Department for Business Innovation & Skills

RESEARCH

BIS RESEARCH PAPER NUMBER 99

Evaluation of the Impact of Capital Expenditure in FE Colleges

DECEMBER 2012

Frontier Economics Ltd. and BMG Research Ltd.

Department for Business, Innovation and Skills

1 Victoria Street

London SW1H 0ET

www.bis.gov.uk

Research paper number 99

December 2012

Table of Contents

Figures and tables

Authors and acknowledgements

This study has been conducted by Frontier Economics Ltd and BMG Research Ltd. BMG Research was responsible for the primary data collection that formed a key component of the quantitative analysis. The qualitative case studies carried out as part of this study were undertaken jointly by members of BMG Research and Frontier Economics. Frontier Economics was responsible for the quantitative analysis and reporting of all components of the study.

Frontier Economics Ltd authors: Sarah Snelson, Michael Ridge, Thomas Baily, Kendal Gaw, and Sho Okamoto.

BMG Research Ltd authors: June Wiseman and Elizabeth Davies.

The authors would like to acknowledge the support and advice provided during the course of the project by the project steering group. In particular, we would like to thank Kris Chapman at the Department for Business, Innovations and Skills (BIS) for his expertise and dedication in the management of this research project. We would like to thank Mark Harvey and Bally Mandara at the Skills Funding Agency for their support and assistance, particularly in helping to facilitate, and providing background information to inform, the qualitative research. We would like to thank Julian Gravatt of the Association of Colleges, both for his support in engaging with colleges in the early stages of the project, and for his insightful comments at Steering Group meetings. We would also like to thank the interviewers at BMG Research who worked on the survey. Above all, we would like to thank all the colleges who dedicated some of their valuable time to respond to the survey and take part in the case studies.

Glossary of acronyms and key terms

Acronym / term	Definition
AoC	**Association of Colleges.**
Achievement rate	This is the number of learning aims that have been fully achieved divided by the number of learning aims that have been completed.
Attainment rate	Attainment rates refer to a set of measures published by the Data Service – Success rate, Retention rate, Achievement rate. See individual entries for specific definitions.
BMS	**Building Management System** – a computer-based control system installed in buildings that controls and monitors a building's mechanical and electrical equipment, such as power systems, fire systems, security systems, lighting and ventilation.
BREEAM	**Building Research Establishment Environmental Assessment Method** – an environmental standard that rates the sustainability of buildings in the UK. The BREEAM environmental assessment aims to minimise environmental impact by ensuring sustainability best practices are in place while also lowering organisations' costs through energy efficiency.
DDA	**Disability Discrimination Act (1995).**
eMandate	**The Estate Management Data Exchange for the UK Further Education sector**. eMandate is a unique information resource established to provide the sector and colleges with access to independent, sector wide estate performance data. The resource facilitates sharing of key estate information and understanding practice across the sector.
ER Learner	**Employer Responsive Learner.** The Employer Responsive Model supports provision driven by employer choice, encompassing Train To Gain, Apprenticeships for Adults (over 19) and Further Education (FE) provision delivered on employers' premises.
FE	**Further Education**.
FM	**Facilities Management.**
GLH	**Guided Learning Hours** – all times when a member of provider staff is present to give specific guidance towards the learning aim being studied on the programme. This definition includes lectures, tutorials and supervised study. It does not include hours where supervision or assistance is of a general nature and is not specific to the study of the learners.
Government funded LR learner	This term is used as shorthand for Learning and Skills Council/ Skills Funding Agency funded Learner Responsive learners

Acronym / term	Definition
HE	**Higher Education.**
ILR	**Individualised Learner Record** – a collection of statistical data returned at various points of the academic year by providers in the Further Education system.
LA	**Local Authority.**
LR Learner	**Learner Responsive Learner.** This model covers funding based on learner choice and demand.
LSC	**Learning and Skills Council.**
NEETs	Young people **Not in Employment, Education or Training.**
NIA	**Net Internal Area.**
NLSS	**National Learner Satisfaction Survey.**
NSRT	**National Success Rates Tables.**
Participation	This is the number of learners at a college. The participation of different groups of learners, such as Learner Responsive, Employer Responsive, Apprenticeships, Adults and 16 to 18 year olds are separately analysed.
RDA	**Regional Development Agency.**
Retention rate	This is the number of learning aims that have been completed divided by the total number of learning aims (excluding those out of which learners transferred).
RHS variables	**Right Hand Side variables**: independent variables that explain the dependent (or Left Hand Side) variable in a regression analysis.
SIR	**Staff Individualised Record** – a comprehensive census of the workforce in the Further Education (FE) college sector. It contains individualised data on demographics, characteristics, qualifications, location, pay as well as other factors.
Success rate	This is the number of learning aims that are achieved as a percentage of those that are started (not including transfers). This is equivalent to the Retention Rate multiplied by the Achievement Rate.
UPIN	**Unique Provider Identification Number** – a unique reference number assigned by the Provider Information Management System (PIMS) to each provider contracted by the LSC.

Acronym / term	Definition
YPLA	**Young People's Learning Association.**

Executive Summary

High level summary

- Total capital spending by colleges since 2002/03 has totalled approximately £6.8 billion at 2012 prices.
- BIS commissioned Frontier Economics and BMG Research to carry out an evaluation of the impact of capital spending, combining quantitative and qualitative research and building on a previous study undertaken by Frontier Economics in 2008.[1] The precise population of interest was 'completed capital spending projects by FE colleges within England (total per college) between April 2001 and September 2011'.
- The quantitative analysis was a statistical and regression analysis that drew on an achieved sample of 142 colleges from a census of all FE colleges in England. The regressions estimate the impact on college outcomes of every £1 million of capital spending completed by colleges in the period 2002/03 to 2010/11. The college outcomes considered as part of this work were learner participation, retention rates, achievement rates, success rates and the ability of colleges to raise additional income and fee revenue.
- The qualitative analysis drew on interview evidence collected from 10 case study colleges that had received a significant grant from the Learning and Skills Council (LSC) between 2007 and 2009, and had completed their capital expenditure projects at least 18 months before the start of this study. The analysis concentrated on the ability of projects to impact on a range of outcome variables.

Participation findings

- The quantitative analysis found that every £1 million of capital expenditure is associated with between approximately 62 and 86 additional learners per year (in 2012 prices). The qualitative analysis found consistent evidence that case study colleges had exceeded targets for growth in learner numbers.
- The qualitative work also highlighted a number of factors that are extremely important for understanding and interpreting the quantitative analysis. Firstly, the qualitative analysis indicates that the quantitative analysis may underestimate the participation impact. Case study colleges indicated that the primary rationale for capital expenditure was the poor quality of college's existing buildings. The regression analysis is not able to fully capture this effect. Secondly, case study colleges have focused on widening participation as well as increasing total participation. The quantitative analysis is unable to capture the different effort and policy impact involved with engaging with these groups and, as such, may fail to capture the full impact of capital expenditure projects.

[1] Frontier Economics (December 2008) *Evaluating the impact of capital expenditure in further education, Learning and Skills Council*: available online at: http://readingroom.lsc.gov.uk/lsc/National/Updated_LSC_report__including_annexes__-_FINAL.pdf [accessed September 2012]

Success, achievement and retention rate findings

- Success, retention and achievement rates were used as proxies for the quality of learning outcomes. But, the analysis was not able to isolate a statistically significant effect of capital expenditure on these variables. This does not mean that there is not a link. In fact, the inability of the quantitative analysis to isolate an effect was driven, to a large extent, by the considerable convergence in success rates, towards the natural ceiling of 100 per cent, which has occurred in recent years.

- Most case study colleges reported improvements in success and retention rates following their respective capital expenditure projects. However, a number of colleges said that other effects that were present at the same time neutralised these gains. Colleges emphasised that participation and success rates would have declined had the capital expenditure not have occurred, so before-after comparisons do not provide the full picture.

- A number of other factors are also of note. Firstly, colleges have sought to widen participation, affecting the 'ability mix' and hence the retention, achievement and success rates that are achievable. Secondly, colleges tend to have a broader interpretation of the quality of learning than success rate measures. Colleges report significant improvements in quality of learning which are not captured by these metrics, for example better engagement with employers and more students progressing into further courses and Higher Education.

Dependency on government funding

- The quantitative analysis found that large capital expenditure projects (£60 million plus) are associated with significant reductions in the dependency of colleges on government funding.

Other indicators of impact

- Colleges recognise the important role they can play in leading economic regeneration of areas and several case study projects played an important role in this regard. The economic regeneration stimulated by college investment can be of direct benefit (employing staff in the college) as well as indirect benefit (stimulating investment from other businesses).

- Colleges are very conscious of improving environmental sustainability across their buildings when undertaking a capital project. The majority of case study colleges secured very good or excellent environmental sustainability ratings for their new buildings and had incorporated a range of sustainable energy sources into their designs.

- Colleges actively manage their new buildings to improve employer engagement. They state that they have been particularly successful in doing so, particularly when the capital stock prior to investment was very poor. The new buildings, equipment and facilities allow colleges to offer services that more accurately match what employers want. They also allow the college to engage employers in other ways.

- Colleges conduct student satisfaction surveys which indicate that learners feel more satisfied on their courses following capital investment. Colleges also note other signs of increased learner satisfaction, including a greater sense of pride in the college.

- Estate utilisation appears to have increased following most capital expenditure projects. This appears to be particularly true for colleges that disposed of old sites and relocated to new sites as part of their project.

- Case study colleges presented mixed views on the maintenance costs of new buildings. On the one hand, colleges indicated that maintaining a new building, designed with better quality and more durable materials was easier. On the other hand, colleges stated that maintaining a brand new building, particularly given its increased use, can increase maintenance costs, particularly where colleges had stopped maintaining their previous low quality buildings.

- Capital expenditure projects appear to have made it significantly easier for colleges to recruit staff and to attract higher quality staff.

Overall findings

- Capital expenditure increases participation by between approximately 62 and 86 learners per year (in 2012 prices), but this figure might be significantly larger if investment in colleges occurs "just in time" to prevent a significant decline in learner numbers. The estimated impact accounts, to a large extent, for possible displacement of learners between colleges and therefore reflects net additions to learner numbers.

- Capital expenditure is not associated with a measurable impact on success, retention and achievement rates. However, there is evidence to suggest that the strong convergence in success rates underpins the inability of the quantitative work to isolate this impact. Colleges have also sought to widen participation as well as increase overall numbers. Changes such as this, which affect the 'ability mix' of the learners starting courses in a college, will have implications for retention, achievement and success rates. Additionally, colleges report significant improvements in the quality of learning that are not captured by these measures. For example, they refer to better engagement with employers and students continuing in other courses or transitioning to Higher Education.

- Capital expenditure is associated with an increased ability of colleges to raise income independently. This equates to a 5.5 percentage point reduction in their dependency on government funding for colleges with large capital projects (£60 million plus).

- Capital expenditure is also associated with a range of other positive impacts. These include increased employer engagement, improved sustainability and better utilisation of estate.

- There is good evidence that the impacts reported are additional. Firstly, the total amount spent on capital expenditure projects has changed in line with LSC and Skills Funding Agency funding availability. This indicates that many colleges do not appear to be able to fund substantial projects in the absence of this funding support. Secondly, some colleges had embarked on phased projects and have been unable to complete the later phases without LSC or Skills Funding Agency funding. This is a further indication that colleges are not able to substitute government funds with other sources of funding. Thirdly, nearly all case study colleges said they could not have carried out their project to the full specification without the LSC/Skills Funding Agency funding component and some said they would not have attempted a project on a substantial scale at all.

There has been a substantial amount of capital expenditure in FE colleges over the last 10 years relative to previous decades. Total capital spending by colleges since 2002/03 has totalled approximately £6.8 billion at 2012 prices. Capital spending in colleges grew substantially year on year from 2002/03 to 2008/09 but, in more recent years, spending returned to 2002/03 levels. Average project size per year (in 2012 terms) reached a high of between £25 and £35 million in 2007/08 and 2008/09 but has also declined more recently. There have been some extremely large projects over this period. Colleges have spent as much as £200 million on capital expenditure over the timeframe for analysis, and individual projects have been as large as £116m.

In 2008 Frontier Economics published a study that showed that capital expenditure in colleges could improve participation by around 111 learners per £1 million spent, and improve success rates by 0.1 percentage point per £1 million.[2] The study drew on both quantitative and qualitative analysis. The quantitative work focused on the direct impact of capital spending on participation and success rates and the qualitative work focused on how projects were implemented and managed. Following consultation with the Association of Colleges (AoC), BIS commissioned Frontier Economic and BMG Research to update the quantitative part of the study and to carry out a further qualitative analysis with a strong focus on the impact of capital expenditure on a number of key policy goals.

Overview of the methodology

There were two strands of work in this study: a quantitative strand and a qualitative strand.

The quantitative analysis in this report is a statistical and regression analysis that draws on data from a sample of 142 FE colleges in England.[3] The regression estimates the impact on college outcomes of every £1 million of capital spending completed by colleges in the period 2002/03 to 2010/11. The college outcomes considered as part of this work were:

- learner participation;
- retention rates;
- achievement rates;
- success rates; and
- the ability of colleges to raise additional income and fee revenue.

Regression analysis of this kind has three main strengths. Firstly, implicit within this analysis is the counterfactual that “a college’s performance would have changed in line with that of other colleges with similar characteristics”. It therefore tries to understand performance relative to what would have occurred in the absence of capital expenditure. Secondly, the analysis doesn’t just

[2] Frontier Economics (December 2008) *Evaluating the impact of capital expenditure in further education, Learning and Skills Council*: available online at: http://readingroom.lsc.gov.uk/lsc/National/Updated_LSC_report__including_annexes__-_FINAL.pdf [accessed September 2012]

[3] All FE colleges were invited to respond to a survey as part of this work. The 142 colleges included in the analysis are those that responded – a response rate of 57 per cent.

indicate that capital expenditure is beneficial, it indicates how beneficial it is by estimating the impact of every £1 million spent. Finally, the analysis controls for other factors that affect a college's performance, isolating the impact of capital expenditure on outcomes.

Despite its strengths, regression analysis cannot answer all of the questions of relevance to this study. Qualitative analysis of the type undertaken in this study is a more appropriate tool for understanding the impact of non-quantifiable indicators, exploring project objectives in the context of wider government policy and exploring the transition mechanisms by which successful project impacts are achieved.

The qualitative analysis drew on interview evidence collected from 10 case study colleges that had received a significant grant from the Learning and Skills Council (LSC) between 2007 and 2009, and had completed their capital expenditure projects at least 18 months before the start of this study. The research team spent 3 to 4 hours in each college, which included hour long interviews with a range of senior staff plus a tour of the college site. The analysis concentrated on the ability of projects to impact on a range of outcomes. In addition to the outcome variables already covered by the quantitative analysis, the impact of projects on the following indicators was also explored:

- Estate condition and efficiency;
- Employer engagement;
- Learner satisfaction;
- Local economic impacts;
- Environmental sustainability; and
- Staff retention and recruitment.

Main findings from the quantitative analysis

The analysis shows that every £1 million of capital expenditure is associated with around 62 additional learners per year (in 2012 prices). This is lower than the results of the 2008 study, which found that every £1 million of capital expenditure was associated with around 111 additional learners (98 learners in 2012 comparable terms).

However, the results of this study are broadly consistent with the 2008 results when a number of large projects (over £60 million) that had only recently completed are excluded from the dataset. Projects of this size were not covered by the 2008 study, and there is evidence to suggest that there is likely to be a time delay in the realisation of impact from projects as large as these. When these projects are excluded, the analysis finds that every £1 million of capital expenditure is associated with around 86 additional learners per year.

However, BIS is not merely interested in the increase in the number of learners attending college, but also in the quality of learning outcomes. To properly assess the quality of learning outcomes would involve incorporating a measure of the earnings and employability of learners completing further education courses. It has not been possible within the scope of this study to construct such a measure. Success, retention and achievement rates have been used as proxies for the quality of learning outcomes.

The analysis has not been able to isolate a statistically significant effect of capital expenditure on these variables. This contrasts with the 2008 study, in which a small effect was found. However, this does not mean that there is no effect. In fact, the difficulty with isolating an impact has been driven by the considerable convergence in success rates, towards the natural ceiling of 100 per cent, which has occurred in recent years. This leaves very little variation for capital expenditure to explain. It should also be noted that colleges have sought to widen participation as well as increase overall numbers. Changes such as this, which affect the 'ability mix' of the learners starting courses in a college, will have implications for retention, achievement and success rates. It was not possible to control for such changes in the quantitative work, which could further explain the difficulty with isolating an impact on success measures.

Finally, the quantitative analysis also finds that each £1 million of capital expenditure is associated with a 0.06 percentage point reduction in the percentage of college income received from government funding bodies.[4] This effect is small, but significant at the 5 per cent level.[5] However, colleges that undertook very large projects (at least £60 million) appear to be associated with a much larger reduction (5.5 percentage points) in government funding, significant at the 10 per cent level. An average college within this group received capital expenditure worth £75 million, and has £30 million total income. The regression analysis suggests that total capital expenditure of that size would decrease dependence on Agency income by up to approximately £1.65 million per annum.

Main findings from the qualitative analysis

The qualitative case studies explored a range of non-quantifiable indicators of impact as well as exploring the processes that helped projects to be successful. A high level summary of the key findings relating to the impact of the projects is set out below.

Learner participation and performance: Case study colleges had all set growth targets for learner participation associated with their capital expenditure projects and had met or exceeded these. Most colleges also reported improvements in success rates and retention rates following their capital expenditure project. However, a number of colleges said that other effects on the college, present at the same time, undermined this. But, colleges emphasise that participation and success rates would have declined had the capital expenditure not have occurred, so before-after comparisons do not provide the full picture.

Economic regeneration: Colleges recognise the important role they can play in leading economic regeneration of areas and several case study projects played an important role in this regard. The economic regeneration stimulated by college investment can be of direct benefit (employing staff in the college) as well as indirect benefit (stimulating investment from other businesses). Colleges were not able to specifically measure these wider impacts but stated that their new college buildings appeared to have stimulated the investment of other businesses in the area with associated jobs.

---

[4] The funding bodies referred to here are the Learning and Skills Council and the Skills Funding Agency.

[5] To put these results into perspective, a typical college (at the median) would have total income of £24 million, of which £18 million would be LSC or Skills Funding Agency income. £10 million of capital expenditure would reduce dependency on LSC or Skills Funding Agency income from 75 per cent to 74.4 per cent, i.e. by £144k per annum.

Environmental sustainability: Colleges are very conscious of improving environmental sustainability across their buildings when undertaking a capital project. The majority of case study colleges secured very good or excellent environmental sustainability ratings for their new buildings and had incorporated a range of sustainable energy sources into their designs. It should be noted, that the inclusion of these renewable sources has not always led to a reduction in energy costs.

Employer engagement: Colleges actively manage their new buildings to improve employer engagement. They state that they have been particularly successful in doing so, particularly when the capital stock prior to investment was very poor. The new buildings allow colleges to offer facilities that more accurately match what employers want. They also allow the college to engage employers in other ways, such as providing spaces for hosting meetings and conferences. The new buildings also appear to provide a better environment for students to interact with industry representatives and to demonstrate that they are 'industry ready'.

Learner satisfaction: College run Student Satisfaction surveys indicate that students feel more satisfied on their courses following capital investment. Colleges also note other signs of increased student satisfaction. There is less gratuitous damage, vandalism and graffiti, indicating that students take a greater pride in their environment and students choose to stay on campus after hours; a sign that they enjoy being there, and something that would not have happened at colleges' old sites.

Estate utilisation: Estate utilisation appears to have increased following most capital expenditure projects.[6] This appears to be particularly true for colleges that disposed of old sites and relocated to new sites as part of their project. Estate utilisation benefits are driven by better utilisation between 9am and 5pm on weekdays, driven by more flexible spaces, as well as better utilisation outside of teaching hours.

Maintenance costs: Case study colleges presented mixed views on the maintenance costs of new buildings. On the one hand, colleges indicated that maintaining a new building, designed with better quality and more durable materials was easier. On the other hand, colleges stated that maintaining a brand new building, particularly given its increased use, can increase maintenance costs, particularly where colleges had stopped maintaining their previous low quality buildings.

Staff recruitment: Capital expenditure projects appear to have made it significantly easier for colleges to recruit staff and to attract higher quality staff. Whilst, colleges recognise that the economic environment has clearly paid its part in increasing the number and quality of applicants for positions, colleges feel fairly confident that the buildings alone have made an important contribution.

Synthesis of the findings from the quantitative and qualitative analysis

Whilst the individual findings from the quantitative work and the case studies are interesting in their own right, it is the combination of the two that gives this analysis a rounded quality. The qualitative work has highlighted a number of factors that are extremely important for understanding and interpreting the quantitative analysis.

---

[6] Projects involving listed or historical buildings appear to be the exception here.

Firstly, the qualitative analysis indicates that the quantitative analysis may underestimate the participation impact. Case study colleges indicated that the primary rationale for capital expenditure was the poor quality of college's existing buildings and their desire to prevent a significant future deterioration in performance. The counterfactual that is implicit in the regression analysis is not able to fully capture such as deterioration in performance and, as such, may lead to an underestimate of the impact of capital expenditure on participation. In fact, some illustrative simulations undertaken as part of this work indicate that the true impact of capital expenditure could be multiples of the impact reported above.

Added to this, case study colleges have focused on widening participation as well as increasing total participation. Colleges have sought to use capital projects to improve their engagement with disenfranchised groups such as young people aged 14 or over otherwise excluded from mainstream education, young people Not in Employment, Education or Training ('NEETs'), and individuals with limited mobility. The quantitative analysis is unable to capture the different effort and policy impact involved with engaging with these groups and, as such, may fail to capture the full impact of capital expenditure projects.

The focus of colleges on previously disenfranchised groups also has potential implications for the quantitative analysis of success, retention and achievement rates. As alluded to already, the quantitative analysis cannot fully capture changes in learner mix between time periods. To the extent that capital investment alters the mix of learners within a college it may make it significantly harder to maintain existing success rates, let alone improve them.

The case study evidence also presents a picture of the additionality of capital expenditure projects. Firstly, the total amount spent on capital expenditure projects has changed in line with LSC and Skills Funding Agency funding availability. This indicates that many colleges do not appear to be able to fund substantial projects in the absence of this funding support. Secondly, some colleges had embarked on phased projects and have been unable to complete the later phases without LSC or Skills Funding Agency funding. This is a further indication that many colleges are not able to substitute government funds with other sources of funding. Thirdly, nearly all case study colleges said they could not have carried out their project to the full specification without the LSC/Skills Funding Agency funding component and some said they would not have attempted a project on a substantial scale at all.

Finally, the case study findings indicate a degree of displacement involved in colleges' participation performance post capital expenditure i.e. that not all learners are 'new' to the system but would have studied elsewhere. On the other hand, the qualitative work also indicates that colleges place a particular emphasis on attracting disenfranchised learners, which are more likely to represent net additions. The quantitative analysis is able to capture displacement to a large extent. The figures of between approximately 62 and 86 additional learners per year (in 2012 prices) are likely to represent net additions to the stock of learners.

Overall the study finds that:

- Capital expenditure increases participation by between approximately 62 and 86 learners per year (in 2012 prices), but this figure might be significantly larger if investment in colleges occurs "just in time" to prevent a significant decline in learner numbers. The estimated impact accounts, to a large extent, for possible displacement of learners between colleges and therefore reflects net additions to learner numbers.

- Capital expenditure is not associated with a measurable impact on success, retention and achievement. But there is evidence to suggest that the strong convergence in success rates underpins the inability of the quantitative work to isolate this impact. Colleges report significant improvements in the quality of learning that are not captured by these measures. For example, they refer to better engagement with employers and students continuing in other courses or transitioning to Higher Education.

- Capital expenditure is associated with an increased ability of colleges to raise income independently. This equates to a 5.5 percentage point reduction in their dependency on government funding for colleges with large capital projects (£60 million plus).

- Capital expenditure is also associated with a range of other positive impacts. These include increased employer engagement, improved sustainability, and better utilisation of estate.

- Finally, there is good evidence that the impacts reported are additional. Many colleges could not have carried out their respective capital projects to the full specification without the LSC/Skills Funding Agency funding component, and most of the case study colleges said they would not have attempted a project on a substantial scale at all.

1. Introduction

There has been a substantial amount of capital expenditure in FE colleges over the last 10 years relative to previous decades. Total capital spending by colleges since 2002/03 has totalled approximately £6.8 billion at 2012 prices with government funding of £3.1 billion invested over this period. Capital spending in colleges grew substantially year on year from 2002/03 to 2008/09 but, in more recent years, spending returned to 2002/03 levels. Average project size per year (in 2012 terms) reached a high of between £25 and £35 million in 2007/08 and 2008/09 but has also declined more recently. There have been some extremely large projects over this period. Colleges have spent as much as £200 million on capital expenditure over the timeframe for analysis, and individual projects have been as large as £116m.

Characteristics of capital expenditure (2002/03 – 2010/11)
Value of capital spend (2012 prices) – £6.8 billion
Average size of individual capital project (2012 prices) – £12.5 million
Average amount of capital expenditure per college (2012 prices) - £27 million
No. of projects undertaken (across all colleges) – 537
Average length of projects – 17 months

Following the demise of the Building College's for the Future programme and the subsequent reassessment of government fiscal policy; the nature, size and scale of government capital investment in colleges changed significantly in 2009. The Spending Review (SR) 2010 ensured that capital funding was available to meet legacy commitments. However, this provided only limited scope for the funding of new projects. As a consequence, uncertainty over access to government capital funding support appears to have affected the confidence of some colleges in developing longer term plans and taking forward larger projects. In addition, changes in government funding policy (towards widening participation and improving curriculum quality) mean that the drive for additional learners has been less prominent during the period of this study. This has led to an increased focus on smaller, phased projects which focus on improving building condition, estate efficiency, rationalisation and refurbishment.

In 2008 Frontier Economics published a study that showed that capital expenditure in colleges could improve participation by about 111 learners per £1 million spent and improve success rates by 0.1 percentage point per £1 million.[7] The study drew on both quantitative and qualitative analysis. The quantitative work focussed on the direct impact of capital spending on participation and success rates and the qualitative work focussed on how projects were

[7] Frontier Economics (December 2008) *Evaluating the impact of capital expenditure in further education, Learning and Skills Council*: available online at: http://readingroom.lsc.gov.uk/lsc/National/Updated_LSC_report__including_annexes__-_FINAL.pdf [accessed September 2012]

implemented and managed. BIS have asked Frontier and BMG to update the quantitative part of the study and also to carry out a further qualitative analysis that, this time, is more focused on the impact of capital expenditure on a number of key policy goals.

The specific objectives for the study have been the following:

1. Review the available data, as well as the research tools and evidence from the previous evaluation of FE college capital spending in order to develop a methodology that is compatible, if not directly comparable, with the impact evaluation conducted in 2008. Although the period of data coverage and the populations of interest are different, it should be possible to compare the results of the 2008 and 2012 impact assessments (noting caveats about comparability, where appropriate).

2. Provide descriptive trend analysis of key college-based performance indicators based on data drawn from Individual Learner Record (ILR) and Skills Funding Agency datasets. The indicators of interest are defined in Table 1 below, but, in particular, key outcomes include learner participation and success rates for general FE colleges in England.

3. Identify an appropriate counterfactual and analysis to establish the impact of completed capital investment projects on quantifiable indicators. In line with the 2008 impact evaluation, it is recommended that this is examined by the total capital investment by each FE college, rather than on a project-by-project basis.

4. Undertake qualitative description and analysis of non-quantifiable indicators (e.g. on soft outcomes such as learner satisfaction and indicators on which there is insufficient quantitative data). The qualitative element of the study should also consider the success criteria for individual FE capital spend projects, identifying the key features of high-impact projects.

5. Synthesise the quantitative and qualitative analysis to clearly identify the economic and participation-related impacts of FE college capital investment. Recommendations should be generated on how the impact of FE college capital investment could be monitored on a regular (e.g. annual), on-going basis.

6. Disseminate key project findings to BIS, Skills Funding Agency and FE college stakeholders.

Table 1. Overview of potential indicators

Essential indicators	***Desirable indicators***
Participation	Wider impacts on the local economy
Retention rates	Capital estate condition and impact of not investing
Success rates	On and off site Guided Learning Hours (GLH)
Achievement rates	Environmental sustainability
Number of apprentices trained by colleges	Staff recruitment and retention
College ability to generate fee income	Efficiency and estate rationalisation
Amount of capital expenditure and dates	
Ability to engage with employers	
Learner satisfaction with learning environment and experience	

The quantitative and qualitative research methodologies followed in this research are explained in detail in this report. In brief:

- The **quantitative analysis** is based on a statistical analysis drawing on data from 142 colleges in England examining the impact of their capital spending over the period 2002/03 to 2010/11. The focus for the quantitative work has been to estimate the impact of capital spending on learner participation, success, retention and achievement rates, number of apprentices trained and the ability of college to increase income and fee revenue.

- The **qualitative analysis** draws on interview evidence collected from 10 case study colleges that had received a significant grant from the Learning and Skills Council (LSC) between 2007 and 2009, and had completed their capital expenditure projects at least 18 months before the start of this study. The research team spent 3 to 4 hours in each college, which included hour long interviews with a range of senior staff plus a tour of the college site. The analysis concentrated on the ability of projects to impact on a range of outcomes. In addition to the outcome variables already covered by the quantitative analysis, the impact of projects on a range of other indicators was also explored. The indicators considered were estate condition and efficiency, employer engagement, learner satisfaction, local economic impacts, environmental sustainability and staff retention and recruitment.

The rest of the report describes the methodology and the results of this study in detail. It is structured as follows:

- Chapter 2 describes the quantitative analysis.

- Chapter 3 describes the qualitative analysis.

- Chapter 4 provides a synthesis of the quantitative and qualitative analysis.

There are three annexes and three appendices at the end of the report, which provide supporting and background material:

- Annex A presents econometric results across the different groups of essential indicators, with regression results from four alternative sample cuts.
- Annex B presents a comparison between the sample and the population that forms the basis of the assessment of whether there are any systematic differences between the two, and thereby to ensure that there is no sample bias in the analysis.
- Annex C provides a technical description and analysis of the way in which the analysis captures displacement effects.
- Appendix 1a presents the quantitative survey script in its original format.
- Appendix 1b presents example web pages of the quantitative survey.
- Appendix 2 presents the approved qualitative topic guide and semi-structured questionnaire used for case study interviews in its original format.

2. Quantitative analysis

Chapter summary

- The analysis in this chapter shows that every £1 million of capital expenditure is associated with around 62 additional learners per year (in 2012 prices). This is lower than the results of the 2008 study, which found that around 111 additional learners were associated with every £1 million spent (2008 prices). However, the results of this study are broadly consistent with the 2008 results when a number of large projects that have only recently been completed are excluded from the analysis. Excluding these projects gives a figure of around 86 additional learners per year per £1 million spent (2012 prices). Finally, for true comparability of the results between 2008 and 2012, the analysis needs to capture the fact that a 2008 £1 of capital expenditure is worth £1.13 in 2012. This has the implication that the 2008 result is actually 98 learners per £1 million spent, in 2012 prices.

- However, BIS are not merely interested in the number of learners, but in the quality of learning outcomes. To properly assess the quality of learning outcomes would involve incorporating a measure of the earnings and employability of learners completing further education courses into the quantitative analysis. It has not been possible within the scope of this study to construct such a measure. Instead, success, retention, and achievement rates have been used as proxies for the quality of learning outcomes. The analysis does not find any effect of capital expenditure on these variables. This contrasts with the 2008 study, in which a small effect was found. However, since 2008 there has been considerable convergence in success rates to around the 80 per cent level across all colleges. This degree of convergence makes it incredibly difficult to robustly identify the impact of capital expenditure on success. The qualitative work described in Chapter 2 explores the likely changes to the quality of learning outcomes, following capital investment. The work in Chapter 2 highlights that colleges have a wider awareness of what success means, beyond the success measures that it has been possible to consider in the quantitative work.

- Finally, the analysis also found that a £1 million of capital expenditure is associated with a 0.06 percentage point reduction in the percentage of college income coming from the Learning and Skills Council or the Skills Funding Agency. This effect is small, but significant at the 5 per cent level. However, this effect appears to be driven by the colleges within the dataset that undertook large amounts of capital expenditure (at least £60 million). These colleges are specifically associated with a 5.5 percentage point reduction in income coming from the Learning Skills Council or Skills Funding Agency, significant at the 10 per cent level. An average college within this group receives capital expenditure worth £75 million, and has £30 million total income, on average. The regression analysis suggests that a capital expenditure project of this size would decrease dependence on Agency income by up to approximately £1.65 million per annum.

2.1 Introduction

As described in the Introduction, the analysis of capital investment contained within this report is divided into a quantitative component and a qualitative component. This chapter of the report

sets out the quantitative research methodology and findings. The quantitative research builds upon and extends the work undertaken by Frontier Economics in 2008 to provide an up-to-date assessment of the impact of capital spending on participation, achievement rates, retention rates, success rates and college fee income generation.[8,9,10] The regression specification used mirrors that used in 2008, in that it measures the extent to which changes in each outcome variable between 2002/03 and 2010/11 relate to the amount spent on capital expenditure completed over the period. The implicit counterfactual is the change in the same outcome experienced by an equivalent college (in a similar area, exposed to similar policies) with a different amount, or no, capital expenditure over the period. Whilst the regression specification mirrors that used in 2008, it should be noted that there are differences in the timescales and populations analysed, which lead to differences between the two sets of analysis.

The rest of this section describes the quantitative methodology and findings in detail and is structured as follows:

- Aims of the quantitative analysis;
- Methodology (including data specification, data collection and dataset development);
- Descriptive analysis of the sample dataset;
- Econometric results; and
- Summary of findings.

2.2 Aims of the quantitative analysis

The overarching aim of the quantitative component of the study was to analyse the economic and learner outcomes associated with capital expenditure received by FE colleges in England between April 2001 and September 2011. The precise population of interest, as defined in the project specification, was:

> *completed capital spending projects (total per college) between April 2001 and September 2011, including Learning and Skills Council-approved projects and Skills Funding Agency-approved projects from phase 1 of the enhanced renewal grant. FE college self-funded projects for which "consent" approval had been given were also within scope. All FE colleges within England were included excluding only Sixth Form colleges, Higher Education Institutes, Academies and National Skills Academies*.

---

[8] Frontier Economics (December 2008) *Evaluating the impact of capital expenditure in further education, Learning and Skills Council*: available online at: http://readingroom.lsc.gov.uk/lsc/National/Updated_LSC_report__including_annexes__-_FINAL.pdf [accessed September 2012]

[9] Both publicly and privately funded capital expenditure projects are included in the analysis contained within this report. 98 out of the 537 projects that were received consent approval between 2002/03 and 2010/11 were privately funded.

[10] The analysis covers total participation, learner responsive participation, employer responsive participation and the number of apprentices trained.

BIS identified 15 indicators of potential interest to this study, as set out in Table 1 (presented in the Introduction). These indicators were divided into 'Essential' and 'Desirable' indicators according to their importance to this study. As a first stage of work, a scoping exercise was undertaken to determine which of these indicators could be included in the quantitative analysis, which could be covered by the qualitative case studies, and which, if any, it would not be possible to include at all.

The methodology developed for this study was designed to be directly comparable with the regression approach conducted in 2008. It therefore provides an up-to-date measure of the impact of capital expenditure that can be used to help inform policy decisions about future funding profiles. Whilst the methodology is fully consistent with the 2008 study, it should be noted that owing to changes in the timeframe for analysis, the college sample analysed, and changes in policy since 2008, there are a number of factors that will cause results from this study to differ from those estimated in 2008. The size and the source of these differences are explored fully in Section 2.5.3.

2.3 Methodology

The quantitative work was divided into four stages.

- **Stage 1 – Data scoping:** The first stage of work was an initial scoping exercise undertaken to determine which of the potential outcome indicators identified by BIS could be included in the quantitative analysis, which in the qualitative case study analysis and which could not be included at all. For those indicators that were suitable for the quantitative work, a further step was taken to determine whether they could be included based on available secondary data or whether the information required collecting or verification from colleges. At this stage, the decisions of which variables would be included in the primary data collection exercise (the Census of FE colleges) were taken.

