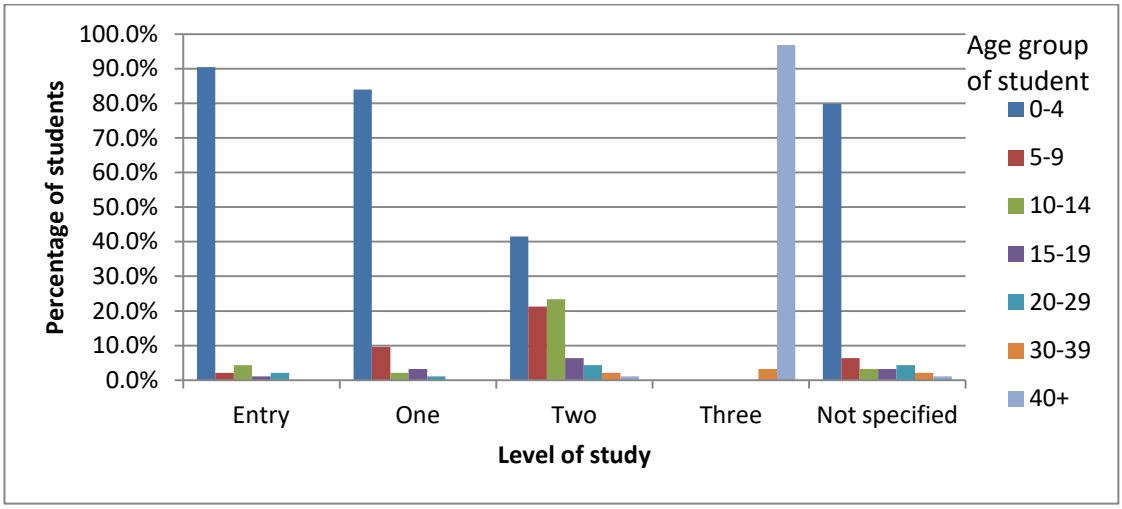


Figure 14.6 - Distribution of level of study in sixth form colleges



Variable: Subject of study

The analysis highlighted the huge range of subject groups taught in colleges in the FE sector, ranging from subject groups like Science and Mathematics to skills based training like Construction, Planning and the Built Environment to Key and Basic Skills. Figure 14.7 presents the percentage of the total aims each subject group represents in the FE college sector. This wide range of subject groups made this the largest and most complicated area to analyse and thus presented here are some examples of subject groups which highlight the key findings of this study in this area.

Each of these subject areas are a source of institutional diversity and the engagement of an individual college varies widely. However, some subject areas provide wider distribution and thus greater diversity in particular administrative types when compared to others. Figures 14.8 and 14.9 illustrate an example of this by highlighting the differences between general FE colleges and sixth form colleges in the subject group Science and Mathematics. Figure 14.8 indicates that whilst general FE colleges do on average enrol a small proportion of their students in the Science and Mathematics group, this tends to be a relatively low amount with only a small number of colleges exceeding even 5% of their aims in this subject area. In contrast Figure 14.9 illustrates the far greater proportion of aims in sixth form colleges in the Science and Mathematics group. Additionally, in sixth form colleges, the distribution of aims is wider with most colleges falling between 10% and 25% of aims in Science and Mathematics.

Figure 14.7 - Subject of study by percentage of aims of each subject

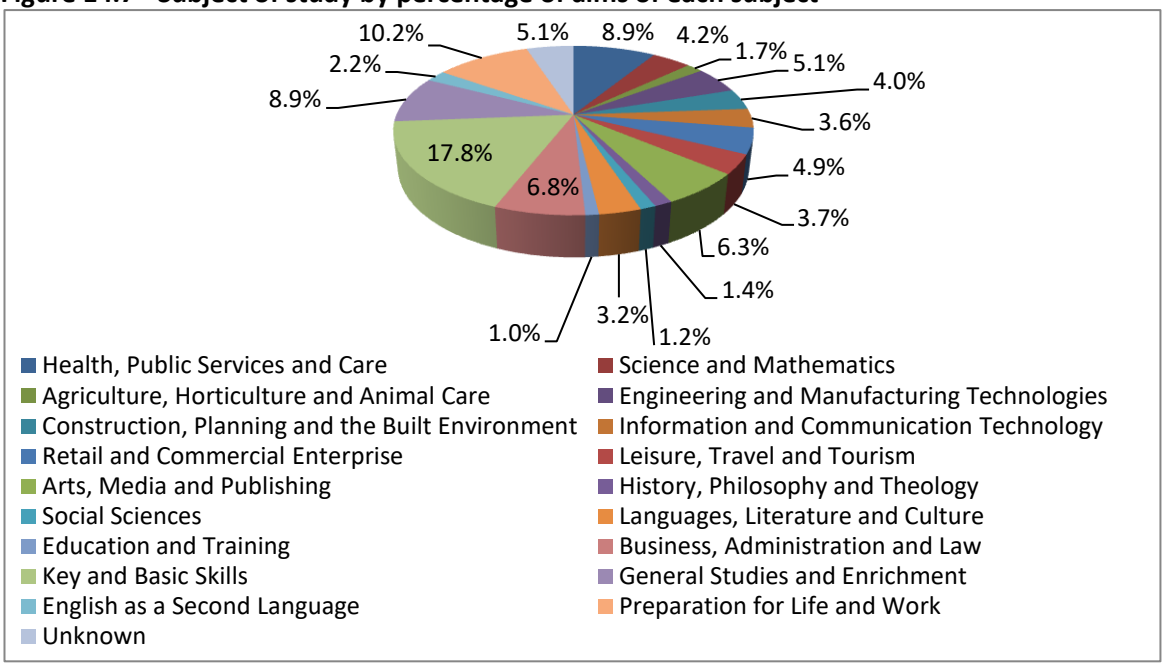


Figure 14.8 - Distribution of Science and Mathematics percentage for general FE colleges

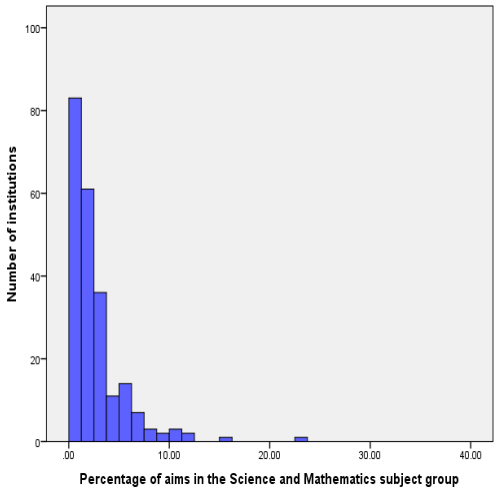
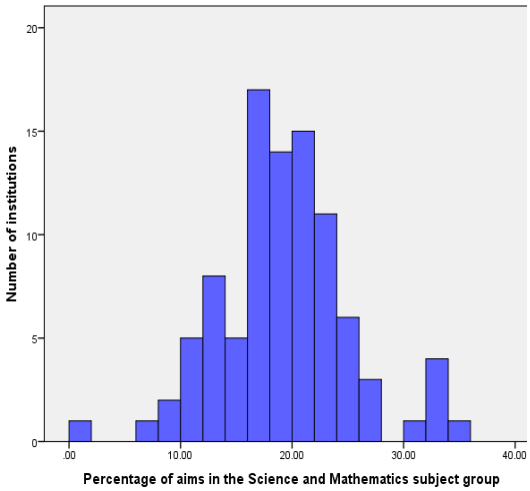


Figure 14.9 - Distribution of Science and Mathematics percentage for sixth form colleges



It is not always sixth form colleges that maintain a wider distribution and greater engagement than general FE colleges. Indeed, Figures 14.10 and 14.11 indicate the reverse pattern in the Engineering and Manufacturing Technologies subject group. This group, which accounts for a similar proportion of aims in the overall system as does the Science and Mathematics group, shows a negligible presence in sixth form colleges with both limited distribution of colleges and a low overall engagement. In contrast, the general FE college type has a wide distribution and a much higher level of engagement with the subject area overall.

Figure 14.10 - Distribution of Engineering and Manufacturing Technologies percentage for general FE colleges

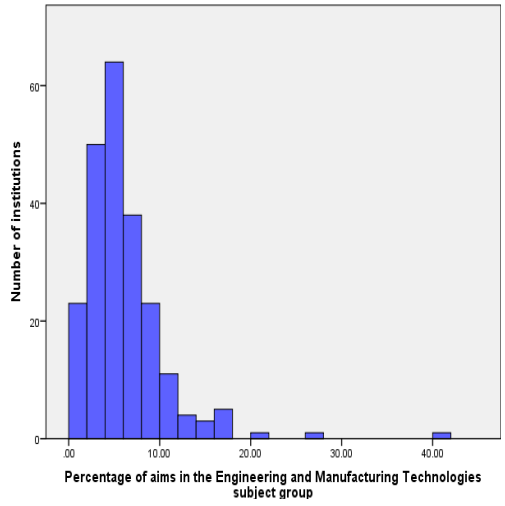
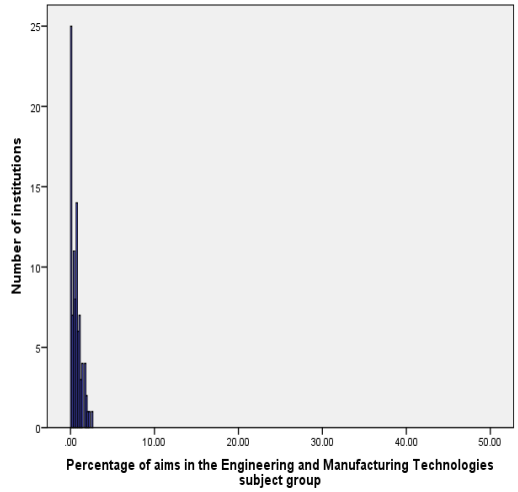


Figure 14.11 - Distribution of Engineering and Manufacturing Technologies percentage for sixth form colleges



Finally, there are subject areas that are common in both sixth form and general FE colleges, an example of which can be seen in Figures 14.12 and 14.13. These figures show the distribution of the Business, Administration and Law subject group in general FE and sixth form colleges respectively. Both figures show a similar pattern of engagement with this subject area with a similar distribution of colleges, mainly between 3% and 10%. Although there are twice as many general FE colleges as sixth form, both administrative types indicate a highly similar pattern of engagement with this subject.

Figure 14.12 - Distribution of Business, Administration and Law percentage for general FE colleges

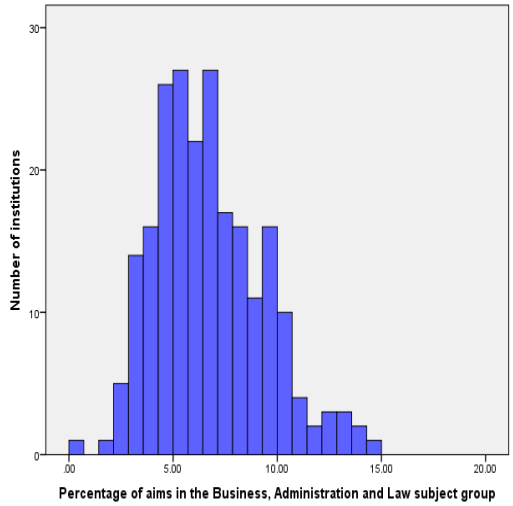
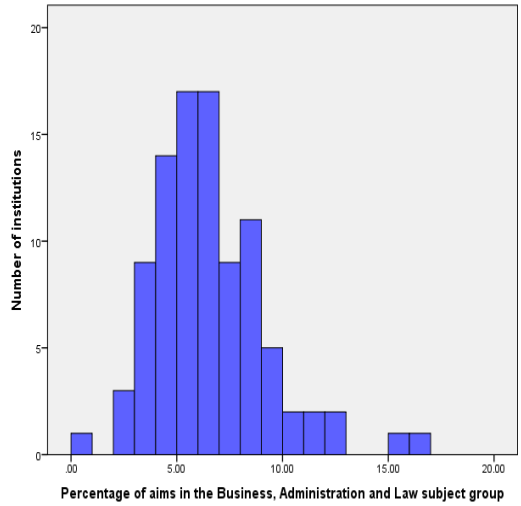


Figure 14.13 - Distribution of Business, Administration and Law percentage for sixth form colleges



The remaining subjects' distribution patterns all fit into one of the three categories described above. Table 14.3 highlights each of the remaining subject areas based on the similarities of their distribution to the three categories described, with key categories for each institutional type highlighted in bold. Categories with sixth form colleges possessing both the greatest engagement and widest distribution are highlighted blue, subject groups that are stronger in general FE colleges are highlighted in pink and those that are reasonably balanced are

highlighted in green. Three subject groups are not highlighted because they are either subject groups with very little engagement in either college type or in the case of the Preparation for Life and Work subject group, far stronger in specialist colleges. In conclusion, there is institutional diversity indicated in each of the subject groups, though most often in only one of the two major administrative types per subject group.

Table 14.3 - Prevalence of provision in general FE and sixth form college administrative types

Subject group	Sixth form college		General FE college	
	Mean	Standard deviation	Mean	Standard deviation
Health, Public Services and Care (HPSC)	3.7%	4.6%	**10.3%**	4.0%
Science and Mathematics (SM)	**19.2%**	5.8%	2.6%	2.9%
Agriculture, Horticulture and Animal Care (AHAC)	0.2%	0.7%	1.1%	2.4%
Engineering and Manufacturing Technologies (EMT)	0.7%	0.6%	**6.1%**	4.5%
Construction, Planning and the Built Environment (CPBE)	0.0%[1]	0.1%	**4.5%**	4.5%
Information and Communication Technology (ICT)	3.2%	1.8%	3.3%	2.3%
Retail and Commercial Enterprise (RCE)	0.3%	0.8%	**5.8%**	2.8%
Leisure, Travel and Tourism (LTT)	3.8%	2.7%	3.9%	2.8%
Arts, Media and Publishing (AMP)	**9.6%**	3.5%	5.4%	4.4%
History, Philosophy and Theology (HPT)	**6.4%**	6.4%	0.5%	0.8%
Social Sciences (SS)	**6.0%**	2.4%	0.6%	0.8%
Language, Literature and Culture (LLC)	**8.8%**	2.6%	2.2%	2.2%
Education and Training (ET)	0.2%	0.6%	1.2%	0.7%
Business, Administration and Law (BAL)	6.6%	2.7%	6.7%	2.6%
Key and Basic Skills (KBS)	4.7%	7.1%	**19.4%**	5.8%
General Studies and Enrichment Programmes (GSEP)	**22.1%**	10.4%	7.6%	5.9%
English as a Second Language (ESL)	0.5%	1.3%	2.4%	3.4%
Preparation for Life and Work (PLW)	3.6%	4.1%	10.7%	5.7%

[1] *This figure is 0.01% before rounding.*

Variable: Age of student

The FE sector enrols students from a wide range of ages including some school age children up to retirement age and above. The average age of students in the FE sector is 29.9 with a standard deviation of 14.5. These statistics, combined with the wide range of ages in the sector, suggests the scope for both internal and external diversity on student age is great. However, the analysis shows that colleges either have a profile focusing on younger students, mainly around the 16-18 age group, or are highly internally diverse. The colleges focusing on younger students are mainly sixth form colleges, although a small number of specialist colleges also focus on this age group. There are also colleges that specialise in adult education but none that target a specific age group of adults. These features are highlighted by comparing Figures 14.14 and 14.15 which show the distribution of internal average ages at general FE and

sixth form colleges, respectively. Thus, the extent of institutional diversity on the age of students is relatively limited, though a high degree of internal diversity is often present, particularly in general FE colleges.

Figure 14.14 - Distribution of average age of students at each general FE college

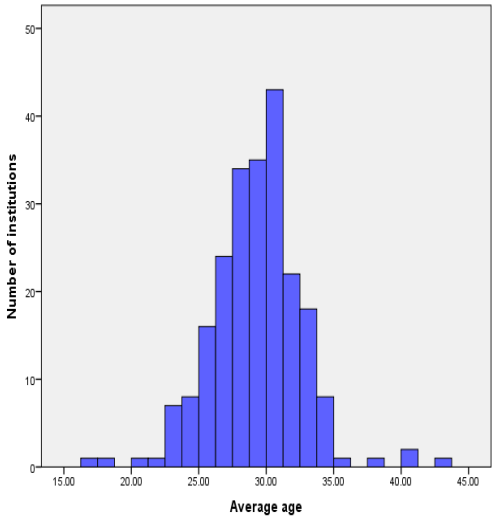
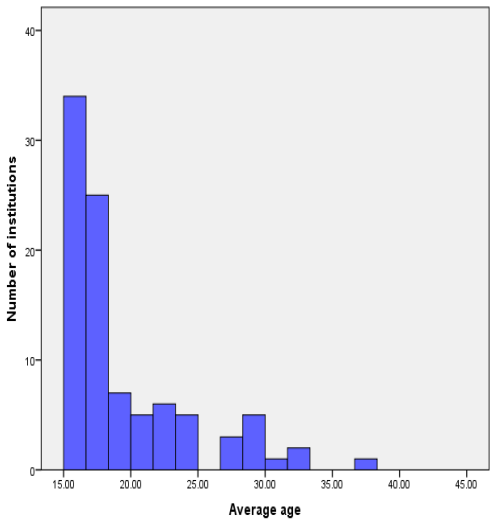


Figure 14.15 - Distribution of average age of students at each sixth form college



Variable: Gender of student

Similar to the age variable there is a limited amount of external diversity by the gender of student, with very few colleges largely recruiting from only one gender. Indeed, in the FE sector as a whole there is almost an even split between the genders. Nonetheless, there is still some variation between administrative types. The specialist colleges and general FE colleges largely maintain the even distribution of genders but sixth form colleges tend to have more female students than male, although in most cases this disparity is not particularly large. Nonetheless, the distribution of the percentage of male students in general FE and sixth form colleges can be seen in Figures 14.16 and 14.17 respectively (the mirror graphs for female students can be found in Figures 14.18 and 14.19 respectively). This illustrates the largely central distribution of gender in general FE colleges at roughly 50% and by comparison to the sixth form colleges, the slightly greater external diversity in the general FE administrative type indicated by the wider distribution. Equally, the sixth form college distribution is skewed slightly to the left demonstrating the prevalence of majority female colleges in the sixth form college type, combined with the narrow distribution previously noted. In conclusion, whilst there is some external diversity on gender of student it does not represent large differences between colleges, albeit with a small number of exceptions.

Figure 14.16 - Distribution of male student percentage for general FE colleges

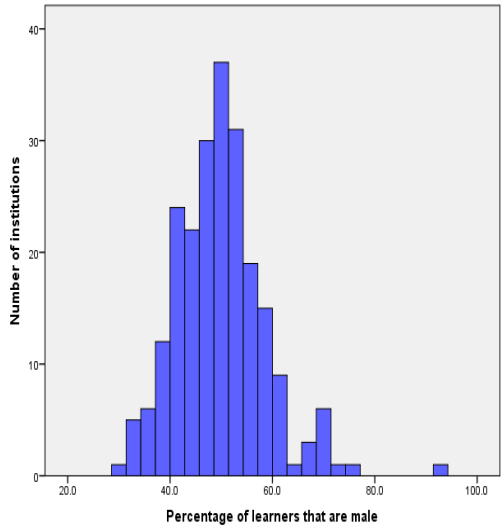


Figure 14.17 - Distribution of male student percentage for sixth form colleges

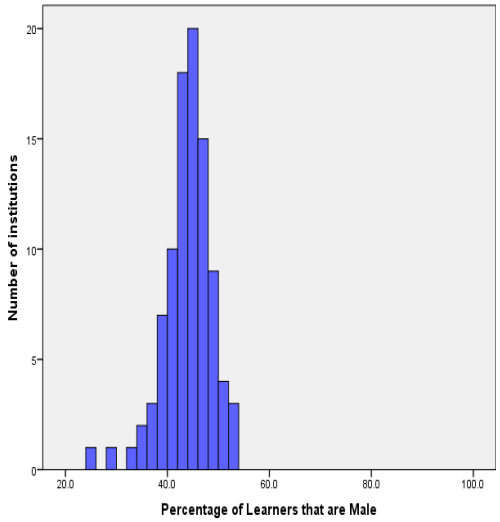


Figure 14.18 - Distribution of female student percentage for general FE colleges

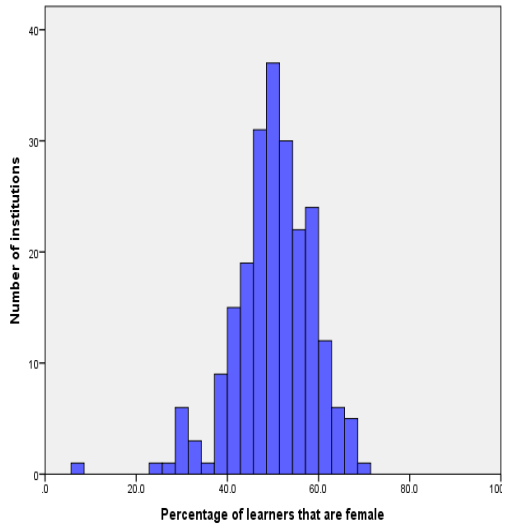
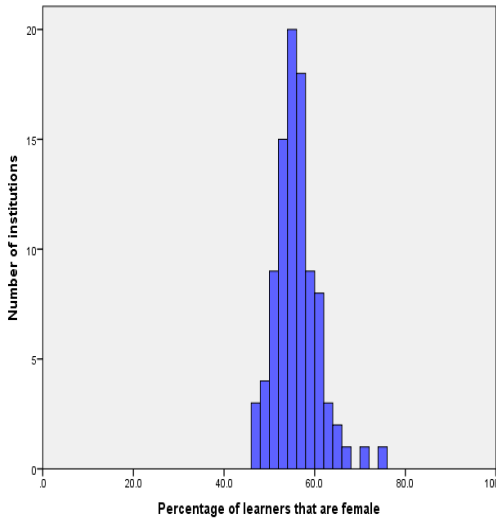


Figure 14.19 - Distribution of female student percentage for sixth form colleges



Variable: Ethnicity of student

The FE system caters for a wide variety of ethnic backgrounds and this study has examined these using the census categories of 2011 and aggregations of these categories. Figure 14.20 shows that the White ethnic group accounts for a substantial majority of students in the FE system and that on their own, each of the minority groups are relatively small. Although, when combined they do account for a substantial proportion of the total students in the system.

The institutional diversity on the ethnicity of students is again similar in nature to that of the age and gender as it is relatively limited. There is substantial internal diversity within some colleges but Figure 14.21 illustrates that the vast majority of colleges are attended by White

students with a small distribution of minority ethnicities[13]. There are a small number of exceptions that have a majority student population from one or more minority backgrounds but this is not connected to any particular institutional type. The only exception to this is the slight tendency of sixth form colleges to enrol a greater percentage of Asian students than other ethnic backgrounds when compared to other college types.

Figure 14.20 - Ethnicity demographics of student population

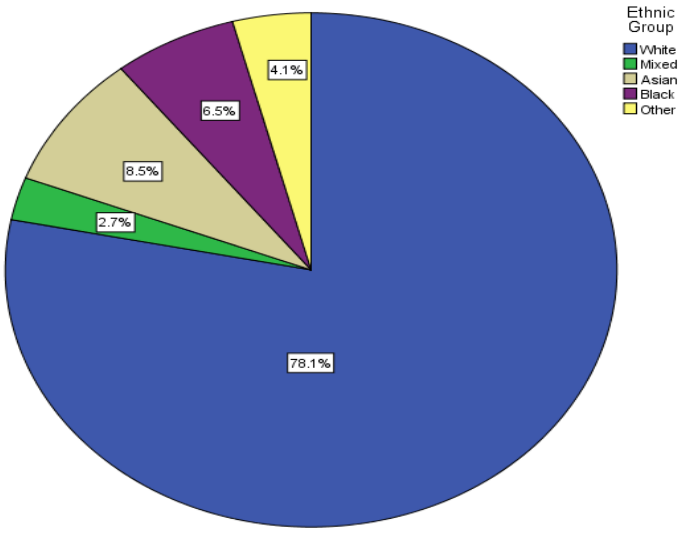
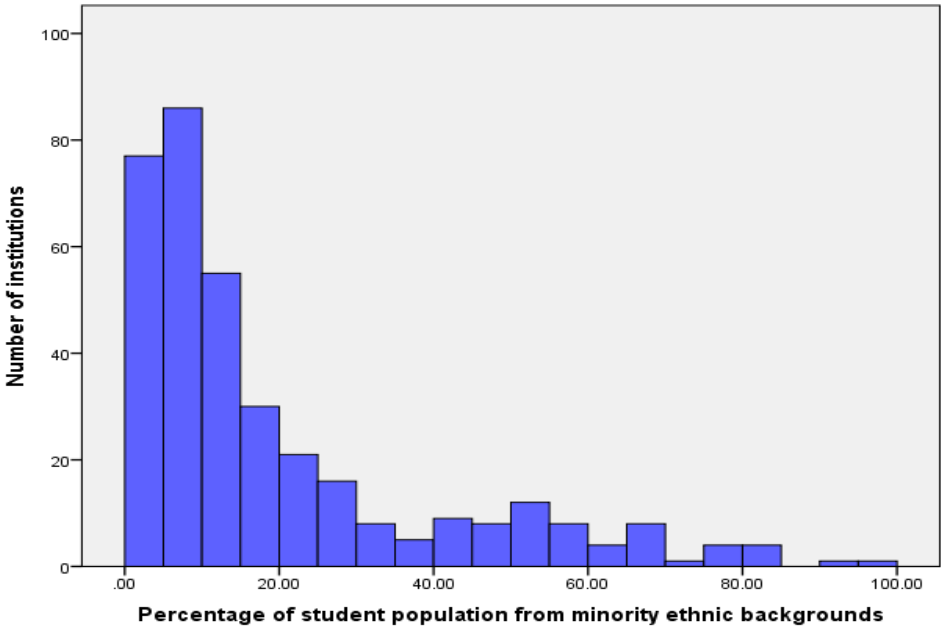


Figure 14.21 - Distribution of colleges by percentage of students from minority ethnic backgrounds



[13] The figure does not include White Europeans or White Irish students from the census categories as they do not differ in ethnicity despite being minorities. However if included they do not change the conclusions.

Summary of administrative type differences

The administrative types of general FE and sixth form colleges do show distinctly different profiles for six of the seven variables (the exception being ethnicity). Sixth form colleges on average tended to be smaller in size, have higher percentages of female, full-time, level three and young students than their general FE counterparts. These students also tended to study the liberal arts and sciences subject groups with general FE colleges tending to provide a broader range of subjects with far less emphasis on the liberal arts.

Although there is more similarity between some specialist college types and the profile of the sixth form college type, all specialist college types differ from this profile in at least one aspect. For example, both special college - art, design and performing arts and special college - agriculture and horticulture share in common with sixth form colleges that they tend to be small in size, where as they both have a distinctly different subject profile than do sixth form colleges.

Generally the colleges within each of the profiles of sixth form colleges and some of the various specialist college types tend to be fairly homogenous. However, the general FE college type and to a lesser extent the specialist designated college type are a highly diverse group of colleges, with substantial external diversity within the administrative types, particularly in size and the three course characteristics. This suggests that these current administrative types are not ideal for their use in describing their constituent colleges.

14.2: Patterns and associations

In addition to the overall patterns of diversity on individual variables, Chapter 10 of this study presented the analysis of the associations between the variables under study. This was conducted as a link between the individual variable analysis and the cluster analysis in order to attempt to explain and contextualise the variations and clusters seen in the final analysis. Furthermore, as a stand-alone analysis it provides insight into the connected patterns of individual variables where present. The key result of this analysis is to demonstrate the influence associations between variables have on the profiles of colleges. Some examples of the nature of these associations are also provided to indicate the effect these associations can have on institutional profiles.

The study used statistical analysis in order to determine the strength of any associations present, using the aims of each student as the point of analysis. This was done at the system level rather than institutional level and thus does not analyse institutional diversity directly, rather it seeks to explain, at least in part, the diversity that is present. As the analysis was conducted at the system level, the size variable was excluded from this stage of the analysis and thus the number of possible associations of the remaining six variables was 15. Each of the associations was statistically significant but the strengths of these associations varied. The *post hoc* test used to measure the strength was Cramer's V and a summary of the results for each association can be found in Table 14.4. Cramer's V can be interpreted as: under 0.1 very weak, 0.1 and above as weak, 0.3 moderate and 0.5 strong. Six associations were very weak and thus provided no substantial insight into the institutional profiles in the final cluster analysis. The most commonly associated variable was the subject group of an individual aim, which was linked, at least weakly, with every other variable in the study for a total of five

associations. Mode of study was the next most commonly associated, being linked with four of the five variables (ethnicity being the exception), level of study and age were associated with three variables (exceptions being gender and ethnicity), gender was associated with mode and subject, and ethnicity was only associated with subject.

Table 14.4 - Strength of associations between variables

Association	Strength (Cramer's V)	Association	Strength (Cramer's V)
Subject and level of study	.485	Mode of study and gender of student	.130
Subject of study and gender	.323	Gender and age of student	.088
Mode of study and age of student	.287	Level of study and gender of student	.086
Subject and mode of study	.226	Level of study and ethnicity of student	.083
Subject of study and age of student	.183	Ethnicity and age of student	.081
Level of study and mode of study	.158	Mode of study and ethnicity of student	.061
Level of study and age of student	.137	Gender and ethnicity of student	.043
Subject of study and ethnicity of student	.132		

The strongest of these associations were between subject and level at .485 and subject and gender at .323. Examples of the nature of these associations include certain subject groups tending to be studied more commonly at certain levels of study within the FE system, such as the liberal arts subject groups including the sciences and mathematics, languages, humanities and the arts which tend to be studied at level three. In contrast, subject groups such as Engineering, Construction, Agriculture and Retail and Commercial Enterprise tend to be studied at level two. Furthermore, there are some subject groups such as English as a Second Language, which tend to be studied at entry level, that have little in common with other subject groups.

Equally, from the other perspective, the vast majority of entry level aims are studied in either, Key and Basic Skills, Preparation for Life and Work or English as a Second Language. Such associations show us that if a college has a high proportion of its students studying at entry level, we would expect them to also have a high proportion of students studying in these subject groups.

A further example is the association between subject and gender, which shows that if a college offers certain subject groups they are likely to also have a male or female dominated student body. For example, if a college focuses primarily on Engineering and Manufacturing Technologies or Construction, Planning and the Built Environment courses, then the vast majority of their students are likely to be male. Equally if a college primarily offers Arts, Media and Publishing courses or Health, Public Services and Care courses then their student body is likely to be mostly female.