- **Stage 2 – Census template development:** This stage of work was focused on developing a data template that could be used to collect all of the information required, for the quantitative analysis, which was not available from secondary sources. The template was developed and tested with 10 pilot colleges to assess its fitness for purpose. The template was refined in line with comments from pilot colleges and rolled out to all colleges for completion.[11]

- **Stage 3 – Data collection**: The third stage of work was the data collection phase. Links to a college specific web-based template were emailed to all colleges, accompanied by a letter from the Association of Colleges (AoC) and a phone call from BMG Research. Colleges were telephoned on a number of occasions to assess progress with completing the survey, answer any queries and offer support in its completion.

- **Stage 4 – Data assessment and analysis:** Completed templates were collated by BMG Research, audited and provided to Frontier for analysis. Frontier undertook the

[11] The 10 pilot colleges were not included in the full census as their results had already been collected separately through the pilot.

detailed descriptive and regression analysis contained within this report and described in detail in Section 2.4 and Section 2.5 of this chapter.

Each of these steps is described in more detail in the sections that follow.

2.3.1 Data scoping

Data scoping was undertaken to determine which of the potential indicators identified by BIS could be included in the quantitative analysis; which could be covered in the qualitative case studies; and which could not be meaningfully covered at all. For those indicators that were suitable for the quantitative work, a further step was taken to determine whether they could be based on available secondary data or whether the information required collecting or verification from colleges.

The decision as to which indicators were suitable for use as outcome variables in the quantitative work was based on an assessment of the extent to which available secondary data already met the following criteria or could be made to meet them using a primary data gathering and verification process:

- an available variable clearly measured the performance of interest in an appropriate manner;
- the variable covered all (or some) of the timeframe April 2001 to September 2011;[12]
- the variable was available for a reasonably large number of colleges; and
- the variable was measured consistently over time.

Clearly, given the critical nature of including information on capital expenditure within the analysis, the assessment criteria for these data were different. They focused around determining the extent to which information collected by the Skills Funding Agency provided accurate information on the value of the investment, the nature of the project, the start date, the completion date and the date from which the building came into use.

Following assessment, the outcome and capital expenditure indicators were each placed into one of three categories for the purposes of the quantitative analysis:

- **Category 1**: available secondary data was fit for the purpose of analysing variable;
- **Category 2**: available secondary data contained a variable of relevance but idiosyncrasies, inconsistencies or missing information meant specific data needed to be verified, edited and/or completed by colleges; and
- **Category 3**: variable was unsuitable for inclusion in quantitative analysis.

[12] The time period of April 2001 to September 2011 was selected for this study as it covered the time period since the institution of the LSC.

Table 2 provides an overview of the datasets that were identified for each potential indicator as well as the assessment that was made of their fitness for purpose for the quantitative analysis. Clearly, some indicators, for example ability to engage employers, were not suitable for quantitative analysis but were included within the qualitative case studies. These indicators are discussed further in Chapter 3.

The availability of Individualised Learner Record (ILR) data was a key issue for the study.[13] The ILR dataset was only available from the period 2002/03 onwards. For consistency reasons, the decision was taken to make the timeframe for analysis the period from September 2002 (the 2002/03 Academic year) to July 2011 (the 2010/11 Academic year) rather than the originally desired time period of April 2001 to September 2011.[14]

Table 2. Overview of data available for each potential indicator

Indicator required for analysis	***Dataset and variable identified***	***Assessment of fitness for purpose***
Participation	ILR (Number of Learner Responsive Learners, Number of Learner Responsive Learners excluding franchised and long distance learners, Number of LSC/Skills Funding Agency funded learner responsive learners)	Category 2 - available ILR data contained variables of relevance but idiosyncrasies, inconsistencies and missing information meant specific data needed to be verified, edited and/or completed by colleges
Success rates	National Success Rate Tables (NSRT) (Proportion of students achieving)	Category 1 - available NSRT data was fit for purpose
Retention rates	NSRT (Proportion of students completing)	Category 1 - available NSRT data was fit for purpose
Achievement rates	NSRT (Proportion of learning aims completed)	Category 1 - available NSRT data was fit for purpose
Number of apprentices trained by colleges	ILR (Number of Employer Responsive Learners)	Category 2 - available ILR data contained variables of relevance but idiosyncrasies, inconsistencies and missing information meant specific data needed to be verified, edited and/or completed by colleges
College ability to generate fee income	College Financial Records (tuition fee income, LSC/Skills Funding Agency income, total income)	Category 2 - available College Financial Records data contained variables of relevance but idiosyncrasies, inconsistencies and missing information meant specific data needed to be verified, edited and/or completed by colleges

[13] A collection of statistical data returned to the Skills Funding Agency at various points of the academic year by providers in the Further Education system.

[14] It should be noted that the timing of the ILR is actually from August to July. There were two mergers in August 2011, after the period of the analysis. These colleges were treated as merged in the analysis (even though they would not have been merged at the time of the ILR data collection). This was felt to be the most consistent methodology for treating these colleges in the analysis.

Indicator required for analysis	***Dataset and variable identified***	***Assessment of fitness for purpose***
Amount of capital expenditure and dates	Capital expenditure records (project number, project description, date of approval, date of completion, total cost of project (initial projection), total cost of project (ex post))	Category 2 - available capital expenditure records contained variables of relevance but idiosyncrasies, inconsistencies and missing information meant specific data needed to be verified, edited and/or completed by colleges
Ability to engage with employers	ILR (Proportion of learners employed and released by employer to learn)	Category 3 - available ILR data did not adequately capture employer engagement. Decision taken that this was better explored through the qualitative case studies.
Learner satisfaction with learning environment and experience	National Learner Satisfaction Survey (NLSS)	Category 3 - available NLSS data not generally reported at college level as sample sizes too small for results to be considered robust. Decision taken that this was better explored through the qualitative case studies.
Wider impacts on the local economy	No data available.	Category 3 - no suitable datasets identified. Decision taken that this was better explored through the qualitative case studies.
On and off site GLH	ILR (GLH for FE learners (not apprentices)	Category 3 - no suitable variable identified to make an appropriate on and off site split. Decision taken that this variable should be excluded from analysis.
Capital estate condition and impact of not investing	eMandate (Breakdown of estate into category A, B,C and D)	Category 3 - suitable variables identified but issues with coverage and reliability at the beginning and end points of the time period. On balance, decision taken to explore this variable through the qualitative case studies rather than making the census template too cumbersome.
Environmental sustainability	eMandate (Net Internal Area (NIA), electricity consumption, energy costs)	Category 3 - suitable variables identified but issues with coverage and reliability at the beginning and end points of the time period. On balance, decision taken to explore this variable through the qualitative case studies rather than making the census template too cumbersome.
Staff recruitment and retention	SIR (recruitment - no appropriate variable could be developed, retention - proportion of all staff still employed at year end)	Category 3 - Recruitment - deriving a recruitment variable is problematic from a conceptual perspective. This study wanted to know whether capital expenditure has made it easier for a college to recruit but the observed recruitment rate will reflect a combination of factors (i) effort undertaken to recruit (ii) replacing lost staff - if capital expenditure improves retention, fewer vacancies would need filling (iii) changes to staffing requirements – capital expenditure could increase the scale of the college. Decision taken to explore within case studies. Retention - variable identified in SIR but idiosyncrasies observed in the variable over time. On balance, decision taken to explore this variable through the case studies rather than making the

Indicator required for analysis	*Dataset and variable identified*	*Assessment of fitness for purpose*
		census template too cumbersome.
Efficiency and estate rationalisation	No data available.	Category 3 - no suitable datasets identified. Decision taken that this variable should be excluded from analysis. Unlikely that this measure specifically collected in the context of a capital expenditure project and wanted to ensure that searching for this information did not have a negative impact on case study overall.

2.3.2 Census template development

The scoping work identified four indicators for which available secondary data sources provided variables of relevance but where idiosyncrasies, inconsistencies or missing information meant specific data was not fully fit for purpose. The data needed to be verified, edited and/or completed by colleges for robust analysis to be undertaken. The indicators for which this was required were:

- participation;
- number of apprentices trained;
- college ability to generate fee income; and
- value of capital expenditure and dates of building work.

A college specific template was developed for each of the 250 colleges.[15] Each template contained information for each college on the indicators above (specific variables are shown in Table 3). Colleges were asked to validate the information contained within these secondary sources, edit and complete as well as provide a commentary to the figures.

[15] The sampling frame was colleges as of September 2011. Given the large number of mergers that occurred during the period of interest, the decision was taken to treat merged colleges as if they had always been single entities. Initial participation figures for constituent colleges prior to a merger were added together to arrive at a 'shadow' participation figure for the merged college. Similarly, the weighted average of initial success rates for constituent colleges were taken to generate a 'shadow' success rate for the merged college.

Prior to circulating the template to all 250 colleges, a pilot exercise was undertaken with 10 colleges to ensure that the data requirements were meaningful and not onerous for colleges. The template design and the data definitions were amended in line with comments from the pilot colleges.

Table 3. Variables used in census

Variable	*Definition*
Participation data – *from ILR (available 2002/03 to 2010/11)*	
Number of Employer Responsive learners	Total number of learners appearing in Employer Responsive ILR return, including apprenticeships and Train To Gain / workplace learning. Does not include Adult Safeguarded Learning / Adult Community Learning.
Number of apprenticeships	Employer Responsive learners studying either Advanced apprenticeship; Apprenticeship; Higher level apprenticeship. Programmes such as Entry 2 Employment, Progression Pathway, Foundation Learning Programme and Diploma are not in scope.
Number of Learner Responsive learners	Total number of learners who appear in the Learner Responsive ILR return.
Number of Learner Responsive learners excluding franchised and long-distance	As above, but excluding learners who are franchised out and learners whose main method of delivery is distance learning or accreditation of previous learning.
Number of LSC/Skills Funding Agency/Young Peoples' Learning Agency (YPLA) funded Leaner Responsive learners	These will include both learners who are funded only by the LSC / Skills Funding Agency / YPLA and those who are co-financed by the LSC / Skills Funding Agency / YPLA and by the ESF Co-Financing.
College financial data – *collated by the Skills Funding Agency (available 2000/01 to 2010/11)*	
Tuition fee income	This includes tuition fees and educational contracts.
LSC / Skills Funding Agency / YPLA income	This is income from the LSC / Skills Funding Agency / YPLA, excluding release of capital grants.
Total Income	Total income of the college.
Capital expenditure data – ***grant and consent approvals from 2000 to 2011***[16]	
Project number	The code number used to identify the project.
Project description	A verbal description of the works carried out.
Date of approval	The date on which LSC / Skills Funding Agency approved the project.
Date of completion	The date on which the project was completed. For projects that are still on-going, the projected completion date is used.
Date of operational use	The date on which the infrastructure came into operational use. For projects not yet operational, projected date of operational use is used.
Cost (initial projection)	The projected total cost of the project, as at the date of approval (including public funding as well as other sources of funding).
Cost (ex post)	The total ex-post cost of the project, after completion. For on-going projects the latest estimate is used (including public funding as well as other sources of funding).

[16] Projects that received consent approval but no public funding were included in the dataset.

2.3.3 Data collection

The full roll-out of the survey took place on Monday, 21st May 2012. The survey was eventually closed on Friday, 13th July 2012, allowing 8 full weeks for responses to be provided. A pre-mailer was sent to all FE colleges in England by the AoC via their newsletter in April 2012. The pre-mailer aimed to raise awareness of the research amongst colleges ahead of them receiving the survey and encouraged colleges to take part.

The survey was designed and hosted online by BMG Research using Confirmit software. Individual college data (provided by Frontier Economics) was merged into the survey for colleges to validate, with particular queries being put to colleges who had data 'flags'. These flags identified anomalies with the data that had been spotted during the scoping stage and which colleges were asked to verify, edit and comment upon. Unique secure links were created and emailed to the Principals of 240 colleges (all colleges, excluding those that had participated in the pilot) following the survey launch on 21st May 2012. Participants were encouraged to utilise the save function in the online survey so they could circulate it to relevant colleagues. Feedback from some colleges indicates that two or more individuals completed the survey (usually an individual from the Data Services or finance team and an individual from facilities management).

Colleges were initially given until Friday, 22nd June to complete the survey and an email was sent to non-completing colleges on 28th June offering an extended deadline until 6th July. Subsequently a further extension to Monday 16th July was given on request to colleges still in the process of completing the survey. The survey fieldwork period therefore lasted a total of 8 weeks.

Throughout the fieldwork process support was provided by BMG Research's call centre in order to raise awareness and encourage completion on the survey. Colleges were contacted in the 2 days following the initial email to confirm they had received the survey link, to identify who would be completing the survey and when they intended to complete it by, and to offer support if required.

Colleges were subsequently contacted every week or at a time and date agreed with the college during the fieldwork period to follow-up on progress until a completed survey was received or a refusal was given. All colleges that had not completed the survey or refused to take part were also contacted within two days of the extension email being sent to ensure they were aware of the change in deadline.

Queries from colleges tended to be regarding the process of completing the survey (e.g. confirming deadlines) and about how the data had been collected to ensuring the correct comparisons were being made; in these instances a data note created by Frontier Economics was provided to colleges to address these queries.

A total of 142 completed surveys were received, a response rate of 57 per cent (142/250); 23 colleges refused to take part; and 85 colleges did not respond. Reasons for refusal were related to lack of time and capacity to respond in the timeframe. In two instances colleges strongly highlighted that they did not want to commit the resource needed to complete the survey, as they had not received capital funding.

The original template script and example web pages can be found within Appendix 1a and Appendix 1b respectively.

2.3.4 Data assessment and analysis

Following the closure of the survey, BMG Research collated the data that had been provided into a single spread-sheet for analysis by Frontier. In compiling the information BMG also

undertook a series of checks to ensure that the information was robust and consistent. Prior to analysing the data in detail, Frontier also undertook a detailed exploration and checking of the data. This was focused around comparing the pre-census and post-census values of each of the variables to identify large discrepancies and considering the comments made by colleges in explaining their data.

Analysis of the Census dataset was undertaken by Frontier, the results of which are presented in Section 2.4 of this chapter. The remainder of this section provides an overview of the quantitative dataset generated for this study, which provides the basis for the descriptive and econometric results.

Overview of the quantitative dataset

The variables included in the quantitative analysis are set out in Table 4. As noted above, most of the variables included within the dataset relate to the period 2002/03 to 2010/11 rather than the original timeframe envisaged for the study of April 2001 to September 2011. This change was due to the fact that ILR data for the period preceding 2002/03 was unavailable. It should also be noted that the timeframe for which the data of this study relate is different to that of the previous study that was based on the time period 1999/00 to 2006/07.

Table 4. Variables in the final dataset

Variable	*Source*	*Time period*	*Definition*
Number of Employer Responsive learners	ILR, verified, corrected and completed in census	2002/03 - 2010/11	Total number of learners appearing in Employer Responsive ILR return, including apprenticeships and Train To Gain / workplace learning. Does not include Adult Safeguarded Learning / Adult Community Learning.
Number of Learner Responsive learners (with and without franchised and long distance)	ILR, verified, corrected and completed in census	2002/03 - 2010/11	Total number of learners who appear in the Learner Responsive ILR return.
All learner participation	ILR, verified, corrected and completed in census	2002/03 - 2010/11	Total number of Employer Responsive learners and Learner Responsive learners.
Apprenticeships	ILR, verified, corrected and completed in census	2002/03 - 2010/11	Employer Responsive learners studying either Advanced apprenticeship; Apprenticeship; Higher level apprenticeship. Programmes such as Entry 2 Employment, Progression Pathway, Foundation Learning Programme and Diploma are not in scope.
Participation by 16-18 year olds	ILR, verified, corrected and completed in census, proportions applied	2002/03 - 2010/11	Using the ILR the percentage of LSC/Skills Funding Agency/YPLA LR learners in each age group were calculated. These weights were applied to the corresponding total from the census, therefore using any adjustment made by the college.
Adult participation (aged 19 and older)	ILR, verified, corrected and completed in census, proportions applied	2002/03 - 2010/11	Using the ILR the percentage of LSC/Skills Funding Agency/YPLA LR learners in each age group were calculated. These weights were applied to the corresponding total from the census, therefore using any adjustment made by

Variable	*Source*	*Time period*	*Definition*
			the college.
Success rate, achievement rate, retention rate data	NSRT tables	2002/03 - 2010/11	Success rates, achievement rates and retention rates for the following groups; all ages, 16-18 and 19 plus. Where a college merged, the weighted average using the number of starters was taken.
Tuition fees as a percentage of income	College Financial Data, verified, corrected and completed in census	2000/01 - 2010/11	Calculated by dividing tuition fee income by total income.
Dependency on LSC/Skills Funding Agency/YPLA income	College Financial Data, verified, corrected and completed in census	2000/01 - 2010/11	Calculated by dividing LSC/Skills Funding Agency income by total income. No colleges reported projects with YPLA funding.
Total capital expenditure by college	Capital expenditure records, verified, corrected and completed in census	2002/03 - 2010/11	Total capital expenditure in real terms (inflated by RPI) from 2002/03 to 2010/11.
College characteristics	Skills Funding Agency	2002/03 - 2010/11	Dummy variables measuring the region the college is located, the type of college, and whether it merged during the time period of analysis.

Degree to which quantitative dataset is representative of population

When undertaking analysis of this kind, it is important to assess the extent to which the colleges that have responded to the survey are representative of the population of colleges of interest. Any response bias, for example, colleges who have received greater amounts of capital expenditure being more likely to respond, could affect the inferences that could be drawn from the results, if not suitably controlled for.

This study was in the relatively unusual position of having data available for many of the variables of interest across the full population of colleges (albeit that data from non-responding colleges has not been verified).

To analyse the degree to which the sample was representative of the population, the characteristics of the colleges that responded to the census were compared with those of the whole population of colleges. As shown in Table 5 it was found that on virtually all measures, and across most of the distribution, the characteristics of the sample and the population were very similar. This provides confidence that the sample does not suffer in observed terms from sample selection bias. (Clearly, it is difficult to assess the extent to which any unobserved factors might contribute to sample selection bias).

It is important to point out that there is one area where the sample does look slightly different from the population of colleges. Average participation tends to be higher for the sample than for the population suggesting that the sample contains slightly more very large colleges than found in the population as a whole. However, this slight difference does not generate cause for concern in terms of the inferences that can be drawn from the results.

Table 5. Observations on variables to be used in analysis

Variable	*Degree to which sample is representative of population*
All learner participation	Slightly higher in sample
Apprenticeships	Slightly higher in sample
Success rates	No difference
Tuition fees as per cent of income	No difference
Dependency on LSC/ Skills Funding Agency income	No difference
Total capital expenditure by college	No consistent difference
College characteristics	No consistent difference

2.4 Descriptive analysis of sample dataset

This section provides a descriptive analysis of the quantitative dataset constructed for this study. This provides valuable context for the econometric analysis. In particular, it helps to paint a picture of the changes that have occurred within the sector over the period of analysis. In summary, the analysis found that:

- Capital expenditure increased from 2000/01 to 2007/08, but has since fallen back to 2001/02 levels.
- The numbers of Learner Responsive learners has fallen over time, whilst numbers of Employer Responsive learners have increased. This reflects an overall reduction in the total number of FE learners as well as a general shift from Learner Responsive funding to Employer Responsive funding.
- Success rates have risen (and converged significantly) to around 80 per cent over the period of analysis, driven by increases in both retention and achievement rates.
- The dependency of colleges on LSC and/or Skills Funding Agency income has remained fairly constant over the time period at between 70 per cent and 80 per cent, although there is an anomaly in 2009/10.[17]

The rest of this section describes the data in more detail.

2.4.1 Capital expenditure

The dataset for this study contains a measure of the total amount of capital expenditure received by each college (in real terms) between 2002/03 and 2010/11.[18] The sample of colleges undertook capital expenditure worth a total of £4 billion over this period, at 2012 prices.[19] This

[17] No specific instances of YPLA funding were noted by colleges in the sample. The findings therefore only refer to LSC and Skills Funding Agency funding.

[18] This includes public funding as well as other sources of funding.

[19] Unless otherwise mentioned, all capital expenditure numbers are in 2012 terms.

equates to around 60 per cent of total capital expenditure by FE colleges over the period (a total of £6.8 billion).[20]

The amount of expenditure on capital in colleges has changed dramatically over time. This is shown in Figure 1. Total capital expenditure in FE colleges grew from around £600 million per year in 2002/03 to £1.4 billion per year in 2007/08 and 2008/09.[21] In the later years of the sample (2009/10 and 2010/11) capital expenditure fell back below 2002/03 levels.

The average value of annual project expenditure changed in line with the profile of total capital expenditure. This is shown in Figure 2. Average project size per year (in 2012 terms) reached between £25 and £35 million in 2007/08 and 2008/09 but reduced to between £5 and £10 million in more recent years.

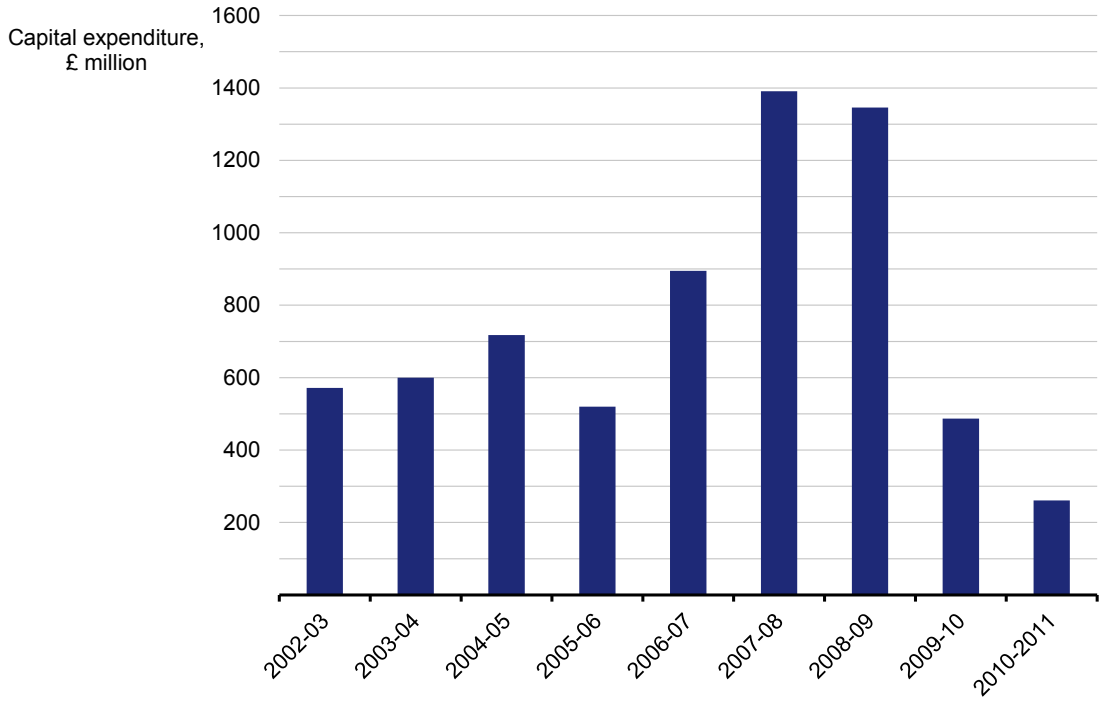
There are some extremely large projects in the dataset for this study. As shown in Figure 3, colleges have spent as much as £200 million on capital expenditure over the timeframe for analysis, and individual projects have been as large as £116m. The inclusion of these larger projects in the dataset should be noted as it has implications for comparisons between the econometrics results from this study and the 2008 study. This issue is discussed further in Section 2.5.3.

However, whilst there are a number of very large projects, it should be noted that the majority of colleges (55 per cent) spent less than £20 million in capital expenditure in total across the sample period.

[20] The total of £6.8 billion comprises £3.1 billion of grant funding from the LSC / Skills Funding Agency and £3.7 billion the colleges provided by themselves.

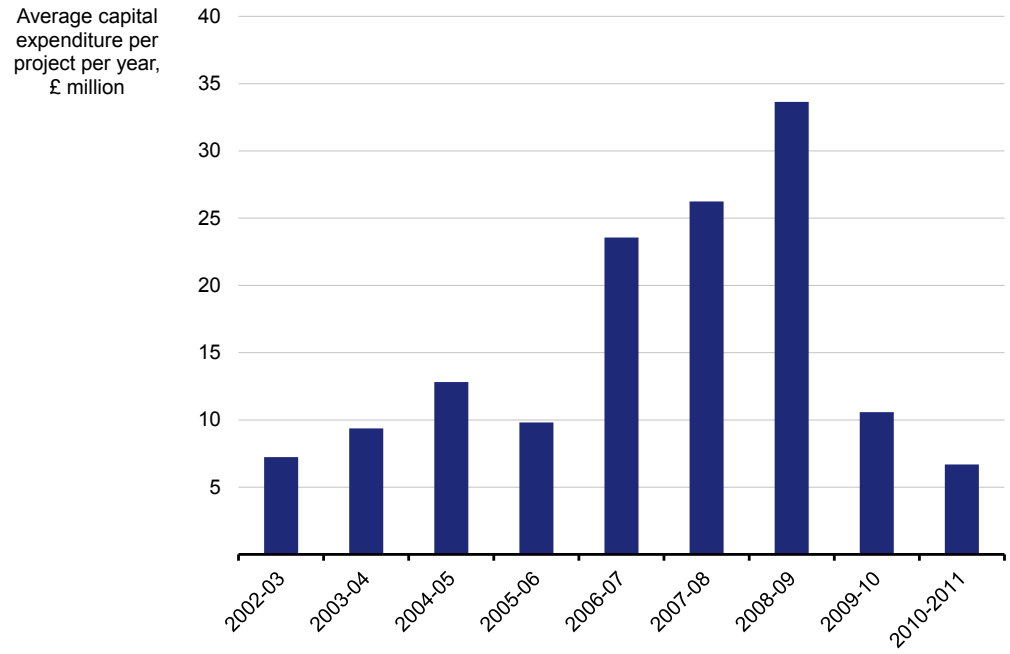
[21] This figure refers to all colleges in the population, not just the sample for analysis.

Figure 1. Total capital expenditure by year of approval across all colleges, £ million



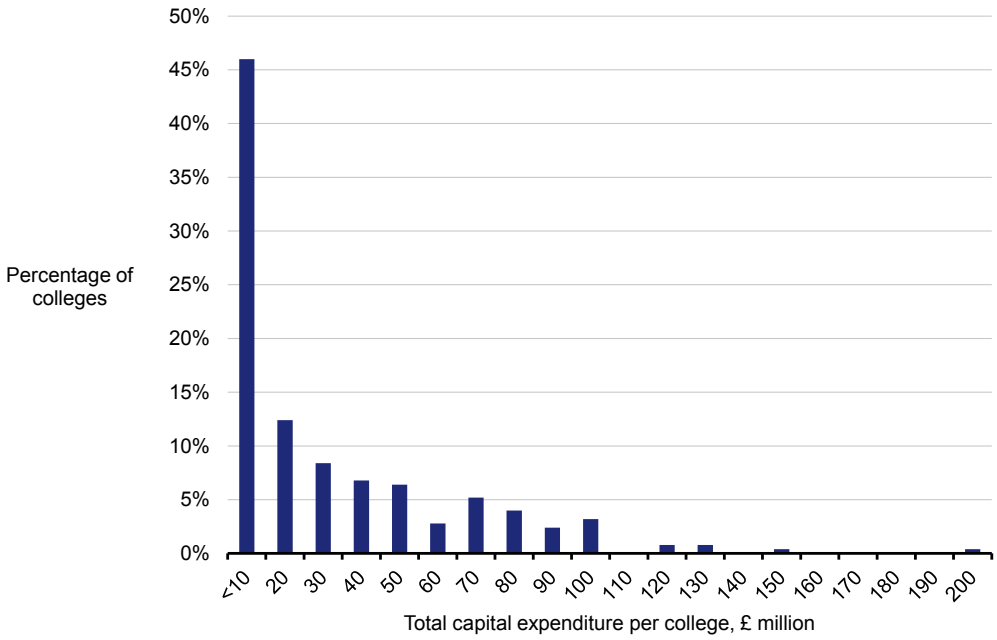
Source: Frontier analysis of Skills Funding Agency capital expenditure approvals data

Figure 2. Average capital expenditure per project by year of approval across all colleges, £ million



Source: Frontier analysis of Skills Funding Agency capital expenditure approvals data

Figure 3. Bar chart of total capital expenditure approved per college across all colleges (2002/03 to 2010/11 in 2012 prices), £ million



Source: Frontier analysis of Skills Funding Agency capital expenditure approvals data

2.4.2 Participation

There are six separate measures of participation included within the dataset for this study:

- Number of learner responsive learners;
- Number of employer responsive learners;
- All learner participation (employer responsive and learner responsive learners);
- Number of 16-18 year old learners (employer responsive and learner responsive);
- Number of 19+ year old learners (employer responsive and learner responsive); and
- Number of apprenticeships.

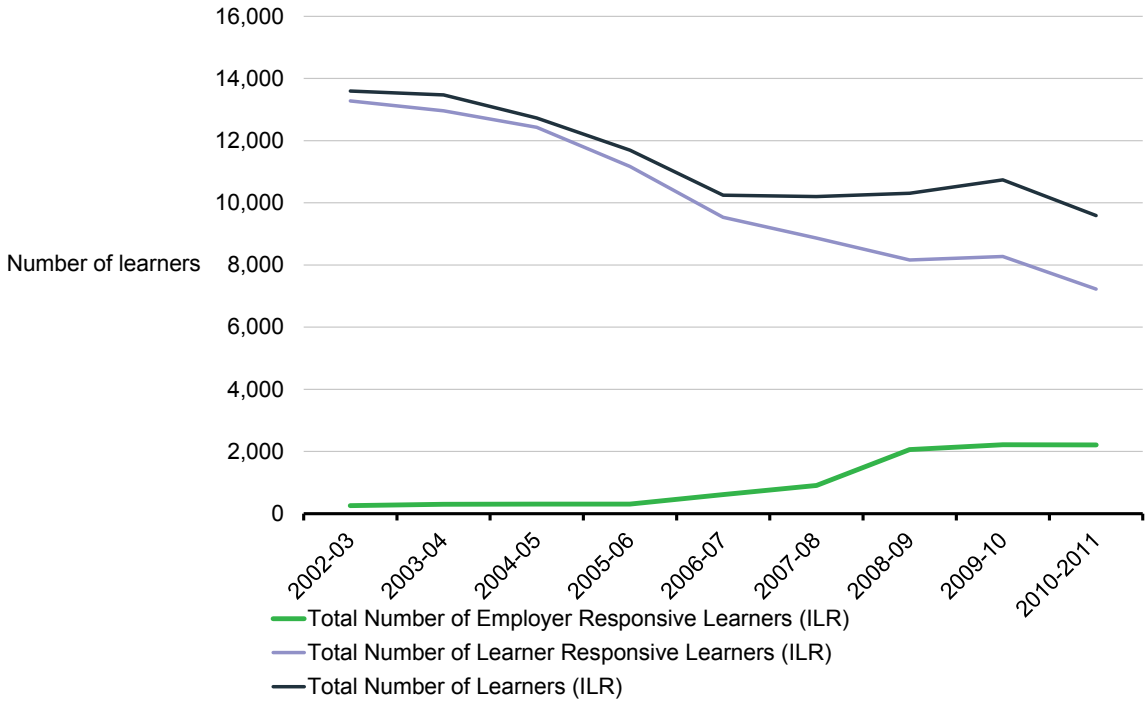
There has been a consistent decline in the number of Learner responsive learners between 2002/03 and 2010/11. The average number of learner responsive learners per college halved, falling from around 16,000 in 2002/03 to around 8,000 in 2010/11. It should be noted that the reduction in the average is driven in part by extremely large reductions for a small number of colleges. The majority of colleges have seen learner responsive learners fall from between 0 and 6,000 learners across the time period.

In contrast to learner responsive numbers, the number of employer responsive learners has increased over time (with a slight drop in recent years). The average number of employer

responsive learners per college has increased from around 250 in 2002/03 to 3,000 in 2009/10, dropping off slightly in 2010/11.

Overall, the losses in learner responsive learners have outstripped the gains in employer learner numbers, meaning that overall participation has declined, as shown in Figure 4. It should be noted that the data in Figure 4 reflect a number of changes in funding priorities from 2004/05. There was a funding policy shift away from widening participation and lifelong learning in favour of skills strategies to improve the labour force. This helps to explain the reduction in the number of learner responsive learners and the increase in the number of employer responsive learners following 2004/05, and is important for interpreting the quantitative results.

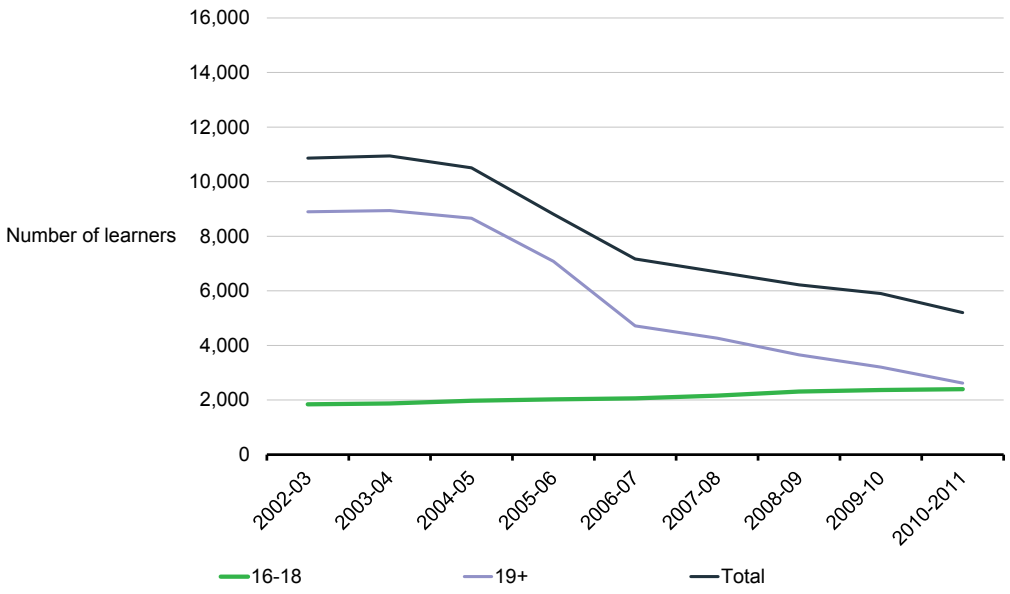
Figure 4. Median total learners, total employer responsive learners and total learner responsive learners per college across the sample of colleges



Source: Frontier analysis of ILR data

There has been a marked difference in the trend over time for different age groups of learners. Learners aged between 16 and 18 years old have seen a slow but steady increase in numbers over the period. In contrast, the median number of learners per college has fallen dramatically from around 9,000 per college in 2002/03 to around 2,500 per college in 2010/11, as shown in Figure 5. Changes that restricted eligibility for funding may help to explain this pattern. For example, funding has reduced for part time adult courses and for short courses. The tighter economic circumstances meant that individuals and employers were less likely to fund these courses themselves and so adult learner numbers have reduced.