This and similar patterns of the gender/subject association, indicate that the subject choices of different genders are substantially different and illustrates the nature of these differences. Moreover, it also indicates that these patterns can form institutional profiles potentially leading to institutional diversity.

In summary the associations show the types of institutional profile that could be present in the cluster analysis and partly explains how such profiles arise.

14.3: The cluster analysis

This section initially presents a summary of the findings of the cluster analyses conducted in this study; it then compares the two alternative methods for the current administrative types. Finally, it reflects on whether the existing administrative types effectively capture the identified diversity.

Initially, this study categorised colleges based on each of the single elements under study, resulting in seven cluster analyses. These categorisations were then used to produce four further cluster analyses; the first two intended to take a fine-grained approach to illustrate the extent of institutional diversity over two different sets of characteristics (course and student) and the size of colleges. The second two used the same two sets of characteristics but did not include size and was intended firstly, to analyse institutional diversity using only what the colleges do or for whom the colleges do it. Secondly, it was intended to produce a more concise description of institutional diversity using a coarser grained approach while still keeping the clusters membership to broadly similar colleges. Overall the fine-grained cluster analyses attempts to cluster colleges together that are highly similar to highlight smaller, but important differences between colleges. In contrast, the coarse-grained approach uses logical steps to reduce some of the detail to group colleges together that are more broadly similar. Both approaches can be used to highlight diversity but can also be used for different overall goals depending on the detail level required.

Sections 14.1 and 14.2 summarised the findings regarding the nature and extent of institutional diversity across the individual variables. This section initially shows how this was categorised at the institutional level by the cluster analysis and then presents the findings of both approaches of cluster analyses on the sets of elements. These sets bring the elements together to create institutional profiles based on sets of variables rather than on one at a time. The dispersion of colleges between these institutional profiles represents the extent of institutional diversity and the profiles themselves the nature of that diversity.

14.3.1: Single variable clusters

This sub-section briefly summarises the categories created by the cluster analysis on each of the single elements under study. These categories were used to create the overall institutional profiles which are discussed in the following section.

The cluster analysis conducted on the colleges using single elements of the study created four categories of college for size and these have been termed small (under 4,199 students), medium (4,200 - 8,800), large (8,801 - 13,699) and very large (13,700+). Within these groups there are a small number of extreme examples at both ends of the spectrum (i.e. colleges with

fewer than 100 or with more than 50,000 students). Such examples do indicate even greater diversity in the system but have not been included as separate groups in this part of the analysis in order to keep the overall results manageable. Within these groups there are 132 small colleges, 95 medium colleges, 67 large colleges and 64 very large colleges.

The mode clustering was based on a simplified version of the modes of study representing the full-time percentage at an individual college and was subdivided by the cluster analysis to represent three groups: high part-time (under 33% full-time), balanced (between 33 and 67% full-time) and high full-time (over 67% full-time). Though this appears to represent roughly even thirds of the percentage it was not pre-selected and was arrived at by the cluster analysis. There are 132 colleges with a relatively even balance between part and full-time mode of study, 134 with a high part-time contingent and 92 with a high full-time student body.

The level clustering attempted to develop clusters based on the percentage of students at each level of study and group colleges based on similar level characteristics. There were five cluster groups identified. The first three comprised a generalist category with relatively high proportions in multiple levels of study, where there was no apparent focus (144 colleges); a cluster which had at least 60% of students focused on level three study (84 colleges) and a cluster which had a focus on level two study wherein colleges had at least 32% of students studying at this level (112 colleges). The fourth cluster contained colleges with high proportions of low level learning (i.e. entry level or level one) with a combined total at either of these levels of at least 50% (12 colleges). The final cluster contained colleges with high proportions (at least 52%) of unclassified level learning (six colleges).

The last of the course characteristics, subject of study, was used to categorise colleges into five specialist categories and three generalist categories (approx 15% and 85% of colleges respectively. The eight clusters identified were:

1. Arts, Media and Publishing and Language, Literature and Culture - 12 colleges
2. Construction, Planning and the Built Environment, Health, Public Services and Care and Key Skills - nine colleges
3. Business, Administration and Law and Key Skills specialists - three colleges
4. Agriculture, Horticulture and Animal Care - 15 colleges
5. Preparation for Life and Work - 13 colleges
6. Moderate to high levels of Science and Mathematics, General Studies, Arts, Media and Publishing, History, Philosophy and Theology, Social Sciences, Language, Literature and Culture and Business, Administration and Law - 86 colleges
7. Highly general college with moderate levels in almost all subjects, though relatively low Agriculture, Horticulture and Animal Care, History, Philosophy and Theology and Social Sciences - 86 colleges
8. High levels of Health, Public Services and Care, Key Skills and Preparation for Life and Work, moderate Retail and Commercial Enterprise, Engineering and Manufacturing Technologies, Construction, Planning and the Built Environment, Business, Administration and Law - 134 colleges

Of these groups, the first five are simply the subjects in which colleges specialise, which is derived from them having a much higher than average percentage of aims in the respective

groups. However, groups six, seven and eight all provide a wider variety of education with less specialism and more emphasis on a general approach. All three groups are characterised by so many subjects that it makes reference to all subject areas each time the group is mentioned impossible. Therefore, each group was characterised thus; group six consists of colleges offering Liberal Arts and Sciences subjects and will be known hereafter as LAS. Group seven offers almost all subject groups and will therefore be known as Broad Subject Mix and finally group eight will hereafter be known as ASAS for Applied Subjects and Skills. All three of these shorthand names are for convenience only and are intended to represent all of the key characteristics in the group, not just the ones best described by the acronym.

For the student characteristics the cluster analysis categorised colleges into two groups, one focusing on young students (95 colleges) and the other on mature students (263 colleges). The clustering on gender was conducted to classify the percentage of students at the college that were male and three categories resulted: highly female (under 45.0% male), highly male (55.0% male or over) and a roughly balanced student population (between 45.0% and 54.9% male). These groups contain 122, 66 and 170 colleges respectively. Finally, the ethnicity element was used to discover that the vast majority of colleges were characterised by their prevalence of White British students (two categories totalling approx 78% of colleges) with a majority of colleges specialising in the education of minority ethnicities (five categories totalling approx 22% of colleges). These details are represented by eight categories, which can be seen in Table 14.5 along with the number of colleges each category contained.

Table 14.5 - Ethnic clustering group characteristics

Group number	Characteristics	Number of colleges
1	Very high White (White British 82.0%+)	169
2	High White (White British between 61.0% and 82.0%)	111
3	Moderate White British (between 31.0% and 61.0%), low/moderate Pakistani (between 0.0% and 38.0%), African (between 0.0% and 17.0%) Black Caribbean (between 0.0% and 13.0%), Indian (between 0.0% and 20.0%) and White other (between 0.0% and 20.0%)	34
4	Moderate African (between 3.0% and 24.0%) and other Whites (between 4.0% and 27.0%) and British White (between 16.0% and 41.0%)	30
5	Very low White (White British under 17.0%), high Black African (over 31.0%), moderate Black Caribbean (between 11.0% and 21.0%)	4
6	Moderate Pakistani (between 17.0% and 38.0%), Bangladeshi (between 7.0% and 24.0%) and African (between 13.0% and 22.0%)	5
7	High Indian (between 23.0% and 46.0%)	4
8	A single college with very high Bangladeshi (43.6%) and moderate African (13.4%)	1

The above categories were used to create two fine-grained institutional profiles, one on size and course characteristics and the other on size and student characteristics, the results of which are summarised below.

14.3.2: Fine-grained cluster analysis of size and course characteristics

The fine-grained cluster analysis of the size and course characteristics identified 72 distinct profiles of colleges. The results showed a wide dispersion of colleges across the different profiles identified with only eight clusters containing more than 10 colleges. The notable exception to this was a single cluster of 73 colleges which was more than three times larger than any other cluster in this analysis. Furthermore, there were a substantial number of single college clusters as well as many clusters with small numbers of colleges, indicating an extremely high degree of institutional diversity in the FE sector. However, there were a greater number of different institutional profiles at smaller colleges than at medium sized or larger colleges. Moreover, institutional profiles at larger sizes were generally a repeat of profiles of smaller size but on a larger scale.

Table 14.6 shows the dispersion of the general FE colleges across the various profiles on each element under study. It indicates that by looking at the number of colleges in each category on each variable there are at least two heavily populated options for general FE colleges.

Table 14.6 - Course characteristics: cluster profile percentages for general FE colleges

Variable	Variable category	Clusters		Colleges	
		Number	Percent	Number	Percent
Size	Small	8	18.6%	15	6.7%
	Medium	13	30.2%	81	36.2%
	Large	10	23.3%	66	29.5%
	Very large	12	27.9%	62	27.7%
Dominant mode of study	Part-time	22	51.2%	118	52.7%
	Balanced	20	46.5%	104	46.4%
	Full-time	1	2.3%	2	0.9%
Level of study characteristics	High level three	2	4.7	3	1.3%
	Moderate levels in multiple groups	20	46.5	116	51.8%
	Moderately high level two	20	46.5	104	46.4%
	High unclassified level learning	1	2.3	1	0.4%
Subject of study characteristics	Arts and Languages	3	7.0	3	1.3%
	Liberal Arts and Sciences	3	7.0	5	2.2%
	Broad Subject Mix	14	32.6	74	33.0%
	Applied Subjects and Skills	15	34.9	130	58.0%
	Construction, Public Services and Key Skills	5	11.6	9	4.0%
	Business and Key Skills	2	4.7	2	0.9%
	High agricultural	1	2.3	1	0.4%

Furthermore, it illustrates that the colleges in each of these categories are often not similar in other aspects under study, as is indicated by the number of clusters each element category is represented by. This indicates that the general FE category is highly diverse with many different institutional profiles within one administrative type.

In contrast Table 14.7 presents the same information for the sixth form college administrative type. It indicates that the sixth form college type is a largely homogenous group with only limited diversity present. Each variable has only one category that is heavily populated, containing at least 83% of colleges for each element. Indeed, the sixth form college type contributed 71 of the 73 colleges in the largest cluster mentioned above, further demonstrating their homogeneity.

Table 14.7 - Course characteristics: cluster profile percentages for sixth form colleges

Variable	Variable category	Clusters		Colleges	
		Number	Percent	Number	Percent
Size	Small	11	78.6%	89	94.7%
	Medium	3	21.4%	5	5.3%
Dominant mode of study	Part-time	1	7.1%	1	1.1%
	Balanced	9	64.3%	15	16.0%
	Full-time	4	28.6%	78	83.0%
Level of study characteristics	High level three	4	28.6%	81	86.2%
	Moderate levels in multiple groups	8	57.1%	11	11.7%
	Moderately high level two	1	7.1%	1	1.1%
	High unclassified level learning	1	7.1%	1	1.1%
Subject of study characteristics	Arts and Languages	1	7.1%	1	1.1%
	Liberal Arts and Sciences	7	50.0%	81	86.2%
	Broad Subject Mix	5	35.7%	11	11.7%
	Applied Subjects and Skills	1	7.1%	1	1.1%

14.3.3: Fine-grained cluster analysis of size and student characteristics

The fine-grained cluster analysis of the size and student characteristics elements identified 68 distinct profiles of colleges. These results also showed a wide dispersion of colleges across the different profiles identified, although in this case there were 11 clusters containing 10 or more colleges, with the largest containing 29 colleges. Similarly, there were also a substantial number of single college clusters and many clusters with small numbers of colleges, again indicating a high degree of institutional diversity on these elements. Furthermore, all other structural patterns stated for the course characteristics analysis were also present in this analysis including the greater diversity at smaller sizes and the repeating profiles. However, when a comparison was made between the memberships of the two analyses, it was not the same colleges involved with little to no apparent matching between the two sets of profiles.

Tables 14.8 and 14.9 present an analysis of the profiles of the general FE and sixth form college administrative types on the student characteristics (respectively). The size element counts for

the same number of colleges but most size categories are represented by a greater number of clusters in both administrative types. Equally, both administrative types are largely represented by only one age category: mature in general FE colleges and young in sixth form colleges. Both administrative types are also heavily populated in at least two gender categories (three in the case of general FE colleges) and also show some diversity in the ethnicity element of this study. Although, there are only a limited number of colleges of both administrative types that have a strong profile of students from minority backgrounds. In summary there is institutional diversity in both administrative types and whilst it is greater in the general FE college type (mainly due to size) there are also distinct differences between the two administrative types, in particular on size and age of student.

Table 14.8 - Student characteristics: cluster profile percentages for general FE colleges

Variable	Variable category	Clusters in this area		Colleges in this area	
		Number	Percent	Number	Percent
Size	Small	8	16.3%	15	6.7%
	Medium	16	32.7%	81	36.2%
	Large	13	26.5%	66	29.5%
	Very large	12	24.5%	62	27.7%
Dominant age group	Mature	43	87.8%	217	96.9%
	Young	6	12.2%	7	3.1%
Dominant gender	Female	17	34.7%	63	28.1%
	Balanced	19	38.8%	109	48.7%
	Male	13	26.5%	52	23.2%
Ethnic character-istics	Very high White	15	30.6%	95	42.4%
	Moderate Pakistani, Bangladeshi and African	1	2.0%	1	0.4%
	Moderate African and other Whites and British White	10	20.4%	24	10.7%
	Very high Bangladeshi and moderate African	1	2.0%	1	0.4%
	Moderate White British, low/moderate Pakistani, African and Black Caribbean, Indian and White other	11	22.4%	17	7.6%
	High White	11	22.4%	86	38.4%

Table 14.9 - Student characteristics: cluster profile percentages for sixth form colleges

Variable	Variable category	Clusters in this area		Colleges in this area	
		Number	Percent	Number	Percent
Size	Small	18	85.7%	89	94.7%
	Medium	3	14.3%	5	5.3%
Dominant age group	Mature	8	38.1%	18	19.1%
	Young	11	52.4%	76	80.9%
Dominant gender	High female	12	57.1%	49	52.1%
	Balanced	9	42.9%	45	47.9%
Ethnic character-istics	Very high White	6	28.6%	48	51.1%
	High White	5	23.8%	19	20.2%
	Moderate African and other Whites and British White	2	9.5%	3	3.2%
	Moderate White British, low/moderate Pakistani, African and Black Caribbean, Indian and White other	2	9.5%	12	12.8%
	Very low White, high Black African, moderate Black Caribbean	1	4.7%	4	4.3%
	High Indian	3	14.3%	4	4.3%
	Moderate Pakistani, Bangladeshi and African	2	9.5%	4	4.3%

14.3.4: Coarse-grained cluster analysis of course characteristics

Chapter 13 presented the results of two alternative, coarse-grained cluster analyses which did not include the size variable due in part to the conceptual differences between size and the other three variables. Furthermore, it was an attempt to cut down the total number of clusters to present an analysis that was more readily accessible and manageable for use in situations where such concerns are a consideration. In the first of these, which examined the course characteristics, in addition to the removal of size from consideration both level and subject used a reduced detail level from the original single variable clusters. This resulted in a total of 14 clusters including a cluster for 33 colleges which maintain an unusual profile, not matched by many other colleges. If separated into their constituent clusters, the colleges in this cluster demonstrate an increased degree of institutional diversity in the system. However, this would have created too many clusters for the purpose for which this analysis was created: thus the reduced detail was deemed acceptable.

Table 14.10, which is colour coded on the level characteristic, presents the full details of each of the remaining 13 clusters. These clusters range in size from nine colleges to 73 colleges with six of the other 13 clusters containing at least 20 colleges. The table uses the same categories presented above in the single variable analysis except it grouped together the smallest two

level categories to form a single category of all lower level learning. It also grouped together all subject specialist categories to form one category for all subject specialists regardless of their specific subject area.