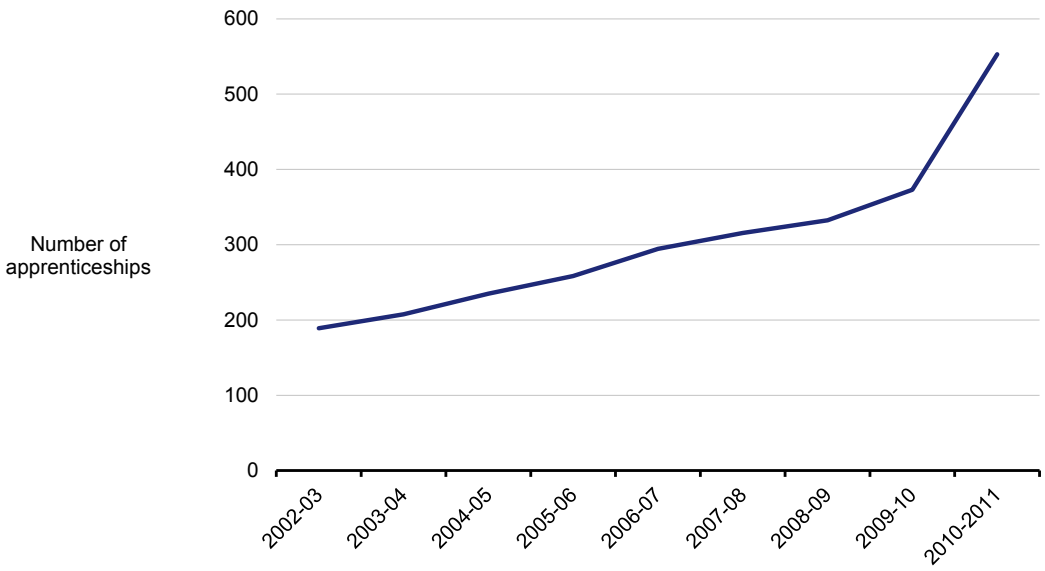
Figure 5. Median learners by age per college across the sample of colleges



Source: Frontier analysis of ILR data

There has been a steady increase in the number of apprenticeships since 2002/03, with a dramatic increase in the latest year, as shown in Figure 6 below.

Figure 6. Median number of apprenticeships per college across the sample of colleges



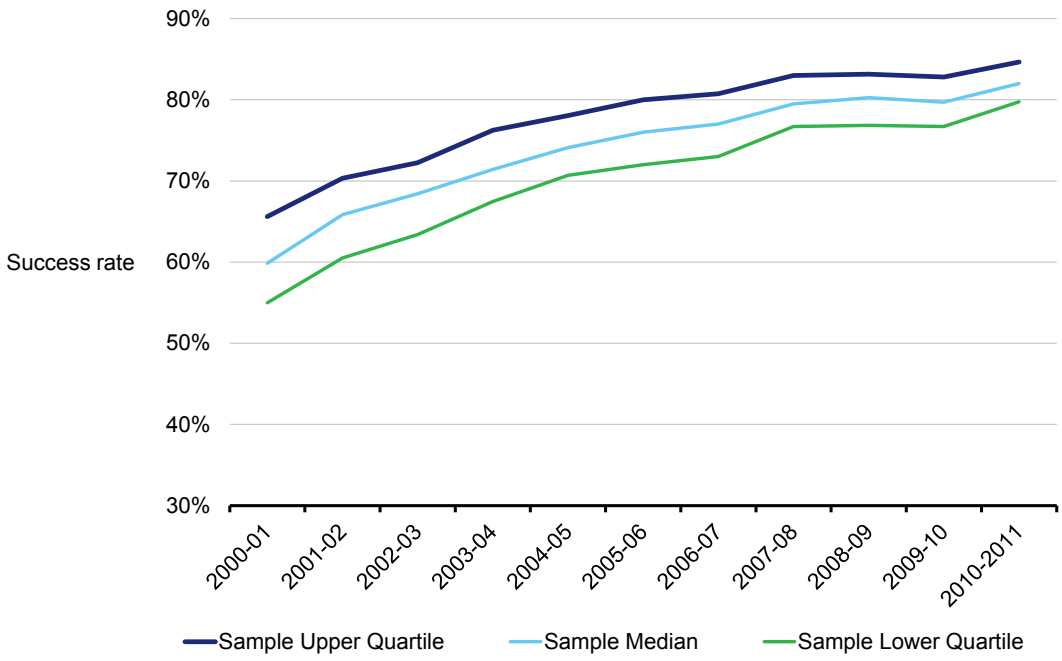
Source: Frontier analysis of ILR data

2.4.3 Success, achievement and retention

The success rate included in the dataset is published by the Data Service and shows how many learners started a qualification and successfully went on to complete it and achieve a qualification.[22] The measure can be further disaggregated into the retention rate and the achievement rate as the former can be obtained by multiplying the latter two variables.[23,24]

There has been a steady increase and convergence in success rates since 2000/01. The average success rate has increased from around 60 per cent in 2000/01 to around 80 per cent in 2010/11. The increase in success rates has been driven by a secular increase across all colleges and not driven by large changes in a few colleges. Most of the colleges saw their success rates increase by between 15 and 30 percentage points over the period, as shown in Figure 7. These trends were compared for colleges that had capital expenditure during the period and those that did none, but the patterns for the two groups were identical.

Figure 7. Median and quartiles of success rates per college across colleges in the sample



Source: Frontier analysis of National Success Rates Tables

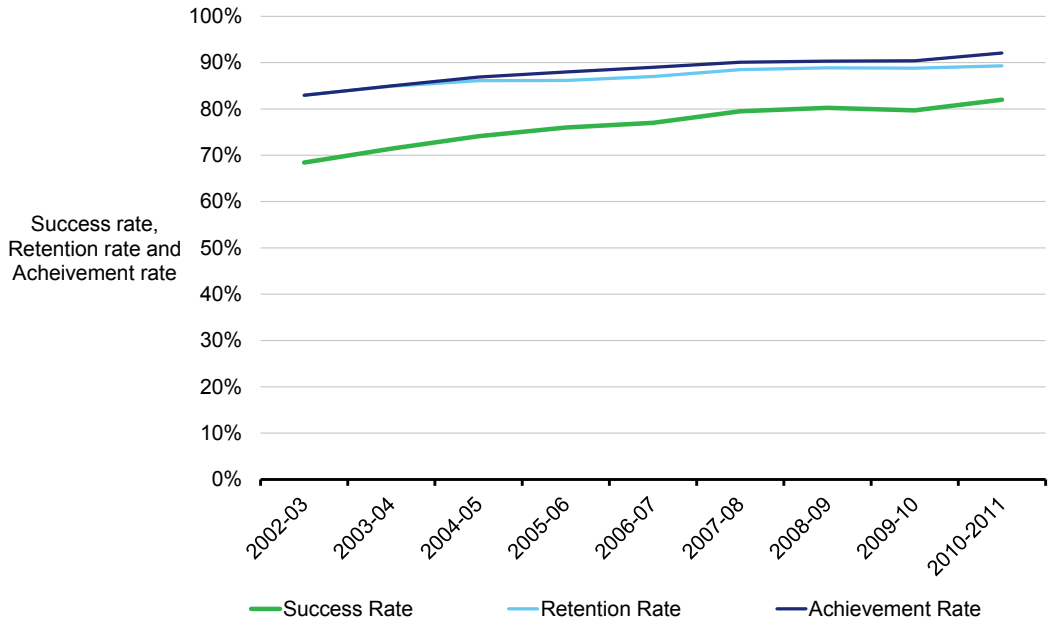
[22] Success rate: the number of aims fully achieved divided by the number of aims that were started.

[23] Retention rate: the number of aims completed (successfully or not), divided by the number of aims that were started.

[24] Achievement rate: the number of aims fully achieved, divided by the number of aims that were completed (successfully or not).

The change in success rates is the result of both more learners completing their courses, and more completers achieving their qualification, with a marginally higher contribution from an increase in achievement rates, as shown in Figure 8 below.

Figure 8. Median success rate, achievement rate and retention rate per college across colleges in the sample



Source: Frontier analysis of National Success Rates Tables

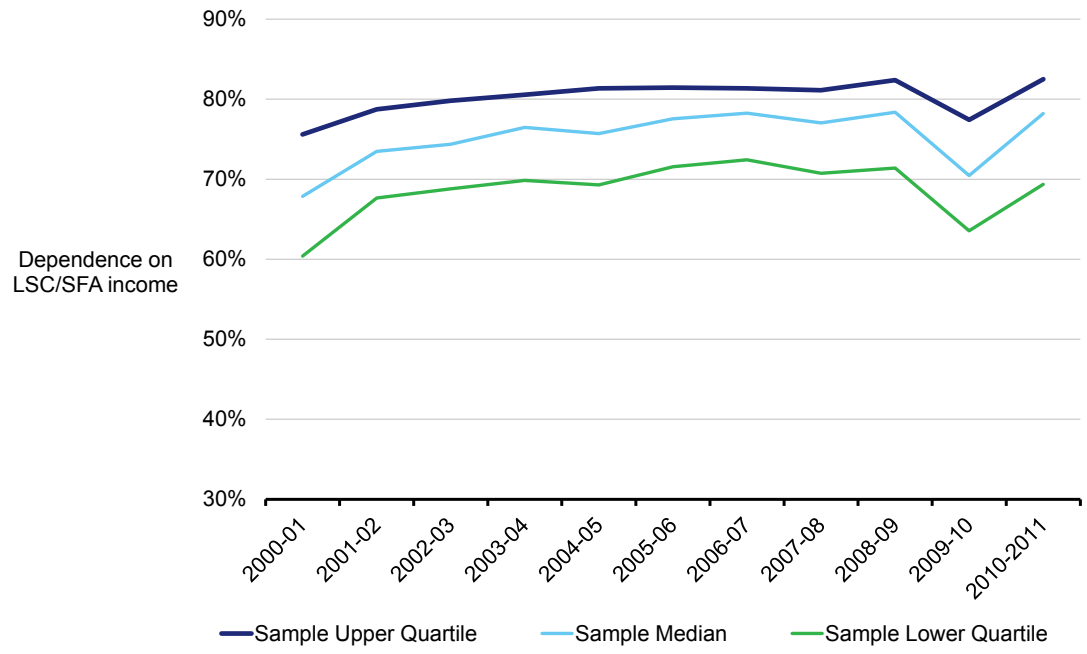
The clear convergence in success rates over the period for this analysis has significant implications for the econometric analysis that can be undertaken. This is discussed further in Section 2.5.3.

2.4.4 Fee income

To analyse colleges' ability to generate fee income, the analysis assessed how dependent the colleges were on LSC or Skills Funding Agency funding.[25] This variable was constructed by dividing the LSC or Skills Funding Agency income by the total college income in order to obtain the percentage of college income that is accounted for by LSC or Skills Funding Agency funding.

The dependency of the average college on LSC or Skills Funding Agency funding appears to have remained between 70 per cent and 80 per cent throughout most of the sample – see Figure 9 below. However, the data for 2009/10 looks unusual. Further checks of this data indicated inconsistencies in that year as to which elements of funding had been defined as coming from the LSC or Skills Funding Agency. Caution has therefore been exercised in the use of 2009/10 data in the analysis contained within this report.

Figure 9. Median and quartiles of distribution of dependence on LSC and/or Skills Funding Agency income per college across colleges in the sample



Source: Frontier analysis of Skills Funding Agency college accounts data

2.5 Econometric analysis

This section presents the results from the econometric analysis. It begins by providing an overview of the basic econometric specification used to derive the results, which is consistent with that used for the 2008 study. This is followed by the results from the basic specification, a

[25] Please note, that while YPLA funding was requested in the survey, no specific instances of this type of funding have been identified in the sample.

detailed description and exploration of the differences between the 2008 and 2012 results, and a look at a number of extensions to the basic specification around the timing of impacts.

2.5.1 Overview of the basic econometric specification

In conceptual terms, the impact of capital investment is the difference between the performance of a college that received capital investment and the performance of the *same* college in a counterfactual scenario where it had not received the capital investment.[26] Clearly, it is not possible to observe a college in two alternative states, so the analysis has to use actual data to construct a counterfactual state of the world, with which a college's performance with capital investment can be compared. This is where econometric analysis comes in.

An obvious counterfactual that could be used is to take a 'treatment/control group' approach which compares the performance of colleges that received capital investment with those that did not receive any. For this approach to be robust, colleges that received capital investment need to have similar characteristics to those that did not, so that any differences in the performance of the college reflect the impact of investment rather than the composition of the groups. Typically, this would be achieved by randomly drawing the two groups, but this was not possible for this study.

Where there are differences between treatment and control groups, a technique known as 'propensity score matching' can sometimes be used to re-weight the groups and make them similar. However, this is also not feasible for this study as the sample size of 'untreated colleges' is too small. Only 24 out of 250 colleges (less than 10 per cent) have not undertaken any capital investment projects in the last ten years. In addition, this approach uses a binary treatment variable (treated vs. untreated), whereas capital investment is a continuous variable, with colleges receiving between zero and £200 million of capital expenditure over the period of analysis. All of this makes application of a 'treatment/control group' approach problematic in this context.

Consistent with Frontier's 2008 study, the approach used to estimate the impact of capital expenditure for this study is to compare the performance of each college before the investment with its performance after the investment. A portion of the changes in performance over time can be attributed to the impact of capital investment. However, there is a potential difficulty here if there are changes over time in performance that are driven by exogenous factors (such as location or policy changes), rather than resulting from the capital expenditure. So long as these exogenous factors are uncorrelated with the level of capital expenditure, they should average out across colleges and the study can obtain a reliable estimate of the impact.

---

[26] To truly understand the impact of the capital stock (college buildings and equipment) on the performance of a college, one would want to compare the outcomes of colleges with different levels of capital stock. Such an approach would allow one to say, for example, that every £1 million incremental increase in the capital stock was associated with X additional leaners or Y improvement in success rates. However, for the purposes of this study, it was not possible to generate a reliable and robust measure of the capital stock of each college. The eMandate data does not yet allow a time series of this type to be constructed. Instead, capital investment has been taken as a proxy for the change in the change in the capital stock over a period of time. For consistency the analysis must compare the change in the capital stock (proxied by the level of investment) with the change in the performance of the college over the same time period. It should be noted that investment is a good, but not perfect, proxy for the change in the capital stock. Its true increment to the capital stock will depend on how wisely and efficiently it was spent.

To apply this approach regression analysis is used to estimate the change in each performance measure (participation, success rates, etc.) as a function of capital investment, and college characteristics.[27] Mathematically, this equation can be written as shown in the box overleaf.

$$\Delta Pi = b0 + b1Ii + \sum_j bj+1Cij + \varepsilon i$$

Where

ΔPi = change in performance measure for college i (2002/03 to 2010/11)

Ii = total capital expenditure by college i, (2002/03 to 2010/11)

Ci1,Ci1,…= other characteristics of college i (e.g. region, type, size)

b0, b1,… = coefficients to be estimated

εi = error term for college i, picking up changes in performance which are not linked to the characteristics that have been controlled for

Essentially, the equation above sets out that the analysis is looking to explain the change in each outcome measure (participation, success etc.) between 2002/03 and 2010/11. Colleges included within the analysis have one or more projects that finished before 2010/11 (although these projects may have started at any point) or indeed no projects over the timeframe.[28] The study seeks to explain the relative change in performance of each college according to its location, its type, its size, the composition of its learners, whether or not it merged and, most importantly the amount of capital expenditure it received over the period. The implicit assumption is that broader policy or economic changes affect all similar colleges in similar ways and therefore do not need to be separately controlled for unless they would differentially impact on colleges with capital expenditure.

The college characteristics controlled for in the analysis are:

- College location (region) - there may be regionally specific changes in performance;
- College type (FE, specialist, agricultural) - there may be changes in performance that are specific to the type of college;

[27] The performance measures used in this analysis are output measures rather than outcome measures. Ideally, BIS would be interested in the impact of capital expenditure on the ultimate life chances of the individuals attending those colleges, for example, their probability of employment or of an uplift to their earnings. It has not been possible to link these outcome measures to this analysis at this point, so the analysis has focused on output measures such as participation and success that have clear links with wider outcome variables.

[28] It would have been desirable to have a consistent time frame for analysis i.e. assess the impact of all projects one year, two year or three years after completion. However, the limited sample size for analysis makes it extremely difficult to make such an assessment. The implications relating to the timing of projects within the timeframe for analysis is explored in Section 2.5.4.

- Size of college (the number of students before capital projects had been implemented) - change in performance might depend on college size, or the impact of capital expenditure could depend on college size;

- The split between 16-18 year olds and adult learners – the impact could vary according to the type of learners in the college; and

- Merged colleges – these may change in ways that are different to other colleges, perhaps because colleges merge out of distress or strength. This variable will also control for any data anomalies that might have arisen due to how data for these colleges were processed.

2.5.2 Results of the basic specification

This section presents the findings from the basic econometric specification described in Section 2.5.1. It covers participation, success, retention and achievement rates and college's ability to generate fee income in turn.

Participation

Table 6 shows the results of the basic specification across the range of participation variables included within the quantitative dataset. The hypothesis being tested is that capital expenditure would increase either the attractiveness or the capacity of a college, which would cause participation to increase.

The analysis finds that total participation increases by around 62 learners per year for every £1 million of capital expenditure in 2012 prices (significant at the 5 per cent level). The bulk of the total change in learners that is observed is made up of changes in Learner Responsive learners. Learner responsive learner numbers increase by 54 for every £1 million of capital expenditure (significant at the 10 per cent level). Employer responsive learners (not shown) increases by 8 for every £1 million, of which apprenticeships make up the entire increase (although neither of these impacts are statistically significant). Learners over the age of 19 make up around 70 per cent of the total increase in LSC/Skills Funding Agency funded learner responsive learners with those aged 16 to 18 making up the remaining 30 per cent.

It should be noted that the impact found here is somewhat lower than that observed in the 2008 study, which found that every £1 million of capital expenditure was associated with an additional 111 learners (or 98 learners in 2012 equivalent terms).[29] The reasons for this difference are explored in Section 2.5.3. It finds that the numerous large projects completed towards the end of the timeframe for this analysis have a significant effect on the results, causing a reduction in the impact on the participation measures. Excluding colleges which had very large amounts of capital expenditure from the analysis generates results that are much closer to those found in 2008.

[29] Frontier Economics (December 2008) *Evaluating the impact of capital expenditure in further education, Learning and Skills Council,* p.3: available online at: http://readingroom.lsc.gov.uk/lsc/National/Updated_LSC_report__including_annexes__-_FINAL.pdf [accessed September 2012]

Table 6. Impact on change in number of learners

	All participation	Learner Responsive learners	LSC/Skills Funding Agency funded LR learners aged 16 to 18	LSC/Skills Funding Agency funded LR learners aged 19 plus	Apprentice-ships
Capital expenditure completed from 2002/03 to 2009/10 (£m)	62**	54*	13***	28	8
Proportion of learners aged 16-18	6394*	7409**	1092*	5600**	431
Number of learners in 2002/03	-0.448***	-0.507***	0	-0.487***	0.022
East of England	-87	97	864**	594	421
London	-774	1235	-359*	2505***	-324**
North East [30]	-3477***	-2450**	-538*	-750	-126
North West	148	1837	232	2625	337
South East	-1426	229	-22	1146	-145
South West	-2075	-328	-32	-67	-97
West Midlands	-1383	-888	-158	-106	-72
Yorkshire	-1793	-296	-54	1002	-191
Specialist College	772	2170*	-2	1067	82
Merged college	1104	1456	374	373	93
Constant (base case = a general FE college, East Midlands)	399	-2447	103	-2258	-84
Number of observations	142	142	142	142	142
R-squared	0.5254	0.6175	0.3399	0.6813	0.2366
Root mean squared error	5599.1	5350.7	768.87	4529.8	894.62

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency capital expenditure approvals data and college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

[30] The regional dummies reflect demographic patterns. The significant negative coefficient on North East is consistent with this region having the lowest population growth. London has had high adult population growth, although the population aged 15 to 19 has fallen.

Success, retention and achievement rates

Table 7 shows the impact of capital expenditure on college success rates across a range of different success rate measures. The hypothesis being tested is that capital expenditure improves the quality of facilities in the college, increasing the quality of provision, making it more likely that students complete their courses and achieve their learning aims, thus increasing the success rate.

The analysis finds that capital expenditure is associated with a 0.002 percentage point increase in the all learner success rate per £1 million on the all learner success rate. The impacts are larger when disaggregated by age group and negative if the sample is split by the success rate at the beginning of the period. The measures are all statistically insignificant with p-values typically in excess of 0.40. Thus the finding from this strand of work is that no significant effect of capital expenditure on success rates can be identified.

Again, this result contrasts quite significantly to the results in 2008, which found an average impact of 0.1 percentage point per £1 million of capital expenditure. Later analysis explores the reasons for this difference. The significant convergence of the success rate over time is a key factor in the lack of impact found in this study. This is discussed further in Section 2.5.3.

Table 7. Impact on percentage point change in success rate

Variable	All learners	Learners aged 16 to 18	Adult learners	All learners (college above median success rate)	All learners (college below median success rate)
Capital expenditure completed from 2002/03 to 2009/10 (£m)	0.002	0.005	0.008	-0.061	-0.002
Proportion of learners aged 16-18	0.968	-18.738***	6.199	0.163	10.488
Number of learners in 2002/03	0	0	0	0	0
East of England	3.134*	4.402*	0.939	-2.723	5.796**
London	-0.626	-2.707	0.712	-2.899	2.09
North East	2.343*	0.103	1.93	0.535	4.502**
North West	2.038	4.419**	0.352	0.18	4.719
South East	1.076	1.586	1.309	-0.762	3.597
South West	4.698***	5.21**	3.572*	1.597	12.797***
West Midlands	1.429	1.58	1.733	-1.539	4.31**
Yorkshire	2.864**	1.024	2.96	2.863**	3.751**
Specialist College	2.858**	5.344***	1.733	2.895*	4.952***
Merged	-1.014	-0.979	-1.964	-0.504	-1.133

Variable	All learners	Learners aged 16 to 18	Adult learners	All learners (college above median success rate)	All learners (college below median success rate)
Capital expenditure exceeded £60m	-0.104	0.184	-1.068	4.917	-0.041
Success rate in 2002 [31]	-0.883***	-0.721***	-0.938***	-0.739***	-0.803***
Constant (base case =a general FE college, East Midlands)	71.764***	68.813***	72.679***	63.36***	62.421***
Number of observations	140	137	140	70	70
R-squared	0.73	0.52	0.62	0.44	0.67
Root mean squared error	4.29	6.13	6	4.49	4.15

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency capital expenditure approvals data / National Success Rates Tables / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Success rates are derived by combining the retention rate of a college with its achievement rate. Similar specifications for retention and achievement were also run and found small and insignificant effects on each of these variables. For the sake of space, these have not been included here. For details of these specifications, please see the relevant tables in Annex A.

College ability to generate fee income

Table 8 below presents the results from two separate regressions estimating the impact of capital expenditure on a college's ability to generate fee income. Two measures were considered. The first measure, consistent with that used in the 2008 study, assesses the college's dependency on LSC/Skills Funding Agency.[32] The second measure examines the impact of capital expenditure on tuition fee income.

The hypothesis being tested is that capital expenditure may result in better buildings and facilities, which are more attractive to individuals and employers, thus raising willingness to pay for learning and increasing a college's ability to generate fee income. Even where they do not generate additional tuition fee income, iconic buildings may give colleges other sources of income, e.g. from rental of conference facilities.

[31] The most important variable by far in explaining the change in success rates is the starting success rate of the college, suggesting the dominant trend is convergence in success rates. Setting aside the other variables, consider the impact of changing the starting success rate. For a college starting at 80 per cent, the change would be 72 per cent (the constant) + 80 per cent*(- 89 per cent) = +0.8 per cent. For a college starting at 50 per cent, the change would be 72 per cent (the constant) + 50 per cent*(-89 per cent) = +27.5 per cent. If the starting success rate is excluded, the R-squared declines very sharply. For example, for the all learners measure it falls from 0.70 to 0.12. So it is by far the variable dominating the change and it is unsurprising that no incremental impact due to capital expenditure is observed.

[32] It should be noted that, while the college census asked colleges about YPLA funding, no specific instances of that funding have been identified. For that reason, this section therefore refers to Learning and Skills Council and Skills Funding Agency funding only.

The analysis finds that each £1 million of capital expenditure is associated with a 0.06 percentage point reduction in the percentage of college income coming from the Learning and Skills Council or the Skills Funding Agency. This effect is small, but significant at the 5 per cent level.[33] However, specifications (2) and (3) suggest this effect is driven by the colleges that undertook very large amounts of capital expenditure (at least £60 million). In particular, specification (3) shows these colleges are associated with a 5.5 percentage point reduction in income coming from the Learning Skills Council or Skills Funding Agency. An average college within this group received capital expenditure worth £75 million, and has £30 million total income. The regression analysis suggests that total capital expenditure of that size would decrease dependence on Agency income by up to approximately £1.65 million per annum.[34]

Exploration of the second measure, the amount of tuition fee income, does not find a statistically significant effect. The analysis identified various anomalies with this variable in the college census and in the 2008 study. Whilst all necessary precautions with the analysis have been taken, it is unsurprising that this variable does not yield anything useful. There are definitional inconsistencies over time and across colleges.[35] However, the insignificance of the effect on tuition fee income potentially also indicates that a college's ability to generate revenue post capital expenditure funding is driven more by the college's ability to generate revenue from other sources such as renting out their facilities, rather than by increasing their tuition fee income.

In the 2008 study the analysis did not identify any statistically significant impact of capital expenditure on a college's ability to generate fee income. The difference in results of the two studies may reflect the fact that many of the large projects, which appear to be driving the relationship, occurred after 2006, so were not covered in the earlier study. Table 8 below shows the impact on the percentage point change in the proportion of college income.

[33] To put these results into perspective, a typical college (at the median) would have total income of £24 million, of which £18 million would be LSC or Skills Funding Agency income. £10 million of capital expenditure would reduce dependency on LSC or Skills Funding Agency income from 75 per cent to 74.4 per cent, i.e. by £144k per annum.

[34] Specification 2 includes both a linear capital expenditure variable and a dummy variable for colleges that undertook capital expenditure in excess of £60 million. A linear variable measures the impact of each additional £ million expenditure (e.g. the change from £30 million to £31 million). By contrast, a dummy variable measures the impact of a change from one category to another (in this case, the difference between colleges that did more than £60 million capital expenditure and those that did less than this amount). Due to the high correlation between these terms, neither variable is statistically significant in specification (2). For this reason, specification (3) is also run, which omits the linear term. This specification measures the difference between large capital expenditure colleges against all others.

[35] Examples of these inconsistences include whether or not employer income, educational grants, and income from HE provision (where the college has an agreement to deliver learning for an HE institution) are included.

Table 8. Impact on percentage point change in proportion of college income

Variable	Dependence on LSC / Skills Funding Agency income (1) using linear capital expenditure variable	Dependence on LSC / Skills Funding Agency income (2) using linear capex variable and large capex dummy	Dependence on LSC / Skills Funding Agency income (3) using large capex dummy only	Percentage point change in tuition fee income as a proportion of college income
Capital expenditure completed from 2002/03 to 2009/10	-0.06**	-0.017	Omitted	0.014
Proportion of learners aged 16-18	-2.991	-2.139	-2.056	1.812
Number of learners in 2002/03	0	0	0	0
East of England	1.1	1.106	1.135	2.107
London	-2.767	-2.711	-2.675	3.247**
North East	-0.02	-0.168	-0.192	5.316***
North West	1.436	1.466	1.527	1.5
South East	4.355	4.47	4.519	1.801
South West	-3.058	-3.262	-3.323	1.624
West Midlands	2.303	2.667	2.719	2.371
Yorkshire	-0.596	-0.397	-0.378	4.904***
Specialist College	-2.112	-2.018	-1.949	3.018*
Merged	-2.057	-2.172	-2.222	-1.058
Capital expenditure exceeded £60m	Omitted	-4.392	-5.522***	-0.177
Constant (base case = FE college, East Midlands)	2.722	2.032	1.827	-5.787***
Number of observations	142	142	142	142
R-squared	0.13	0.13	0.13	0.12
Root mean squared error	8.31	8.3	8.28	5.42

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency capital expenditure approvals data / Skills Funding Agency college accounts data and college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

2.5.3 Exploring the differences with the 2008 study

Section 2.5.2 set out the results of analysis using the basic econometric specification developed for the 2008 study and applied consistently here. Despite the consistent specification, these results were different in several key ways to those generated in the 2008 study:

- the impact of capital expenditure on participation was found to be lower than in 2008;
- the impact of capital expenditure on success was found to be lower than in 2008; and
- the impact of capital expenditure on college ability to generate fee income was higher than in 2008.

This section explores a range of potential explanations for the differences observed. In particular it considers the differences between the two studies in terms of:

- data quality;
- methodology;
- the sample of colleges contained within each dataset;
- the sample of capital expenditure projects contained within each dataset;
- the level of endogeneity bias – the extent to which changes in performance of colleges are correlated in some way with the amount of capital expenditure they receive; and
- other structural changes to performance measures.

Data quality

The data used in this study are of a similar, if not of a higher standard, than those used for the previous study so data quality was not considered further as a potential explanation for the differences observed.

Methodology

The methodology used in this study is entirely consistent with that used in 2008. Extensive checks of the analysis were undertaken to ensure that all elements of the specification were consistent with that undertaken in 2008. Methodological differences can therefore be ruled out as a potential explanation of the differences observed.

Sample of colleges

An obvious potential explanation for the difference between the results of each study is the different samples used. The analysis finds that only 79 colleges completed both surveys and, of those, only 44 had capital expenditure projects completed in the period covered by both studies (2002/03 to 2005/06). Thus, there is limited overlap between the samples for the two studies.

To explore the extent to which this difference affects the results of the two studies, the basic specification for a time period covered by both studies (2002/03 to 2005/06) was run. It used capital expenditure completed in this period and the change in performance from 2002/03 to 2005/06.[36] Table 9 shows the results of this analysis. The impact per £1 million of capital expenditure is 225 learner responsive learners in the 2012 dataset and 191 learner responsive learners in the 2008 dataset, statistically significant in both cases.[37] The results for learners aged 16 to 18 year old and 19 or over are broadly similar in magnitude.[38]

The estimates of impact of capital expenditure are actually higher for the 2012 study than for the 2008 study. This indicates that differences between the samples of colleges in the two studies actually increase the results for the current study relative to 2008. This suggests that there is

[36] The 2008 capital expenditure totals have been rebased in 2012 terms, so that the monetary base in both columns is equivalent.

[37] The 2008 study did not analyse impacts on the numbers of Employer Responsive learners. Therefore, it is not possible to directly compare the impacts from the two studies on the total numbers of learners.

[38] The other important variable in these regressions is the 2002/03 number of learners; the coefficients and significance are very similar between datasets. The region dummies, college type dummies and merged college dummies are less similar but this is not a cause for concern.

clearly another factor working strongly in the opposite direction for the time periods that do not overlap. The analysis in Section 2.5.4 suggests that the very large capital expenditure projects occurring in the 206/07 to 2010/11 period are the most likely factor driving this effect.

Table 9. Impact on change in number of learners from 2002/03 to 2005/06 using 2008 and 2012 study datasets

	2012 study			2008 study		
	Learner Responsive learners	**LSC/ Skills Funding Agency funded LR learners aged 16 to 18**	**LSC/ Skills Funding Agency funded LR learners aged 19 or over**	**Learner Responsive learners**	**LSC/ Skills Funding Agency funded LR learners aged 16 to 18**	**LSC/ Skills Funding Agency funded LR learners aged 19 or over**
Capital expenditure completed from 2002/03 to 2004/05 (£m)	225**	18*	137*	191***	28***	160**
Proportion of learners aged 16-18	309	24	2686	3955	1184*	2990
Number of learners in 2002/03	-0.42***	-0.005	-0.38***	-0.46***	-0.012	-0.45***
East of England	-3854*	216	-1903	3939	595	3278
London	-391	-33	999	3504	-176	3748
North East	-4713	-145	-2968	-1091	-227	-849
North West	1943	324	1841	2131	149	2154
South East	373	294	51	4176	486	3790
South West	-664	-104	-237	4844	341	4562*
West Midlands	-2124	-124	-1534	3948	123	3860
Yorkshire	84	68	748	3136	272	2847
Specialist College	795	-8	38	794	15	866
Merged college	1873	501**	229	-267	223	-462
Constant (base case = a general FE college, East Midlands)	9	13	-376	-4257	-332	-4129
Number of observations	84	84	84	76	76	76
R-squared	0.58	0.38	0.67	0.7558	0.772	0.7729
Root mean squared error	4929	535	3615	3102.6	2871	2871.2

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

This exercise was repeated for success rates, achievement rates and retention rates. For simplicity the analysis presented focusses only on the headline rates, without investigating any disaggregation by age group.

Table 10 compares the estimates from the 2008 and 2012 study datasets. The results are strikingly different. The 2008 dataset shows an impact on success of 0.15 percentage points per £1 million (significant at the 1 per cent level), compared to an impact of -0.04 percentage points

estimated with the 2012 dataset (which is insignificant). Similarly, the 2008 dataset suggests an impact on retention of 0.113 percentage points per £1 million (significant), compared to -0.019 percentage points with the 2012 data (insignificant). The impact on achievement is not significant in either dataset.

Table 10. Impact on change in success rates, retention rates and achievement rates from 2002/03 to 2005/06 using 2008 and 2012 study datasets

	2012 study			2008 study		
Variable	Success	Retention	Achievement	Success	Retention	Achievement
Capital expenditure completed from 2002/03 to 2004/05 (£m)	-0.04	-0.019	-0.011	0.147***	0.113***	0.046
Number of learners in 2002/03	0	0	0	0	0	0
Success rate / retention rate / achievement rate	-0.46***	-0.34**	-0.679***	-0.84***	-0.83***	-0.896***
East of England	3.122	2.168	1.013	3.57*	3.02**	0.86
London	1.346	0.908	-0.132	3.68	4.25*	-0.05
North East	3.685	2.709	1.081	9.12***	6.95***	3.14*
North West	-1.498	-0.664	-0.608	5.21***	2.94**	3.31*
South East	-2.009	-1.154	-1.323	5.77***	3.14**	3.41*
South West	2.241	0.426	1.729	3.02*	1.14	2.04
West Midlands	4.391	3.037*	1.618	6.68***	4.3***	3.34*
Yorkshire	1.794	1.614	0.18	2.81	2.3	0.78
Specialist College	0.934	-0.253	1.654	2.96	2.33*	1.75
Merged college	-2.333	-0.83	-1.845*	-0.35	-0.63	0.35
Proportion of learners aged 16-18	9.445	2.321	10.306	12.6	1.95	11.36
Constant (base case = FE college, East Midlands)	37.3***	31.09**	59.54***	60.35***	70.2***	76.38***
Number of observations	84	84	84	73	73	73
R-squared	0.4	0.34	0.6	0.75	0.75	0.84
Root mean squared error	5.884	4.081	3.85	4.57	3.04	3.23

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency capital expenditure approvals data / National Success Rates Tables / college census data

Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

It was important to rule out the fact that it was changes to reported success rates between the two samples that were causing the difference in results. The analysis was repeated (see Table 11) for only the subset of colleges that appear in both regression samples. There are only 30 colleges in this group. To avoid over-fitting the model the number of right-hand side variables was reduced such that only capital expenditure and the starting level of the attainment variable were used.[39] The results from 2008 and the 2012 datasets are now very similar. This indicates that the different results observed in the 2002/03 to 2005/06 period are strongly driven by the inclusion of a different sample of colleges. Given the superior college census methodology employed in the 2012 study, greater weight might be placed on that set of results. However, the results of the 2008 study are also valid and the findings indicate that the impacts across the

[39] This analysis has also been run with the full set of RHS variables, but this is not sensible for such a small sample size, as the coefficients in an over-fitted model are unstable.

population appear to be heterogeneous. Table 11 below shows the impact on the change in success rates, retention rates and achievement rates from 2002/03 to 2005/06 using overlapping observations in the two datasets.

Table 11. Impact on change in success rates, retention rates and achievement rates from 2002/03 to 2005/06 using overlapping observations in the two datasets

	2012 study			2008 study		
Variable	Success	Retention	Achievement	Success	Retention	Achievement
Capital expenditure completed from 2002/03 to 2004/05 (£m)	0.131**	0.091**	0.044	0.17***	0.10***	0.08**
Success rate / retention rate / achievement rate Number of learners in 2002/03	-0.756***	-0.783***	-0.661***	-0.667***	-0.714***	-0.626***
Constant	59.6***	68.4***	60.2***	53.5***	63.0***	57.0***
Number of observations	30	30	30	30	30	30
R-squared	0.50	0.51	0.60	0.53	0.53	0.61
Root mean squared error	5.18	3.5	3.22	4.83	3.19	3.15

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency capital expenditure approvals data / National Success Rates Tables / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Sample selection bias and the impact of changes in the composition of capital expenditure projects

There are two potential drivers of the differences between the current results and those from the 2008 study that can be explored further by adapting the econometric specification:

- sample selection bias; and
- the impact of changes in the composition of capital expenditure projects.

It is clear that differences in the samples used for the 2008 and 2012 study are a potential explanation for the difference in the success rate finding, but not a strong factor in determining the difference in participation results. To ensure the validity of the results from the current study, it is therefore important to ensure that the 2012 sample is representative of the population. It is crucial to rule out the possibility that the sample suffers from sample selection bias due to the fact that colleges responding to the survey may have different characteristics to those across the population of colleges. Section 2.4 has already described the analysis undertaken to check that the sample has similar observed characteristics to the population of colleges.

This section explores the extent to which the sample and population look different in a way that is consistent with sample selection bias being present. This study is in the relatively fortuitous position that it is able to run the basic specification using population data. However, there is the obvious caveat that there are valid reasons for using the census only measure as the data for all colleges included has been validated (reflecting changes in some cases). It is not possible to know whether changes might be required for colleges that did not respond to the survey.

The descriptive analysis set out in Section 2.4.1 indicated that there have been a number of extremely large projects in the latter part of the timescale for this study. The inclusion of these

projects (which were not included in 2008) could have several potential implications for the results, including:

- The basic specification treats every £1 million of capital expenditure as equivalent in terms of its expected impact on performance. In reality, this relationship might not be expected. An additional £1 million added to a £50 million project might not be expected to have the same impact on participation as an extra £1 million added to a £10 million project. In fact, the £50 million project may be seeking to address a range of goals and increasing the volume of participation may be only one of those.

- Capital expenditure projects may not achieve their full impact in the first year after completion. In fact, the positive participation results generated by the study may be the result of projects completed many years previously. Thus recently completed projects may not generate their full anticipated impact for several years. The inclusion of these projects, coupled with the fact they are large and would be expected to generate a large impact, may lead the results to look lower than in 2008. To explore the impact of these additional projects the basic specification is run but excluding them from the sample.

The results in Table 12, Table 13 and Table 14 estimate the impact of capital expenditure on participation, success rates and colleges' ability to generate fee income for four different cuts of the 2012 data.

1. The basic specification on the sample (repeated from earlier)

2. The basic specification on the whole population

3. The basic specification on the sample but excluding colleges with large projects

4. The basic specification on the whole population but excluding colleges with large projects

Participation

Table 12 shows positive and significant impacts of capital expenditure on all learner participation, Learner Responsive participation and participation of 16 to 18 year old learners. The impacts on adult learners and on apprenticeships are not statistically significant. However, these sub-groups are included in the wider participation measures, and it is reasonable to suppose that they do contribute part of the impact, even though the analysis does not find the impacts on these groups to have statistical significance independently of the wider participation measure.

More importantly, some clear patterns emerge in relation to the issues of sample selection bias and the impact of large projects. Impacts are smaller when estimated across the whole population than when estimated using only the census colleges. It is not possible to determine whether this is because of a difference between the impact of capital expenditure for the 2012 census sample and the whole population, or if the reason is that the data for non-census colleges is not as reliable (because anomalies have not been addressed). It is not obvious which sample should have greater weight placed on it, but it is clear that sample selection bias is not causing the difference between the current results and those from 2008 (in that both samples are representative of the population of colleges).

Impacts are larger if the analysis excludes colleges that did very large amounts of capital expenditure during the period (in excess of £60 million in real terms). It is not possible to be sure whether this is because the incremental effect of each million spent gets smaller the larger the project is, or whether there is a timing issue here. However, the results in Section 2.5.4 suggest that timing issues have a significant effect on the observed impact of capital expenditure.

It is most likely too early to observe the impact of the large projects completed late on in the sample period. Whilst the analysis finds that the impact on all learner participation is therefore likely to be between 42 learners and 86 learners per £1 million of capital expenditure (in 2012 prices), the most informative estimates are likely to be at the higher end of this range, and in fact are likely to be close to 86 learners per £1 million of capital expenditure. This is similar to the finding from the previous study (which finds 98 additional learners per £1 million in 2012 comparable terms).

Table 12. Impact of £1m capital expenditure on participation measures when using different sample cuts using 2012 study data

Regression sample	All learners	Learner Responsive learners	LSC/ Skills Funding Agency funded LR learners aged 16 to 18	LSC/ Skills Funding Agency funded LR learners aged 19 plus	Apprentice -ships
Census only, including large capex colleges [Sample size = 142]	62** [0-120]	54* [-6-113]	13*** [6-20]	28 [-19-76]	8 [-2-18]
Whole population, including large capex colleges [Sample size = 250]	42** [10-80]	38** [3-73]	9*** [4-14]	22 [-6-49]	4 [-3-10]
Census only, excluding large capex colleges [Sample size = 125]	86*** [37-134]	56** [10-102]	14*** [6-21]	20 [-10-50]	6 [-2-13]
Whole population, excluding colleges [Sample size = 222]	44** [7-81]	29* [-1-58]	7** [0-14]	5 [-16-25]	2 [-4-7]

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency capital expenditure approvals data / college census data

Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Success, retention and achievement rates

Table 13 shows the impact of capital expenditure on success rates. It shows that running the basic specification across all colleges in the population and then excluding large capital expenditure projects makes very little difference to the observed results. The impacts on success rates are all small and statistically insignificant. Neither sample selection nor large projects appear to be behind the differences between the current results and those from 2008.

Table 13. Impact of £1m capital expenditure on percentage points change in success rates under different sample cuts

Regression Sample	Learner group: All learners	Learners aged 16 to 18	Adult learners
Census only, including large capex colleges [Sample sizes= 140, 137, 140]	0.002 [-4.9 - 5.5]	0.005 [-7.4 - 8.4]	0.008 [-5.4 - 6.9]
Whole population, including large capex colleges [Sample sizes= 248, 242, 248]	-0.016 [-5.2 - 1.9]	-0.016 [-7.2 - 4.0]	0.002 [-4.1 - 4.5]
Census only, excluding large capex colleges [Sample sizes= 126, 123, 126]	0.018 [-4.6 - 8.3]	0.024 [-7.5 - 12.2]	0.026 [-5.2 - 10.5]
Whole population, excluding large capex colleges [Sample sizes= 226, 220, 226]	-0.005 [-4.5 - 3.5]	-0.002 [-6.6 - 6.1]	0.009 [-4.3 - 6.0]

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency capital expenditure approvals data / National Success Rates Tables / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

The findings for retention and achievement rates are similar. For reasons of space they are not included here, but they can be found in Annex A.

College ability to generate fee income

Table 14 shows the impact on the percentage point change in dependency on LSC and Skills Funding Agency income. In the first row (the basic specification) the impact of each £1 million of capital expenditure is to reduce the dependency by 0.06 percentage points. The coefficient is slightly smaller (0.052 percentage points) when estimated across the whole population, but still significant. Sample selection does not therefore appear to be a key driving factor of the differences with the 2008 results.

In the census, many anomalies were identified with the college financial information. Although the survey data has been cleaned as much as possible, the same has not been possible for the colleges that did not respond to the census and, as such, the population data should be approached with caution. For this reason, it may make sense to focus on the census-only results.

If colleges with large projects are excluded, the effect is smaller and insignificant. This is consistent with the view that the main driver behind the relationship is the very large projects and this is potentially a key contributory factor behind the difference between results of the studies.[40]

Table 14. Impact of £1m capital expenditure on percentage points change in proportion of college income

	Fee income measure:		
Regression Sample	Dependence on LSC / Skills Funding Agency income (1) - using linear capital expenditure variable	Dependence on LSC / Skills Funding Agency income (2) using linear capex variable and large capex dummy	Percentage point change in Tuition fee income as a proportion of college income
Census only, including large capex colleges [Sample size = 142]	-0.06** [-11.3 - -0.63]	-0.017 [-12.0 - 8.7]	0.014 [-5.0 - 7.8]
Whole population, including large capex colleges [Sample size = 250]	-0.052* [-10.7 - 0.29]	-0.064* [-13.3 - 0.4]	0.046** [0.1 - 9.1]
Census only, excluding large capex colleges [Sample size = 128]	0.004 [-11.8 - 12.6]	Not applicable	0.003 [-7.6 - 8.1]
Whole population, excluding large capex colleges [Sample size = 228]	-0.048 [-12.6 - 2.9]	Not applicable	0.04 [-1.3 - 9.2]

Source: Frontier analysis of ILR (R08 collection) / Skills Funding Agency capital expenditure approvals data / Skills Funding Agency college financial data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Endogeneity bias and structural changes in performance

Up until this point, exploration of the potential explanations for the differences between the 2008 and 2012 studies has indicated that:

- **Participation:** the inclusion of large, recently completed projects in the 2012 dataset has the effect of reducing the impact observed.
- **Success:** there appear to be differences between the sample used in the 2008 study and the sample used in the 2012 study, with the latter reporting a lower impact. However, the convergence of success rates is also likely to be a key consideration.

[40] The second column shows the impacts per £1 million of capital expenditure when the regression separately controls for the impact of large projects using a dummy variable. This specification is not applicable for the sample cuts excluding colleges with large capital expenditure, as the dummy would be zero in all cases.

- **Ability to generate fee income:** the inclusion of large, recently completed projects in the 2012 dataset has the effect of increasing the impact observed relative to 2008.

However, there are two further factors that may also be contributing to the differences between the results from the two studies. It is not possible to directly measure their impact, so this section provides a short discussion of how these factors might be operating.

- **Endogeneity bias**: for this to be an important factor, it would need to be the case that the changes in performance of colleges were correlated in some way with the amount of capital expenditure they received. For this to explain the differences of the 2012 and the 2008 results it must also be the case that there is greater correlation between performance and capital expenditure in the period since 2006/07 (i.e. in the period covered by the 2012 study but not the 2008 one).

- **Structural changes in performance**: there has been an overall decline in participation and a strong convergence in success rates over the timeframe for this analysis. For these factors to explain the differences with the 2008 participation results there must be some factor that has limited the increase in participation for capital expenditure projects in the 2012 study. Colleges refer to three factors that may be of significance. Firstly, the effect of the recession could mean that colleges were unable to achieve the demand levels anticipated at the outset of their projects. In the census, some colleges stated that economic circumstances meant employers and individuals were less likely to fund courses. As a result, the uptake of courses requiring funding would be lower than would otherwise be the case. Secondly, colleges refer to the fact that. Demographically, there are fewer 16 to18 year olds, which places a potential limit on their numbers. Finally, colleges refer to funding policy changes, for example the shift in funding away from short courses. As it was not possible to analyse guided learning hours in the quantitative analysis, any shift towards longer courses will not be captured by the analysis. For success rates, the natural threshold to success rates of 100 per cent and the strong convergence towards the 80 to 90 per cent level leaves very little variation to be explained by capital expenditure.

2.5.4 Extension of basic specification to examine trajectory of impact

This section considers various extensions to the basic specification set out above. A primary focus of this work was to explore the extent to which the impact of capital expenditure projects on participation has varied over time.[41] This was not possible in the previous study due to the size of the sample.

The results of a regression specification that uses dummy variables to identify the year the last capital expenditure project at a college was completed is presented.[42] This analysis allows the exploration of how the impact of projects completed in different time periods varies. The results of this specification for participation are shown in Table 15. The first column shows the

[41] Given that the analysis was unable to identify a strong positive effect on success, achievement and retention rates, these have been excluded from 'trajectory' analysis. Furthermore, problems with a number of years of the fee income data mean that it was not considered robust to undertake 'trajectory' analysis for this variable either.

[42] A specification that split the data into two different time periods (2002/03 to 2006/07 and 2006/07 to 2010/11) to see if the magnitude of impact changed over time, yielded consistent results.

regression coefficient for each £1 million of capital expenditure.[43] The dummy coefficients show the (one off) impact on learners for a college that completed its capital expenditure projects in the specified year, where the base case is comparison to a college that currently has on-going projects.[44] The interpretation for a college that completed £10 million of capital expenditure in 2008 (for the first regression specification) would be an increase of (63*10 +580) = 1,210 learners. For brevity the analysis focuses on the all learner (ER + LR) participation measure; similar results hold for other participation measures.

Table 15. Impact of £1m capital expenditure on all learner participation, controlling for year of last project completion

	Including dummies					Excluding dummies
		Year of last completion				
Regression sample	£m capex	2008-2010	2005-2007	2002-2004	<2002	£m capex
Census only, include large project colleges	63**	580	170	5234**	700	62**
[Sample size = 142]	[6-111]					[0-120]
Whole population, include large project colleges	46**	171	390	1702	917	42**
[Sample size = 250]	[10-82]					[10-80]
Census only, exclude large project colleges	87***	-712	-451	4090*	364	86***
[Sample size = 128]	[32-140]					[37-134]
Whole population, exclude large project colleges	52***	-551	118	1763	447	44**
[Sample size = 228]	[13-92]					[7-81]

Source: Frontier analysis of combined ILR / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

The analysis indicates that the impacts of capital expenditure are much larger in the 2002/03 to 2004/05 period than in the period from 2005/06 onwards. In terms of the year dummies, the findings suggest a much larger impact for colleges that completed their last project between 2002/03 and 2003/04. This coefficient tends to be significant, whereas the others are not.

Again, there could be a number of factors that influence this result. Firstly, projects completed in the later period tend to be significantly larger (an average of £18 million as opposed to £5 million). It is possible that these large projects take longer to deliver benefits, or that the impact

[43] For comparison, the column on the right shows the corresponding coefficient from the regression without dummies (as per the sample cuts in Table 12, Table 13 and Table 14).

[44] These are level dummies. The impacts these give depend only on the year of completion, not the amount of capital expenditure. Regression specifications using interaction dummy variables were also considered but these gave unstable estimates.

per £1 million is diminishing in project size. Unfortunately, both these hypotheses are difficult to explore, as the regression specifications used to test these yield unstable estimates.

Ideally, the analysis would have explored a specification that could directly explore, for given projects, how the impact changes as the number of years since completion increases. Unfortunately, this has not been possible given the sample size and the trends at play within the dataset.[45]

2.6 Summary of findings

The analysis presented in this chapter shows that each £1 million of capital expenditure is associated with around 62 additional learners per year. This is lower than the results of the 2008 study, which found that around 111 additional learners were associated with every £1 million spent. However, in fact, the results of this study are more consistent with the 2008 results when a number of large projects that have only recently been completed are excluded from the analysis.[46] Excluding these projects gives an estimated impact of around 86 additional learners per year per £1 million spent. Finally, for true comparability of the results between 2008 and 2012, the analysis needs to capture the fact that a 2008 £1 of capital expenditure is worth £1.13 in 2012. This has the implication that the 2008 result is actually 98 learners per £1 million spent, in 2012 prices.

However, BIS are not merely interested in the number of learners, but in the quality of learning outcomes. To properly assess the quality of learning outcomes would involve incorporating a measure of the earnings and employability of learners completing further education courses into the quantitative analysis. It has not been possible within the scope of this study to construct such a measure. Instead, success, retention, and achievement rates have been used as proxies for the quality of learning outcomes. The analysis does not find any effect of capital expenditure on any of these variables. This contrasts with the 2008 study, in which a small effect was found. However, since 2008 there has been considerable convergence in success rates to around the 80 per cent level across all colleges. This degree of convergence makes it incredibly difficult to robustly identify the impact of capital expenditure on success. The qualitative work described in Chapter 2 explores the likely changes to the quality of learning outcomes, following capital investment. The work in Chapter 2 highlights that colleges have a wider awareness of what success means, beyond the success measures that it has been possible to consider in the quantitative work.

Finally, the analysis also found that a £1 million of capital expenditure is associated with a 0.06 percentage point reduction in the percentage of college income coming from the Learning and Skills Council or the Skills Funding Agency. This effect is small, but significant at the 5 per cent level.[47] However, this effect appears to be driven colleges that undertook very large amounts of

---

[45] This is a question which could be explored using a panel approach, but this is problematic because of the significant downward trend in participation over the timeframe of interest. Taking account of these factors makes the panel very unbalanced and inappropriate for generating robust results.

[46] This can easily be justified by the work (described in Section 2.4.4) looking at the time delay of impact from projects and is likely to be even more pronounced for large projects such as these.

[47] To put these results into perspective, a typical college (at the median) would have total income of £24 million, of which £18 million would be LSC or Skills Funding Agency income. £10 million of capital expenditure

capital expenditure over the time period of analysis. These colleges are specifically associated with a 5.5 percentage point reduction in income coming from the Learning Skills Council or Skills Funding Agency, significant at the 1 per cent level. A typical very large project is worth £75 million, and colleges that have undertaken these projects have £30 million total income, on average. The regression analysis suggests that a capital expenditure project of this size would decrease dependence on Agency income by up to approximately £1.65 million per annum.[48]

would reduce dependency on LSC or Skills Funding Agency income from 75 per cent to 74.4 per cent, i.e. by £144k per annum.

[48] The 5.5 per cent impact is taken from the dummy-only specification. Similar impacts occur for the specification with both dummy and linear terms. However, in that specification, the two terms are very highly correlated. Because there is not sufficient variation within the data to disentangle their respective impacts, they each become statistically insignificant. This phenomenon is referred to as 'multicollinearity', and a common remedy is to drop one of the collinear variables from the specification.

3. Qualitative analysis

Chapter summary

The main aim of the qualitative case studies was to explore and inform non-quantifiable indicators of impact, and to understand the processes that helped projects to be successful. A high level summary of the key findings relating to the impact of the projects is set out below.

- Learner participation and performance: Colleges have met or exceeded growth targets for learner participation at a site specific level. In a large part these changes have been due to curriculum improvements that have been possible alongside the capital expenditure. Most colleges also reported improvements in success rates and retention rates following their capital expenditure project. Some colleges commented that other effects present at the time (such as mergers) limited these effects to some extent. However, all colleges emphasised that success rates would have declined had the capital expenditure not have occurred, so before-after comparisons do not provide the full picture.

- Economic regeneration: Colleges recognise the role they can play in leading economic regeneration of areas and several case study projects have played an important role in this regard. The economic regeneration stimulated can be of direct benefit (employing staff in the college) as well as indirect benefit (stimulating investment from other businesses).

- Environmental sustainability: Colleges are very conscious of improving environmental sustainability across their buildings. The majority of case study colleges secured very good or excellent environmental sustainability rating for their new buildings. Colleges had incorporated a range of sustainable energy sources into their designs, but this has not always led to a reduction in energy costs.

- Employer engagement: Colleges actively manage their new buildings to improve employer engagement. They state that they have been particularly successful in doing so, particularly when the capital stock prior to investment was very poor. The new buildings, equipment and facilities allow colleges to offer services that much more accurately match what employers want. They also engage employers in other ways, such as providing spaces for employers to host meetings and conferences and a better environment or students to use industry-standard equipment, interact with industry representatives and to demonstrate that they are 'industry ready'.

- Learner satisfaction: College run Student Satisfaction surveys indicate that students feel more satisfied on their courses following capital investment across a range of indicators. However, a degree of caution is required in interpreting these findings. Colleges also note other signs of increased student satisfaction. There is less gratuitous damage, vandalism and graffiti, indicating that students take a greater pride in their environment. Also, students choose to stay on campus after hours; a sign that they enjoy being there, and something that would not have happened at colleges' old sites.

- Estate utilisation: Estate utilisation also appears to have increased following capital expenditure projects. This appears to be particularly true for colleges that disposed of old sites and relocated to new sites as part of their project. Estate utilisation

benefits are driven by better utilisation between 9am and 5pm on weekdays and better utilisation outside of teaching hours.

- Maintenance costs: Case study colleges presented mixed views on the maintenance costs of new buildings. On the one hand, colleges indicated that maintaining a new building, designed with better quality and more durable materials was easier. On the other hand, colleges stated that maintaining a brand new building, particularly given its increased use, can be expensive.

- Staff recruitment: Capital expenditure projects appear to have made it significantly easier for colleges to recruit staff and to attract higher quality staff. Whilst, colleges recognise that the economic environment has clearly paid its part in increasing the number and quality of applicants for positions, colleges feel fairly confident that the buildings alone have made an important contribution.

- Additionality: Any evaluation must consider the extent to which the impacts observed could have been achieved without government intervention. There is not a culture of measuring the additionality of college capital projects. However, a range of evidence suggests that it is unlikely that LSC/Skills Funding Agency funding crowded out other potential sources of funding. In fact the likelihood is that the availability of this funding led to colleges being more confident in putting forward larger scale projects and to seek other sources of funding to support the project.

3.1 Introduction

This chapter sets out the key findings of the qualitative work undertaken to explore the impact of capital expenditure in colleges on a wide range of non-quantifiable performance indicators. The work involved the analysis of significant sized capital expenditure projects carried out in 10 case study colleges. The chapter provides detailed analysis of college-reported impacts of the capital expenditure they had received on a range of performance measures.

The rest of this chapter provides an overview of the qualitative work and the key findings flowing from it. It is structured as follows:

- Aims of the qualitative analysis;
- Methodology – how the study was designed and carried out;
- The key findings; and
- Summary.

3.2 Aims of the qualitative analysis

The overarching aim of this study was to understand the impact of the capital expenditure projects on a number of key performance indicators. The quantitative work described in Chapter 2 provides a quantifiable estimate of the impact of capital expenditure on participation, success rates and the ability of a college to generate income. The ability of the econometric specification to robustly identify a counterfactual is very important in presenting the impact of capital expenditure within government. However, it is not possible to generate similar estimates for all performance indicators. Moreover, the quantitative work can neither help to understand the

transition mechanisms by which funding is translated into improved performance nor provide context to understand the nuances of investment of this type.

Qualitative work provides a clear complement to the quantitative analysis for these reasons. The main aim of the qualitative case studies has been to explore and inform non-quantifiable indicators of impact, and to understand the processes that helped projects to be successful. The study has also considered issues around project management and post-project evaluation.

The key performance indicators covered by the case studies were:

- **Participation, success, retention, and achievement rates** – this study looked to understand the degree to which improvements in these factors were the main rationale for the projects and also the degree to which objectives in these areas had been achieved.

- **Local economic impacts** – this included whether the projects had a regenerative impact in a local area that, in turn, stimulated further economic activity and also the degree to which spending power of students had impacted locally.

- **Environmental sustainability** – the study explored the degree to which environmental sustainability measures were included in the project specifications and their rationale. Evidence was also sought on the degree to which the projects were able to generate energy cost savings.

- **Employer engagement** – the study has identified the different routes to employer engagement followed by the colleges and the degree to which the projects were able to extend employer engagement.

- **Learner satisfaction** – colleges were asked for evidence on how learners have responded to the new facilities and for evidence on satisfaction levels.

- **Estate condition and efficiency** – most colleges will dispose of sites in poor condition to part-fund their project(s). The analysis for this study examined the degree to which colleges were able to rationalise space, increase utilisation and achieve efficiency savings.

- **Staff retention and recruitment** – the analysis has looked for evidence on the degree to which staff were involved in the project's development and how they responded to changes such as open plan design layouts, limited parking and different teaching methods.

3.3 Methodology

This section explains the methodology in carrying out the case studies. In line with the key objective, the focus of the work was on understanding the impact of each project on project outcomes and impacts, and keeping in mind the outcome indicators as much as possible.

3.3.1 Designing the study

A detailed topic guide was developed that set out the steps to carrying out the qualitative study. A copy of the topic guide (which includes the semi-structured questionnaire) is provided in Appendix 2.

There were 6 main steps to carrying out the case studies. These were:

1. Clarifying the objectives (case study themes), and defining the research questions;
2. Selecting the case study colleges;
3. Articulating the information gathering techniques;
4. Preparing and collecting data in the field;
5. Evaluating and analysing the data for each case study; and
6. Developing case study themes and links with the quantitative analysis.

3.3.2 Case study themes

As indicated, the main aim of the study was to understand the impact of capital expenditure on key performance outcomes, with a particular focus on non-quantifiable indicators.

The primary themes for the study were the following:

- **Contextual and background descriptive information** of the college and the project(s) – e.g. its main activities, its sites, its previous experience with capital projects.
- **Project rationale and objectives** – e.g. what was the main rationale for the project and its success criteria, how the objectives were set, how the design would meet the objectives, who were the main stakeholders that needed to be involved and consulted? This also explored the use of investment for capital maintenance versus creation of new buildings.
- **Project impact and evaluation** – were colleges able to assess whether the project met the original objectives that had been set out in the rationale, in terms of college performance what has been the impact, and have there been wider impacts? Were there evaluation assessments on impacts on the local economy and the college's environmental sustainability? What could the college tell the Research team about the impact on the key performance indicators listed in Table 1 in Chapter 1?

The secondary themes for the study were:

- **Project planning and procurement** – who were the key decision makers, what was the project consultation process, what where the main features of the contract, and what outside advice was drawn upon?
- **Project implementation** – considering issues about: the time frame and stages, assessing process performance, disruption on teaching during the project, disruption on other aspects of college operations, and end game evaluation.

3.3.3 Selecting the case study colleges

The Skills Funding Agency were asked to provide a long list of colleges that had received a significant grant from the LSC between 2007 and 2009, and whose projects had completed at least 18 months before the start of this study (and therefore should have completed a post

project review in line with Skills Funding Agency guidance).[49] A long list of 21 colleges was received, which the Skills Funding Agency had suggested to ensure appropriate coverage across various criteria. These criteria, listed below were also used to select the 10 colleges from the list of 21. The sample was selected to:

- have broad regional representation across England;
- include a range of different sized colleges in different types of location, e.g. central city locations and more rural locations;
- include a mix of colleges that had either opted (i) to redevelop / refurbish on the same site or (ii) to develop / refurbish in a new location;
- include colleges with different proportions of financial support from the LSC;
- include a range of project sizes in terms of total amount of capital expenditure allocated to the project.

The 10 case study colleges chosen were general and further education colleges that were evenly spread over the different regions of England. The projects had all been completed between the academic years 2008 and 2010.[50] The amount of capital expenditure on the projects ranged from £25 million to £70 million with a mean average value of £43 million. The size of grant support from the LSC ranged from between 10 per cent and 62 per cent with a mean average of 39 per cent.

All colleges approached to take part as case studies gave positive responses to the overall evaluation, and those that did take part were particularly accommodating, given the timing of the case studies overlapping with end of academic year demands. Only one college refused to participate, due to concerns that the unique nature of its current situation would compromise its anonymity. Two other colleges approached were unable to facilitate interviews with appropriate personnel within the given timeframe. One other college also ended up being unable to facilitate interviews within the given timeframe, although it had wanted to participate. That college agreed for its capital expenditure project to be used as one of the 10 case studies and has been included in the analysis, using a combination of background information (quantitative data, LSC documentation, Ofsted reports) and information from the college's own post project review, which was fairly thorough and informative.

[49] The SFA's current guidance on post occupancy reviews can be found here: http://readingroom.skillsfundingagency.bis.gov.uk/sfa/Post_project_Review_May_2012.pdf and the relevant post project review form here: http://readingroom.skillsfundingagency.bis.gov.uk/sfa/sfa-post-occupancy-evaluation-form-may2012.pdf [accessed: September 2012].

[50] One college chose to speak about a project which had completed before the specified timescale, but interviewees were able to comment helpfully on its impact across the different indicators. The college did have two more recent projects; however, one of these had only completed last year (so too recently to comment on impacts), and there were not the appropriate staff available to speak about the other. The college views all three projects as part of its overall property strategy and any capital expenditure funding as essentially 'shared' in helping to realise this.

Table 16 provides a brief overview of the ten case study colleges. Each college was told that the interviews would be confidential and that the findings would not refer to any particular college by name or include any unpublished or confidential data (such as student surveys).

Table 16. Overview of case study colleges [51]

Region	Urban / Non-Urban	Size of college	Type of build	Relocation	Value of project	Percentage of LSC support
Greater London	Urban	Medium	New build	No	Medium	Medium
East Midlands	Urban	Large	New build/ Refurb.	Yes	Large	Large
Yorkshire & the Humber	Non-Urban	Medium	New build	Yes	Medium	Small
North West	Non-Urban	Large	New build/ Refurb.	No	Medium	Medium
North East	Urban	Medium	New build	Yes	Large	Large
South East	Urban	Small	New build/ Refurb.	No	Medium	Large
South East	Non-Urban	Medium	New build	Yes	Large	Large
East of England	Non-Urban	Small	New build	No	Large	Medium
South West	Urban	Large	New build	No	Medium	Medium
South West	Non-Urban	Large	New build/ Refurb.	No	Medium	Large

3.3.4 Information gathering techniques

A semi-structured questionnaire was developed which provided a range of potential questions and areas of inquiry under each of the above themes. Experienced researchers were used to carry out semi-structured questioning, with questions acting as prompts rather than direct questions, to enable interviewees to elaborate on their respective areas of experience or expertise. Discussion was prioritised around the themes where interviewees would be most likely to be able to comment. For example, asking a college's finance director about any efficiency cost savings. The interviews followed a sequential approach exploring the experiences of the colleges in an end-to-end manner, and enabling the Research team to use the experience of earlier case studies to adapt the approach when required.

[51] 'Urban' and 'Non-urban' have been used to distinguish between city-central locations and non-city locations (some of which are rural and some suburban) of the capital projects in the sample. Current learner numbers have been used to group colleges by size using thresholds of 7,500 and 15,000 annual learners to define medium- and large-sized colleges respectively. Similarly, thresholds of £20m and £40m have been used to group colleges according to the value of the capital expenditure project they were interviewed about, and thresholds of 20 per cent and 40 per cent to define medium and large percentages of support from the LSC for those projects.

3.3.5 Fieldwork

The fieldwork was carried out between the beginning of May 2012 and the end of August 2012. Before visiting each college the relevant college contact(s) were emailed a summary of the context and aims of the project, an overview of the approach to the qualitative study and likely areas for discussion, assurance about confidentiality, as well as a copy of the topic guide.

To inform each case study visit, a background note summarising information about the college and its capital expenditure project was prepared in advance of the interviews. Information was drawn from quantitative data (ILR, e-mandate, financial, participation and attainment), information provided by the Skills Funding Agency (which generally comprised a college's original capital application and minutes from the relevant LSC grant award-decision meeting), college Ofsted reports, as well as other information available from the colleges' respective websites. As well as familiarising the interviewers with the context and history of each particular college, this process was useful in highlighting any unusual features about the college – such as spikes in participation data or comments from Ofsted about the college's local economic generation initiatives – so that the interviewers could prioritise asking interviewees about these features and potential links to their respective capital expenditure project.

One pilot case study (which is one of the total 10) was undertaken by researchers from Frontier and BMG Research at the beginning of May 2012 to test the robustness of the proposed approach. For the pilot study researchers spoke to five different key individuals at the college: the Principal, Finance Director, Corporate Director, Estates Manager, and project Cost Consultant. The researchers spent between 45 and 60 minutes with each interviewee. At the end of each interview, they asked for feedback about the interview process itself. All the interviewees said that they were satisfied with the approach that had been taken, the range of questions asked, and the length of interview. The researchers were also given a tour of the new site, which was important in complementing the comments from interviewees. The pilot did not lead to any substantive changes to the planned approach, although it was useful in helping better identify which personnel researchers should speak to in the main study and also that it would be useful to have a site tour at other colleges.

For the main study Frontier and BMG undertook one case study together; Frontier undertook a further two case studies; and BMG undertook the remaining six. As with the pilot, for each of the case studies, researchers spent between 3 to 4 hours in each college and had in-depth discussions lasting 45-60 minutes with key senior individuals involved at the time of the project using a semi-structured questionnaire based on the case study themes. Interviews were either recorded then transcribed or detailed notes were taken. Typically researchers spoke to at least three of the following: the Principal / Deputy Principal, Finance Director, Project Manager, Curriculum Director, Corporate Director, and Estates Director/Manager.

The reporting of the case studies has followed a thematic anonymised approach, where information is drawn together from the 10 case studies in a general form, making use of anonymised quotations and examples.

A range of other data sources have also been used to inform the case studies. These include:

- ILR data on participation, retention and success rates;
- E-mandate data on estate condition;
- Post project evaluations where available;

- Ofsted reports; and
- Documents provided to the research team by the colleges, such as presentations about their capital projects, and student satisfaction surveys.

3.4 Key findings

This section sets out the key findings from the 10 case studies. The write up that follows provides a summary of the evidence gathered from the 10 case study colleges under each theme. The evidence is primarily based on responses by the senior team in each college. The respondents were only able to talk about the periods before and after their project and were not able to compare the college's performance to comparators in any robust manner. In this context the research team did ask respondents about what they thought would be the situation if the project had not gone ahead. These responses are referred to, where relevant below.

3.4.1 Contextual and background

Section summary:

- Case study colleges had fairly comprehensive estate strategies with a number of phases. Case study projects represented one phase of the strategy.
- Colleges draw on the experience of other colleges when embarking on capital expenditure projects.
- Colleges are confident in their approach to managing and executing these projects.

All of the case study colleges had fairly comprehensive estate strategies. 8 of the 10 colleges had a 'phased' capital expenditure plan, of which the project they were interviewed about represented one phase. Half of the colleges still had a further phase or phases of these original plans to complete. 9 of the 10 colleges already had solid experience in undertaking large scale projects and were confident in their approach and execution. Those same 9 colleges were positive about how the project had been implemented and managed, with only one college expressing any significant concerns about processes. That college's Principal indicated that they would change their approach if undertaking another project of the same scale again; namely, to manage the project themselves, or at any rate appoint a single project manager to oversee everything, rather than appointing multiple external contractors to manage different elements of the project. Most colleges mentioned visiting 2 to 3 other colleges to gain insight about best practice and design ideas, before embarking on their respective projects. Half of the colleges themselves have been visited by other colleges since completion of their own projects.

3.4.2 Project rationale

Section summary:

- Main rationale for projects is the need to improve very poor estate condition.
- Estate condition inappropriate for requirements of specialised courses and for responding to employers' needs.
- In some cases there was also a clear need to improve accessibility.

The main rationale for the capital expenditure projects was the need to improve very poor estate condition, and combined with that, in half of the cases, the need for estate rationalisation and improved accessibility. Most colleges referred to some combination of the following problems:

- Older sites that had less than a couple of years of shelf life before they would have to be either demolished or have major renovation;
- Substantial maintenance bills that could only slow the decline of the buildings;
- Poorly located sites away from good transport links and the student market - and disparate estate structures; and
- Sites not being fit for purpose for the changing curriculum and meeting learners and employers' needs.

All of the colleges felt that poor estate condition was deterring learners, and they either did not have the facilities to match-up to the requirements of the more specialised courses that they already offered (such as catering, engineering, or hairdressing) or did not have the space or necessary IT infrastructure to be able to expand their provision. This was particularly true of their ability to respond to employers' needs or local skills gaps. A number of colleges the Research team spoke to also mentioned that their old buildings were not then DDA (Disability Discrimination Act 1995) compliant, and so they could not offer places to mobility-impaired users, and the design of the buildings was such that it was not possible to install lifts or other requisite access measures.