Table 14.10 - Course characteristics alternative typology

Cluster number	Number of cases in each cluster	Dominant mode	Level characteristic	Subject characteristic
1	30	Balanced	Moderate levels in multiple groups	Applied Subjects and Skills
2	43	Balanced	Moderate levels in multiple groups	Broad Subject Mix
3	10	Balanced	Moderate levels in multiple groups	Subject specialist
4	21	Balanced	Moderately high level two	Applied Subjects and Skills
5	11	Balanced	Moderately high level two	Broad Subject Mix
6	73	Full-time	High level three	Liberal Arts and Sciences
7	9	Full-time	High low level learning (entry, one or unclassified)	Subject specialist
8	29	Part-time	Moderate levels in multiple groups	Applied Subjects and Skills
9	12	Part-time	Moderate levels in multiple groups	Broad Subject Mix
10	10	Part-time	Moderate levels in multiple groups	Subject specialist
11	53	Part-time	Moderately high level two	Applied Subjects and Skills
12	14	Part-time	Moderately high level two	Broad Subject Mix
13	10	Part-time	Moderately high level two	Subject specialist
14	33	Mixed	Mixed	Mixed

Table 14.11 illustrates the dispersion of both general FE colleges and sixth form colleges in each of the 14 identified clusters. Despite the removal of size for this analysis and the reduction in detail the degree of institutional diversity in general FE colleges based on course characteristics is still high. Equally, sixth form colleges remain a largely homogenous group, with only one major group containing 75.5% of all sixth form colleges. The mixed approach cluster (number 14) does contain 17.0% of the sixth form college type but because of the nature of that cluster these colleges cannot be considered homogeneous. Nonetheless the degree of homogeneity in the sixth form college administrative type remains consistent with the previous analysis. Similarly, the general FE college type also remains consistent with the other analysis, though in their case this indicates a high degree of institutional diversity based on course characteristics. The general FE college dispersion between clusters is wide with four clusters containing more than 10% of the colleges and a further four clusters also containing more than 10 colleges. This indicates the institutional diversity of this administrative type and highlights the differences between them and sixth form colleges.

Table 14.11 - Course characteristics: number and percentage of colleges in each cluster by original administrative type

Cluster number	Number of colleges in each cluster	GFECs in cluster	Percentage of total GFECs	SFCs in cluster	Percentage of total SFCs
1	30	29	12.9%	1	1.1%
2	43	39	17.4%	4	4.3%
3	10			1	1.1%
4	21	20	8.9%		
5	11	11	4.9%		
6	73	2	0.9%	71	75.5%
7	9*				
8	29	28	12.5%		
9	12	12	5.4%		
10	10	6	2.7%		
11	53	53	23.7%		
12	14	12	5.4%	1	1.1%
13	10	6	2.7%		
14	33	6	2.7%	16	17.0%

GFEC = General FE College, SFC = Sixth Form College
**this cluster contains exclusively specialist colleges*

14.3.5: Coarse grained cluster analysis of student characteristics

The second of the two alternative cluster analyses examined the student characteristics and, similar to the previous analysis, size was again removed due to the conceptual differences and the intention of creating a smaller number of clusters. Moreover, substantial detail was also removed from the ethnicity element reducing this element to two categories, White British (containing the first two categories from the single variable analysis) and all others (containing all other categories), resulting in a total number of 12 clusters. However, unlike in the previous analysis this did not include a 'catch all' cluster and all colleges were classified in homogeneous groups. This did include two very small clusters with a membership of only six and one college(s), but this was deemed acceptable due to the relatively small number of clusters in total. Table 14.12 illustrates the profiles of these clusters which ranged in size between one and 103 colleges with four of the 12 clusters containing at least 40 colleges.

Despite the reduced detail on ethnicity and the removal of size from the analysis there remained a reasonable degree of institutional diversity. Table 14.13 (colour coding based on gender) illustrates how this diversity translated to the general FE and sixth form college administrative types. This analysis did maintain reasonable consistency to the original fine-grained analysis but the reduced detail on ethnicity did have some impact, in particular on the degree of institutional diversity of general FE colleges. Due to the small number of colleges with a high percentage of ethnic minorities this was inevitable. Nonetheless, it does show that on student characteristics the sixth form college type is actually more heterogeneous than the general FE college type. The general FE colleges only have three clusters with more than 10% of general FE colleges within them and 40.2% of colleges are in a single cluster. In contrast the sixth form college type includes five clusters with more than 10% of sixth form colleges with

the largest only 31.9%. This wider dispersion of colleges between different profiles indicates a greater degree of institutional diversity at sixth form colleges based on student characteristics.

Table 14.12 - Student characteristics alternative typology

Cluster number	Number of cases in each cluster	Student age group	Dominant gender	Ethnic characteristic
1	14	Mature	Balanced	All others
2	103	Mature	Balanced	White British
3	25	Mature	Female	All others
4	62	Mature	Female	White British
5	11	Mature	Male	All others
6	48	Mature	Male	White British
7	13	Young	Balanced	All others
8	40	Young	Balanced	White British
9	14	Young	Female	All others
10	21	Young	Female	White British
11	1	Young	Male	All others
12	6	Young	Male	White British

Table 14.13 - Student characteristics: number and percentage of colleges in each cluster by original administrative type

Cluster number	Number of colleges in each cluster	GFECs in cluster	Percentage of total GFECs	SFCs in cluster	Percentage of total SFCs
1	14	13	5.8%		
2	103	90	40.2%	3	3.2%
3	25	19	8.5%	1	1.1%
4	62	44	19.6%	14	14.9%
5	11	10	4.5%		
6	48	41	18.3%		
7	13	1	0.4%	12	12.8%
8	40	5	2.2%	30	31.9%
9	14			14	14.9%
10	21			20	21.3%
11	1				
12	6	1	0.4%		

GFEC = General FE College, SFC = Sixth Form College

Chapter 15: Conclusions and reflections

In this final chapter, the justification for the research, the scope of the inquiry and the methods of investigation are revisited. In addition, the ways that the work might be developed beyond the thesis are considered. Drawing on the findings of the research, an argument is made for a review of the standard classification of further education colleges in England in order to reflect important changes to the organisation and profile of these institutions since the 1990s.

15.1: Rationale for the study

The literatures reviewed for this study are notable for the lack of a systematic statistical understanding and analysis of institutional diversity in the English FE sector. At the same time, these literatures highlighted the importance of such exercises to policymakers and researchers in other sectors and other jurisdictions (Van Vught, 2008; Huisman, 1995; Birnbaum, 1983). Together, these make a compelling case for an academic and policy-related study of institutional diversity in the FE sector in England. The research has employed a statistical methodology based on that used by Tight (2007, 1996 and 1988), Dolton and Makepeace (1982) and King (1970) in their studies of institutional diversity in the English HE and UK sectors.

In contrast to the field of higher education, there were few examples of empirical or statistical studies of further education in England that examined the nature and extent of diversity among its colleges. Chapter Three reviewed the few that were available for this study along with the work in this area that resulted from the strategic area reviews. The chapter indicated that organisational studies in further education have not been informed, to any major extent, by theoretical and typological debates about the nature of institutional differentiation and diversification. Instead attention had been given to specific governmental policy questions, rather than larger issues relating to the benefits and drawbacks of institutional diversity or critiques of official categories and classifications.

In England, the standard classification of further education colleges in use today had its origins in legislation in 1992 which secured the incorporation of colleges, including the addition of sixth form colleges to the further education sector. Although this classification was originally designed for administrative and data collection purposes, it has remained in wide use by policy makers, researchers and commentators.

However, Chapter Two drew attention to the succession of policy reforms and other changes that showed the limits of this classification. The post-1992 period was one in which major inquiries into further education (the Kennedy committee on widening participation and the Foster review of the mission of colleges) reported on the multiple roles and responsibilities of the majority of FE institutions. This was rarely accompanied by published analyses of patterns of institutional provision and participation or by serious efforts to map the changing profiles of individual colleges. A key driver of these changes was the merging of institutions. Between 1993 and 2011, there had been some 108 mergers in the further education sector, each with consequences for the size, shape and scope of the colleges that emerged from these developments.

Over the same period, policy priorities shifted between different types and levels of education and training. With these policies often came separate or special funding streams in relation to which colleges and other providers were expected to compete for units of funding. At various times, there were incentives for general further education colleges to adopt more specialist missions, especially in a vocational area in which they could become a centre of excellence. Running alongside these measures were efforts to expand work-based and employer-led programmes, including an expanded role for colleges in vocational higher education and, more recently, the expansion of apprenticeships.

While some areas of work expanded, other types of provision declined, such as courses for adults that did not lead to formal qualifications. As levels of public funding in further education were reduced, so students and employers were asked to share more of the costs of education and training. Such were the conditions which saw a decrease in the number of colleges, a different profile of programmes than previously and a changed student population reflecting economic, social, demographic and policy influences.

These changes, coupled with the added responsibility for planning and encouraging participation in learning as well as several short term funding policies like Train to Gain and Learning Accounts, contributed to a continued volatile environment for FE colleges and substantial potential change for the profiles of colleges. Yet still no attempt was made to review the official classification or to check the state of institutional diversity in the sector. Thus the initial premise for the study was confirmed by examining the historical context of the FE sector.

15.2: Scope of the inquiry

Throughout the thesis, the limits of the study and the boundaries imposed on the research have been made clear and justified:

- Data for only one recent base year: a time series analysis or a comparison of selected years would have been problematic, given the changes in how data was collected, reported and recorded in the ILR. Furthermore, including a time series in the analysis would have changed the focus from a study of the nature and extent of diversity to a large-scale investigation of trends, patterns and processes of differentiation.
- Focused purely on a statistical description and analysis based on administrative data, with no engagement with the contextualisation of this data (through fieldwork with 'real world' colleges and their situations) or the checking and validation of this data with individual colleges. Contextualisation and validation would have involved a large multi-method design which was beyond the timetable and scope for a Doctoral thesis.
- Restriction of data coverage to colleges in the further education sector (and not other providers): colleges are the centre of the FE system accounting for the majority of the total provision (especially full-time) and of the student population.
- Need for selected course and student variables to be combined for analytical purposes: given that the purpose was to capture the nature and extent of diversity for the whole college sector, the focus was on provision and participation rather than other areas of coverage (such as sources and levels of funding, staff populations or

quality assessments) which would have brought additional layers of complexity to the research and additional sources of data (outside that of the ILR).

- Restriction to data available in the ILR: the data used was restricted to that available in the ILR. This required the use of headcount as a measure of size rather than an alternative potentially more accurate measure such as student capacity or total student learning hours. However, this restriction ensured consistency, comparability and availability of all data between colleges in the study.
- The use of cluster analysis as a tool for analysing institutional diversity: the results produced by cluster analysis will vary according to how it is deployed and thereby is open to a variety of interpretations. However, as recognised in the literature, the value of this type of analysis is its ability to examine the full complement of relationships between variables. Additionally, it did not require any prior knowledge of the membership clusters to categorise new colleges.

15.3: A platform for further research

There are several ways in which this research could be extended. Firstly, there is the possibility of examining different dimensions of diversity or extending the existing dimensions. Secondly, there are benefits to be gained by extending the methodology to examine other types of institution and sectors of education. Finally, the geographical range and reach of the study might be extended. These address possible statistical extensions to the work presented in this thesis. However, it would also be possible to combine and complement the statistical treatment with qualitative fieldwork to elaborate, validate and contextualise the findings of the study.

15.3.1: Dimensions of diversity

The most obvious extension of the study would be to produce additional complementary cluster analyses based on the same methodology using a different combination of student and course variables. This would allow colleges to be classified from a different perspective, which may be more useful to some users. For example, typologies could be produced based on only subject and level of study or gender and mode of study or any other combination of the variables available to the investigation.

Similarly, it would be possible to extend the study to include additional variables such as socio-economic group of students, qualification type or awarding body. These variables could either replace existing variables or simply add to existing variables to provide further information and dimensions of diversity. Such variables could be attained either directly from the ILR where available or calculated using combined ILR data and other sources (such as on the socio-economic status of students derived from postcode data).

A different approach could be to extend the individual variable investigation to examine more fine-grained differences within and between colleges on a single variable. This would be particularly suitable for the subject element but similar investigations could also be conducted on level of study or qualification type. For example, this could include an analysis of colleges by subject using the tier two of the sector subject area classification system.

Again, an additional perspective could be added to an existing element in the study. For example, the size of colleges could be considered in terms of the organisation, location and distribution of their campuses.

15.3.2: Institutions and sectors

The research used the cross-sectional data for the year 2011-2012 and between this data and the current date the government have made some substantial changes to the funding of the FE sector, in particular the adult education sector. Therefore, an important extension to this project would be to apply the methodology to current data. This could be used to create a modern typology but also to make an historical comparison examining the processes of differentiation/de-differentiation since the government policy changes and the impact these have had on institutional diversity. Moreover, further historical comparisons could be made using older data, perhaps going back in intervals as far as the ILR original data set (provided there is comparable data available). Studying such time series data would allow detailed examination of the processes of differentiation and de-differentiation over the course of time and successive government policy interventions. A study of this nature would also allow the examination of the differentiation/de-differentiation theories discussed in Chapter Five from the fields of HE (e.g. academic drift theory from Riesman (1956)) and organisation theory (e.g. isomorphism theory from Di Maggio and Powell (1983)) and their applicability to the FE sector. This may allow the creation of a theoretical framework specifically for the English FE sector.

Equally, as the institutions under study are the colleges in the English FE sector, a possible extension to the work would be to include other institutions in the English FE system, such as private training organisations. If such data were available, this could also include privately funded further education.

Similarly, the research could encompass the HE and schools sectors (including appropriate qualification levels from those sectors) to create a larger typology covering all education and training in England. Though very few (if any) HE institutions or schools would fit into the current types identified in this study, the methodology used could potentially be extended to identify types of other institutions both within and outside the FE sector. This would require similar data to be available for other sector institutions and this could be the limiting factor on this extension.

15.3.3: Geographical extension

The research was focused on colleges in England. However, it did not examine provision on a geographical basis, including regions and localities. Therefore, the clusters presented in this study could be examined for geographical patterns, for example do all rural colleges belong to the same cluster? Similarly, specific regions could be compared to see if colleges within their borders are similar in both number and profile.

The study could also be extended to the other UK nations in order to compare similarities and differences in their college systems and institutional profiles. Scotland, Wales and Northern Ireland have broadly similar further education sectors but, since political devolution, distinctive policies on tertiary education have been pursued in each jurisdiction. This is particularly the case in Scotland there the number of colleges has been halved in recent years

as a result of policies of rationalisation and regionalisation. In this way, patterns of divergence and convergence could usefully be mapped.

15.4: An argument for review and revision

15.4.1 The evidence for review

This study has indicated that not only does the FE sector as a whole engage in study programmes at diverse levels, in different modes of study and in multiple subject groups, but the institutions within the sector are also diverse in their student populations. These features have been highlighted by both the fine-grained and coarse-grained cluster analyses but the importance of these findings is best demonstrated by the comparisons between the results of the cluster analysis and the current administrative types. These comparisons have shown that the general FE college type is highly heterogeneous with many different profiles of colleges within this single group. Other administrative types are more homogeneous, in particular the sixth form college type, but even here there are institutional variations within the standard categories. These findings highlight the problems in using the current administrative types to inform policy decisions, to compare similar colleges or indeed using these administrative types to draw any significant conclusions about FE provision.