An urban college that had merged two colleges some years ago had a strategic plan to rationalise its estate (reducing its total gross internal area by 45 per cent) and to improve its quality. Learner numbers at the site had been falling – both in terms of new starters and retention rates – which was felt to be due primarily to poor estate condition. The research team were told by the Senior Project Manager that the site was in '*real danger of closure'* and it was about to reach the point where management was of the view that '*the risk of keeping the building open was greater than risks of closing it.'*

For another college, located in a non-urban area, poor estate condition and limited facilities were felt to be restricting potential. The college has an ambitious growth plan, and had in fact already seen growth and quality improvements in recent years, but these were at risk of falling off. The Principal commented: '*the buildings were really hampering development. There were a lot of issues around DDA compliance, for example; teaching and learning couldn't really progress. I think young people were not really engaging with the environment particularly well, and also employers, I think.*'

Rationale – other comments
The old estate was in such need of repair… [the] standard of accommodation is key to a college's success.
The design and condition of the estate was appalling. There was a real danger of closure – in fact the risk of keeping the building open was greater than closing [it]. We didn't have a planned preventative maintenance programme because the estate was not worth maintaining.
The layout of the main building was a nightmare – there were 5 staircases – we couldn't have a lift, so couldn't offer places to mobility-impaired learners.
Our previous sites were in terrible condition – not fit for purpose – and there were massive running costs; too much space – utilisation was awful. The other major factor was location; although the college was (and is) named after the city it's now located in, none of its previous sites were near the centre of the city.
[The LSC] stated that, for the number of students that we'd got, we were about 10,000m^2 oversized. The estate was at the end of its life expectancy based on the Hunter's report information, and the city centre campuses were difficult to manage, being two sites…We'd got the wrong sized spaces, and the wrong places, and utilisation of the estate was low.
The estate was literally crumbling around our ears. It couldn't be maintained any longer and it wasn't capable of refurbishment.
We had an old, tried, worn-out building with poor layout…We weren't attractive – we had poor outcomes, success rates, and we are in a very competitive area.

3.4.3 Project objectives

Section summary:

- Project objectives were strongly linked to the rationale of improving poor estate condition and maintaining or increasing learner numbers and performance.
- There was also a focus on widening participation to engage with NEETs and other disenfranchised young people.
- Colleges also have a focus on generating income from their new buildings.

The main focus of the case study colleges was to invest in the college estate to make it a more attractive proposition to learners in order to maintain or increase both numbers and learner performance.

Colleges were very aware of their competitive position in the local market of providers of post-16 education and the competition for learners. Each college provided the LSC with a financial appraisal that emphasised the likely growth of learner numbers and fee income to support the case for their project. However, in general there was little evidence that the colleges had undertaken substantial research into understanding their market and catchment areas in order to

predict future demand. A rural college indicated that it needed to upgrade its estate so that it could be seen as a viable alternative to other competing colleges in the region and reported that it was seeing a rise in participation of learners from the immediate local area, who might otherwise have chosen to attend a college further away. The college said that, in this way, it was not displacing learners from other areas, but rather reengaging with its local population. However, again, there had been limited specific research into or evidence in support of this assertion.

Some colleges' objectives did also include employer-engagement, local economic regeneration, and addressing local skills gaps (through a changed curriculum). Other aims given by colleges included: demographic change (to use the new location and design of the building to engage with NEETs (young people Not in Employment, Education or Training) and other local disenfranchised young people, consolidating the success of a merger, and effecting a 'cultural' change in terms of teaching provision and interaction amongst and between teaching staff and learners. But again, these aims are all essentially linked to colleges providing the facilities and environment to improve the learning and teaching experience and thereby raise participation and attainment rates.

Many of the colleges the research team spoke to also said they were conscious of a need to think commercially and develop alternative ways to generate income. These colleges had designed their new buildings/redevelopments to offer spaces which could be hired out for private events or include high quality facilities that could compete with outside businesses (such as restaurants or theatres). Colleges said that these were areas that were being developed gradually and expected that they would not realise the full benefits for another few years.

3.4.4 Learner participation and performance

Section summary:

- Colleges tend to have met or exceeded growth targets for learner participation at a site specific level. Colleges have also focused on widening participation to disenfranchised groups with relocation of college buildings playing a key role here.
- Increases in participation have occurred in a large part due to curriculum improvements. Post capital expenditure, colleges can offer new courses with high quality facilities as well as offering better facilities for existing courses.
- Most colleges also reported improvements in success rates and retention rates following their capital expenditure project. However, some colleges said that other effects on the college present at the same time, such as mergers, limited these effects.
- Colleges emphasise that success rates would have declined had the capital expenditure not have occurred. So a before-after comparison does not provide the full picture.

All of the colleges the research team spoke to indicated that the old facilities were out of date with the modern requirements for the curriculum. Colleges reported that curriculum improvements – either in being able to offer new courses, or improve those it already offered through better facilities and learning environment – have been key to the growth in student

numbers. In the most part colleges appear to have been successful in either hitting or going above their expected growth numbers. Some colleges have seen a significant improvement in applications and enrolments. Two of the colleges mentioned that application levels are now so high at their new campuses, that they were now ostensibly 'closed' to many potential learners. The Finance Director of one of these (a large urban college) said, '*enrolment has been transformed because of the building – the college is full now.*' However, the scale of these individual project impacts is not captured fully by the quantitative data as those data are not site-specific.

> *Young people…expect to engage in practical activities that are in keeping with their interests and their aspirations, and those old buildings with the old facilities they were really disconnected from that… I calculated a while back that the numbers we've had in this year, compared to two or three years ago, have increased by 18 per cent. That could have been for a number of factors, but I'm sure that a lot of that's due to the new building.*
>
> **Principal – Medium sized suburban college**

One medium sized college in a rural catchment pointed to the increased number of courses they could now offer at a much improved quality. In particular, curriculum changes to now offer catering and motor vehicles had led to a significant increase in demand. The college also felt that the new development had raised its local profile (which had been deteriorating in recent years due to falling success rates and poor Ofsted reports) and that they were seeing increased attendance from the local population who they think would previously have opted to go elsewhere. The Principal commented: *'It's been transformative. I think that's not too big a word.... We have succeeded each year in building up the student numbers…[and] now that the whole campus is built, we have space to continue to develop*.'

The other significant impact on participation has been location. Of the four colleges which had chosen to relocate as part of a wider estate rationalisation plan – reducing two or more campuses to a single new site – all of them felt that improved accessibility had led to increased participation. Two of these colleges had noticed students coming from further away; so, even having consolidated multiple sites into one, because of being well located with good transport links, their new single sites had in fact widened their pool of potential learners. The Principal of one of these colleges said, *'we are now attracting students from other areas because of our good reputation and improved accessibility*.' The Vice Principal from another large urban college commented that people were coming from further afield as they now have the *'sort of building people will want to travel to.'* That college has received 250 more applications for the current academic year from 17-18 year old learners than it did for the last academic year (when the new building had only just completed).

Three of the case study colleges had set out to use their new campuses in part not only to increase participation, but also to effect a demographic shift in their learners. One of these colleges in a central urban location did not relocate, but had a specific aim for its capital project to facilitate reengagement with local disenfranchised youth (young people aged 14 or over otherwise excluded from mainstream education) who they could not cater for in their old building. The Project Manager explained, *'we simply could not have offered services for this group in the old building…the college can manage troubled students much better in the new building and offer them the holistic provision needed.'*

The other two colleges aimed to widen their learner demographic by relocating to economically deprived areas to engage with the immediate local population which had high unemployment and low basic qualifications. One of these was a medium sized college in a suburban area which relocated from having two sites both in relatively affluent areas to an area where, at time of the college's capital grant application, unemployment was around 50 per cent higher and participation in FE/HE of population in the immediate area was around 10 per cent lower than the wider region and unemployment. In the first year of opening numbers of new students were very high, although success and retention rates dropped slightly. Since then the college has found that intake numbers have stabilized and overall retention rates increased by 5 per cent between 2006/07 (the year before the project started) and 2010/11 (a year after project completion) which is perhaps even more significant bearing in mind the change in demographic. The Principal commented, '*we wanted to put ourselves at the heart of the community…Now people are able to attend who wouldn't otherwise be in Further Education at all.'* The Principal also remarked that the college was now offering far more basic level courses, again to attract new learners to the college, with a wider objective of improving opportunities for local people who might otherwise not access such courses outside the immediate geographical area to gain basic qualifications.

An isolated case where a college was disappointed that it had not reached the growth numbers set out in their project application was a medium sized urban college. They felt that their growth predictions had been slightly over-ambitious, and they had not anticipated that their location would still be perceived as unattractive by learners, and particularly the parents of younger learners. The campus is in a deprived area that can be perceived as threatening, and they think it will take further investment in development of the area, as well as completion of further phases of capital investment in the college to counteract that.

Most of the colleges reported improved success rates since completion of their capital projects. However, two of the colleges the Research team spoke to which had recently undergone mergers with less successful colleges felt that this had limited these improvements, and one of these colleges also felt that the disruption of relocating may have affected success rates in the short term too. The Corporate Director commented, '*in some ways it's hard at this point in time to pin down overall impact on success rates, given all the moves, disruptions, and that* [recently merged college] *was a failing college which has also driven overall success rates down. We probably need longer before we can really assess those impacts.'*

Several of the colleges reported that participation and success rates were either falling or at risk of falling before the projects, in which case any improvements in these areas should be compared against a counterfactual of a pattern of decline, rather than a pattern of growth (albeit to a lesser extent) or of plateauing, had the capital project not gone ahead. As mentioned in Section 3.4.2 (on project rationale), and discussed further in Section 3.4.13 (on additionality), a number of colleges commented that estate condition was so poor that they would have had to close their respective sites altogether within a few years. These colleges indicated that without receipt of capital grants, they would either not have built a new campus at all, or would have only opted to build smaller or lower spec campus These options could not have provided the learning environment which they consider their respective capital projects have led to improved learner numbers and success rates.

3.4.5 Local economic impact

Section summary:

- Colleges are aware of the impacts of their project on the local economy, but these impacts did not tend to be a key driver of the project.
- Colleges recognise the role they can play in leading economic regeneration of areas and several case study projects have played an important role in this regard. The economic regeneration stimulated can be of direct benefit (employing staff in the college) as well as indirect benefit (stimulating investment from other businesses).
- Colleges find that the projects lead to better community engagement and, in fact, the college facilities can offer a route for improving the health of the local community, for example by providing onsite health clinics.

Colleges indicated that they were very aware of the potential impact of their projects on the local economy, although in most cases this was not a key driver of why they went ahead with the project. Half of the colleges were actively aware of the potential for economic regeneration benefits as a result of their investment, and three colleges had actively worked with local regeneration partners in this context. A number of colleges mentioned having won local or regional awards for their efforts and achievements in helping to revive or boost local economy.

One large urban college was the first mover in an area that was run down and had not been developed for decades. In partnership with the local council the college arranged for environmental improvements and for access improvements. Subsequently, the area has had a substantial amount of investment from private developers, and there are now several businesses established on the site, with a high-tech cluster being developed more recently. The Estates Manager explained '*the local area had been in long-term decline with a number of derelict buildings and land problems.'* Interestingly, a number of proposals to develop the site by private retail chains were rejected by the local authority. The college thinks this is because the council did not see that type of business as having the long-term positive economic impacts the college's presence at the site would. As an indication of the council's support of the college's project, it was willing to sell the acquired land and buildings to the college for a de-minimus amount.

This project also involved restoration of a local historical building which had long stood neglected. The college commented that the new campus clearly signals investment in the area's heritage and education to attract outside interest and investment. The campus is now very much a 'symbol' for regeneration and a landmark for the city, and the college itself is one of the largest employers in the area, with around 1,500 employees. One other large urban college also restored a local historical landmark as part of its capital project and reported similar positive impacts. The Director of Finance and Estates remarked that '*preserving the building… was seen as a very positive thing*', and has helped raised the college's profile as being an investor in the area.

Colleges which relocated referred to the increased spending by students in local shops in the new area and other multiplier effects. The Project Director at a medium sized non-urban college remarked, '*there wasn't a lot of movement in the high street before, and it was quite run down, but that's all changed now. New shops have opened and the high street has been revitalised*

since the new college campus opened.' This sort of insight was generally not matched with a view about what the impact had been on the areas that they left. However, in the majority of cases colleges had moved from residential areas where there were very few local businesses the colleges' student and teaching population could have been seen to support in any event.

A large urban college which had chosen to relocate to a less affluent area felt that longer would be needed before being able to realise the local economic impacts they had hoped to achieve. The college said that unemployment and deprivation were high in area where they chose to relocate, and one of their aims was to encourage local people into education and training and thereby raise aspirations and address the '*poor self-image*' of area. They hoped to help local people into employment through offering courses in basic skills as well as skills tailored to local economy needs. The college thinks it has managed to achieve those objectives to some degree, although feel that the positive impacts may have been neutralised by the current economic climate. The college is hoping that in coming years its presence in the area will attract developers to start building more houses closer to the college campus to help increase learner numbers and create more of a *'sense of community'*.

Under this theme a number of colleges talked of how their projects increased their involvement and engagement with the local community. In particular, they highlighted their ability to host local public and private events, as well as seeing increased use of the colleges' public-facing services, such as hairdressers, restaurants and travel agencies. The Finance Director from a medium sized college which had relocated to a less affluent area commented that the new campus was proving to be '*excellent for community engagement…our travel agency has doubled its customers compared with the old site. Local people are using the college's facilities*.' The college also spoke about its positive impacts for the local community through its onsite health services provision. The college has an onsite sexual health clinic and offers health advice and counselling services. The Principal commented that '*people in the area have poor health, and there are trends of high teenage pregnancies and teen obesity etc. The college has benefitted the demographic of deprived wards in the area through its holistic provision*'.

Another large urban college houses a publicly available library and resource centre and refectory on its new campus, which has led to a high level of community engagement with the college. The Finance & Estates Director of the college commented:

> *There is a lot of support from the local community…Within about six months, the pensioners who used to spend their time in the very derelict two smaller libraries nearby, which were then amalgamated to form this library, started to actually come and have their breakfast and lunch in the refectory. Actually, it started to, in a way, blend the community of the building, because a lot of them had grandchildren at the college*.

A large college in a rural location has engaged with very deprived estate which is local to the campus by working with voluntary and community groups and engaging young people to come to visit and have activities on the site they hope to encourage a sense of community ownership and also increase aspirations. The Director of Finance explained:

> *For me, the really meaningful thing is this momentum change…rather than being on a downwards spiral, as with much of [the local town] in the recession, this is on an upwards spiral. It's having a knock-on, upward, buoyant effect on all of the businesses and the communities that we work with*.

Overall, although colleges were able to point to anecdotal evidence of the positive local economic impacts of the capital expenditure projects, they often found it difficult to show any robust evidence of their impact. Indeed, many interviewees commented that it had not been indicated to them that they ought to collect evidence on this.

3.4.6 Environmental sustainability

Section summary:

- Colleges are very conscious of improving environmental sustainability across their buildings.
- The majority of case study colleges (9 out of 10) secured very good or excellent environmental sustainability rating (BREEAM rating) for their new buildings.
- Colleges have incorporated a range of sustainable energy sources into their designs, including solar panels, wind turbines, biomass boilers and rain water harvesting.
- The inclusion of sustainable energy sources does not always lead to a reduction in energy costs. However, the impact of rising energy prices may have, to some extent, disguised potential savings that have been made.
- Redeveloping listed buildings can limit the ability of colleges to deliver improved environmental sustainability.

9 of the 10 case study colleges reported that their buildings had Very Good or Excellent BREEAM ratings and in all those cases colleges commented on environmental sustainability as being a 'given' within their designs.[52] Some colleges went for ambitious environmental specifications for their projects, including: photovoltaic (solar) panels, wind turbines, biomass boilers and rain water harvesting. Others decided to go for less ambitious specifications, but nevertheless still included a significant number of environmental initiatives in their designs. Colleges which had relocated to areas more accessible by public transport also mentioned the indirect environmental benefit of reduced car journeys.

There was a mix of views on energy savings achieved by environmental initiatives. One college claimed to have made 50 per cent savings in its energy bill as a result of the new building, and felt in particular that movement-sensor lighting had made a big difference. Another college said that its gas bills were down as expected but electricity bills were the same as the new buildings put more demand on this power source and energy prices had increased. At the other extreme, a college indicated to the Research team that their per metre bills had risen substantially (and beyond what might be expected due to the increase in energy prices). Whilst they had incorporated numerous green features in their building design (including solar panels and a cedar roof), they installed energy sources expecting to develop two more phases of building, which cannot materialise in the immediate future due to a lack of funding.

[52] The Building Research Establishment Environmental Assessment Method – an environmental standard that rates the sustainability of buildings in the UK.

One large urban college which had a particularly innovative and ambitious environmental sustainability agenda in its project design managed to secure a very good grant from the Cleaner Skies strategy for introducing renewables. The building design incorporated solar panels on the front of the building and across the top of the roofs. The architect for the project said that this green approach also delivered significant build-cost savings, explaining, '*if you'd have tried to clad a building like this in marble or granite, it would have cost thousands more*'.

A large rural college was persuaded by their project architect to incorporate a wind turbine into their plans. The Finance Director explained that the turbine '*works so the wind turbine is in synergy with the ground source heat pumps. It really does provide a very cost effective situation*.' Unfortunately the college has lost records for running costs of its old buildings, so was not able to comment precisely on any cost savings realised by these sustainable initiatives, but they were confident that systems were more efficient and the buildings better to run.

Only one medium sized suburban college did not design a building with a Very Good or Excellent BREEAM score. They said that they had not received appropriate guidance on the BREEAM levels, so they did not follow these models or work towards achieving a superior BREEAM rating. They are currently looking to address this now, however, and are putting solar panels on to the building. The college now has a carbon management plan which is approved by the Carbon Trust, and the college aims to reduce its carbon footprint by 30 per cent by 2015. Other colleges which commented on limitations on delivery of sustainability objectives were ones which had redeveloped older buildings, parts of which were listed, meaning that there were design and material constraints in maximising any potential sustainability/efficiency gains through their developments.

3.4.7 Employer engagement

Section summary:

- Colleges actively manage their new buildings to improve employer engagement. They state that they have been particularly successful in doing so, particularly when the capital stock prior to investment was very poor.
- Engagement with *existing employers* appears to have improved post capital expenditure. Colleges can offer facilities that much more accurately match what employers want.
- New buildings also attract *new employers*. This engagement, in one case, happened whilst the building was in the design phase, with a catering school and restaurant being included in the design in response to employers' stated needs.
- The new buildings also engage employers in new ways, such as providing spaces for employers to host meetings and conferences.
- The new buildings also appear to provide a better environment for students to interact with industry representatives and for demonstrating that they are 'industry ready'.

All colleges pointed out that their new buildings have increased employer engagement in a number of ways. The most reported improvement has been the ability of colleges to tailor

apprenticeships and vocational courses more in line with what employers are asking for. This is because the new buildings have more up-to-date equipment and appropriate work-related space, and the college can improve employability of learners through offering real industry experience; for example, through preparing meals in a campus restaurant or serving real clients at a hairdressing salon. One medium sized college in a suburban area told us that they had specifically consulted employers as part of the design process, to ensure that the facilities would meet the employers' needs.

Colleges also point that the new buildings have given them greater visibility in the local business community, which has improved contacts, with many local businesses using college facilities to host business meetings and conferences.

One Corporate Director at a large urban college told the Research team that '*there are a lot of initiatives but no single source of evidence. The college has a '"robust strategy" for employer engagement, and we are very aware of needing to think commercially*.' The college has numerous high profile training contracts with local employers. In particular, the new campus has made a big difference for the apprenticeships delivered in conjunction with two major employers. The college previously had good working relationships with these employers, but the condition and restrictions of their previous facilities were limiting opportunities to grow. After the building work, one of these employers delivers half their Apprenticeship training at the college and half at their own site. The Principal explained, '*the old site simply wasn't meeting [employers'] needs – particularly given the current economic climate which means colleges need to work with companies in more flexible ways to provide the right courses to help upskill their workforces.'*

As well as improving established employer links, the college also responded to new employer needs. The college had closed down its catering school at one of its old sites (in a different area), and had no plans to include catering at the new campus. However, the college received feedback from local hospitality industry groups, who said they needed those skills provided locally, so the college extended its plans to incorporate a catering school with a restaurant open to public. This has proved extremely successful and the courses are very popular.

In some colleges there was little physical employer engagement at the actual site, so the Research team questioned the colleges as to whether the new buildings were necessary to achieve the benefits they were claiming, but colleges' responses were that they considered their respective image and brand as fundamental in drawing in new and maintaining existing employers. Colleges commented that they now had a brand that was worth marketing, and could attract employers from further afield and also compete with private training providers (although some did acknowledge that they could not achieve the same margins as the private sector). The principal of a large urban college gave an example of a company in a neighbouring county which came to the new campus to do bespoke AutoCAD training: "they seemed a bit apprehensive at first as to how college provision would compare with typical 'pampered' training courses they might have been used to, but feedback was very positive, so this will probably lead to further training."

Businesses are connecting with students through different channels. One large urban college explained that the new building has enabled them to host industry events which they previously would have been unable to. The Principal commented, *'students get to interact with real industry representatives. Students get to help with professional productions staged in the theatre or when music industry events are held at college.'* Another medium sized suburban college commented on their increased "credibility" with employers, as the new building can offer industry standard facilities to produce potential employees with the relevant skills and who will already be adept to

handle the demands of real workplaces. The college has seen16-18 apprentices are up 50 per cent in two years. The Principal of a medium sized urban college also emphasised the need to create the appropriate environment to secure employer engagement. That it is not only about the facilities but, through having busy, public-facing outlets, colleges can show employers that learners are 'industry ready'. The Principal said, *'We have a much, much better restaurant now…students are getting good skills and learning to work under pressure, which is what businesses want and need. We didn't have enough real customers to create that atmosphere before'.*

Employer engagement – other comments
We did an employers' open day when we first opened the building…it was an event that was exceptionally well attended.
There is now an enhanced role of employers as both customers and suppliers: the college is using employers as resource on courses as well as job opportunities for students. It's important to have a 'show piece' building, particularly in areas like engineering.
We have much more access to employers, better links with our accounts, such as the Chambers of Commerce. We host Chambers of Commerce meetings here, our market intelligence is so much richer than it ever was
You don't have the same credibility when you're in all tired, tatty buildings as you do when you are in a building like this...our links with business and our credibility with business have really improved since we've been in this building…We wouldn't have been able to entertain [e.g. business meetings] in our previous buildings.
The new building and resources it offers helps increase employer engagement as the college appears more professional
People are curious and want to come just to have a look round [at the new building], and so you use that and you get them in and you talk about the kinds of opportunities we can offer, get them interested and excited about the potential for apprenticeships or for other training opportunities for their employees.

Overall, colleges tend not to monitor their developments in employer engagement, which means there is a lack of hard evidence to support their claims. This said, it was clear that they very much aware of the concept and were actively using the new build to maximise employer engagement wherever possible.

3.4.8 Learner satisfaction

Section summary:

- College-run Student Satisfaction surveys indicate that students feel more satisfied on their courses following capital investment across a range of indicators. These surveys also appear to indicate that, following a capital build, more students intend to take a further course, including Higher Education, following the completion of their existing course.

- Colleges also note other signs of increased student satisfaction. There is less gratuitous damage, vandalism and graffiti, indicating that students take a greater pride in their environment. Also, students choose to stay on campus after hours; a sign that they enjoy being there, and something that would not have happened at colleges' old sites.

- However, a degree of caution is required in interpreting these findings. It should be noted that college based student satisfaction surveys do not tend to be randomly sampled. They also do not ask direct questions about the learning environment and, in many cases, are not site-specific. It is therefore difficult to be confident of their reliability and the extent to which they can be used to directly infer the impact of changes to the physical environment of learners.

- That said, one college's survey that was site specific and where the capital project did not involve other significant concurrent changes (such as curriculum change or relocation) may be used more reliably to infer the impact of capital expenditure in that college. The survey showed sharp increases (of around 20 per cent) in student satisfaction between 2007/08 (immediately before the capital project) and 2010/11 (a year after project completion).

As indicated in Section 3.4.3 colleges have indicated that one of the main goals of their capital expenditure projects has been to make their colleges more attractive to learners. College survey evidence shows satisfaction increasing among students across a range of indicators (both at induction and on courses) following completion of capital projects.[53] This includes students feeling safer on campus and more satisfied on courses – in terms of teaching and personal development – since the completion of their colleges' respective capital projects. These surveys appear to indicate that colleges have successfully increased learner satisfaction as a result of their capital builds.

There is also evidence to show that learners take a greater pride in the new buildings, with less gratuitous damage, vandalism and graffiti. A number of colleges also pointed to the fact that many students are now choosing to stay on campus after hours; a sign that they enjoy being there, and something that would not have happened at colleges' old sites.

Colleges also commented that the improved facilities and overall curriculum delivery meant that more students were being given the skills and experience to progress to Higher Education or skilled professions. This is reflected to some extent in student satisfaction surveys provided by some colleges, which show an increase in the number of learners who said they intended undertaking a further course after completion of their current one. However, to fully ascertain whether students do progress to Higher Education would require a mechanism for following students after they have completed their college courses, and would require an alternative evidence collection approach.

[53] This evidence is drawn by the student feedback surveys conducted by individual colleges.

A degree of caution is required in interpreting these findings. It should be noted that these student satisfaction surveys do not tend to be randomly sampled, so it is difficult to be confident of their reliability. Further, most of the student surveys undertaken by colleges which the Research team saw did not ask students direct questions about their learning environment (in terms of physical surroundings) so it is difficult to directly infer that the buildings are the key driver of improved satisfaction. Finally, in most cases, surveys conducted by colleges were not site-specific, so any results would have been distorted by those from other campuses.

One medium sized suburban college which undertakes a variety of feedback mechanisms with learners (surveys, forums, group discussions) reported that satisfaction had increased since the opening of their new campus. Staff reported that open spaces for learners were particularly popular as they allowed students to integrate with individuals from other areas, promoting tolerance. The Principal commented, '*there are lots of different types of people mixing [now]…where before, certainly some of those were separate. But they've all really gelled very, very well and I'm sure the environment has facilitated that*.'

Learner satisfaction – evidence of impact

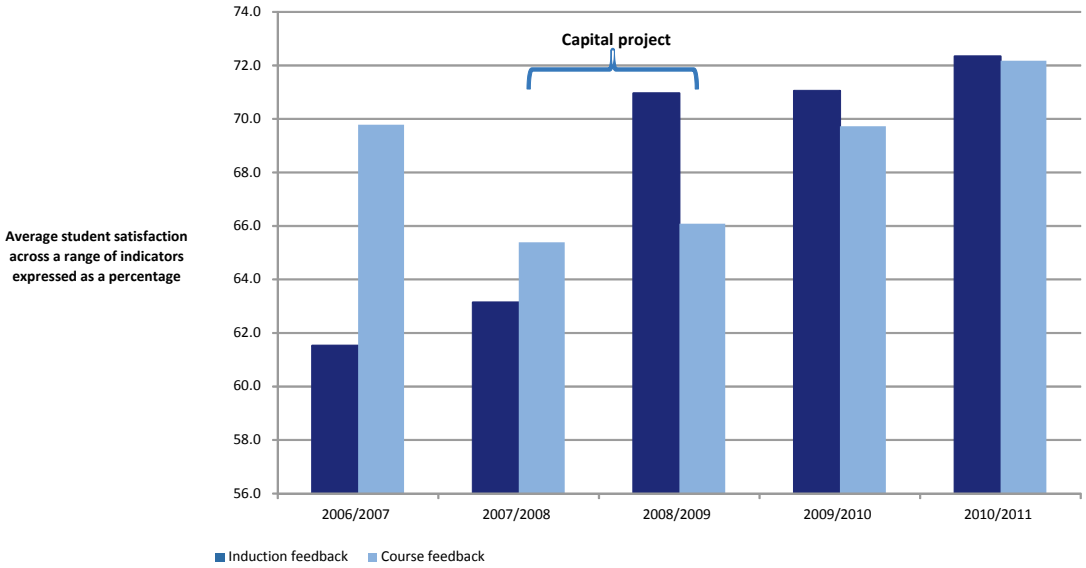
A college in a central urban location cited improving estate condition as the primary rationale for its capital expenditure project. The investment involved demolishing its previous accommodation and creating a new building on the same site. Staff commented that both participation and retention rates at the site had been falling due to the 'appalling' building condition and learner satisfaction was notably declining. The college draws the vast majority of its onsite students from outside catchment areas, and so relies heavily on being able to attract students to travel to it.

Unlike many colleges, this college conducts site-specific induction and course surveys of its learners. And, as the college's project did not involve relocating or drastic curriculum changes, it could be expected that any variations observed in the surveys can be linked to a large extent to the new building. In particular, the surveys showed sharp increases in student satisfaction in categories covering learning environment and equipment, and overall enjoyment, which had improved by around 20 percentage points between 2007/08 (immediately before) and 2010/11 (a year after project completion).

The survey results reflect the evidence provided by the college, as demonstrated in the illustrative figure below.[54] The figure shows learner satisfaction on courses falling before the capital expenditure project and then starting to rise again following its completion; and learner satisfaction at induction increasing sharply after the project. This also emphasises the need, as noted elsewhere, to consider impacts of capital projects compared against a forecast of decline rather than one of improvement or constancy.

[54] This chart is for illustrative purposes only. As the information sources are not publicly available and were shared confidentially by the college, the underlying data cannot be disclosed.

Figure 10. Illustrative example of the impact of a capital project on learner satisfaction



Source: Frontier analysis of student satisfaction feedback survey results 2006/07 to 2010/11 (inclusive)

3.4.9 Estate condition and efficiency

Section summary:

- The condition of estate at the new sites has dramatically improved as a result of capital expenditure projects. Moreover, the condition of the buildings is being maintained well, such that they still look brand new two to three years after opening.
- Estate utilisation also appears to have increased following capital expenditure projects. This appears to be particularly true for colleges that disposed of old sites and relocated to new sites as part of their project.
- Improved estate efficiency has been driven by better space utilisation between 9am and 5pm on weekdays, for example new buildings enable larger class sizes, more flexibility of use to facilitate a greater variety of courses and better timetabling. The use of Wi-Fi also means that space previously assigned to IT rooms is no longer required and can be better utilised. Improved efficiency has also driven by better utilisation outside of teaching hours. The new buildings are better designed to meet the standards for external organisations to hire them. This includes use by the local council and businesses, events hire and use by HE colleges for evening classes. The development of historical or listed buildings may constrain the utilisation benefits that can be derived.
- Case study colleges presented mixed views on the maintenance costs of new buildings. On the one hand, colleges indicated that maintaining a new building, designed with better quality and more durable materials was easier. On the other hand, colleges stated that maintaining a brand new building, particularly given its increased use, can be expensive. Furthermore, capital projects that involved maintenance of an historical or listed building did not have the effect of reducing maintenance costs, in the same way as new builds. Finally, three colleges

commented on issues with their respective Building Management Systems (BMS), which had negatively affected efficiency cost savings. In general, colleges were not able to be precise about maintenance costs of specific buildings in their portfolio and were therefore not able to make a like-for-like comparison of costs with the old estate, not least as many had abandoned a maintenance programme.

Estate condition

As noted earlier, the main rationale for the case study capital expenditure projects was the need to improve very poor estate condition. All colleges interviewed spoke about the importance of having buildings better designed around curriculum delivery, and that modern, flexible spaces were essential to being able to adapt to changing needs.

The condition of estate at the new sites has been dramatically improved as a result of capital expenditure projects. Moreover, the condition of the buildings is being maintained well, such that they still look brand new two to three years after opening. This is, in part, down to the fact that the new campuses are better respected by learners and less damage, graffiti and vandalism occurs.

Space utilisation

Space utilisation was found to increase following capital expenditure projects. This seems to be particularly true for colleges that rationalised their estates by disposing of old sites and relocating to new sites. The Estates Director of a large suburban college remarked, 'occupation is pretty high – it's doing what it should have done…you can walk round [the new site] in fifteen minutes; you'd need an hour to walk round [the old one]. From an operational point of view it's easier to run.' One case study college saw space utilisation within teaching hours increase from 20 per cent to 40 per cent. Utilisation outside of teaching hours has also increased substantially as business and other users take advantage of the more attractive surroundings.

The Estates Manager at a large urban college said that there was much better space utilisation in the new building. He gave the example of having Wi-Fi everywhere post-project compared with the pre-project situation where there were fixed IT rooms only. Fixed IT rooms had only seen utilisation of around 20 per cent and so overall space was being better utilised by their absence. The Finance Director of another college commented, '*the new building enables larger class sizes and a greater variety of courses – different lengths and timings etc., plus better timetabling, so there's much more efficient use of space and time now*.'

One college which had consciously chosen to invest in and develop a historical building, it had anticipated and allowed for certain constraints on efficiency and utilisation in the protected parts of the building – for example, not being able to fix things to walls so having completely free standing catering equipment, as well as having to build internal cubes which reduced space. However, the college considered this to be a relatively minor concern when compared with the other benefits of developing the site, and in some ways by keeping internal fittings temporary allowed for more flexibility in the long term.

A number of colleges specifically commented on their respective new buildings now meeting the standards for external organisations to hire spaces out e.g. local councils and businesses, which has created further space utilisation opportunities. However, as one Project Director pointed out,

official space utilisation figures drastically understate the improvements that their college has seen, as they only capture space utilisation between normal working hours, and do not capture not all the types of utilisation benefits (out of hours activities and hiring spaces out for events at weekends, or renting rooms to local adult HE college in the evenings) that new campuses have delivered.

Some colleges had also designed spaces to allow for future growth, so they were conscious they had not yet achieved optimal utilisation, and expected this to improve further in coming years. One Project Manager further cautioned that high rates of utilisation do not necessarily mean that the space is being managed effectively – they could indicate overcrowding, for example – so other measures, such as out of hours use and flexibility of space to allow for future curriculum changes do need to be borne in mind when assessing estate efficiency.

Maintenance costs

Case study colleges presented mixed views on the maintenance costs of new buildings.

On the one hand, colleges indicated that maintaining a new building, designed with better quality and more durable materials was easier. One college said it expected that maintenance costs had fallen in square metre terms by about 25 per cent. The Finance Director at another college commented, '*generally speaking, to run a building that is a little bit older, you're probably talking £60-£70 per square metre. For a modern building, we're talking £45 per square metre. So, we're very conscious of the fact that there is an expectation to live within a budget on an operational basis*.' One large urban college said that they had reduced overall running and maintenance costs by 30 to 50 per cent and energy bills by 50 per cent compared with their old sites. Another large urban college said that the greater functionality of the building, together with outsourcing of hard and soft facilities management across the estate, has enabled the college to reduce pay costs within the estates team by over £200k, and that the college has achieved overall savings of around 35 per cent in pay and 20 per cent in non-pay costs, particularly in respect of energy costs.

On the other hand, colleges stated that maintaining a brand new building, particularly given its increased use, can be expensive. One college thought that premises costs had increased a bit due to the need to constantly clean and maintain the grounds, but they could not provide exact data on heating, cleaning and premises costs. Furthermore, capital projects that involved maintenance of a historical or listed building did not have the effect of reducing maintenance costs, in the same way as new builds. At one suburban college, local residents successfully campaigned for one of the existing buildings on the site to be registered as a listed building during development, so the college were not given permission to knock it down as they had planned. As a result, they now have to maintain it, which is extremely costly. The Principal said, '*torrential rains recently caused a roof leak and it cost us over £30,000 to repair it, just to facilitate a building that is actually serving no purpose to anybody. It's surplus to college requirements, but we are having to maintain it.*' The college is currently exploring the possibility of selling the building to the local authority.

Three colleges commented on issues with their respective Building Management Systems (BMS), which had negatively affected efficiency cost savings.[55] In two cases this was because

[55] Building Management Systems are computer-based control systems installed in buildings that control and monitor a building's mechanical and electrical equipment, such as power systems, fire systems, security systems, lighting, and ventilation.

colleges did not have the technical knowledge to be able to operate the systems effectively and had underestimated the time needed to do so, although they felt that they were getting this right now. In the third case the impacts have been more serious. The college has seen its energy costs increase, partly because of prices increasing, but mainly because of BMS issues. The system was more complicated than the college had anticipated, and they are still unsure of whether the system is faulty. They think that the main issue is that they installed a system intended to serve a further phase of development. As such, the college is currently heating water for a system which only serves a small proportion of the space it was designed for. The college is still planning to continue the development, after which long-term cost savings may be achieved by the system operating at capacity, although this may be several years to completion. The short- to medium-term impacts on energy costs are negative, as the system was meant to serve an additional building.