15.4.2 The argument for regular review

In short, the original classification system has not been adjusted or updated to reflect the dynamics and directions of change within the sector. The impact of mergers is just one of the ways in which colleges have changed in their size, the nature and balance of their provision, and the kinds of students they attract to their programmes. In the future, it is probable that the Post-16 Skills Plan (BIS and DfE, 2016) will have a substantial effect on the profile of FE colleges, with a major overhaul of technical education being proposed alongside an expansion of apprenticeships. A further reduction in the number of general FE colleges, through amalgamations and federal arrangements, is an explicit goal of the current round of area reviews. At the same time, two new types of education provider, the institutes of technology and the national colleges, will alter the institutional landscape of further education. At this time it is unknown whether these past or future pressures on institutional forms have caused institutions to become more or less homogeneous. Furthermore, a static classification has no way to examine past processes of differentiation/de-differentiation or to take into account future changes to the FE institutional landscape.

However, even with the inherent weaknesses of a static classification, FE remains a central concern to policy makers, with a whole range of policies bearing on the purposes and organisational profiles of colleges. Arguably, an accurate and detailed picture of institutional forms and types would be a valuable policy tool. Equally, college managers seeking to learn from their peers and to evaluate local competition and cooperation opportunities, would benefit from a detailed and readily available method of identifying which colleges are most similar to themselves, and how other local colleges are operating. Whilst a single review would bring up-to-date the current classification for use by policy makers and other stakeholders, it leaves open the question about how best to ensure that any system of classification is subject to regular evaluation and updating in order to take into account the processes of differentiation/de-differentiation.

15.4.3 A Carnegie style Classification for England?

A possible model for best practice in the classification of tertiary education that could be adopted or adapted in English FE is that of the Carnegie Classification developed by the Carnegie Foundation and applied to all types of post-secondary and higher education in the USA. The Carnegie Classification is a regularly updated classification. Initially, institutions are categorised according to their broad similarities. These institutions are then sub-divided by variables that are important to that particular group (i.e. research institutions by research intensity). It is currently updated every five years and has been so since 2000. Previously it was updated irregularly, with the most recent in 1994. However, even after official publication it is still updated with modest amendments, such as changes to the name of establishments. Within the first year, updates for consolidations and mergers, clearing any data errors or misclassifications and errors in the application of exception rules, can also be applied (Carnegie Classifications, 2016). This regular updating has allowed the Carnegie Classification to stand the test of time and it remains of acknowledged value to policy makers.

These key aspects of the Carnegie Classification could be applied to a review of English FE. The principle of regular updates to avoid obsolete classification and the categorisation of institutions based on what they do and whom they teach, would be an excellent starting point for an FE classification. This study has demonstrated that there is wide institutional diversity on these characteristics, within and between the colleges in the FE sector in England. It has also illustrated that there is a lack of evidence-based theory specific to the processes of differentiation/de-differentiation in the FE sector. Such a regularly updated classification would provide evidence for such a theoretical base to be formed, allowing policy makers to be better informed on the potential impacts of their decisions.

Furthermore, the Carnegie Classification covers all post-school education in the US, ranging from the community colleges through to the high intensity research organisations. Therefore, it is arguable that not only should this review cover the FE sector, it should cover all post-16 education in England. A regularly updated review of this nature would give policy makers and other stakeholders a powerful tool in assessing the provision of education, particularly as the creation of new types of institution such as the 16-19 academies, the national specialist colleges and the institutes for technology start to affect the landscape of education. Extending the review to all tertiary education would be particularly advantageous as the overlap between the FE sector, the HE sector and the schools sector is likely to widen. Despite the possibility of the sixth form colleges returning to the schools sector, many 16-19 year olds will remain in the FE sector, especially if colleges become the primary route to vocational education and training, at the intermediate and the higher levels.

The paradox of a further education sector subject to constant policy-led change but ill-equipped to map and monitor its effects on institutions is probably a reflection of the lower status and weaker resource base of the college sector compared to higher and secondary education. As a consequence, the collection of administrative data on further education has often been more for funding purposes and less for analytical services to support its agencies, institutions, courses and students. With the attempt by present-day governments to create markets in English further and higher education has come the need for regulatory oversight of its public and private providers, including the protection of students. It is in the context of these developments that arguments for an 'English Carnegie' will need to be made.

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Annex 1: School leaving age

When education first became compulsory, the school leaving age initially started at age 10. It was then extended in stages to 13 prior to 1900, though sources differ on which acts and when these changes occurred (Elledge, 2013; Gillard; 2011; Russell, undated).

Furthermore, in the past 100 years the age for leaving compulsory education has been raised from 13 to 18 in modern education, again in stages (see Table A1.1). The benefits and purpose of these changes have been much debated both politically and historically but this is beyond the scope of this discussion. Suffice to say that the changes in school leaving age had an effect on colleges by changing the age of entry to the post-compulsory education system, though more recently younger students have entered some colleges in addition to, or as part of, their schooling.

Table A1.1 - Changes to compulsory education leaving age

New compulsory education leaving age	Year of increase*	Act of parliament
14	1921	Education Act (1921)
15	1947	Education Act (1944)**
16	1972	Education Act (1969)
17	2013	Education and Skills Act (2008)
18	2015	Education and Skills Act (2008)

** The exact date of increase and the act that officially increased it is under debate with some scholars disagreeing on particulars, thus, this table is intended as a guideline summary rather than taking a particular position. See Elledge (2013), Gillard (2011) and Russell (undated) for further details.*

***Some sources claim that this was initially included in the 1936 Education Act (Education Act, 1936) but that it did not actually occur until 1947.*

Annex 2: Percentage of students at each level in specialist colleges

Figure A2.1 - Percentage of students at each level of study at special colleges

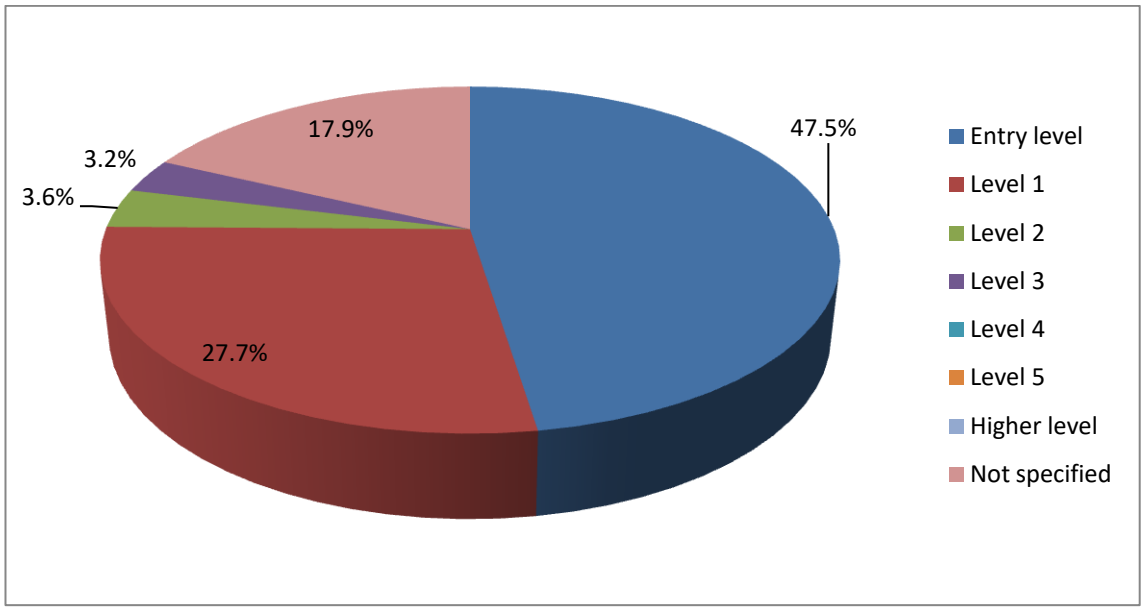


Figure A2.2 - Percentage of students at each level of study at special colleges - agriculture and horticulture

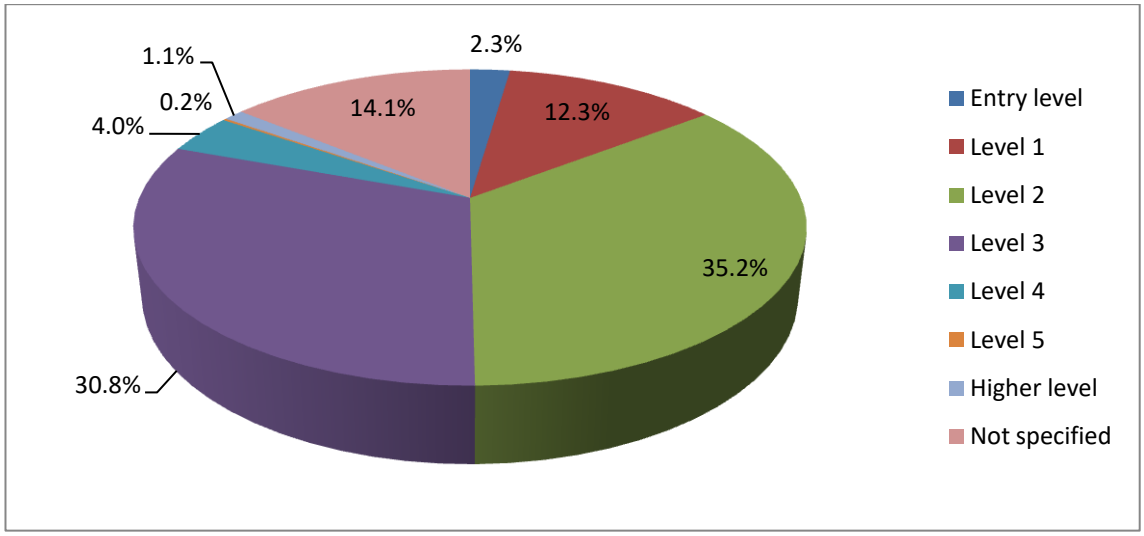


Figure A2.3 - Percentage of students at each level of study at specialist designated colleges

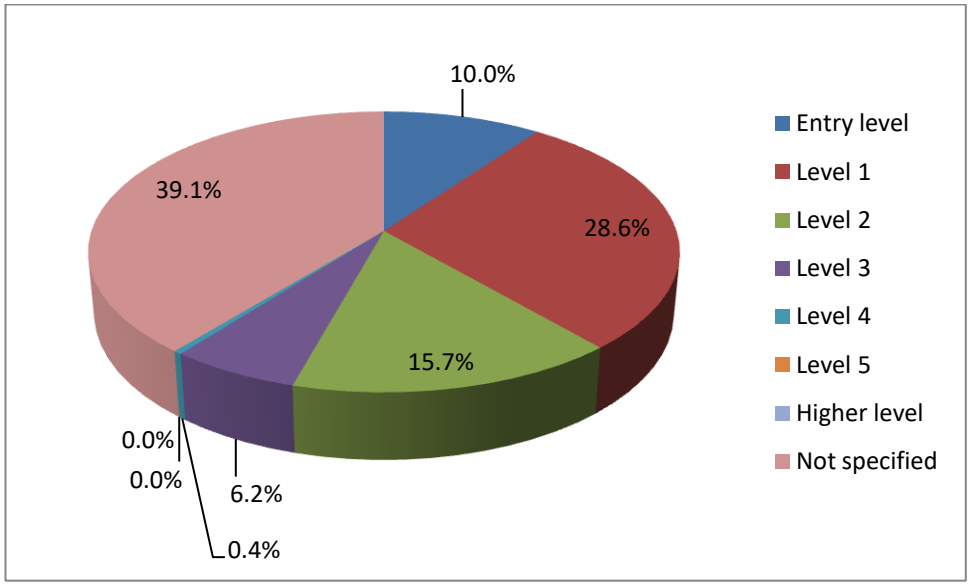
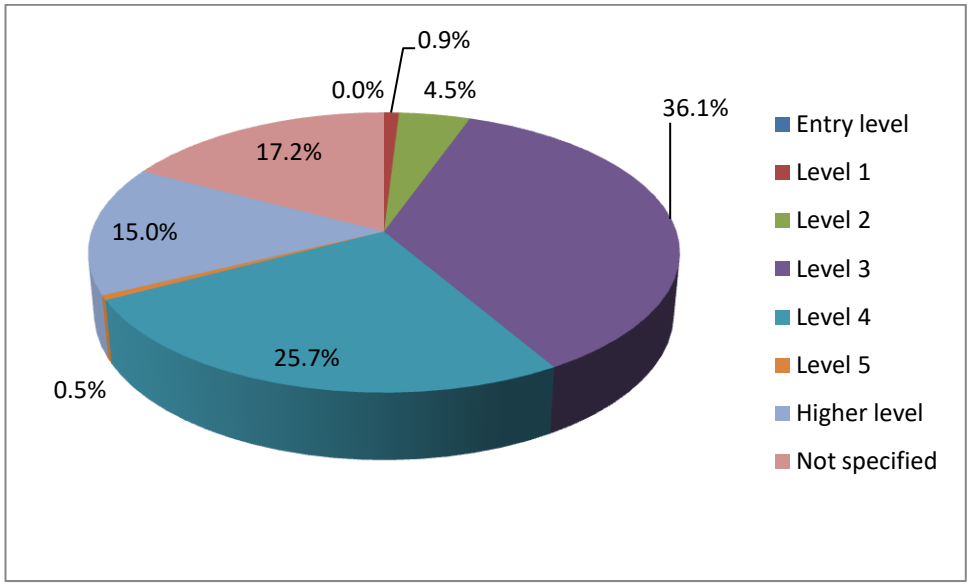


Figure A2.4 - Percentage of students at each level of study at special colleges - art, design and performing arts



Annex 3: Distribution of ethnic sub-groups over colleges

Table A3.1 - Distribution of the White sub-group over colleges

Mixed ethnicity sub-group	Colleges with at least one student	
	Number	Percent
White British	358	100.0%
White - Irish	340	95.0%
White Gypsy or Irish Traveller	222	62.0%
White - any other White background	354	98.9%

Table A3.2 - Distribution of the mixed ethnicity sub-group over colleges

Mixed ethnicity sub-group	Colleges with at least one student	
	Number	Percent
White and Black Caribbean	350	97.8%
White and Black African	341	95.3%
White and Asian	346	96.6%
Any other mixed ethnicity background	351	98.0%

Table A3.3 - Distribution of the Asian sub-group over colleges

Asian sub-group	Colleges with at least one student	
	Number	Percent
Indian	348	97.2%
Pakistani	344	96.1%
Bangladeshi	334	93.3%
Chinese	345	96.4%
Any other Asian background	351	98.0%

Table A3.4 - Distribution of the Black sub-group over colleges

Black sub-group	Colleges with at least one student	
	Number	Percent
Black African	348	97.2%
Black Caribbean	333	93.0%
Any other Black background	338	94.4%

Table A3.5 - Distribution of the Other sub-group over colleges

Other sub-group	Colleges with at least one student	
	Number	Percent
Arab	266	74.3%
Any other background	333	93.0%
Not disclosed	319	89.1%

Annex 4: Very weak associations

This annex presents the same information for the very weak associations identified as part of the analysis on variable associations presented in Chapter 10. Table A4.1 shows the strength of these associations and the following sub-sections present what little can be learned from analysing these associations.