In general, colleges were not able to be precise about maintenance costs of specific buildings in their portfolio and were therefore not able to make a like-for-like comparison of costs with the old estate, not least as many had abandoned a maintenance programme. As one college Principal pointed out, their old building was in such disrepair that the college '*limited the amount of maintenance going in as it was money straight out the door.*'

Estate condition and efficiency – other comments
The thing about the new building is that it actually used very effective flexible space with the use of an in-situ frame. The in-situ frame allowed all the floor plates to be opened up. So, almost like a department store. There is a preferred configuration for the college in terms of how it's used, but that doesn't have to be the case at all. The whole thing can be stripped out. So, if we did end up with open plan learning areas in the future, that would be part of the design flexibility and adaptability.
We can use <u>all</u> of the campus now...homogenous classrooms – generic teaching space – which is much more flexible, we can move faculties around.
There was loads of asbestos in [the] old buildings meant it was really difficult to reconfigure any rooms, it was difficult to make any internal changes or improvements… We couldn't even put notices on walls because of the risk of asbestos, which was really problematic and very, very expensive. The new building has been able to absorb 18 per cent more students even without expanding. We can do more and also the way it was designed, we're making more efficient use of the space, perhaps than we were previously and there is capacity for growth on top of that.
[The buildings] have all got energy management system connections…we've got very centralised energy management controls across all of the buildings…Of course the old buildings didn't have that kind of sophisticated energy management systems which meant they were very much more difficult.

3.4.10 Staff retention and recruitment

Section summary:

- Colleges report some change management issues with staff, despite consultation processes. These changes tend to focus on dissatisfaction with the new teaching environment, lack of a common room and loss of parking spaces. However, in most cases, staff did adapt to the new environments.
- Capital expenditure projects are often accompanied with wider rationalisation strategies, leading to job losses, but very few staff left due to dissatisfaction with the building.
- Capital expenditure projects appear to have made it significantly easier for colleges to recruit staff and to attract higher quality staff. Whilst, colleges recognise that the economic environment has clearly paid its part in increasing the number and quality of applicants for positions, colleges feel fairly confident that the buildings alone have made an important contribution. There are many possible reasons for this, but they include the improved safety of the college environment, better transport links and better teaching equipment.

Colleges reported having consultation approaches with their staff and other stakeholders before and during project implementation. However, in most cases there tended to be some relocation or change management issues with staff. The main issues reported were:

- dissatisfaction with the new teaching environments (such as open-plan layout and virtual learning blackboards);
- lack of a common room; and
- loss of car parking spaces.

Most colleges indicated that staff did adapt to the new environments.

A large urban college explained that there was a certain amount of resistance by staff to the changes, and in particular that staff didn't like the open-plan layout. But the college had made a conscious decision to make staff, as well as students, more visible and so help create a more 'integrated culture'. The college firmly believes that better design influences and enables better control and management of student behaviour, which in turn makes teaching easier and more enjoyable. They felt it was important to make staff offices open-plan to encourage better communication and idea sharing.

In many cases a wider estate rationalisation strategy had led to necessary streamlining of jobs, but very few staff left specifically because of dissatisfaction with the new building.

Colleges reported significantly improved rates of recruitment and the ability to attract the higher quality teaching staff. Colleges attributed this largely to the improved reputation of their colleges resulting from the new buildings and the immediate attractiveness of the new buildings as places

to work in. However, there were concessions that this impact could be partly owing to the economic downturn having made the job-market more competitive in any event.

A large urban college said that the new building has helped improve the reputation of the immediate area (in which both students and staff had previously reported feeling unsafe) which has probably made it easier to attract quality staff. There was no specific evidence to support this, although staff were reporting that they feel much safer getting to the site now. The college Principal said, '*there is a much more integrated environment now….a much more of a community type feel*'. The Finance Director further explained: '*The teaching experience has been improved – I hear from colleagues that things are completely different now… The improved design and layout of new building also affords much better child protection. The college now has the ability to lock down and secure certain areas of the building which makes a big difference for staff*.'

In terms of recruitment, a large urban college which had relocated to a site with much better transport links said that improved accessibility had helped widen their recruitment pool, as the only way for most staff to reach their old sites was by car. The Corporate Director commented, '*the new building is a big pull and influence on retention– people want to work there*.' The Principal gave a recent example of the college having over 100 applications for a part-time receptionist job at the college, saying '*this was unprecedented. Admittedly, the recession and slow job market skews this impact slightly, but anecdotally I would confidently say that the new campus has improved recruitment and retention, and the ability to attract and select from the best*.'

For a large rural college the key impact of their capital project in this area was in protecting the jobs of employees they already had, and that increased learner numbers at the site had helped create opportunities for new staff in an area of high unemployment and economic deprivation. The Finance Director commented:

> *Recruitment has been made easier…as the college is now a site where most people would be happy to work with pride. I think with the financial hardships that have now hit the education sector, without this turn-around, the whole college would have gone under. Therefore I think it's safeguarding; it's safeguarded all the jobs that we have*.

A medium sized suburban college said they found impact on staff recruitment hard to measure as the college is aware of the number of job cuts in the area and appreciate this will have impacted on the overall number of applicants per vacancy, although said that the number of applications per job vacancy since the new building opened has increased significantly. Staff retention and satisfaction was reported to be higher as staff are happy with the level of facilities they have been provided to work with, and that this has also enabled staff to improve their skills and help with career development. The Director of Curriculum commented:

> *I think the staff appreciate the industry standard facilities, I mean, on the same token having those facilities delivered to teach the learner has contributed to their happiness, or satisfaction. Chefs or other lecturers who felt that they were limited by the facilities, can now do whatever is necessary and that's quite liberating for a lot of people. People are building their skills here…which is really positive*.

A medium sized urban college said that the new building was an opportunity to '*shake-up'* worn-out approaches and low motivation levels amongst staff, which was understandable given the

dilapidated estate, poor facilities, and falling success rates of the college. The Principal said that the new building:

> *requires people to work very, very differently, and it took long time to get used to. Some staff didn't or weren't prepared to adjust and left. Part of the problem was that people weren't used to having such beautiful facilities and equipment. People were treating it like a classroom. But we wanted it to be professional. And now we have this because of this state-of-the art professional environment we have now, we can recruit higher quality staff*.

For example, the college has recently recruited a new creative arts manager who comes with real industry knowledge rather than just an educational background, which the college feels is important in getting learners industry-read and encouraging higher levels of aspiration.

3.4.11 Project planning and procurement

Section summary:

- In general colleges seem to be very proficient at implementing large scale investments and follow effective processes. Most colleges used established construction and design frameworks to recruit contractors for the projects. Most colleges visited 2-3 other colleges to gain insight about best practice and design ideas, before embarking on their respective projects.
- There appear to be three key factors to successful project planning and implementation:
    - consistent and thorough communication and consultation but retaining sight of the overall vision and goals of the expenditure;
    - a strong leadership team; and
    - oversight from a curriculum perspective.
- In a few cases colleges reported that, despite their efforts at positive stakeholder engagement processes, there were various obstacles and issues. These obstacles relate to planning issues, historical and listed buildings, political obstacles and, in one case, the identification that the college sat on an ancient Saxon site.

In general colleges seem to be very proficient at implementing large scale investments and follow effective processes. The majority of colleges the Research team spoke to already had experience in undertaking capital projects and benefitted from continuity of the college's leadership team across projects. Colleges undertaking further phases of their capital development strategies said that they would apply any lessons learned to forthcoming projects. Most colleges used established construction and design frameworks to recruit contractors for the projects. One college which had not, regretted that; in retrospect, they could see it would have saved time and money.

Most colleges mentioned visiting 2-3 other colleges to gain insight about best practice and design ideas, before embarking on their respective projects. Half of the colleges themselves have been visited by other colleges since completion of their own projects, and one college was particularly proactive about dissemination of good practice, and had organised their own seminar

for other colleges and stakeholders about their project. However, there is scope for a more systematic and centralised means for colleges sharing knowledge and learning from each other's experiences.

The key factors to successful project planning and implementation reported were:

- **Consistent and thorough communication and consultation** across staff, learners and other stakeholders, including engagement with local council, community and other local groups where appropriate, but ensuring that vision and goals are not lost.

- **A strong leadership team** either from within the college itself or under a project director appointed by the college; and

- **Oversight from a curriculum perspective** – either having a curriculum director on the project team, or ensuring close partnership between capital and curriculum teams, to ensure that buildings were truly fit for purpose.

One large urban college was particularly thorough in its consultation and planning process to ensure the project ran smoothly. The Estates Manager explained:

> *there was constant consultation, and we did a huge marketing drive, as well as continual internal communications – including timelines, planning of relocation of different departments etc. down to the finest details to keep everyone in the loop...We even created a relocation database and had designated 'move champions' for different faculties*.

One college also consulted feeder schools to get their input. The Estates Manager explained, *'we had some workshops with students coming in and [we asked them], 'When this opens, you'll be the students that come in, what is it that you'd like? How would you like it to work?' We listened to them. They particularly influenced the refectory style service that we offer at [the new site]'.*

A few colleges cautioned against over-consultation, however. The Finance Director of a rural college said, *'what you don't do is invite 50 staff to give their views as to how it should be because you just get 50 different opinions. It doesn't work, someone has got to be bold enough to say, 'Okay, this is what our buildings are going to look like and these are the things that matter'.* The Project Director at another college said, *'It was important to have a robust project structure to ensure things ran smoothly but there is fine line between the need to involve people, and take on their current wishes, but also having to bear in mind what future will look like – in terms of curriculum/policy etc…And you can't keep making changes within the process'.*

Colleges consistently commented on the importance of having a strong and committed leadership team within the college, even though there was a significant amount of outside advice used by most colleges. One urban college admitted that they *'underestimated the amount of management time needed, which was stressful'*. Another college indicated that they had used nearly a third of the total project funding on external adviser fees and regretted this. They would consider changing their approach in undertaking future projects. Several colleges also emphasised the need to involve curriculum leaders in the project team, to ensure that building would actually perform on a practical level. One Principal commented, *'close links between the capital project team and the curriculum people in the college [were important] because one of*

the key objectives was not necessarily to expand the prepped provision, but to improve the quality of the provision and to improve the environments for existing provision'.

A number of colleges mentioned the importance of support from local councils and key members from the local business community for ensuring successful project implementation. Other colleges also commented on the importance of support from their local communities. The Director of Finance at a rural college commented, *'the local community was incredibly supportive about this project. It was a bit of a delight, really. Because as you may well be aware, when you try and do anything, you put your head above the parapet…you seem to attract more criticism rather than support. Whereas this was a bit of an exception to that rule…The local planning committee in particular were phenomenally supportive about this development going forward and the transformative impact it could have on the community'.*

In a few cases colleges reported that, despite their efforts at positive stakeholder engagement processes, there were various obstacles and issues. These included the local council of an urban college granting planning consent on the condition that the college gave up a considerable portion of an already tight site for residential development. A rural college reported facing particular objections from a local MP as well as local residents. One college faced a campaign for its original building to be listed, which would have prevented the whole project going ahead. Fortunately this did not happen; although, as mentioned in Section 3.4.9 above, one college did have a building within its site listed during development with various negative cost implications. Development was also delayed by several months for another college to allow for archaeological digs, as it was discovered that the campus sat on an ancient Saxon site.

3.4.12 Capital / resource interaction

Section summary:

- There is not a uniform link between expenditure on capital and expenditure on resource costs.
- Some colleges indicated that expenditure on capital had allowed them to make one-off savings in revenue costs through estate and staff rationalisation. Colleges have also sought to make energy savings in their new buildings, but this is also a mixed picture.
- Other colleges have indicated that resource costs have increased, for example to maintain the attractiveness and high spec of the new building. These colleges saw the additional resource cost as part of the investment required to get the outcomes they were looking for.
- Overall, there is very little concrete evidence about like-for-like resource costs on which to base this assessment.

As indicated in Section 3.4.1 all case study colleges had a clear plan for their capital expenditure. All colleges were aware of the resource implications of their investments. However, there was not a uniform response that capital investment in their projects would deliver resource savings. Many colleges reported 'one off' savings in pay costs as a result of estate rationalisation facilitated by their capital expenditure projects, although rationalisation of estate could have been achieved through other means. Some colleges looked to make energy savings from the outset and believe these have or will materialise. As mentioned in Section 3.4.9 one

urban college reported overall savings of around 35 per cent in pay and 20 per cent in non-pay costs at its site, particularly in respect of energy costs – the Energy Performance Asset Rating for the building is now very good. The Finance Director of a rural college, who reported that their new building is less expensive to run, pointed out, *'it's important to the college to have these funds available to be redirected to our frontline services*.'

On the other hand, colleges talked of the need to allow for increased resource costs in order to maintain the attractiveness and high spec they wanted from their new building. These colleges saw the additional resource cost as part of the investment required to get the outcomes they were looking for.

In most cases, it was also difficult for colleges to make direct comparisons between previous and current maintenance costs because they had started reducing the amount they spent on these as the estate had been deemed too difficult or not worth maintaining. As the Finance Director of a suburban college explained, *'maintenance costs have shifted from continually patching things up to needing to ramp up plans for preventative maintenance, like painting. Before there was no point spending money on cleaning. Now we're continually cleaning painting to ensure everything is kept brand new.'* Another rural college could not provide exact data on estate running costs, but said they had been trying to keep premises costs at their original levels. However, they think costs have increased as there is now more need of "more cleaning and maintaining the grounds".

Again, there was limited hard evidence on changes in resource costs associated with each project.

3.4.13 Additionality

Section summary:

- Additionality is the extent to which an activity is undertaken on a larger scale (or at all), or to a better standard, due to public sector intervention.
- There is not a culture of measuring additionality of projects in this way, which makes it extremely difficult to understand additionality ex-post. However, several facts are of pertinence to this discussion.
    - Firstly, the total amount spent on capital expenditure projects has changed in line with LSC and Skills Funding Agency funding availability. This indicates that, colleges do not appear to be able to fund projects in the absence of this funding.
    - Secondly, some colleges had embarked on phased projects and have been unable to complete the later phases without LSC or Skills Funding Agency funding. This is a further indication that colleges are not able to substitute government funds with other sources of funding.
    - Thirdly, nearly all case study colleges said they could not have carried out their project to the full specification without the LSC/Skills Funding Agency funding component and some said they would not have attempted a project on a substantial scale at all.

- In sum, it does not appear that LSC/Skills Funding Agency funding crowded out other potential sources of funding. In fact the likelihood is that the availability of this funding led to colleges being more confident in putting forward larger scale projects and to seek other sources of funding to support the project.

A precise definition of the additionality of the LSC's or the Skills Funding Agency's intervention in a college would be to consider its net impact after taking into account what would have happened in the absence of the funds. Additionality is the extent to which an activity is undertaken on a larger scale (or at all), or to a better standard, due to public sector intervention. There is not a culture of measuring additionality of projects in this way, which makes it extremely difficult to understand additionality ex-post.

However, several facts are of pertinence to this discussion.

- Firstly, as indicated in Chapter 2 the total amount spent on capital expenditure projects has changed in line with LSC and Skills Funding Agency funding availability. The college census included capital expenditure projects that colleges had funded themselves (for which approval had been granted), but very few of these projects were identified. This indicates that, colleges do not appear to be able to fund projects without government funding.

- Secondly, some colleges had embarked on phased projects and have been unable to complete the later phases without LSC or Skills Funding Agency funding. This is a further indication that colleges are not able to substitute government funds with other sources of funding.

- Thirdly, nearly all case study colleges said they could not have carried out their project to the full specification without the LSC/Skills Funding Agency funding component and some said they would not have attempted a project on a substantial scale at all. The counterfactual for these colleges would have been to either continue with the older buildings carrying out repairs and maintenance work or a smaller scale build equal to the funds they could self-generate. For example, funding could have been found from sales of land that were being held for future projects or money could have been borrowed. However, a number of colleges mentioned being cautious about taking large loans to fund projects. The Finance Director of a large urban college said that borrowing more would have put the college in '*a precarious position financially*' and a Finance Director from medium sized suburban college said that, even if the college had wanted to borrow more money, it could have been difficult to get internal approval, as '*the governors wouldn't have felt comfortable.*' Colleges also pointed out that drawing on estate disposals or securing bigger loans would ultimately have limited future projects within their overall estates strategies, and would simply have been a displacement of funds.

Additionality – comments
The capex grant was essential to the survival of college…Without the grant we probably wouldn't have done anything – it would have been financially impossible…And it gave us that push to be able to do something ambitious.
If we hadn't had the grant, we wouldn't have taken the risk to do [the project], but the old building wasn't capable of refurbishment – it would have had to have been levelled to ground.
The grant enabled us to get better quality, and better value for money. Without it, it would have been much, much more difficult.
We are living proof that it does impact, and it does enable you to improve the quality of teaching and learning, and it does enable you to engage with young people and adults in a way that you wouldn't if you hadn't invested the levels, the quality of resource.

In sum, there is little doubt that LSC grant funding did not crowd out any other potential sources of funding. In fact the likelihood is that the availability of LSC potential funding led to colleges being more confident in putting forward larger scale projects and to seek other sources of funding to support the project.

One large urban college which secured (minor) grants from its RDA and the ERDF commented that, applying for these on the basis of being awarded the LSC grant signalled that it was a *'worthy investment'*, and in turn this helped raise interest of local partners and businesses in the project.

3.5 Summary of findings

The main aim of the qualitative case studies was to explore and inform non-quantifiable indicators of impact, and to understand the processes that helped projects to be successful. The key findings across each of the case study themes identified in Section 3.3.2 are set out below.

3.5.1 Contextual and background information

Case study colleges had fairly comprehensive estate strategies with a number of phases. Case study projects tended to represent one phase of that strategy. Colleges draw on the experience of other colleges when embarking on capital expenditure projects and appear confident in their approach to managing and executing these projects

3.5.2 Project rationale and objectives

The main rationale for projects is the need to improve very poor estate condition. Estate condition is frequently inappropriate for the requirements of specialised courses and for responding to employers' needs. In some cases there was also a clear need to improve accessibility.

Project objectives are strongly linked to the rationale of improving poor estate condition and maintaining or increasing learner numbers and performance. There was also a focus by colleges on widening participation to engage with NEETs and other disenfranchised young people. Colleges also frequently had a separate objective focused on generating income from their new buildings.

3.5.3 Project impact and evaluation

Projects appear to have led to a range of different impacts, summarised below.

- **Learner participation and performance:** Increases in participation were a focus for investment and colleges tend to have met or exceeded growth targets for learner participation at a site specific level. Increases in participation have occurred in a large part due to curriculum improvements. Post capital expenditure, colleges can offer new courses with high quality facilities as well as offering better facilities for existing courses. Colleges have also focused on widening participation to disenfranchised groups with relocation of college buildings playing a key role here.

    - Most colleges also reported improvements in success rates and retention rates following their capital expenditure project. However, a number of colleges said that other effects on the college, present at the same time, undermined this. Colleges emphasise that success rates would have declined had the capital expenditure not have occurred, so before-after comparisons do not provide the full picture.

- **Local economic impact:** Colleges are aware of the impacts of their project on the local economy, but these impacts did not tend to be a key driver of the project. Colleges recognise the role they can play in leading economic regeneration of areas and several case study projects have played an important role in this regard. The economic regeneration stimulated can be of direct benefit (employing staff in the college) as well as indirect benefit (stimulating investment from other businesses). Colleges also find that the new buildings lead to better community engagement and, in fact, the college facilities can offer a route achieving wider government goals, such as improving the health of the local community, for example by providing onsite health clinics.

- **Environmental sustainability:** Colleges are very conscious of improving environmental sustainability across their buildings. The majority of case study colleges secured very good or excellent environmental sustainability rating (BREEAM rating) for their new buildings. Colleges had incorporated a range of sustainable energy sources into their designs, including solar panels, wind turbines, biomass boilers and rain water harvesting. But, the inclusion of sustainable energy sources has not always led to an observable reduction in energy costs. Colleges point out that the impact of rising energy prices may have, to some extent, disguised the savings that have been made. However, savings have been made when compared against the counterfactual of an old building and higher energy prices. It should be noted that projects which have focused on redeveloping listed buildings have not been able to deliver the same levels of improved environmental sustainability.

- **Employer engagement:** Colleges actively manage their new buildings to improve employer engagement. They state that they have been particularly successful in doing

so, particularly when the capital stock prior to investment was very poor. Engagement with existing employers appears to have improved post capital expenditure. Colleges can offer facilities that much more accurately match what employers want. New buildings have also attracted new employers. This engagement, in one case, happened whilst the building was in the design phase, with a catering school and restaurant being included in the design in response to employers' stated needs. The new buildings also engage employers in other ways, such as providing spaces for employers to host meetings and conferences. They also appear to provide a better environment for students to interact with industry representatives and to demonstrate to potential employers that they are 'industry ready'.

- **Learner satisfaction:** College run Student Satisfaction surveys indicate that students feel more satisfied on their courses following capital investment across a range of indicators. These surveys also appear to indicate that, following a capital build, more students intend to take further courses, including Higher Education courses, following the completion of their existing course. However, a degree of caution is required in interpreting these findings. It should be noted that college based student satisfaction surveys do not tend to be randomly sampled. They also do not ask direct questions about the learning environment and, in many cases, are not site-specific. It is therefore difficult to be confident of their reliability and the extent to which they can be used to directly infer the impact of changes to the physical environment of learners. That said, one college's survey that was site specific and where the capital project did not involve other significant concurrent changes (such as curriculum change or relocation) may be used more reliably to infer the impact of capital expenditure in that college. The survey showed sharp increases (of around 20 per cent) in student satisfaction. Colleges also note other signs of increased student satisfaction. There is less gratuitous damage, vandalism and graffiti, indicating that students take a greater pride in their environment. Also, students choose to stay on campus after hours; a sign that they enjoy being there, and something that would not have happened at colleges' old sites.

- **Estate condition and efficiency:** The condition of estate at the new sites has dramatically improved as a result of capital expenditure projects. Moreover, the condition of the buildings is being maintained well, such that they still look brand new two to three years after opening. Estate utilisation also appears to have increased following capital expenditure projects. This appears to be particularly true for colleges that disposed of old sites and relocated to new sites as part of their project. Estate utilisation benefits are driven by better utilisation between 9am and 5pm on weekdays, for example new buildings enable larger class sizes, a greater variety of courses and better timetabling. They are also driven by better utilisation outside of teaching hours. The development of historical or listed buildings may constrain the utilisation benefits that can be derived. Case study colleges presented mixed views on the maintenance costs of new buildings. On the one hand, colleges indicated that maintaining a new building, designed with better quality and more durable materials was easier. On the other hand, colleges stated that maintaining a brand new building, particularly given its increased use, can be expensive. Furthermore, capital projects that involved maintenance of a historical or listed building did not have the effect of reducing maintenance costs, in the same way as new builds. Finally, three colleges commented on issues with their respective Building Management Systems (BMS), which had negatively affected efficiency cost savings.

- **Staff recruitment and retention:** Colleges report some change management issues with staff as a result of capital projects. However, in most cases, staff adapted well to the

new environments. Capital expenditure projects are often accompanied with wider rationalisation strategies, leading to job losses, but very few staff left due to dissatisfaction with the building.

Capital expenditure projects appear to have made it significantly easier for colleges to recruit staff and to attract higher quality staff. Whilst, colleges recognise that the economic environment has clearly paid its part in increasing the number and quality of applicants for positions, colleges feel fairly confident that the buildings alone have made an important contribution. There are many possible reasons for this, but they include the improved safety of the college environment, better transport links and better teaching equipment.

- **Additionality:** additionality is the extent to which an activity is undertaken on a larger scale (or at all), or to a better standard, due to public sector intervention. There is not a culture of measuring additionality of college capital projects in this way, which makes it extremely difficult to understand additionality ex-post. However, several facts are of pertinence to this discussion. Firstly, the total amount spent on capital expenditure projects has changed in line with LSC and Skills Funding Agency funding availability. This indicates that, colleges do not appear to be able to fund projects in the absence of this funding. Secondly, some colleges had embarked on phased projects and have been unable to complete the later phases without LSC or Skills Funding Agency funding. This is a further indication that colleges are not able to substitute government funds with other sources of funding. Thirdly, nearly all case study colleges said they could not have carried out their project to the full specification without the LSC/Skills Funding Agency funding component and some said they would not have attempted a project on a substantial scale at all.

  In sum, it does not appear that LSC/Skills Funding Agency funding crowded out other potential sources of funding. In fact the likelihood is that the availability of this funding led to colleges being more confident in putting forward larger scale projects and to seek other sources of funding to support the project.

3.5.4 Project planning, procurement and implementation

In general colleges seem to be very proficient at implementing large scale investments and follow effective processes. Most colleges used established construction and design frameworks to recruit contractors for the projects. Most colleges visited 2-3 other colleges to gain insight about best practice and design ideas, before embarking on their respective projects.

There appear to be three key factors to successful project planning and implementation:

- consistent and thorough communication and consultation but retaining sight of the overall vision and goals of the expenditure;
- a strong leadership team; and
- oversight from a curriculum perspective.

In a few cases colleges reported that, despite their efforts at positive stakeholder engagement processes, there were various obstacles and issues. These obstacles relate to planning issues,

historical and listed buildings, political obstacles and, in one case, the identification that the college sat on an ancient Saxon site. Such issues caused delays which in most cases led to increased costs and compromised certain aspects of the respective projects, such as space utilisation. However, in general, colleges affected by such issues did not feel that they had had a substantive impact on project outcomes and, in some cases, they had been anticipated as calculated risks (e.g. when opting to restore a listed property). As mentioned in the Maintenance Costs section, only in one case where a college was refused permission to demolish a listed building on its site, is it facing on-going, unanticipated costs.

4. Synthesis of quantitative and qualitative analysis

Chapter summary

- The previous chapters describe the quantitative and qualitative research that has been undertaken as part of this study. This chapter draws together the analysis from these strands of research to develop a rounded picture of the impact of capital expenditure projects.

- Quantitative analysis of the type described in this report is extremely valuable as it provides an estimate of the impact of capital expenditure per £1 million spent on a number of alternative outcome variables. The results are generated using a robust specification which includes an implicit counterfactual. This provides a picture of the extent to which the expenditure improves outcomes compared to what would have been expected in its absence.

- The qualitative analysis provides an insight into the impact on non-quantifiable performance measures, an insight into the rationale for capital investment, indicates the nuances of the expenditure and the transmission mechanisms by which investment leads to outcomes.

- The qualitative and quantitative research strands present a similar picture of the impact of capital projects on participation. Case study colleges indicated that, for the most part, they had successfully met or exceeded their growth numbers following investment. Similarly, the quantitative work indicates a clear relationship between capital expenditure and growth in learners.

- However, the qualitative work highlights two important factors that it was not possible to fully account for in the quantitative work. The case studies indicated that, in the absence of investment, it is likely that college performance would have deteriorated significantly. The case studies also indicate that colleges were focused on widening access to disenfranchised groups and not just increasing numbers. Both these factors mean that the quantitative analysis may underestimate the true impact of capital expenditure on participation.

- The qualitative work is also important because it indicates that there is a degree of displacement of learners involved in colleges' performance post capital expenditure i.e. that not all learners are ‘new’ to the system but would have studied elsewhere. On the other hand, the qualitative work also indicates that colleges place a lot of emphasis on attracting disenfranchised learners, which are more likely to represent net additions. The quantitative analysis is able to capture displacement to a large extent. The figures of between approximately 62 and 86 additional learners per year are therefore likely to represent net additions to the stock of learners.

- The quantitative and qualitative research strands present a slightly different picture of success, achievement and retention. Many of the case studies indicated that their colleges experienced improvements on these metrics following capital expenditure. However, the quantitative work was not able to isolate this impact. This is in large part due to the observed convergence in success rates since 2008. Widening participation will also have played a part as it is likely to be harder to maintain, let alone increase success rates if the ability mix of learners shifts. Clearly, there is also

the risk that the case study colleges are misinterpreting general trend improvements in these outcome measures with the impact of capital expenditure. However, what is clear from the case studies is that the quality of learning is a core focus of college investment. Colleges have a much wider view of what constitutes an improvement in quality, and as a result it is likely that this improved quality is manifesting itself in other variables such as better employment prospects after college.

- All in all, the combined analysis indicates that capital expenditure is affecting a range of indicators that range from participation to employer engagement, environmental sustainability and the ability of colleges to raise income. There is also evidence to suggest that these impacts are additional, in the sense that they would not have occurred in the absence of government funding of capital projects.

- As this is not the first study examining the impact of capital expenditure on college outcomes, it is not just important to synthesise the quantitative and the qualitative results but also the results from the study in 2008 and the study in 2012.

- On participation, the primary difference between the two studies was that the impact of capital expenditure was found to be lower in 2012 than in 2008. The inclusion of large, recently completed projects in the current (2012) dataset has the effect of reducing the impact observed relative to 2008. Projects of this magnitude (£60 million plus) were not included in the 2008 dataset as most started after that study was undertaken. In addition, the overall decline in participation over the timeframe for analysis may also have played some part in acting as a natural ceiling for changes in learner numbers. This could reflect economic shifts but also demographic changes such as falling numbers of 16 to 18 year olds. Fundamental policy shifts could also have played their part in limiting the extent to which capital projects can increase participation (relative to the counterfactual state of the world). For example, shifts in funding from short to long courses may have limited the increase in participation to be observed, particularly as the study was unable to look at guided learning hours or full time equivalent students as a participation metric.

- On success, the impact of capital expenditure was found to be lower in 2012 than in 2008. There are differences between the samples of the two studies, with the 2012 study reporting a lower impact. However, the natural ceiling (100 per cent) and the strong convergence of success rates towards that ceiling is also a key consideration. The strong convergence towards the 80 per cent to 90 per cent level leaves very little variation to be explained by the impact of capital expenditure projects. A further factor that may have limited the ability of the quantitative analysis to identify an impact is the fact that capital expenditure attracts different types of learners (for whom success rates may be lower).

- Overall, the results of the two studies are equally valid in the sense that both provide robust estimates of the impact occurring within the population of interest and in the timeframe of interest. However, the fact that the 2012 has used multiple sample cuts and covers a more recent time period means these results are more relevant as an estimate of impacts in the current state of the world.

This study comprises a quantitative component of work with a complementary qualitative component. Quantitative analysis of the type described in this report is extremely valuable as it provides an estimate of the impact of capital expenditure per £1 million spent on a number of alternative outcome variables. In fact the results show that capital expenditure is associated with:

- An increase of between approximately 62 and 86 learners per year per £1 million spent;

- No measurable increase in success, achievement and retention rates, but the increase in participation means that the number of learners succeeding increases per £1 million spent; and

- A reduction in college's dependency on Skills Funding Agency or LSC funding such that for every £1 million of capital expenditure a college receives, its reliance on income from the Skills Funding Agency or LSC reduces by 0.06 percentage points, with a notably larger effect for colleges with large projects.

These results are generated using a robust specification which implicitly models a counterfactual. In the case of the results above, the implicit counterfactual is the change in the outcome measure experienced by an equivalent college (in a similar area, exposed to similar policies) with a different amount, or no, capital expenditure over the period. This counterfactual, whilst not capturing a state that any college would find itself in, does provide a clear base case against which to assess the impact of the capital expenditure received.

The regression approach used also allows the effect of a number of different factors that affect a college's performance at the same time to be disentangled. Capital expenditure is one of many influences on a college's performance over time. Other changes driven by national or regional policy or by demographics also affect the performance of a college. The regression approach allows these effects to be isolated from each other, such that changes in performance are not incorrectly attributed to capital expenditure.

However, there are also a number of weaknesses to regression analysis of this kind, which qualitative case studies can help to provide an insight to. Qualitative analysis is key to understanding the rationale for capital investment, which may in reality be somewhat removed from the high level performance measures of participation, success and fee income. It is also crucial for understanding transmission mechanisms. How is it that capital investment leads to an increase in learner numbers, an impact on the local economy or improved staff retention, for example?

Qualitative analysis is also critical for understanding the full impact of capital expenditure in two further ways:

- Firstly, it allows the impact of capital expenditure on variables, which it is not currently possible to measure accurately in a quantitative way to be explored, for example student satisfaction, staff retention and the local economy.

- Secondly, it allows the nuances of specific projects to be understood. For example, some projects may be very specific to a particular type of learners, so their impact on the overall performance of the college may be masked. Alternatively, projects where large amounts of spend are required to meet particular specifications such as renovating listed buildings may see their performance underrepresented in the quantitative specification.

Only by combining the quantitative and the qualitative work can a rounded picture of the impact of capital expenditure be provided. The rest of this chapter brings together these two components of work. It discusses those areas in which the quantitative and the qualitative work

are mutually reinforcing. It also explores the areas where the quantitative and qualitative results point in slightly different directions.

4.1 Participation

The quantitative work described earlier, found that capital expenditure was associated with an increase in learner numbers of between approximately 62 and 86 per year per £1 million spent. This is very much consistent with the qualitative work. All of the colleges the research team spoke to as part of the case studies indicated that their old facilities were out of date with the modern requirements for the curriculum. Colleges reported that curriculum improvements – either in being able to offer new courses, or improve those it already offered through better facilities and learning environment – have been key to the growth in student numbers. In the most part colleges appear to have been successful in either hitting or going above their expected growth numbers.

The qualitative work provides further depth to the quantitative analysis, because it highlights two important factors that it was not possible to fully account for in the quantitative work.

- The primary rationale for capital expenditure in all of the case study colleges was to prevent a significant deterioration in their buildings that would, in turn, have led to significant reductions in performance, had investment not been made. This indicates that the counterfactual for the case study colleges would not have been the level of performance achieved by similar colleges with different amounts of (or no) capital investment. Instead, it is likely that performance would have deteriorated significantly in the absence of investment. The regression approach will not capture this if colleges undertake investment “just in time” to prevent the decline in performance from occurring. There is evidence to suggest that colleges are good at recognising problems with their estate and making their investment before significant problems arise.

- Some of the case study colleges had not just focused their efforts on the expansion of participation but also on widening access to participation. This included facilitating reengagement with local disenfranchised youth (young people aged 14 or over otherwise excluded from mainstream education), NEETs, and those with limited mobility. The quantitative analysis was not able, to date, to capture the variety of participation, only the volume.

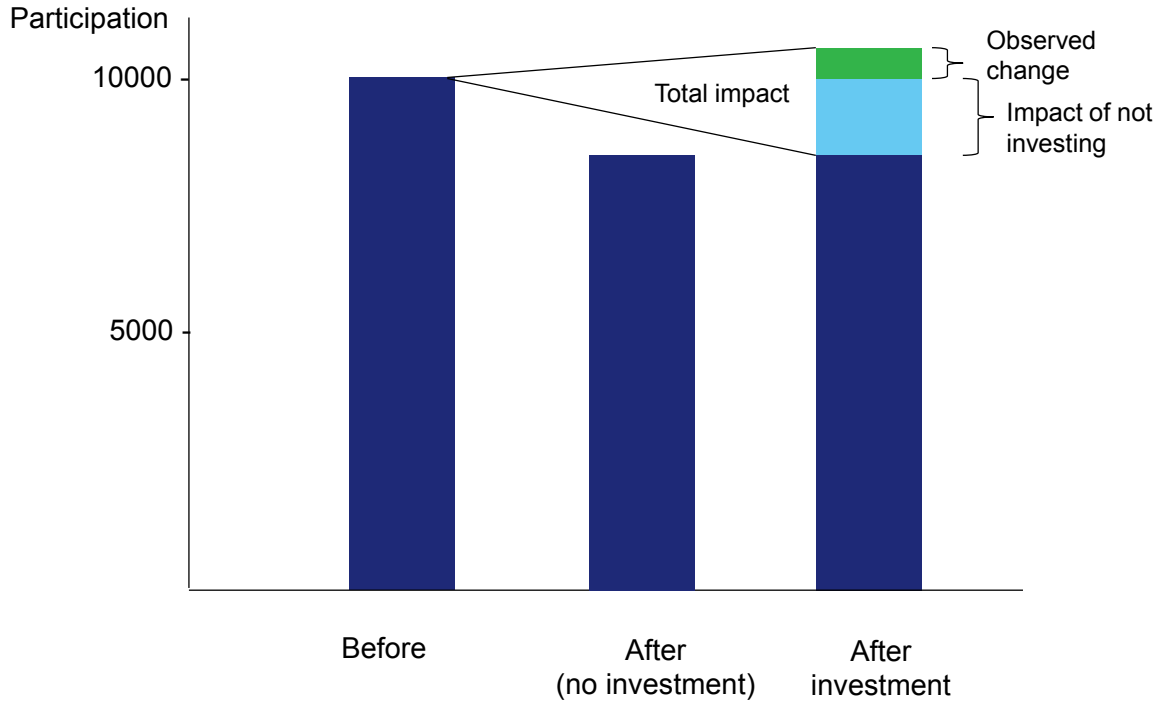
Returning to the issue of the counterfactual that has been considered in the quantitative analysis, the qualitative work indicates that it may not fully reflect the impact of capital expenditure. Colleges receiving capital investment were actually in dire straits. The impact of investment in these circumstances was likely to greatly exceed that measured by the quantitative specification.