Table A4.1 - Strength of associations between variables

Association	Strength (Cramer's V)
Gender and age of student	.088
Level of study and gender of student	.086
Level of study and ethnicity of student	.083
Ethnicity and age of student	.081
Mode of study and ethnicity of student	.061
Gender and ethnicity of student	.043

A4.1: Gender and age of student

The chi-square test of an association between level and gender indicates that there is a statistically significant very weak association (χ^2 (7) = 62,462.9, p < .001, V = .088, p <.001). Figure A4.1 shows the dispersion of each ethnic group for courses attended by students of each age group and Figure A4.2 shows the reciprocal relationship.

Similarly to level of study and mode of study, the average age of the students attempting each aim (which as noted previously may be the same student attempting several aims) is only marginally affected by gender. Nonetheless, the average age of female students attempting aims are, on average, two years older than their male counterparts (as shown on Table A4.2).

Table A4.2 - Age of student by gender of student

	Number of aims	Average age
Male	4,175,038	25.0
Female	3,855,820	27.0

Figure A4.1 shows that the percentage of aims attempted by females is consistently slightly higher for the older age groups (those spanning the 25-60+ age range) than for males. Equally, the percentages in the younger age groups are slightly lower for females.

Figure A4.2 also reflects this pattern with the percentage of female students consistently higher than males in the older age groups (this time 35-59+) and lower than males in the younger age groups. Therefore, though the association between age and gender is very weak it can be clearly seen where the association is from the table and figures.

A4.2: Level of study and gender of student

The chi-square test of an association between level and gender indicates that there is a statistically significant very weak association (χ^2 (5) = 59,341.9, p < .001, V = .086, p <.001). Figure A4.3 shows the dispersion of level for courses attended by each gender and Table A4.3 shows the reciprocal relationship.

Figure A4.1 - Percentage of aims in each age group of student by gender of student

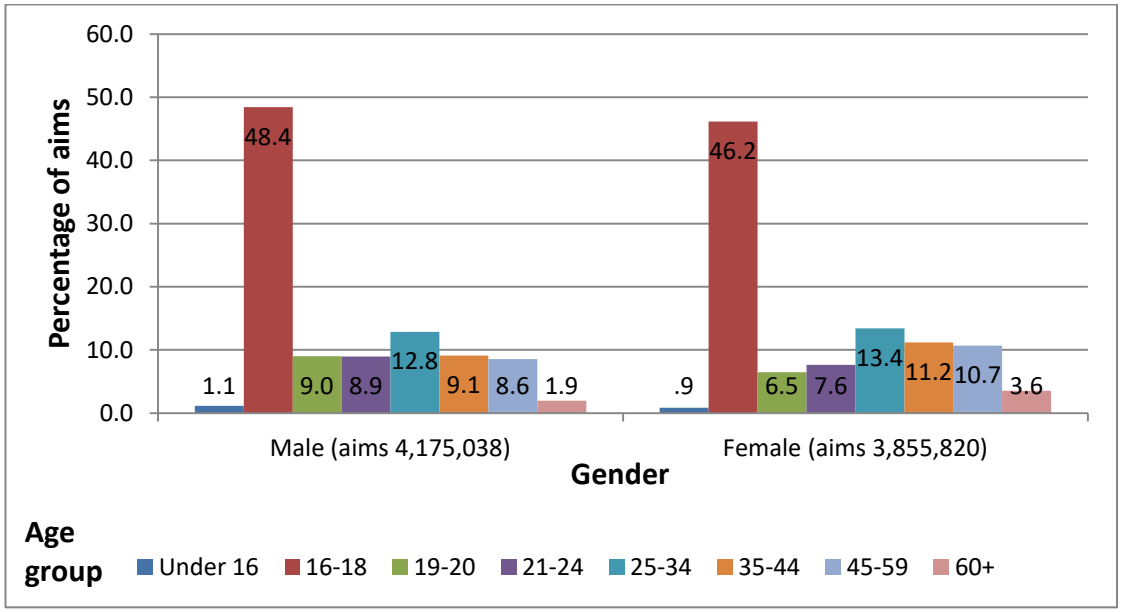


Figure A4.2 - Percentage of aims for each gender of student by age group of student

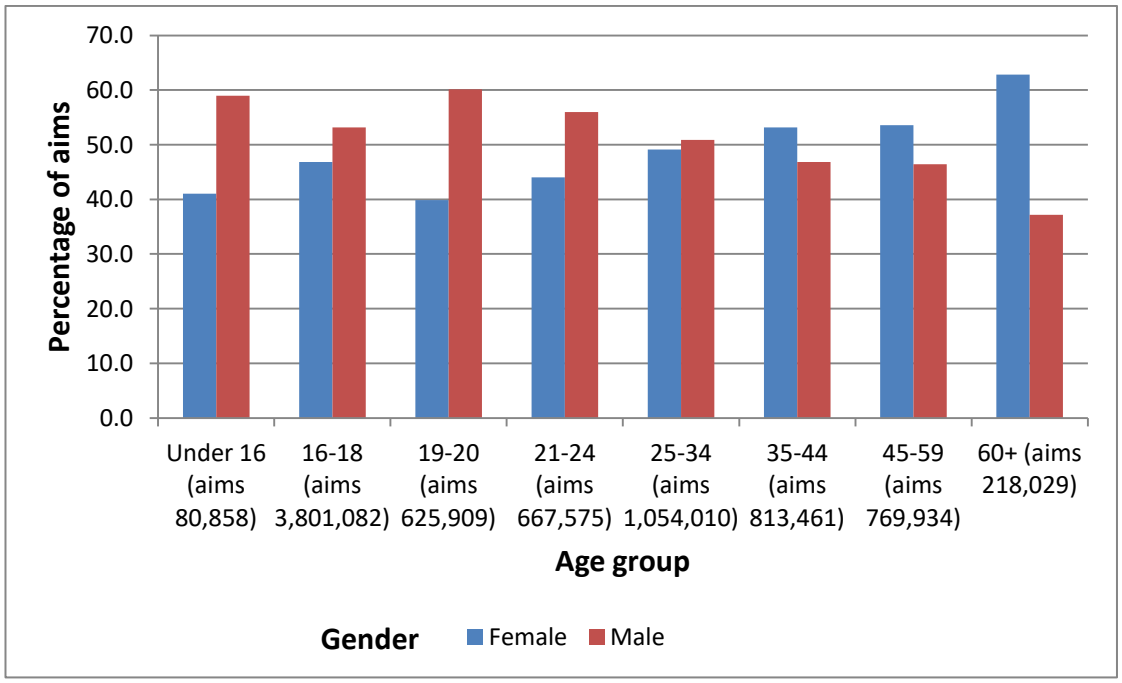


Figure A4.3, which shows the breakdown of the level of aims by the gender of the student attempting that aim, indicates only minor differences between the two genders. The shape of both graphs is very similar with the only major difference between the two genders is the swap in the percentages between levels one and three. Males have 23.4% for level one and 18.1% for level three, whereas females have 18.1% for level one and 23.2% for level three. This change is the only major effect though there are other small differences at other levels. Therefore, it can be concluded that the gender of the student does make a small difference to the level of study but it is only truly noticeable at two specific levels.

Table A4.3 shows that, with the exception of the transition between entry level and level one, there is a steady decline in the percentage of aims attempted by males as the level of study increases. However, this is best described by categorising the levels into two groups; levels

entry to two in group one show a slightly greater percentage of males and there is a small shift (roughly 8%) towards female students at levels three and higher for group two. These groups show that while level has relatively small effect on the gender balance it does demonstrate that an institution focusing on lower level instruction would expect to have a greater percentage of male students than one focusing at the higher levels.

Figure A4.3 - Percentage of aims at each level of study by gender of student

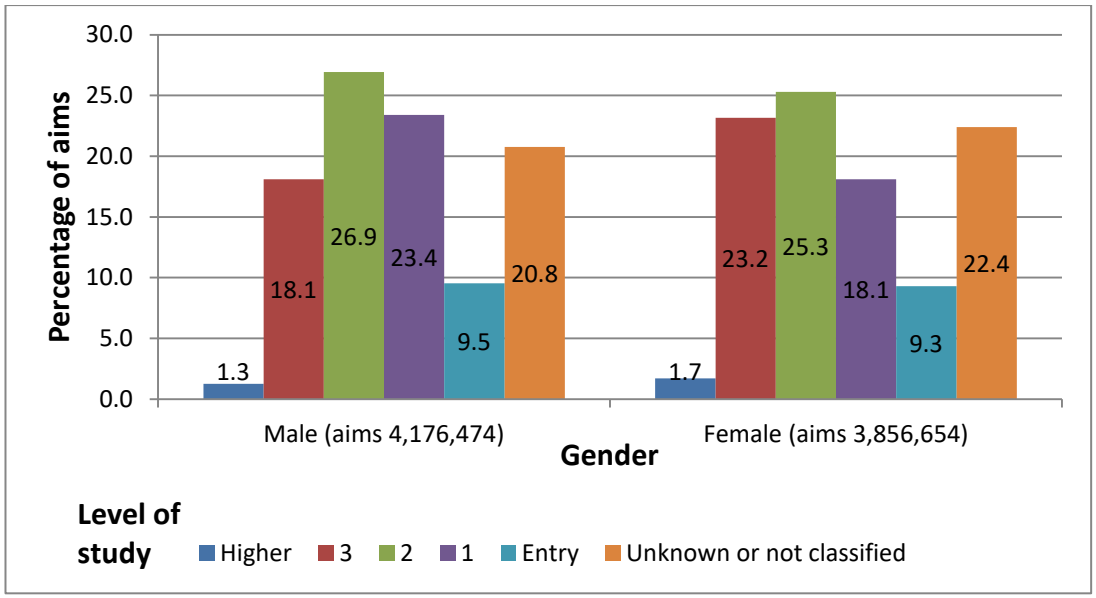


Table A4.3 - Percentage of aims by gender of students for each level of study

Level of study	Total aims	Percentage male	Percentage female
Entry	757,144	52.6%	47.4%
1	1,675,243	58.3%	41.7%
2	2,100,239	53.6%	46.4%
3	1,649,585	45.8%	54.2%
Higher	119,427	44.5%	55.5%
Unknown, mixed and N/A	1,731,490	50.1%	49.9%
Total/overall average	8,033,128	52.0%	48.0%

A4.3: Level of study and ethnicity of student

The chi-square test of an association between level and ethnicity indicates that there is a statistically significant very weak association (χ^2 (30) = 274,100.1, p < .001, V = .083, p <.001). Figure A4.4 shows the dispersion of each ethnic group for courses attended at each of the levels of study and Figure A4.5 shows the reciprocal relationship.

Figure A4.4 shows that the level of study has a limited relationship with the ethnicity of students. Indeed it is only at entry level where there is an obvious difference with all other levels (including mixed and unknown) at roughly the same percentage (between 72.5% and 77.6%) of White British students. This is perhaps related to the high percentage of English as a Second Language aims also found at entry level. Therefore, it could be reasonably concluded that level of study has little relationship with ethnicity, particularly if you accept the subject matter explanation for the low percentage of White British students attempting aims at entry level.

Figure A4.4 - Percentage of aims for each ethnic group of student by level of study

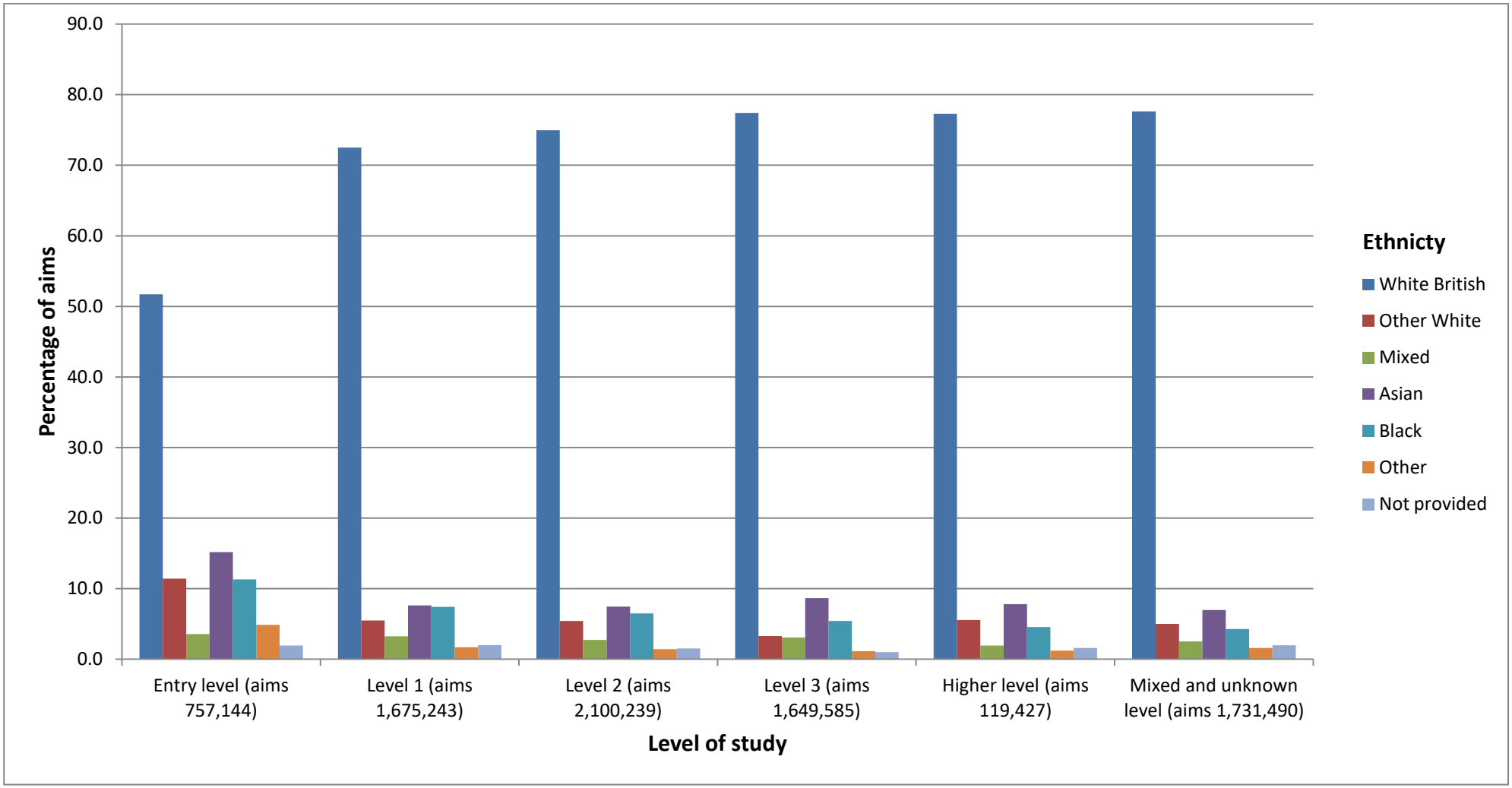
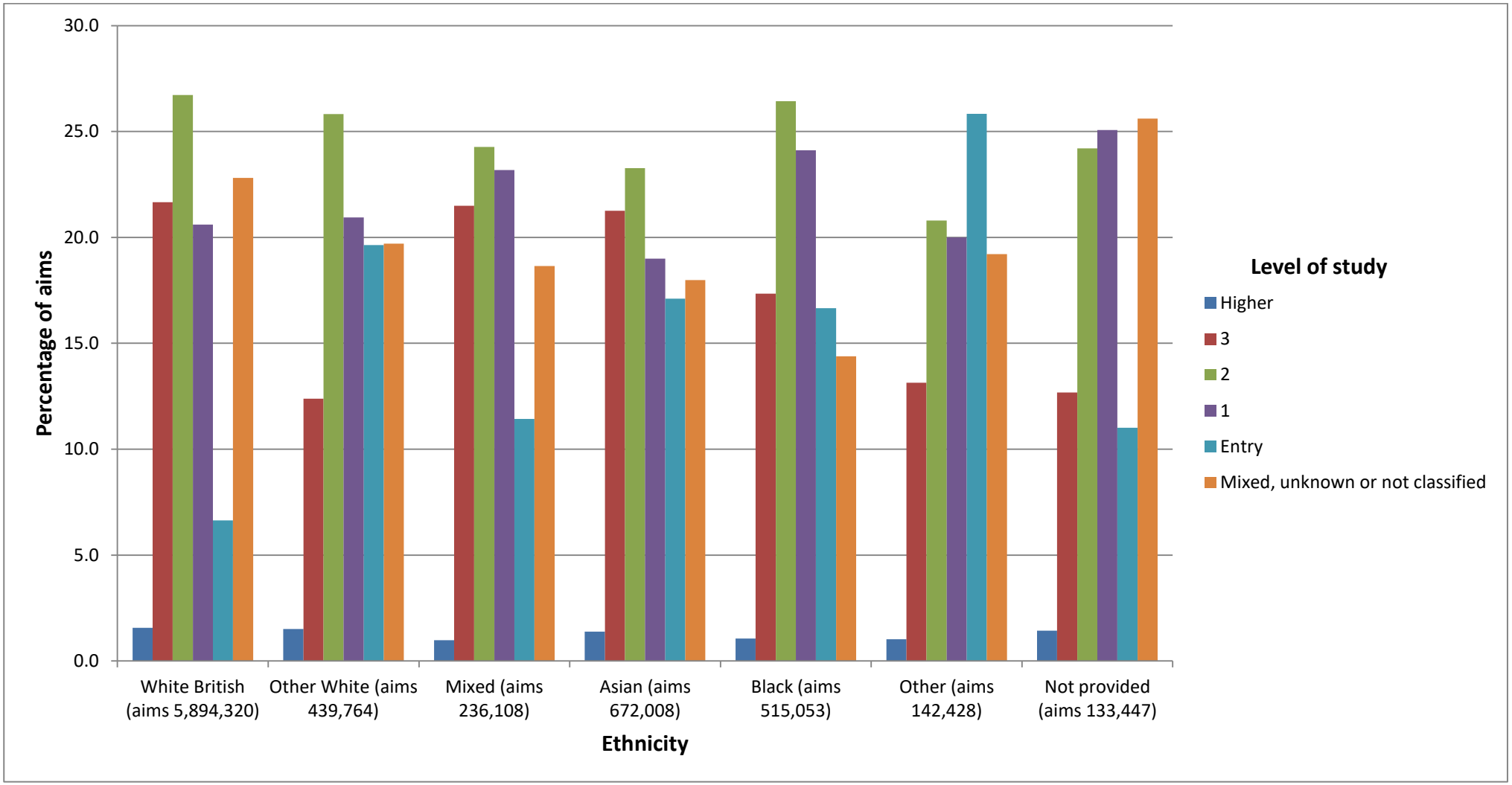


Figure A4.5 - Percentage of aims at each level of study by ethnic group of student



Furthermore, Figure A4.5, which shows the profile of minority ethnicities for each of the levels of study, also indicates only a minor relationship with the ethnic profile. Similarly to aims attempted by White British students the largest impact of ethnicity in terms of raw percentages is at entry level. However, the shape of the profile is still largely similar to that of levels one, two and higher. It is only level three that differs from this profile primarily due to a smaller percentage of aims attempted by students from any other White background. However, this is only a fairly small difference in shape and this reinforces the conclusion that level has only a minor relationship with ethnicity

A4.4: Ethnicity and age of student

The chi-square test of an association between level and gender indicates that there is a statistically significant very weak association (χ^2 (42) = 313,981.9, $p < .001$, V = .081, $p < .001$). Figure A4.6 shows the dispersion of each ethnic group for courses attended by students of each age group and Figure A4.7 shows the reciprocal relationship.

Figure A4.6 shows several minor differences on the percentages of aims for each ethnicity in each age group. The largest of these is the much lower percentage of aims attempted by 16-18 year olds in the other White category. In turn this group have a much higher percentage of 25-34 year olds and a slightly higher percentage in the 35-44 age group. Other smaller differences that are still noteworthy include the lower percentage of 16-18 year olds for the Black ethnic group and the slightly higher 35-44 percentage. There are other differences in the dispersion between age groups but these are relatively minor as you would expect with a very weak association. For completeness Table A4.4 shows the average age of each ethnic group but there is little difference between groups. Indeed, it is only the relatively low average age for the mixed ethnicity group that even slightly stands out.

Table A4.4 – Average age of students by ethnic group

	White British (aims 5,893,230)	Other White (aims 439,716)	Mixed (aims 236,087)	Asian (aims 671,393)	Black (aims 514,951)	Other (aims 142,385)	Not provided (aims 132,550)
Average age	25.7	28.8	22.8	25.0	27.3	27.9	30.8

Figure A4.7, which shows the percentage of each age group for each ethnic group, illustrates the similarities of each age group with very little differences between groups. It is only really the 25-34 and 35-44 age groups that show visible differences and even these are relatively minor. These groups have 59.8% and 65.0% aims attempted by White British students respectively. This is substantially lower than any other group and consequently the percentage of some minority groups is higher. Both groups follow the same pattern with higher percentages in the groups other White, Asian and Black than in other age groups.

Figure A4.6 - Percentage of aims for each ethnicity of student by age group of student

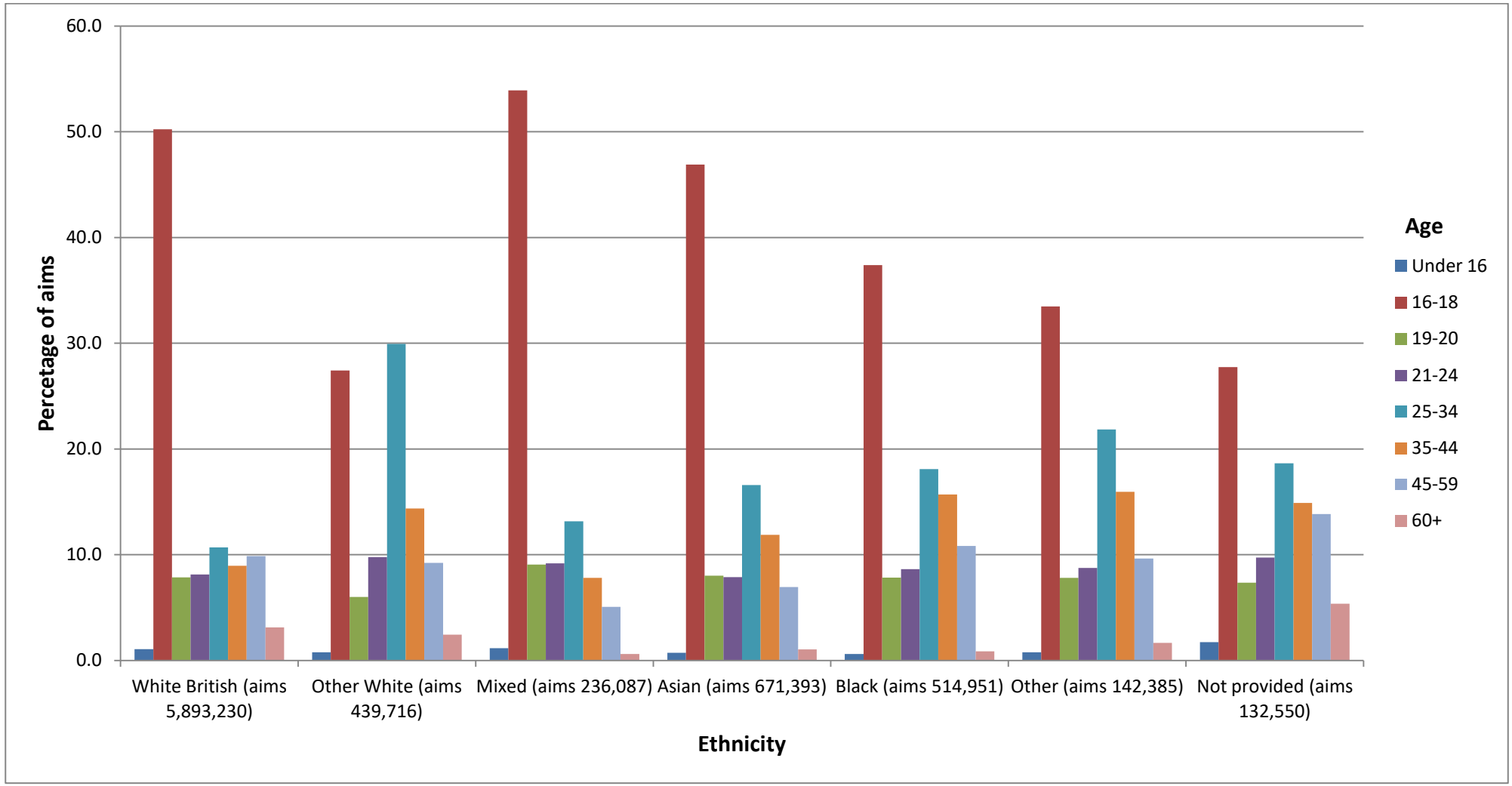
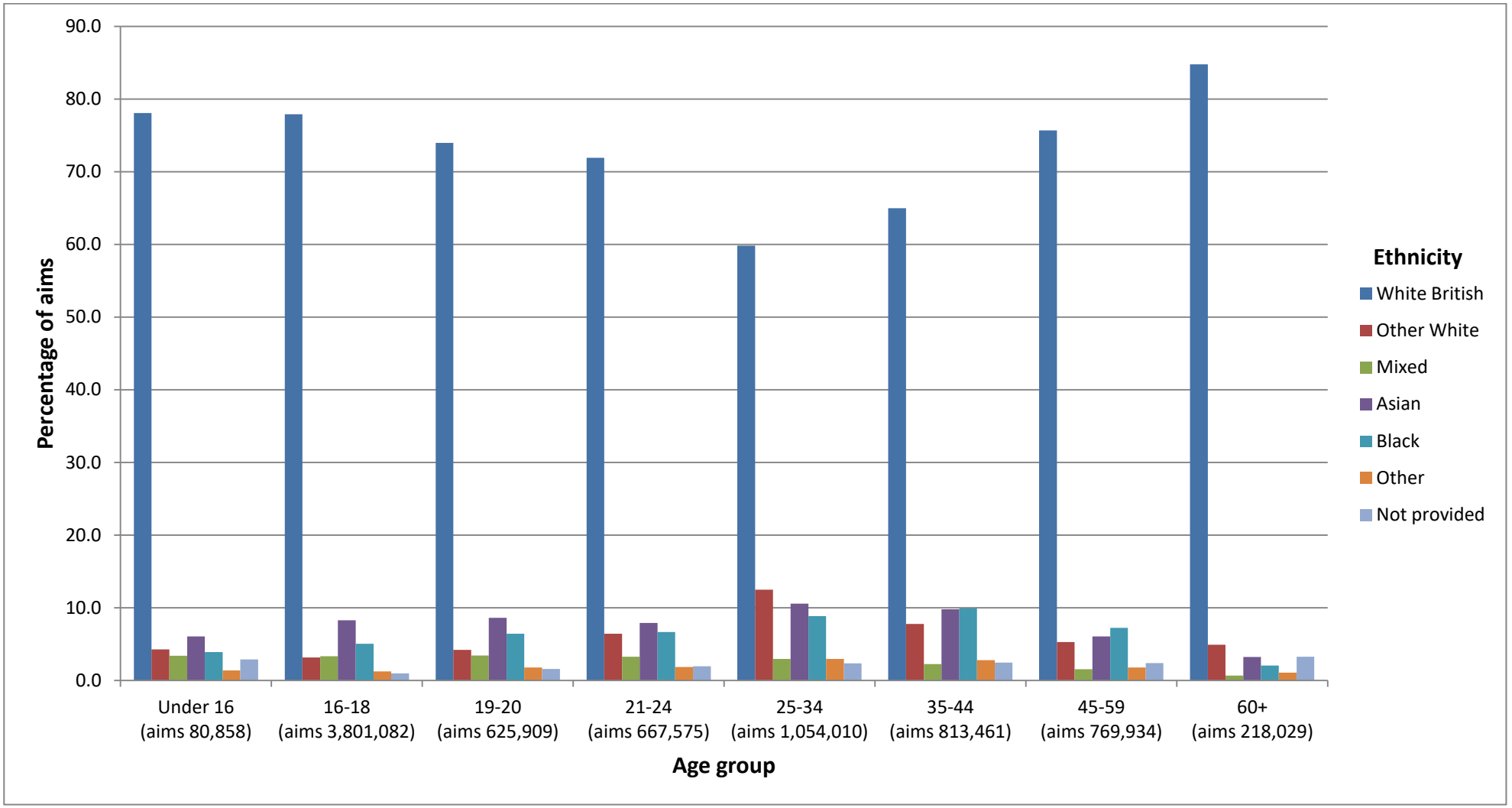


Figure A4.7 - Percentage of aims in each age group of student by ethnicity of student



A4.5: Mode of study and ethnicity of student

The chi-square test of an association between level and gender indicates that there is a statistically significant very weak association (χ^2 (36) = 179,849.6, p < .001, V = .061, p < .001). Figure A4.8 shows the dispersion of each ethnic group for courses attended using each of the modes of study and Figure A4.9 shows the reciprocal relationship.

Figure A4.8 shows two distinct groups for the percentage of White British students attempting aims in each of the modes of study. In group one there are four modes of study: (five if you include unknown or not applicable, 83.6%), full-time full-year (74.2%) part-time other including e-learning (74.6%), part-time open (78.3%) and part-time distance learning (81.5%). In contrast there are two modes of study in group two: full-time part-year (62.1%) and part-time evening (62.6%). This indicates that the mode of study has almost no impact on the ethnic mix between the two major modes of study and only a relatively limited impact on the ethnicity mix in two of the minor modes of study.

However, Figure A4.9, which shows the percentages for each of the minorities from the census in each of the modes of study, suggests that this impact is slightly greater (though still small) for minorities. There are a small number of differences in shape for some of the modes of study such as the extremely high percentage of aims attempted by other White students in the part-time evening mode of study.

A4.6: Gender and ethnicity of student

The chi-square test of an association between level and gender indicates that there is a statistically significant very weak association (χ^2 (6) = 14,597.2, p < .001, V = .043, p < .001). Figure A4.10 shows the dispersion of each ethnic group for courses attended by each gender and Figure A4.11 shows the reciprocal relationship. (These appear after Figures A4.8 and A4.9).

In examining the differences in ethnicity of each gender of student, Figure A4.10 shows that a very slightly larger percentage (1.1%) of male students has a White British ethnicity. This relatively small difference is also seen in Figure A4.1 which shows the percentage of each minority ethnicity for each gender. Indeed the only area where there is a noticeable difference is in the percentage of White students from any other background. Such students form only 4.7% of aims for male students and 6.3% of aims for female students, which is still a relatively small difference. Otherwise most other ethnicities are within 0.1% to 0.4% of each other and so it is reasonable to conclude that gender mix is largely unaffected by ethnicity.