It is not possible to directly measure the impact of not investing, as to do this would require comparing a college after capital expenditure with the same college in a world where it had not invested. It was also not possible to generate an accurate estimate of the status of a college’s capital stock prior to investment, which might have provided an alternative route for

understanding the impact of not investing.[56] However, it is possible to make some assumptions about what the impact of not investing would be, and compare this with the observed impact.

This is illustrated in Figure 11 using assumptions about a hypothetical college with participation of 10,000 learners, which had £10m capital expenditure over the period of this analysis.[57] Using the results from the basic econometric specification, which indicated that every £1 million of capital expenditure was associated with an additional 62 learners, an increase of 621 learners would be observed to result from an expenditure of £10 million. But suppose that, if the college had not received this capital expenditure, there would have been a sharp fall of participation, say 15 per cent.[58] In this case, the capital expenditure would prevent the loss of 1,500 learners. Combining the observed impact with the assumed counterfactual impact, the total impact of the capital expenditure would be 1,500 + 621 = 2,121, more than 3 times the observed impact.

Figure 11. Impact of not investing (assuming illustrative 15 per cent decline)



Source: Hypothetical example using illustrative figures from ILR and Frontier analysis

Table 17 shows what the total impact of investment would be under a range of different scenarios. For example, the first column assumes that the hypothetical college with 10,000 students could spend £5m on keeping its estate in serviceable condition, which would prevent a 5 per cent decline in participation (= 500 learners). Together with an observed impact of 62

[56] The eMandate data that is collected by the Skills Funding Agency provides information of this type but it was not available for a sufficient number of colleges in the timeframe of interest.

[57] The participation figure of 10,000 and the capital expenditure figure of £10m are based on the sample medians appearing in the ILR and capital expenditure data, respectively.

[58] There is no concrete evidence of the size of the impact of not investing - the figure of 15 per cent is purely illustrative.

students per £1m, the total impact (post-investment versus post-deterioration) would be 810 students.

Table 17. Simulation of impact of not investing

Total participation	**10,000**								
Capital expenditure (£m)	5			10			15		
Assumed loss if no investment	5 per cent	15 per cent	25 per cent	5 per cent	15 per cent	25 per cent	5 per cent	15 per cent	25 per cent
Observed impact (62 per £m)	310	310	310	620	620	620	930	930	930
Impact of not investing	-500	-1500	-2500	-500	-1500	-2500	-500	-1500	-2500
Total impact	810	1810	2810	1120	2120	3120	1430	2430	3430
Total impact per £m	162	362	562	112	212	312	95	162	229

Source: Stylised example

What is crucial here is the relationship between the level of required capital expenditure and the assumed loss in participation. For example, if a £5m project averts a 15 per cent loss in a college of 10,000 learners, this gives a total impact of 362 learners per £1 million. But if the amount of capital expenditure required for this is instead £15m, the total impact per £m would be only 162 learners.

It is left to the reader to speculate what the magnitude of the impact of not investing might be. However, the simulations show that even if these effects are quite small, the true impact of capital expenditure on participation may be significantly larger than the impact estimated using regression analysis.

The qualitative work is also important because it indicates that there is a degree of displacement involved in colleges' performance post capital expenditure. This occurs where new learners attracted to a college after the investment would have studied at an alternative provider if the new building work had not been undertaken. They are not, therefore, new learners to the system. However, the qualitative work also indicates that colleges place a lot of emphasis on attracting disenfranchised learners to college. It is much more likely that these learners represent net additions to the total number of learners in the system, rather than learners that have been displaced from elsewhere.

It is important to consider how the issue of displacement affects the results from the quantitative analysis. The amount of displacement that occurs in the quantitative results will depend on the degree of competitive overlap between colleges (in terms of geography and course offering), and the pattern of allocation of capital expenditure between them. For example, if there were two colleges in close proximity, but with an unequal pattern of capital expenditure allocation between them, it is likely that students would choose the college with the better capital stock, so a large displacement flow would be observed. Clearly, the extent of competitive overlap between colleges varies greatly across the population. Some colleges are in isolated geographies, whereas others have nearby competitors offering the same range of courses.

Regarding the allocation of capital expenditure, there is reason to believe this has been fairly even across colleges. From both the qualitative work and the census of colleges, an important rationale for investment was to bring estate in poor condition back to an operable standard. In this case, one would expect to see fairly even allocations across colleges and minimal displacement. Even where larger projects were undertaken, one would expect the allocation to be even handed, so that the funding authorities would not be more likely to give grant funding to one college instead of another. This is clearly different to a Treatment / Control group approach where a randomised allocation mechanism would give rise to unequal capital allocations and drive displacement flows.

In any event, it would be reasonable to assume that larger displacement effects would occur where a college receives a large amount of capital expenditure. But the participation impacts are larger, not smaller, when these colleges are excluded from the dataset. This suggests that while displacement could in principle drive impacts, this can only be happening to a very limited extent in the current study.

A further technical discussion of displacement effects is included in Annex C.

4.2 Success, achievement and retention

Many of the case studies indicated that colleges experience improvements in success, achievement and retention rates following capital expenditure. This is not borne out by the quantitative work which finds no evidence of a significant impact of capital expenditure on success, achievement or retention rates.

The natural boundary to success rates (100 per cent) and the observed convergence in success, achievement and retention rates over time makes it extremely difficult to identify a significant positive impact from capital expenditure. Clearly, there is always the risk that the case study colleges are misinterpreting general trend improvements in these outcome measures with the impact of capital expenditure. However, what is clear from the case studies is that the quality of learning is a core focus of investment. This could be manifesting itself in variables other than success, achievement and retention. As stated earlier, success rates are but a proxy for the outcome variables of real interest in this situation; increased employability and uplift to earnings, which are, in turn proxies for the economic value of learning. These variables are not possible to measure in the quantitative work directly, but the qualitative work does indicate that colleges appear better able to engage with employers and are focusing course design on what is needed by local employers. These changes may neither increase success or achievement rates but nevertheless improve the employment chances and lifetime earnings of those that take them. It is thus entirely possible that capital investment is improving the quality of learning within colleges but that the effect is masked by overall convergence in success rates or is, in fact, not captured by that variable at all.

It is also possible that the quantitative results on success are entirely consistent with the case study findings for a further reason. That is, the widening participation issue that was discussed earlier. It is not possible in the quantitative work to generate estimates of success that are fully like for like results in the sense that they take account of the changing base of learners within a college. The qualitative work indicates that many capital projects are focused on expanding access. Improving access in this way may actually alter the ability mix of leaners engaged in a college making it harder to maintain existing success rates, let alone improve them. Ideally, the quantitative analysis would make this like for like comparison, but controlling for ability in an appropriate way is a notoriously difficult exercise.

As already indicated, it has not been possible within the scope of this study to construct a measure to properly assess the *quality* of learning outcomes. Ideally, BIS would like to know the likelihood of employment for learners and whether that has improved and whether there has been an uplift in their earnings. This is not something that could be achieved with the data available for the econometric work. Also, colleges were not able to provide any evidence on these outcomes in robust way. And, this would most likely be too onerous and difficult a task to expect of them.

However, the qualitative work highlighted that colleges have a wider awareness of what success means, beyond the success measures considered in the quantitative work. Colleges were conscious that 'success' also meant that students were better prepared for employment, and colleges were looking for ways to improve employability through their respective capital projects. For example, in the context of capital spending this meant consulting with local employers about the most appropriate equipment and layout for the new buildings, to ensure that there was a closer match between the college and work environment so learners would be 'industry-ready' on completing courses.

4.3 Other indicators of impact

Colleges highlight a range of other indicators upon which capital expenditure projects have had an impact.

- Colleges recognise the important role they can play in leading economic regeneration of areas and several case study projects played an important role in this regard. The economic regeneration stimulated by college investment can be of direct benefit (employing staff in the college) as well as indirect benefit (stimulating investment from other businesses).

- Colleges are very conscious of improving environmental sustainability across their buildings when undertaking a capital project. The majority of case study colleges secured very good or excellent environmental sustainability ratings for their new buildings and had incorporated a range of sustainable energy sources into their designs.

- Colleges actively manage their new buildings to improve employer engagement. They state that they have been particularly successful in doing so, particularly when the capital stock prior to investment was very poor. The new buildings allow colleges to offer facilities that more accurately match what employers want. They also allow the college to engage employers in other ways.

- College run Student Satisfaction surveys indicate that students feel more satisfied on their courses following capital investment. Colleges also note other signs of increased student satisfaction.

- Estate utilisation appears to have increased following most capital expenditure projects. This appears to be particularly true for colleges that disposed of old sites and relocated to new sites as part of their project.

- Case study colleges presented mixed views on the maintenance costs of new buildings. On the one hand, colleges indicated that maintaining a new building, designed with better quality and more durable materials was easier. On the other hand, colleges stated that maintaining a brand new building, particularly given its increased use, can increase maintenance costs, particularly where colleges had stopped maintaining their previous low quality buildings.

- Capital expenditure projects appear to have made it significantly easier for colleges to recruit staff and to attract higher quality staff.

4.4 Consistency of findings over time

As this is not the first study examining the impact of capital expenditure on college outcomes, it is not just important to synthesise the quantitative and the qualitative results but also the results from the study in 2008 and the study in 2012.

The primary differences between the two studies are:

- the impact of capital expenditure on participation was found to be lower than in 2008;

- the impact of capital expenditure on success was found to be lower than in 2008; and

- the impact of capital expenditure on college ability to generate fee income was higher than in 2008.

The quantitative section, explored in detail a range of potential explanations for the differences observed, including data quality, the methodology, the sample of colleges contained within each dataset, the sample of capital expenditure projects contained within each dataset, an increase in endogeneity bias and other structural changes to performance measures.

It was possible to rule out data quality and methodology differences as contributors to the different results from the studies. The potential factors contributing to the differences between the 2008 and 2012 results for participation, success and ability to generate fee income can be summarised as follows:

- **Participation:** the inclusion of large, recently completed projects in the current (2012) dataset has the effect of reducing the impact observed. The overall decline in participation over the timeframe for analysis may also have played some part in acting as a natural ceiling for changes in participation. Fundamental policy shifts and the effect of the recession could have played their part in limiting the extent to which capital projects can increase participation (relative to the counterfactual state of the world).

- **Success:** there are differences between the samples of the two studies, with the 2012 study reporting a lower impact. However, the natural ceiling (100 per cent) and the strong convergence of success rates is also a key consideration. The strong convergence towards the 80 per cent to 90 per cent level leaves very little variation to be explained by the impact of capital expenditure projects. It is also possible that capital expenditure attracts different types of learners (for whom success rates may be lower).

- **Ability to generate fee income:** the inclusion of large, recently completed projects in the current dataset has the effect of increasing the impact observed relative to 2008.

The results of the two studies are equally valid in the sense that both provide robust estimates of the impact occurring within the population of interest. However, the fact that the 2012 has used multiple sample cuts and covers a more recent time period means these results are more relevant as an estimate of impacts in the current state of the world.

4.5 Summary of findings

All in all, the study finds that:

- Capital expenditure increases participation by between approximately 62 and 86 learners per year, but this figure might be significantly larger if investment in colleges occurs “just in time” to prevent a significant decline in learner numbers. The estimated impact accounts, to a large extent, for possible displacement of learners between colleges and therefore reflects net additions to learner numbers.

- Capital expenditure is not associated with a measurable impact on success, retention and achievement. But, there is evidence to suggest that the strong convergence in success rates underpins the inability of the quantitative work to isolate this impact. Colleges report significant improvements in the quality of learning that are not captured by these measures. For example, they refer to better engagement with employers and students continuing in other courses or transitioning to Higher Education.

- Capital expenditure is associated with an increased ability of colleges to raise income independently. This equates to a 5.5 percentage point reduction in their dependency on government funding for colleges with large capital projects (£60 million plus).

- Capital expenditure is also associated with a range of other positive impacts. These include increased employer engagement, improved sustainability and better utilisation of estate.

- There is good evidence that the impacts reported are additional. Firstly, the total amount spent on capital expenditure projects has changed in line with LSC and Skills Funding Agency funding availability. This indicates that, colleges do not appear to be able to fund projects in the absence of this funding. Secondly, some colleges had embarked on phased projects and have been unable to complete the later phases without LSC or Skills Funding Agency funding. This is a further indication that colleges are not able to substitute government funds with other sources of funding. Thirdly, nearly all case study colleges said they could not have carried out their project to the full specification without the LSC/Skills Funding Agency funding component and some said they would not have attempted a project on a substantial scale at all.

Annex A: Further econometric results

This annex presents full econometrics results for the following groups of indicators:

- Participation (All participation, Learner Responsive learners, Government funded LR learners aged 16 to 18, Government funded LR learners aged 19 plus, Apprenticeships);[59]
- Success rates (All learners, Learners aged 16 to 18, Adult learners);
- Retention rates (All learners, Learners aged 16 to 18, Adult learners);
- Achievement rates (All learners, Learners aged 16 to 18, Adult learners); and
- College ability to generate fee income (Dependence on LSC/ Skills Funding Agency income, Dependence on LSC/ Skills Funding Agency income (controlling for very large projects), Tuition fee income).

For each group of indicators, regression results from four alternative sample / population cuts are presented:

- Census colleges (142);
- Whole population (250);
- Census colleges, excluding those that completed in excess of £60 million capital expenditure from 2002/03 to 2009/10 (125); and
- Whole population, excluding those that completed in excess of £60 million capital expenditure from 2002/03 to 2009/10 (222).

Each sample cut is considered in turn.

Note that it was not possible to verify the data for colleges that did not respond to the census. This means that there may be anomalies in the whole population sample cuts. These anomalies are likely to be most serious in relation to colleges' ability to generate fee income.

[59] Government funded' is used as short replacement for 'LSC / Skills Funding Agency funded Learner responsive learners'

Analysis of colleges that responded to the census (142 colleges)

Table 18. Impact on change in number of learners (census colleges)

	All participation	Learner Responsive learners	Government funded LR learners aged 16 to 18	Government funded LR learners aged 19 plus	Apprentices hips
Capital expenditure completed from 2002/03 to 2009/10 (£m)	62**	54*	13***	28	8
Proportion of learners aged 16-18	6394*	7409**	1092*	5600**	431
Number of learners in 2002/03	-0.448***	-0.507***	0	-0.487***	0.022
East of England	-87	97	864**	594	421
London	-774	1235	-359*	2505***	-324**
North East	-3477***	-2450**	-538*	-750	-126
North West	148	1837	232	2625	337
South East	-1426	229	-22	1146	-145
South West	-2075	-328	-32	-67	-97
West Midlands	-1383	-888	-158	-106	-72
Yorkshire	-1793	-296	-54	1002	-191
Specialist College	772	2170*	-2	1067	82
Merged college	1104	1456	374	373	93
Constant (base case = FE college, East Midlands)	399	-2447	103	-2258	-84
Number of observations	142	142	142	142	142
R-squared	0.5254	0.6175	0.3399	0.6813	0.2366
Root mean squared error	5599.1	5350.7	768.87	4529.8	894.62

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Table 19. Impact on percentage point change in success rate (census colleges)

Variable	All learners	Learners aged 16 to 18	Adult learners	All learners (college above median success rate)	All learners (college below median success rate)
Capital expenditure completed from 2002/03 to 2009/10 (£m)	0.002	0.005	0.008	-0.061	-0.002
Proportion of learners aged 16-18	0.968	-18.738***	6.199	0.163	10.488
Number of learners in 2002/03	0	0	0	0	0
East of England	3.134*	4.402*	0.939	-2.723	5.796**
London	-0.626	-2.707	0.712	-2.899	2.09
North East	2.343*	0.103	1.93	0.535	4.502**
North West	2.038	4.419**	0.352	0.18	4.719
South East	1.076	1.586	1.309	-0.762	3.597
South West	4.698***	5.21**	3.572*	1.597	12.797***
West Midlands	1.429	1.58	1.733	-1.539	4.31**
Yorkshire	2.864**	1.024	2.96	2.863**	3.751**
Specialist College	2.858**	5.344***	1.733	2.895*	4.952***
Merged	-1.014	-0.979	-1.964	-0.504	-1.133
Capital expenditure exceeded £60m	-0.104	0.184	-1.068	4.917	-0.041
Success rate in 2002	-0.883***	-0.721***	-0.938***	-0.739***	-0.803***
Constant (base case = FE college, East Midlands)	71.764***	68.813***	72.679***	63.36***	62.421***
Number of observations	140	137	140	70	70
R-squared	0.73	0.52	0.62	0.44	0.67
Root mean squared error	4.29	6.13	6	4.49	4.15

Source: Frontier analysis of combined ILR (R08 collection) / National Success Rate Tables / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Table 20. Impact on percentage point change in retention rate (census colleges)

Variable	All learners	Learners aged 16 to 18	Adult learners
Capital expenditure completed from 2002/03 to 2009/10 (£m)	0.012	0.034	0.013
Proportion of learners aged 16-18	0.868	-5.387	3.458
Number of learners in 2002/03	0	0	0
East of England	1.006	2.213	-0.285
London	0.362	-0.006	0.763
North East	0.778	-1.316	1.029
North West	-0.052	2.011	-1.507
South East	0.282	-0.155	1.18
South West	1.905	2.252	0.85
West Midlands	0.871	0.045	1.368
Yorkshire	0.949	-0.637	0.898
Specialist College	0.753	1.809	0.81
Merged	-0.554	0.387	-1.169
Capital expenditure exceeded £60m	-0.622	-1.011	-1.516
Retention rate in 2002	-0.869***	-0.723***	-0.944***
Constant (base case = FE college, East Midlands)	77.518***	68.278***	82.459***
Number of observations	140	137	140
R-squared	0.78	0.58	0.64
Root mean squared error	2.95	4.34	4.45

Source: Frontier analysis of combined ILR (R08 collection) / National Success Rate Tables / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Table 21. Impact on percentage point change in achievement rate (census colleges)

Variable	All learners	Learners aged 16 to 18	Adult learners
Capital expenditure completed from 2002/03 to 2009/10 (£m)	-0.011	-0.026	-0.009
Proportion of learners aged 16-18	0.785	-17.802***	4.968
Number of learners in 2002/03	0	0	0
East of England	2.511**	2.811	1.276
London	-1.158	-3.027	0.073
North East	1.697	0.862	1.078
North West	2.279**	3.508**	1.779
South East	0.812	2.189	0.307
South West	3.145**	3.238	3.065**
West Midlands	0.632	1.855	0.561
Yorkshire	2.169**	1.414	2.592*
Specialist College	2.352**	4.856***	0.934
Merged	-0.499	-1.277	-1.065
Capital expenditure exceeded £60m	0.75	1.408	0.615
Achievement rate in 2002	-0.894***	-0.775***	-0.919***
Constant (base case = FE college, East Midlands)	81.396***	78.536***	81.418***
Number of observations	140	137	140
R-squared	0.80	0.54	0.73
Root mean squared error	2.89	4.78	3.79

Source: Frontier analysis of combined ILR (R08 collection) / National Success Rate Tables / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, ** = 5 per cent, * = 10 per cent

Table 22. Impact on percentage point change in proportion of college income (census colleges)

Variable	Dependence on LSC / Skills Funding Agency income (1) using linear capital expenditure variable	Dependence on LSC / Skills Funding Agency income (2) using linear capex variable and large capex dummy	Dependence on LSC / Skills Funding Agency income (3) using large capex dummy only	Percentage point change in tuition fee income as a proportion of college income
Capital expenditure completed from 2002/03 to 2009/10	-0.06**	-0.017	Omitted	0.014
Proportion of learners aged 16-18	-2.991	-2.139	-2.056	1.812
Number of learners in 2002/03	0	0	0	0
East of England	1.1	1.106	1.135	2.107
London	-2.767	-2.711	-2.675	3.247**
North East	-0.02	-0.168	-0.192	5.316***
North West	1.436	1.466	1.527	1.5
South East	4.355	4.47	4.519	1.801
South West	-3.058	-3.262	-3.323	1.624
West Midlands	2.303	2.667	2.719	2.371
Yorkshire	-0.596	-0.397	-0.378	4.904***
Specialist College	-2.112	-2.018	-1.949	3.018*
Merged	-2.057	-2.172	-2.222	-1.058
Capital expenditure exceeded £60m	Omitted	-4.392	-5.522***	-0.177
Constant (base case = FE college, East Midlands)	2.722	2.032	1.827	-5.787***
Number of observations	142	142	142	142
R-squared	0.13	0.13	0.13	0.12
Root mean squared error	8.31	8.3	8.28	5.42

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency capital expenditure approvals data / Skills Funding Agency college accounts data and college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Analysis of the whole population (250 colleges)

Table 23. Impact on change in number of learners (whole population)

	All participation	Learner Responsive learners	Government funded LR learners aged 16 to 18	Government funded LR learners aged 19 plus	Apprenticeships
Capital expenditure completed from 2002/03 to 2009/10 (£m)	42**	38**	9***	22	4
Proportion of learners aged 16-18	6100**	6944***	1092**	4418***	244
Number of learners in 2002/03	-0.464***	-0.543***	0.001	-0.506***	0.026**
East of England	-290	1298	675***	1473	-169
London	-155	2451**	-263	3175***	-598**
North East	-2469**	-861	-354	-213	-323
North West	-94	2111	102	2557	-142
South East	-937	1244	147	1456*	-438
South West	-418	1795**	140	1636**	-451*
West Midlands	-812	507	-21	637	-400
Yorkshire	436	1908*	153	1980**	-272
Specialist College	367	1648*	-77	642	17
Merged college	2327*	1879*	412**	797	145
Constant (base case = FE college, East Midlands)	12	-2979	47	-2296	243
Number of observations	250	250	250	250	250
R-squared	0.5291	0.6859	0.2492	0.7426	0.2235
Root mean squared error	5064.3	4454.6	720.88	3633.4	792.49

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Table 24. Impact on percentage point change in success rate (whole population)

Variable	All learners	Learners aged 16 to 18	Adult learners
Capital expenditure completed from 2002/03 to 2009/10 (£m)	-0.016	-0.016	0.002
Proportion of learners aged 16-18	0.555	-17.985***	0.635
Number of learners in 2002/03	0	0	0
East of England	1.065	0.73	0.194
London	-1.293	-3.746*	0.813
North East	2.025*	1.682	2.338*
North West	1.781	2.594	2.022
South East	0.963	1.101	1.486
South West	2.058*	0.025	2.988**
West Midlands	0.091	-0.565	1.086
Yorkshire	1.63	0.072	1.57
Specialist College	2.482**	0.913	2.292
Merged	-0.403	-1.142	-0.656
Capital expenditure exceeded £60m	0.57	1.577	-0.902
Success rate in 2002	-0.893***	-0.65***	-1.002***
Constant (base case = FE college, East Midlands)	73.758***	66.488***	78.536***
Number of observations	248	242	248
R-squared	0.77	0.43	0.70
Root mean squared error	4.23	6.66	5.75

Source: Frontier analysis of combined ILR (R08 collection) / National Success Rate Tables / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Table 25. Impact on percentage point change in retention rate (whole population)

Variable	All learners	Learners aged 16 to 18	Adult learners
Capital expenditure completed from 2002/03 to 2009/10 (£m)	-0.002	0.017	-0.003
Proportion of learners aged 16-18	-0.779	-3.18	-3.117
Number of learners in 2002/03	0	0	0
East of England	0.427	0.1	0.255
London	0.308	-0.78	1.218
North East	0.449	-0.925	1.218
North West	-0.248	0.561	-0.139
South East	0.655	-0.241	1.355
South West	1.025	-1.13	2.093*
West Midlands	0.166	-0.253	0.777
Yorkshire	0.143	-1.158	-0.184
Specialist College	1.158	-0.623	1.497
Merged	-0.303	-0.031	-0.271
Capital expenditure exceeded £60m	0.043	-0.16	-0.139
Retention rate in 2002	-0.915***	-0.706***	-1.023***
Constant (base case = FE college, East Midlands)	82.268***	67.888***	90.503***
Number of observations	248	242	248
R-squared	0.79	0.49	0.70
Root mean squared error	3.00	4.82	4.22

Source: Frontier analysis of combined ILR (R08 collection) / National Success Rate Tables / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Table 26. Impact on percentage point change in achievement rate (whole population)

Variable	All learners	Learners aged 16 to 18	Adult learners
Capital expenditure completed from 2002/03 to 2009/10 (£m)	-0.017	-0.033	0.004
Proportion of learners aged 16-18	1.367	-20.476***	5.201
Number of learners in 2002/03	0	0	0
East of England	0.699	0.313	-0.013
London	-1.827*	-3.6**	-0.121
North East	1.786*	2.661	1.423
North West	2.172***	2.675*	2.296**
South East	0.389	1.67	0.333
South West	1.232	0.816	1.441
West Midlands	-0.155	-0.478	0.485
Yorkshire	1.604*	0.867	2.165*
Specialist College	1.639*	1.815	0.971
Merged	-0.119	-1.204	-0.536
Capital expenditure exceeded £60m	0.668	2.072	-0.768
Achievement rate in 2002	-0.898***	-0.72***	-0.951***
Constant (base case = FE college, East Midlands)	82.455***	76.482***	84.073***
Number of observations	248	242	248
R-squared	0.81	0.49	0.75
Root mean squared error	2.97	5.21	3.89

Source: Frontier analysis of combined ILR (R08 collection) / National Success Rate Tables / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Table 27. Impact on percentage point change in proportion of college income (whole population)

Variable	Dependence on LSC / Skills Funding Agency income (1) using linear capital expenditure variable	Dependence on LSC / Skills Funding Agency income (2) using linear capex variable and large capex dummy	Dependence on LSC / Skills Funding Agency income (3) using large capex dummy only	Percentage point change in tuition fee income as a proportion of college income
Capital expenditure completed from 2002/03 to 2009/10	-0.052*	-0.064*	Omitted	0.046**
Proportion of learners aged 16-18	-4.913	-5.161	-4.814	6.931
Number of learners in 2002/03	0	0	0	0
East of England	2.653	2.588	2.579	-0.386
London	-1.573	-1.612	-1.553	1.723
North East	1.732	1.8	1.256	1.622
North West	1.336	1.337	1.264	-0.165
South East	0.815	0.776	0.659	0.001
South West	-1.209	-1.204	-1.29	0.072
West Midlands	1.508	1.379	1.563	1.702
Yorkshire	0.011	-0.072	-0.018	2.409*
Specialist College	-5.699***	-5.717***	-5.541	4.183***
Merged	-0.717	-0.705	-0.741***	-0.374
Capital expenditure exceeded £60m	Omitted	1.26	-2.915	-3.703**
Constant (base case = FE college, East Midlands)	3.501	3.706	3.098	-6.849***
Number of observations	250	250	250	250
R-squared	0.08	0.08	0.07	0.1
Root mean squared error	8.7	8.72	8.75	5.46

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency capital expenditure approvals data / Skills Funding Agency college accounts data and college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Analysis of census colleges, excluding those with very large capital expenditure (125 colleges)

Table 28. Impact on change in number of learners - census colleges (excluding those with very large capital expenditure)

	All participation	Learner Responsive learners	Government funded LR learners aged 16 to 18	Government funded LR learners aged 19 plus	Apprenticeships
Capital expenditure completed from 2002/03 to 2009/10 (£m)	86***	56**	14***	20	6
Proportion of learners aged 16-18	3667	4557*	739	4499*	-295
Number of learners in 2002/03	-0.522***	-0.575***	-0.005	-0.523***	0.011
East of England	378	174	727***	420	241
London	656	1898*	-252	2222***	-266**
North East	-2410***	-1697**	-609**	-315	-63
North West	-930	-137	138	330	25
South East	-56	914	171	1237	-38
South West	-603	651	201	459	3
West Midlands	361	-429	83	-130	70
Yorkshire	817	1141	328	1715*	-12
Specialist College	113	1458	-89	574	-46
Merged college	-515	-319	218	-893	-111
Constant (base case = FE college, East Midlands)	1158	-803	181	-857	285
Number of observations	125	125	125	125	125
R-squared	0.7574	0.8589	0.3483	0.8955	0.1505
Root mean squared error	3600	2904.4	568.82	2244.1	552.19

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Table 29. Impact on percentage point change in success rate - census colleges (excluding those with very large capital expenditure)

Variable	All learners	Learners aged 16 to 18	Adult learners
Capital expenditure completed from 2002/03 to 2009/10 (£m)	0.018	0.024	0.026
Proportion of learners aged 16-18	1.363	-14.89**	6.375
Number of learners in 2002/03	0	0*	0
East of England	3.193*	3.925	2.194
London	-0.529	-2.974	1.232
North East	1.989	-0.168	1.852
North West	2.102	3.623	1.041
South East	1.007	1.033	1.614
South West	4.982***	4.967*	4.274*
West Midlands	0.713	0.31	1.698
Yorkshire	3.679***	2.507	3.742**
Specialist College	3.114**	5.324***	1.989
Merged	-1.303	-1.358	-2.247*
Capital expenditure exceeded £60m	Dropped	Dropped	Dropped
Success rate in 2002	-0.889***	-0.697***	-0.954***
Constant (base case = FE college, East Midlands)	71.522***	65.996***	72.972***
Number of observations	123	120	123
R-squared	0.71	0.46	0.60
Root mean squared error	4.29	6.16	6.04

Source: Frontier analysis of combined ILR (R08 collection) / National Success Rate Tables / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Table 30. Impact on percentage point change in retention rate - census colleges (excluding those with very large capital expenditure)

Variable	All learners	Learners aged 16 to 18	Adult learners
Capital expenditure completed from 2002/03 to 2009/10 (£m)	0.024	0.048	0.023
Proportion of learners aged 16-18	0.876	-2.535	3.185
Number of learners in 2002/03	0	0**	0
East of England	1.282	2.084	0.78
London	0.188	-0.85	0.852
North East	0.474	-2.158	1.019
North West	-0.191	0.893	-1.183
South East	0.234	-0.882	1.496
South West	1.797	1.623	1.088
West Midlands	0.259	-1.297	1.144
Yorkshire	1.539*	-0.135	1.847
Specialist College	0.691	1.692	0.748
Merged	-0.76	-0.094	-1.296
Capital expenditure exceeded £60m	Dropped	Dropped	Dropped
Retention rate in 2002	-0.855***	-0.6***	-0.974***
Constant (base case = FE college, East Midlands)	76.363***	57.48***	84.989***
Number of observations	123	120	123
R-squared	0.69	0.40	0.55
Root mean squared error	2.94	4.20	4.56

Source: Frontier analysis of combined ILR / National Success Rate Tables / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Table 31. Impact on percentage point change in achievement rate - census colleges (excluding those with very large capital expenditure)

Variable	All learners	Learners aged 16 to 18	Adult learners
Capital expenditure completed from 2002/03 to 2009/10 (£m)	-0.008	-0.015	-0.005
Proportion of learners aged 16-18	1.324	-16.19***	5.488
Number of learners in 2002/03	0*	0	0*
East of England	2.363*	2.542	1.773
London	-0.792	-2.847	0.875
North East	1.714	1.483	1.171
North West	2.407*	3.385*	2.196*
South East	0.829	2.292	0.413
South West	3.554***	3.318	3.736***
West Midlands	0.476	1.904	0.882
Yorkshire	2.466**	2.998	2.393*
Specialist College	2.564**	4.77***	1.188
Merged	-0.649	-1.372	-1.271
Capital expenditure exceeded £60m	Dropped	Dropped	Dropped
Achievement rate in 2002	-0.883***	-0.8***	-0.88***
Constant (base case = FE college, East Midlands)	79.77***	80.165***	77.105***
Number of observations	123	120	123
R-squared	0.81	0.57	0.74
Root mean squared error	2.91	4.76	3.61

Source: Frontier analysis of combined ILR / National Success Rate Tables / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Table 32. Impact on percentage point change in proportion of college income - census colleges (excluding those with very large capital expenditure)

Variable	Dependence on LSC/Skills Funding Agency income	Percentage point change in tuition fee income as a proportion of total income
Capital expenditure completed from 2002/03 to 2009/10	0.004	0.003
Proportion of learners aged 16-18	-2.973	2.27
Number of learners in 2002/03	0	0
East of England	1.158	1.965
London	-1.816	3.192*
North East	2.098	5.63***
North West	0.886	2.356
South East	5.115	1.91
South West	-3.086	1.482
West Midlands	3.685	1.689
Yorkshire	0.386	5.318***
Specialist College	-2.039	3.086*
Merged	-1.709	-0.846
Capital expenditure exceeded £60m	Omitted[60]	Dropped
Constant (base case = FE college, East Midlands)	1.599	-6.191***
Number of observations	125	125
R-squared	0.12	0.12
Root mean squared error	8.26	5.43

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency college accounts data / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

[60] Where a variable has been purposefully omitted from a specification it is marked as “omitted”. In other cases a variable is automatically dropped, because there is no variation in the data with which to identify it. In this case it is marked as “dropped”. For example, the large capital expenditure dummy variable is automatically dropped in cuts where colleges with very large capital expenditure have been excluded from the sample.