Figure A4.8 - Percentage of aims for each ethnic group of student by mode of study

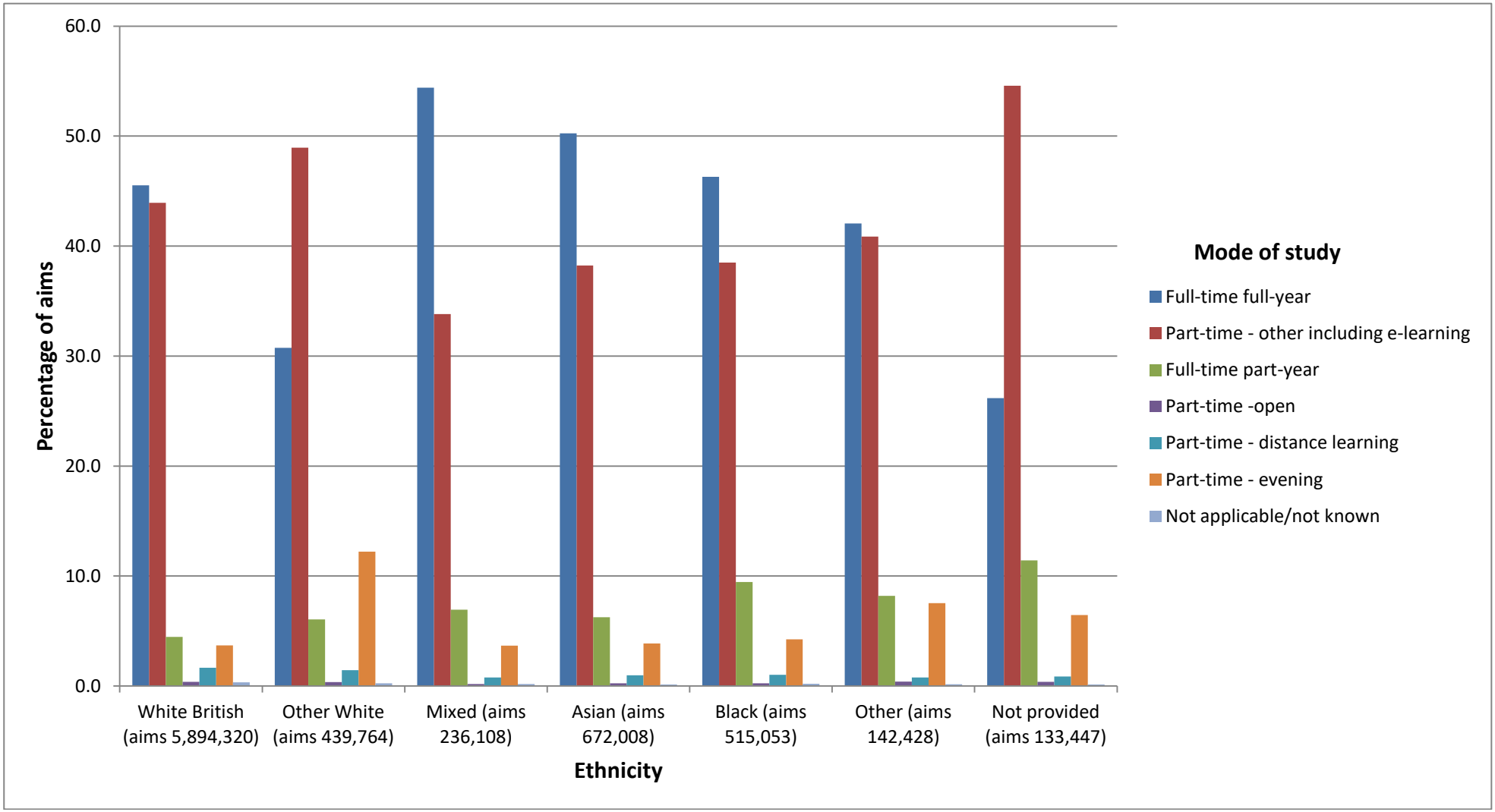


Figure A4.9 - Percentage of aims in each mode of study by ethnic group of student

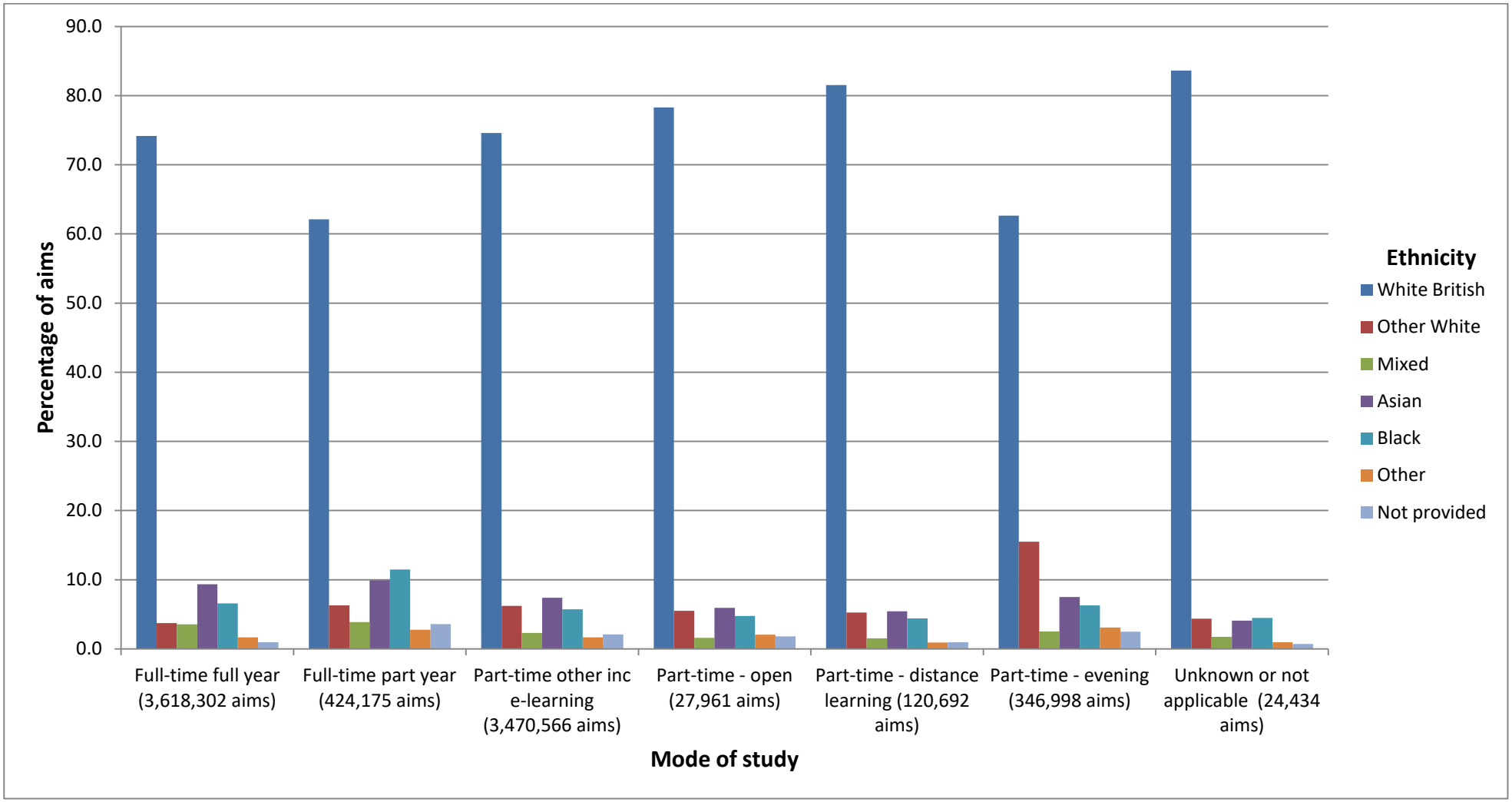
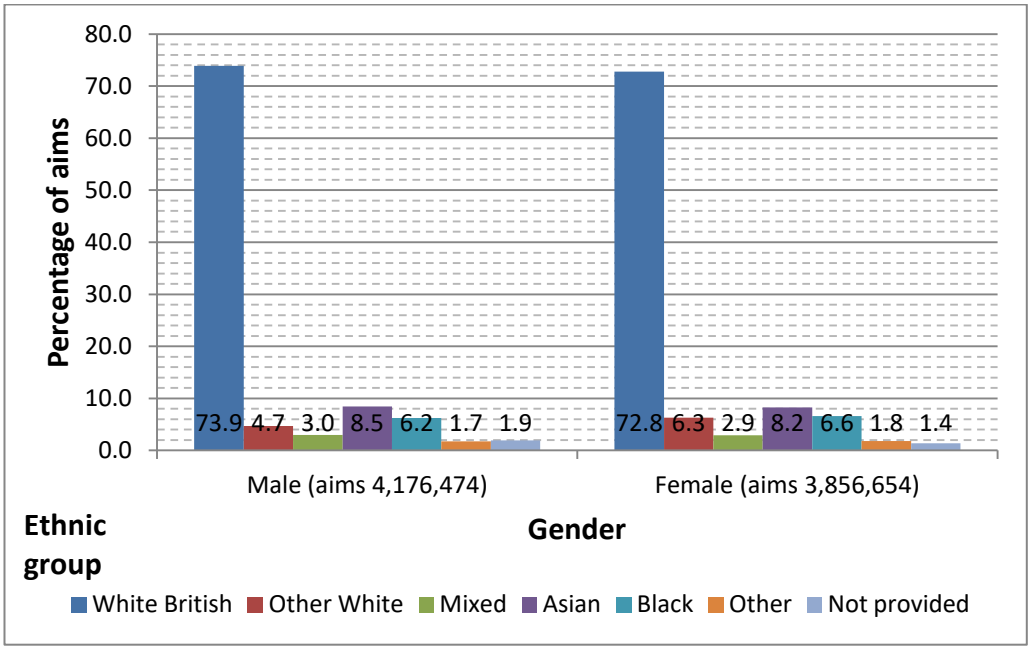
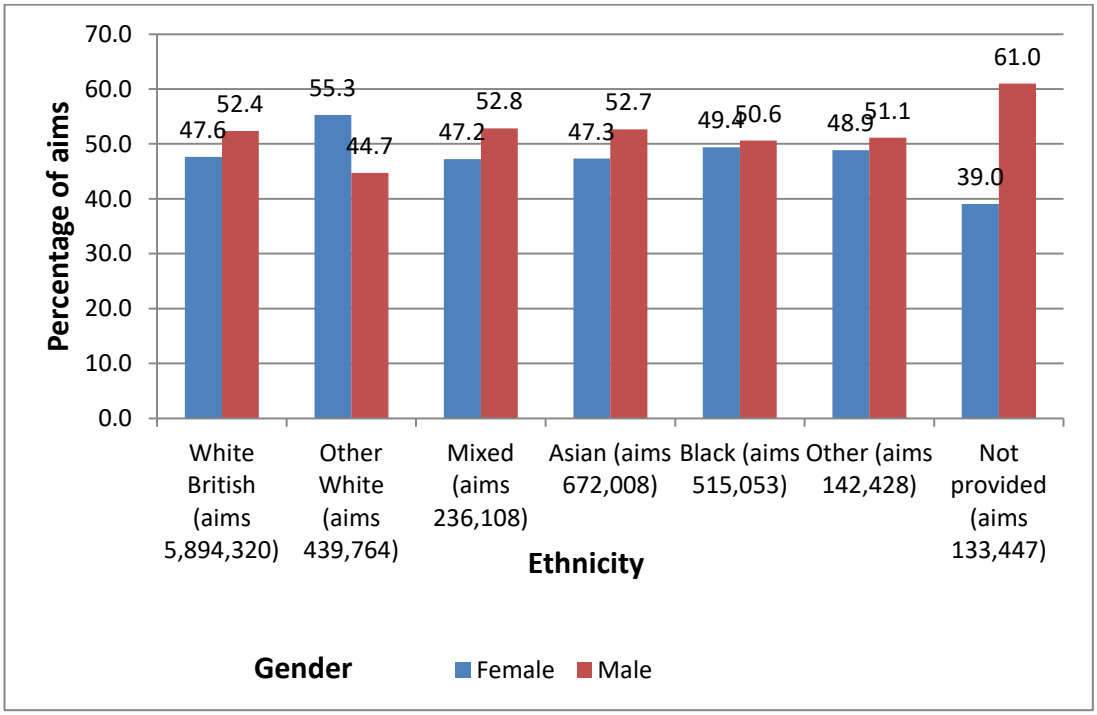


Figure A4.10 - Percentage of aims for each ethnicity of student by gender of student



Similarly, Figure A4.11, which shows the percentage of male and female students for each of the ethnic groups, indicates very little difference between the ethnic groups. For the most part all ethnic groups have marginally higher percentages of aims attempted by male students than by female students. The only exception to this is that of the other White group which has a 55.3% to 44.7% split in the opposite direction (more female). Aims attempted by mixed ethnicity, Asian and White British students all have near identical numbers. However, aims attempted by Black students, while still favouring male students are much closer in percentage (49.4% female to 50.6% male). In summary these difference are relatively small and it can be concluded that ethnicity of student and gender of student are largely unaffected by each other.

Figure A4.11 - Percentage of aims for each gender of student by ethnicity of student



Annex 5: Subject cluster boundaries

This annex contains the boundaries for the three complex subject clusters that cover numerous subject groups.

Table A5.1 - Key subject group boundaries for group six, Liberal Arts and Sciences

Group six Liberal Arts and Sciences - subject	Minimum	Maximum
Science and Mathematics	10.8%	35.0%
Arts, Media and Publishing	2.7%	17.3%
History, Philosophy and Theology	1.3%	29.9%
Social Sciences	2.7%	13.2%
Language, Literature and Culture	4.5%	17.7%
Business, Administration and Law	0.9%	16.2%
General Studies	0.0%	45.4%

Table A5.2 - Key subject group boundaries for group seven, Broad Subject Mix

Group seven Broad Subject Mix - subject	Minimum	Maximum
Health, Public Services and Care	2.1%	34.7%
Science and Mathematics	0.0%	24.4%
Agriculture, Horticulture and Animal Care	0.0%	11.5%
Engineering and Manufacturing Technologies	0.0%	13.6%
Construction, Planning and the Built Environment	0.0%	9.1%
Information and Communication Technology	0.3%	8.0%
Retail and Commercial Enterprise	0.0%	11.8%
Leisure, Travel and Tourism	0.1%	16.5%
Arts, Media and Publishing	0.5%	16.7%
History, Philosophy and Theology	0.0%	22.8%
Social Sciences	0.0%	8.4%
Languages, Literature and Culture	0.1%	10.7%
Education and Training	0.0%	3.7%
Preparation for Life and Work	2.3%	14.8%
Business, Administration and Law	7.2%	33.9%
Key and Basic Skills	0.0%	23.7%
General Studies and Enrichment	0.0%	28.2%
English as a Second Language	0.1%	19.5%

Table A5.3 - Key subject group boundaries for group eight, Applied Subjects and Skills

Group eight Applied Subjects and Skills - subject	Minimum	Maximum
Health, Public Services and Care	0.4%	23.3%
Engineering and Manufacturing Technologies	0.0%	41.7%
Construction, Planning and the Built Environment	0.0%	11.0%
Retail and Commercial Enterprise	0.0%	18.2%
Preparation for Life and Work	2.8%	43.3%
Business, Administration and Law	1.5%	13.9%
Key and Basic Skills	1.7%	36.1%