Analysis of whole population, excluding colleges with very large capital expenditure (222 colleges)

Table 33. Impact on change in number of learners - Whole population (excluding colleges with very large capital expenditure)

	All participation	Learner Responsive learners	LSC/SFA funded LR learners aged 16 to 18	LSC/SFA funded LR learners aged 19 plus	Apprentice-ships
Capital expenditure completed from 2002/03 to 2009/10 (£m)	44**	29*	7**	5	2
Proportion of learners aged 16-18	3146	4390**	619	3140*	-347
Number of learners in 2002/03	-0.526***	-0.601***	-0.005	-0.54***	0.017**
East of England	-124	1205	625***	979	-330
London	459	2649***	-260*	2732***	-647**
North East	-2175**	-881	-385**	-145	-349
North West	-1196	575	48	956	-423
South East	-469	1248	223	1240	-442
South West	-53	1790**	215	1484**	-512*
West Midlands	-605	20	6	150	-452
Yorkshire	148	1560**	228	1562*	-432
Specialist College	-450	840	-167**	126	-112
Merged college	492	241	225	-168	-75
Constant (base case = FE college, East Midlands)	1692	-960	258*	-703	653**
Number of observations	222	222	222	222	222
R-squared	0.7269	0.8707	0.2269	0.8978	0.1969
Root mean squared error	3559.3	2685.3	580.8	2114.4	558.99

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Table 34. Impact on percentage point change in success rate - Whole population (excluding colleges with very large capital expenditure)

Variable	All learners	Learners aged 16 to 18	Adult learners
Capital expenditure completed from 2002/03 to 2009/10 (£m)	-0.005	-0.002	0.009
Proportion of learners aged 16-18	0.024	-17.473***	0.796
Number of learners in 2002/03	0	0	0
East of England	1.787	0.429	2
London	-1.306	-3.764*	1.148
North East	1.813	2.035	2.254
North West	1.798	1.966	2.479*
South East	0.967	0.504	1.896
South West	2.047*	-0.263	3.268**
West Midlands	-0.334	-1.036	0.935
Yorkshire	1.997*	1.191	1.601
Specialist College	2.384**	0.987	2.12
Merged	-0.377	-0.875	-0.776
Capital expenditure exceeded £60m	Dropped	Dropped	Dropped
Success rate in 2002	-0.888***	-0.649***	-0.991***
Constant (base case = FE college, East Midlands)	73.451***	66.168***	77.556***
Number of observations	220	214	220
R-squared	0.76	0.42	0.69
Root mean squared error	4.28	6.72	5.79

Source: Frontier analysis of combined ILR (R08 collection) / National Success Rate Tables / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Table 35. Impact on percentage point change in retention rate - Whole population (excluding colleges with very large capital expenditure)

Variable	All learners	Learners aged 16 to 18	Adult learners
Capital expenditure completed from 2002/03 to 2009/10 (£m)	0.005	0.024	-0.001
Proportion of learners aged 16-18	-1.088	-2.208	-3.154
Number of learners in 2002/03	0	0	0
East of England	1.027	0.352	1.3
London	0.084	-1.044	1.05
North East	0.32	-0.981	1.165
North West	-0.411	-0.078	-0.077
South East	0.577	-0.99	1.691
South West	0.884	-1.511	2.161*
West Midlands	-0.345	-0.913	0.42
Yorkshire	0.39	-0.407	-0.135
Specialist College	1.03	-0.73	1.411
Merged	-0.29	-0.026	-0.23
Capital expenditure exceeded £60m	Dropped	Dropped	Dropped
Retention rate in 2002	-0.908***	-0.648***	-1.038***
Constant (base case = FE college, East Midlands)	81.855***	62.945***	91.827***
Number of observations	220	214	220
R-squared	0.77	0.41	0.68
Root mean squared error	3.04	4.79	4.27

Source: Frontier analysis of combined ILR (R08 collection) / National Success Rate Tables / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Table 36. Impact on percentage point change in achievement rate - Whole population (excluding colleges with very large capital expenditure)

Variable	All learners	Learners aged 16 to 18	Adult learners
Capital expenditure completed from 2002/03 to 2009/10 (£m)	-0.011	-0.023	0.007
Proportion of learners aged 16-18	1.074	-20.735***	5.323
Number of learners in 2002/03	0	0	0
East of England	0.91	-0.384	0.984
London	-1.634	-3.586**	0.487
North East	1.671*	3.14	1.369
North West	2.363***	2.35	2.797***
South East	0.484	1.604	0.514
South West	1.358	0.655	1.791*
West Midlands	-0.106	-0.286	0.688
Yorkshire	1.765**	1.536	2.094
Specialist College	1.66*	1.884	0.954
Merged	-0.092	-0.877	-0.742
Capital expenditure exceeded £60m	Dropped	Dropped	Dropped
Achievement rate in 2002	-0.895***	-0.753***	-0.928***
Constant (base case = FE college, East Midlands)	82.031***	79.263***	81.675***
Number of observations	220	214	220
R-squared	0.81	0.52	0.76
Root mean squared error	3.02	5.24	3.86

Source: Frontier analysis of combined ILR (R08 collection) / National Success Rate Tables / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Table 37. Impact on percentage point change in proportion of college income - Whole population (excluding colleges with very large capital expenditure)

Variable	Dependence on LSC/Skills Funding Agency income	Percentage point change in tuition fee income as a proportion of total income
Capital expenditure completed from 2002/03 to 2009/10	-0.049	0.04
Proportion of learners aged 16-18	-4.517	7.417
Number of learners in 2002/03	0	0
East of England	0.691	0.658
London	-1.179	1.635
North East	2.409	1.842
North West	0.782	0.679
South East	1.858	0.03
South West	-0.927	0.159
West Midlands	2.115	1.262
Yorkshire	0.524	2.668*
Specialist College	-5.619***	4.391***
Merged	-0.29	-0.249
Capital expenditure exceeded £60m	Dropped	Dropped
Constant (base case = FE college, East Midlands)	2.994	-7.397***
Number of observations	222	222
R-squared	0.09	0.09
Root mean squared error	8.09	5.42

Source: Frontier analysis of combined ILR (R08 collection) / Skills Funding Agency college accounts data / Skills Funding Agency capital expenditure approvals data / college census data
Significance levels: *** = 1 per cent, **=5 per cent, *=10 per cent

Annex B: Degree to which sample is representative of population

Description of the approach taken

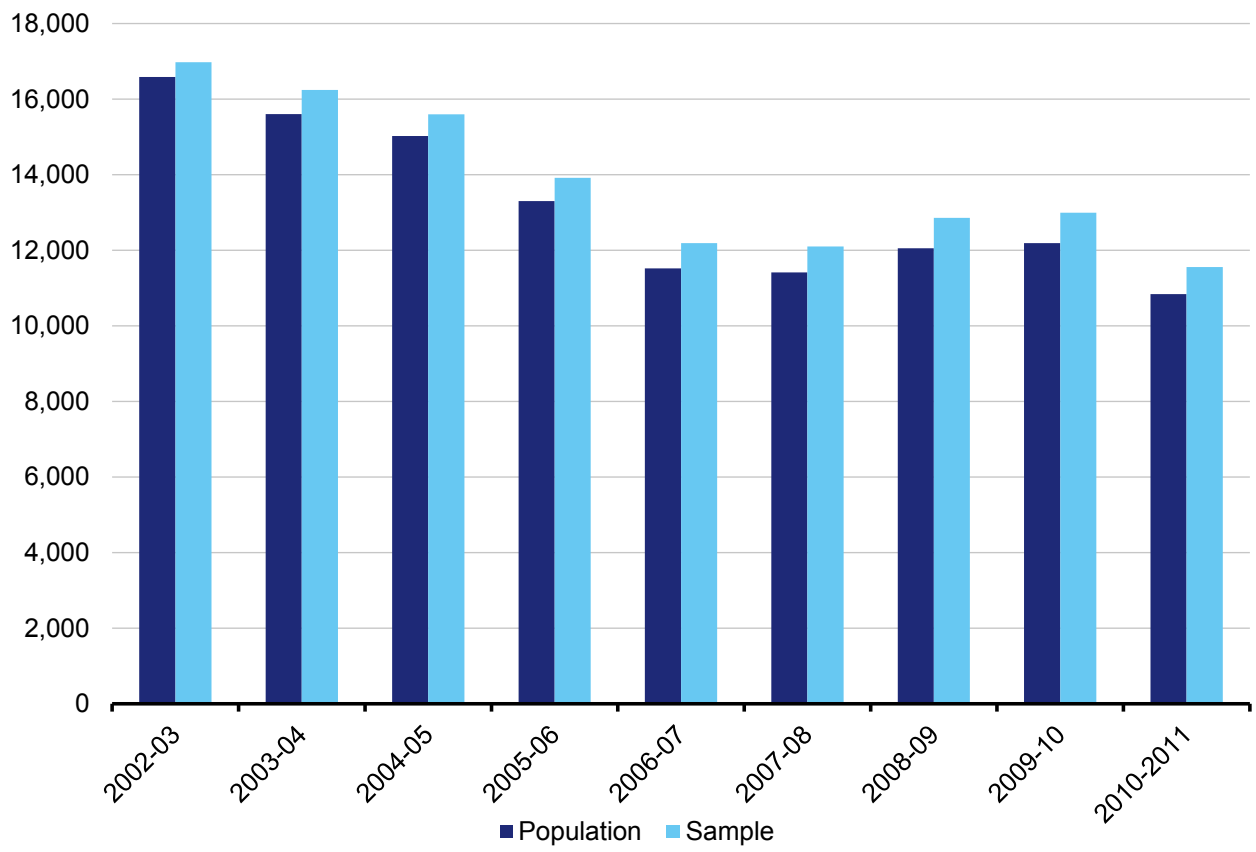
For each of the following variables, this Annex shows the mean for the sample and the population for each year (except for capital expenditures where it shows a bar chart of total capital expenditure for the sample and the population across all years):

- All learner participation
- Apprenticeships
- Success rates
- Retention rates
- Achievement rates
- Tuition fees as a percentage of total income
- Dependency on LSC income
- Total capital expenditure by college
- College characteristics

By comparing the sample and the population in this manner, it is possible to assess if there are any systematic differences between the sample and the population to ensure that there is no sample bias in the analysis.

All learner participation

Figure 12. Average of total learner numbers

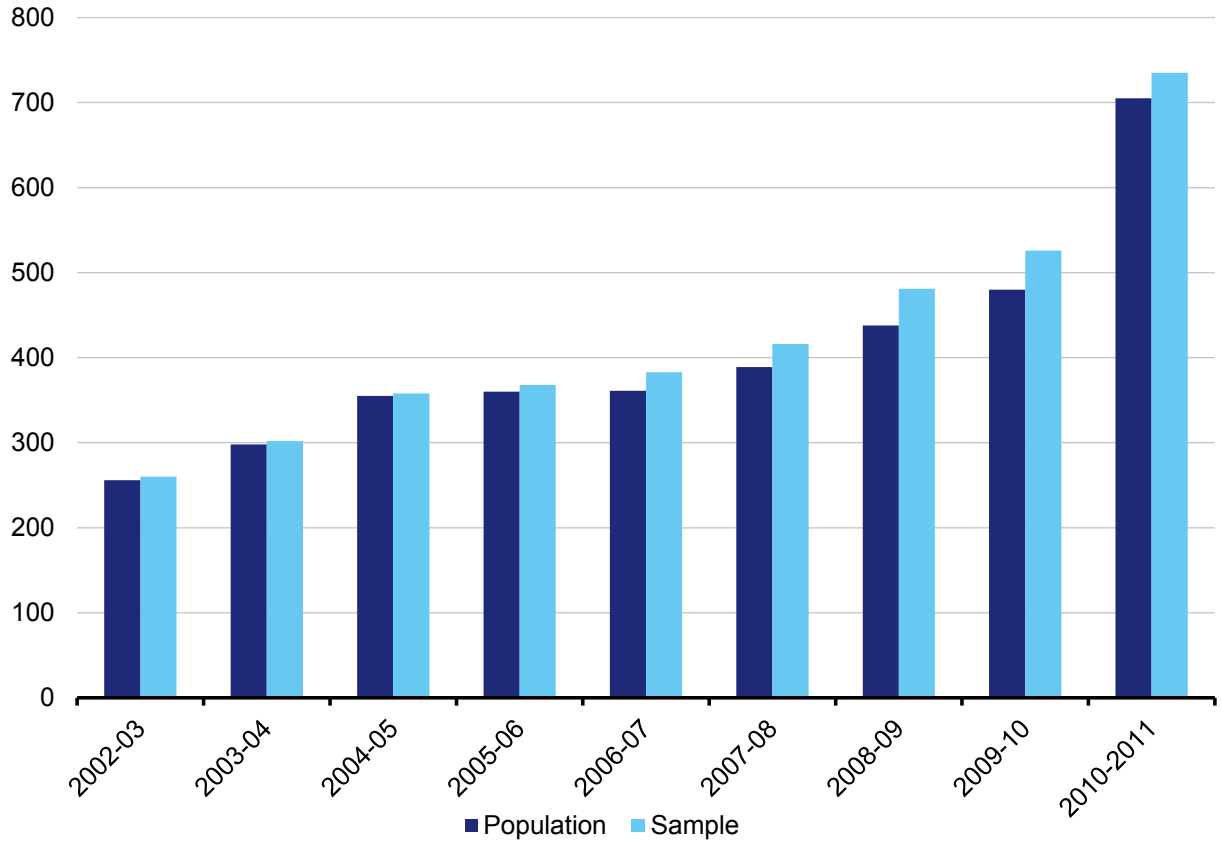


Source: Frontier analysis of ILR learner and learner aims data (R08 collection)

As can be seen from Figure 12, the sample colleges have a higher average of total learners (defined as the sum of the employer responsive and learner responsive) than the population of colleges. However this difference is consistently small and is unlikely to cause sample biases.

Apprenticeships

Figure 13. Average of number of apprenticeships

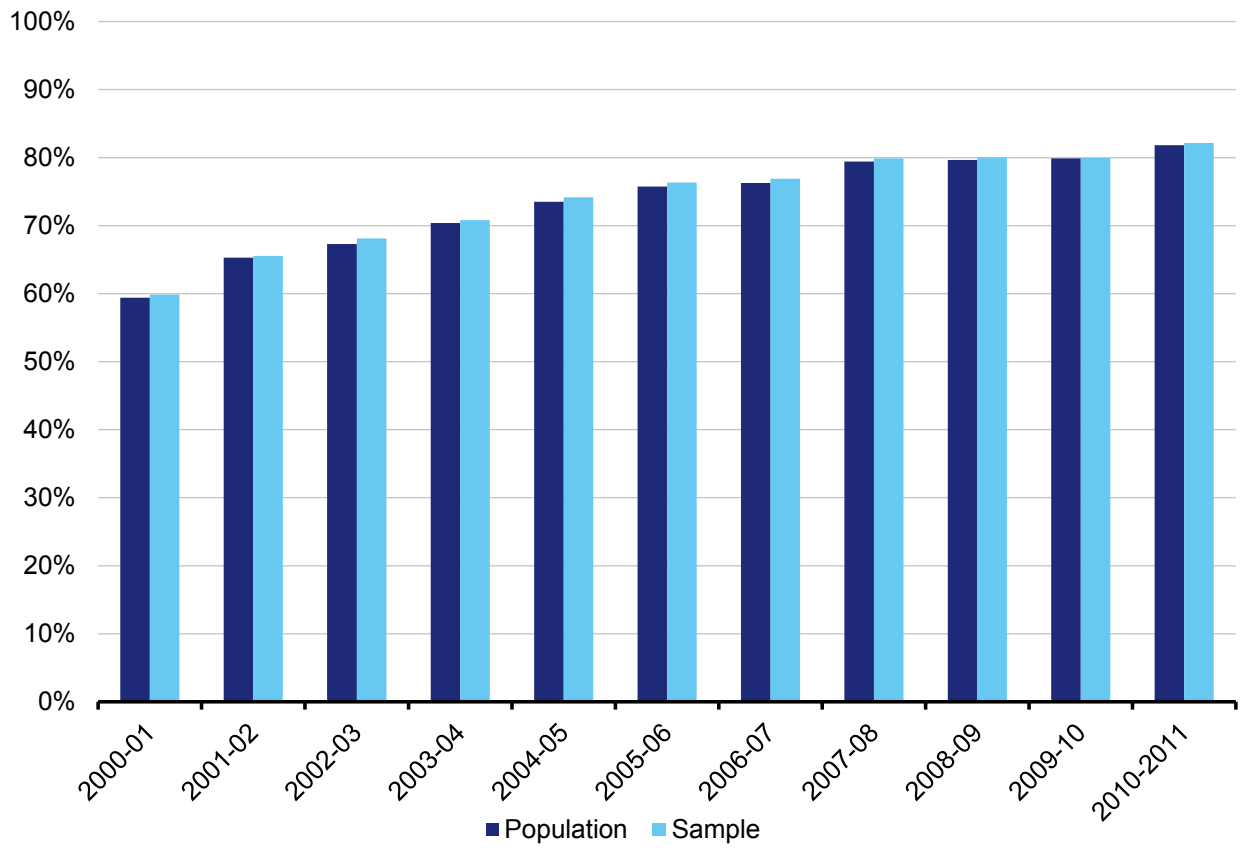


Source: Frontier analysis of ILR learner and learner aims data (R08 collection)

As can be seen from Figure 13 the sample colleges have higher number of average apprenticeships when compared to the population. Though this difference seems to be growing over time, the difference is marginal and is unlikely to cause sample bias.

Success rates

Figure 14. Average of success rates (all ages)

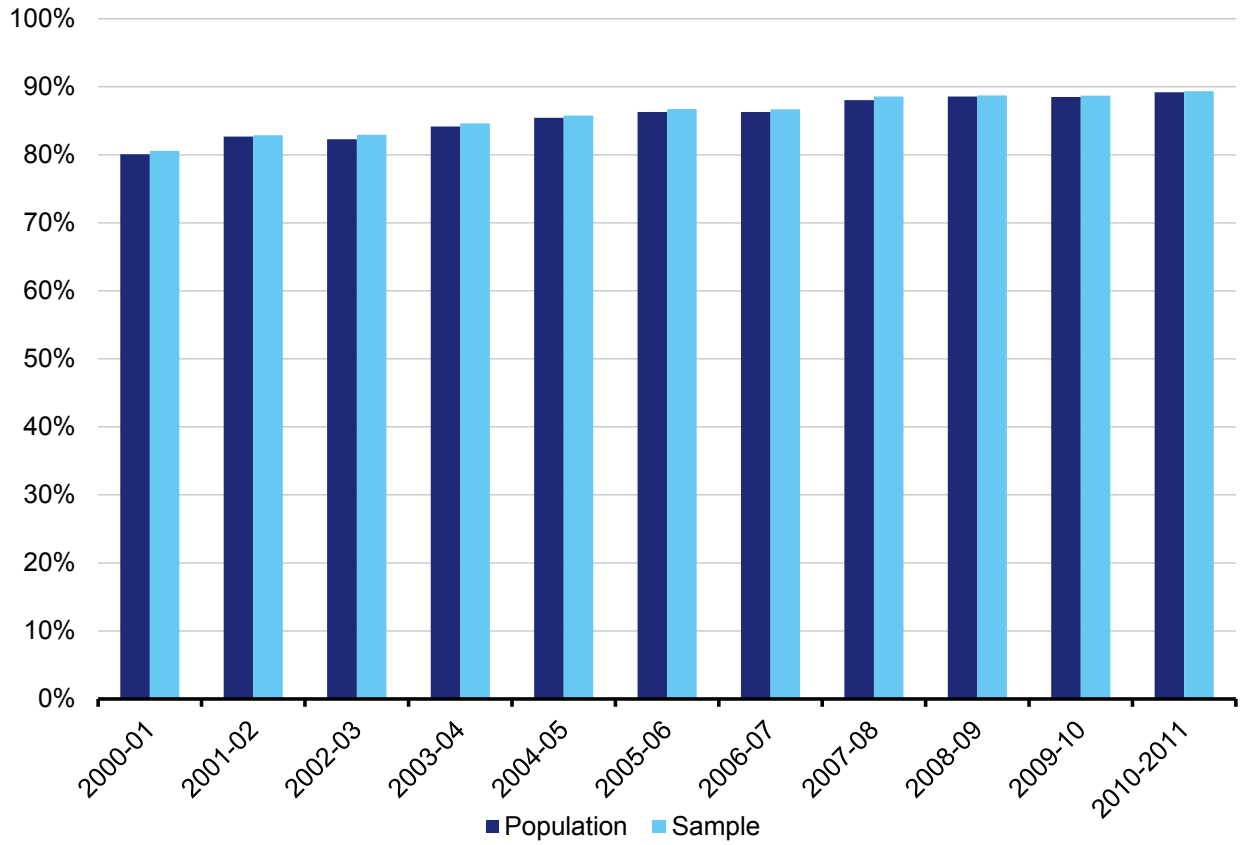


Source: Frontier analysis of National Success Rate Tables data

As can be seen from Figure 14, there are no significant differences between the sample and the population in terms of success rates for all ages.

Retention rates

Figure 15. Average of retention rates (all ages)

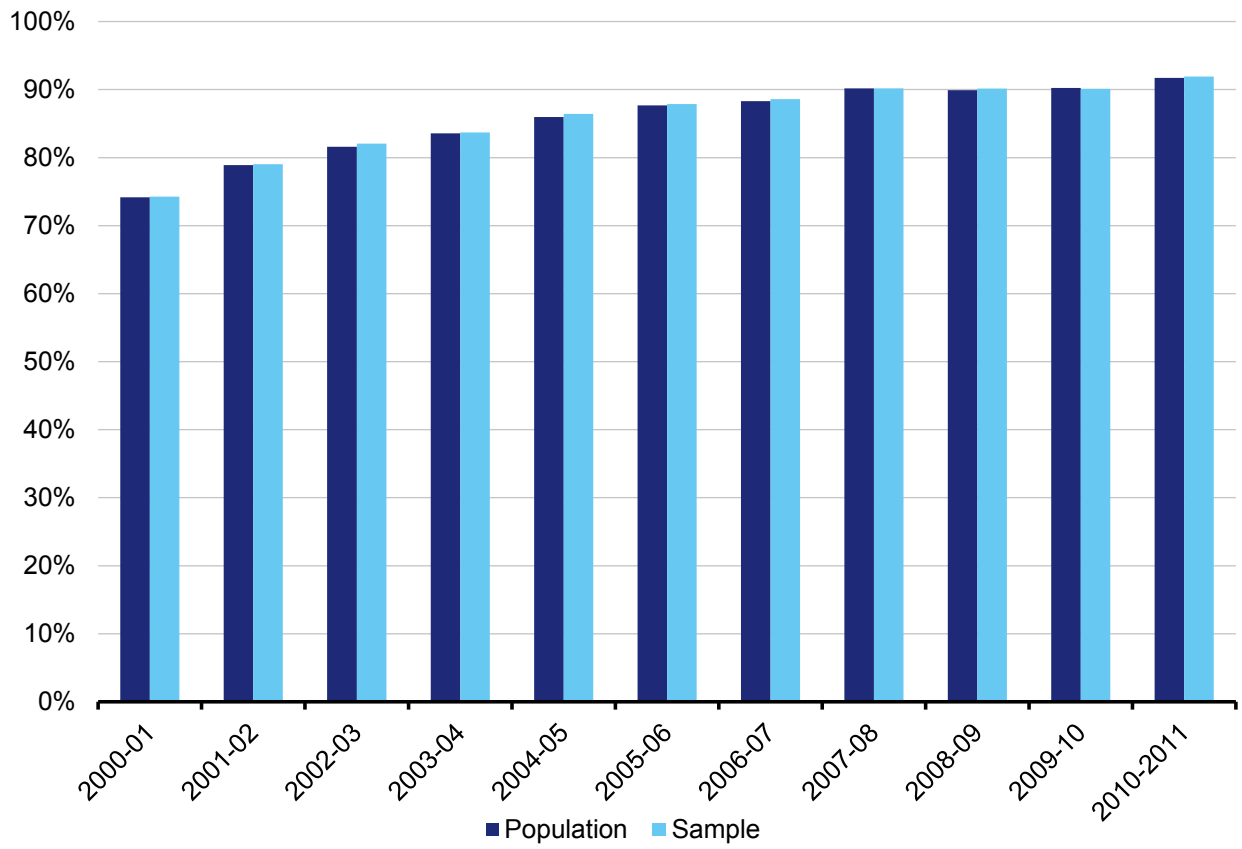


Source: Frontier analysis of National Success Rate Tables data

As can be seen from Figure 15, there are no significant differences between the sample and the population in terms of retention rates.

Achievement rates

Figure 16. Average of achievement rates (all ages)

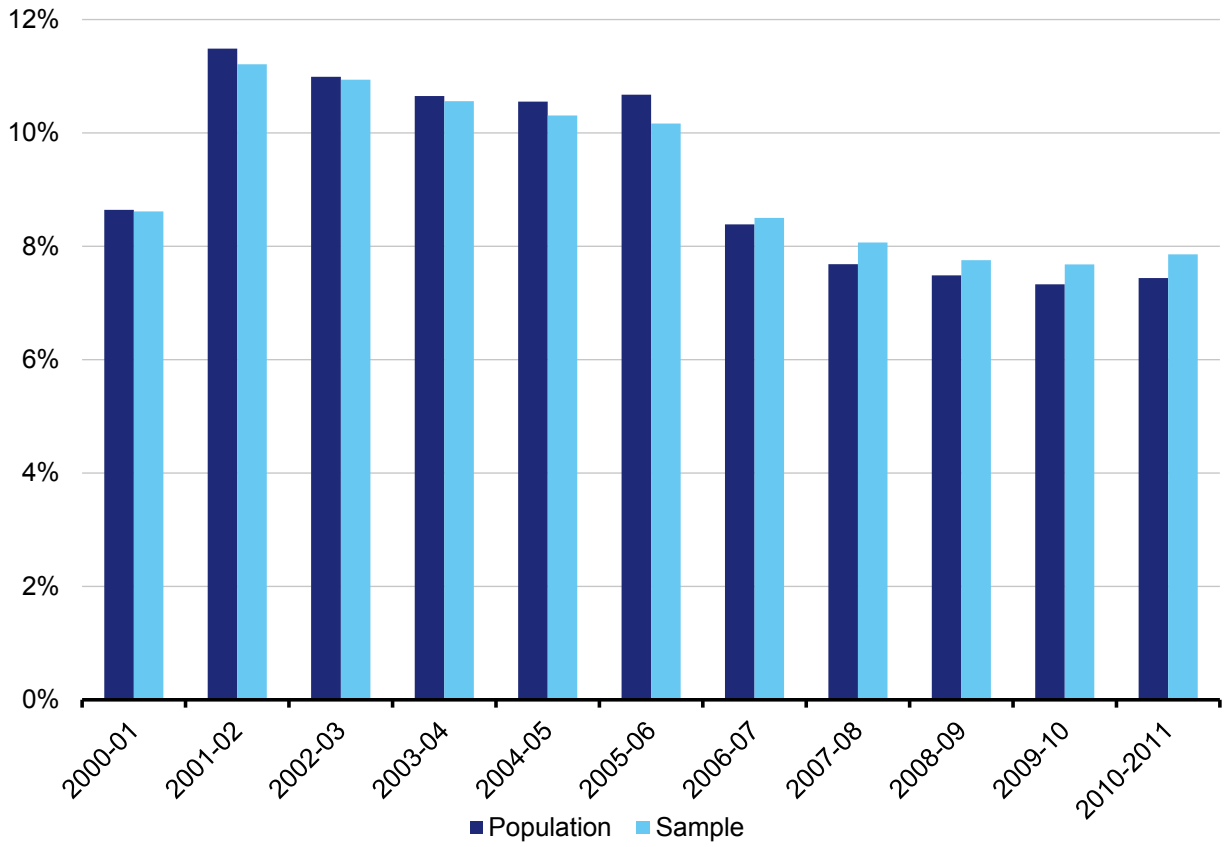


Source: Frontier analysis of National Success Rate Tables data

As can be seen from Figure 16, there are no significant differences between the sample and the population in terms of achievement rates.

Tuition fee as a percentage of income

Figure 17. Average of tuition fee income as a percentage of total income



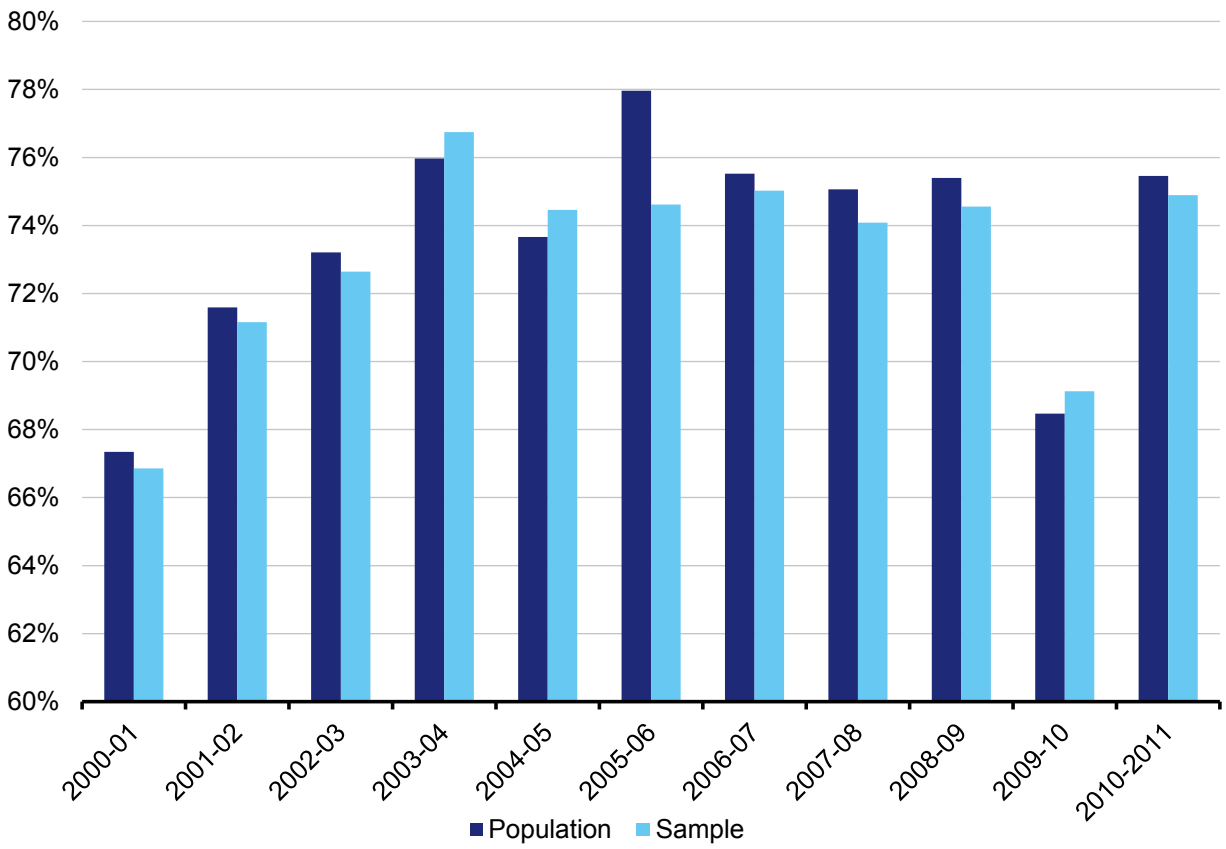
Source: Frontier analysis of Skills Funding Agency college accounts data

As can be seen from Figure 17, there are no significant or consistent differences between the sample and the population in terms of tuition fee as a proportion of total income.

Dependency on LSC/Skills Funding Agency/YPLA income

As can be seen from Figure 18, although there are some differences between the sample and the population there are no consistent differences between them in terms of dependency on LSC/Skills Funding Agency income and there is unlikely to be sample bias.

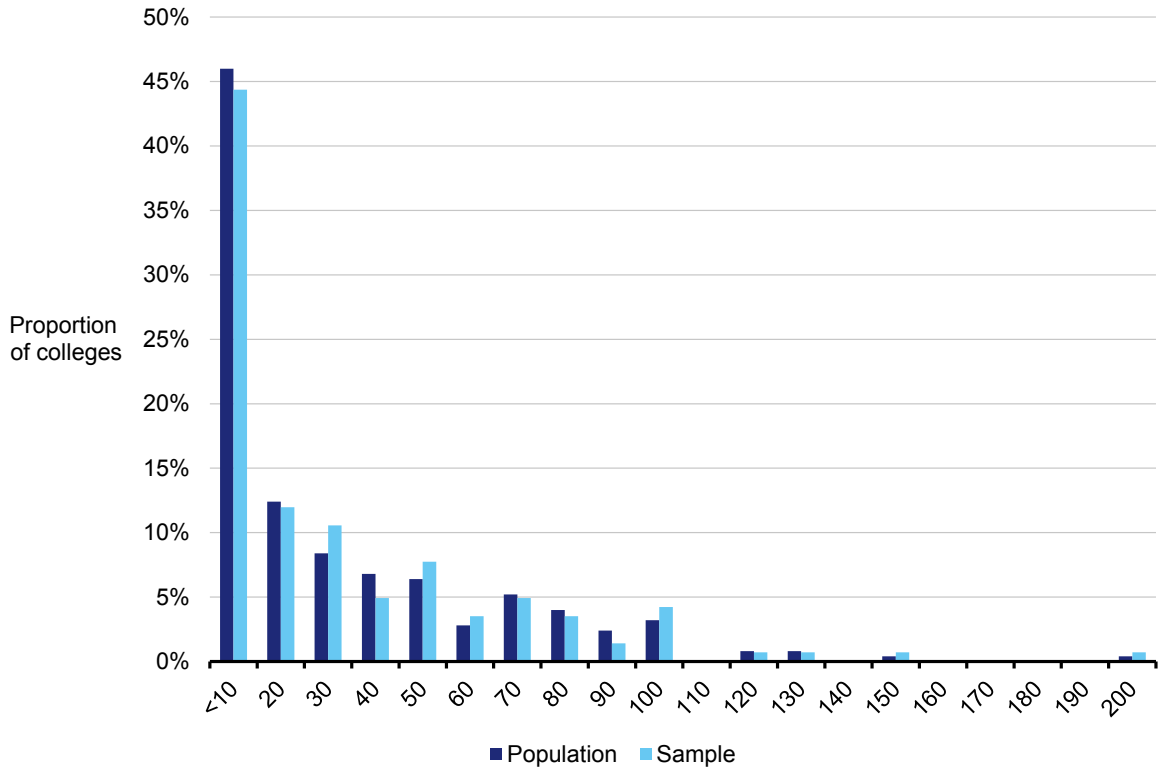
Figure 18. Average of LSC / Skills Funding Agency income as a percentage of total income



Source: Frontier analysis of Skills Funding Agency college accounts data

Total capital expenditure by college

Figure 19. Bar chart of total capital expenditure approved per college from 2002/03 to 2010/11 across all colleges, £ million



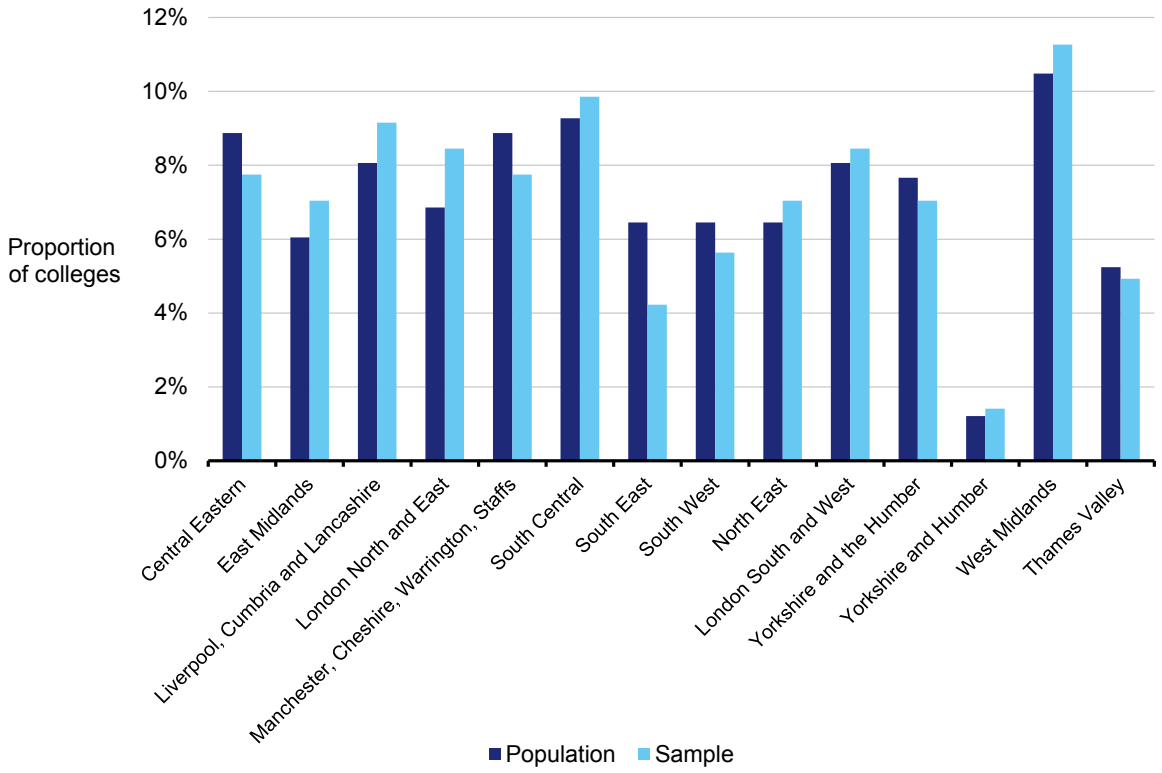
Source: Frontier analysis of Skills Funding Agency capital expenditure approvals data

As can be seen from Figure 19, there are no consistent differences between the capital expenditure conducted across all colleges between the sample and the population.

College Characteristics

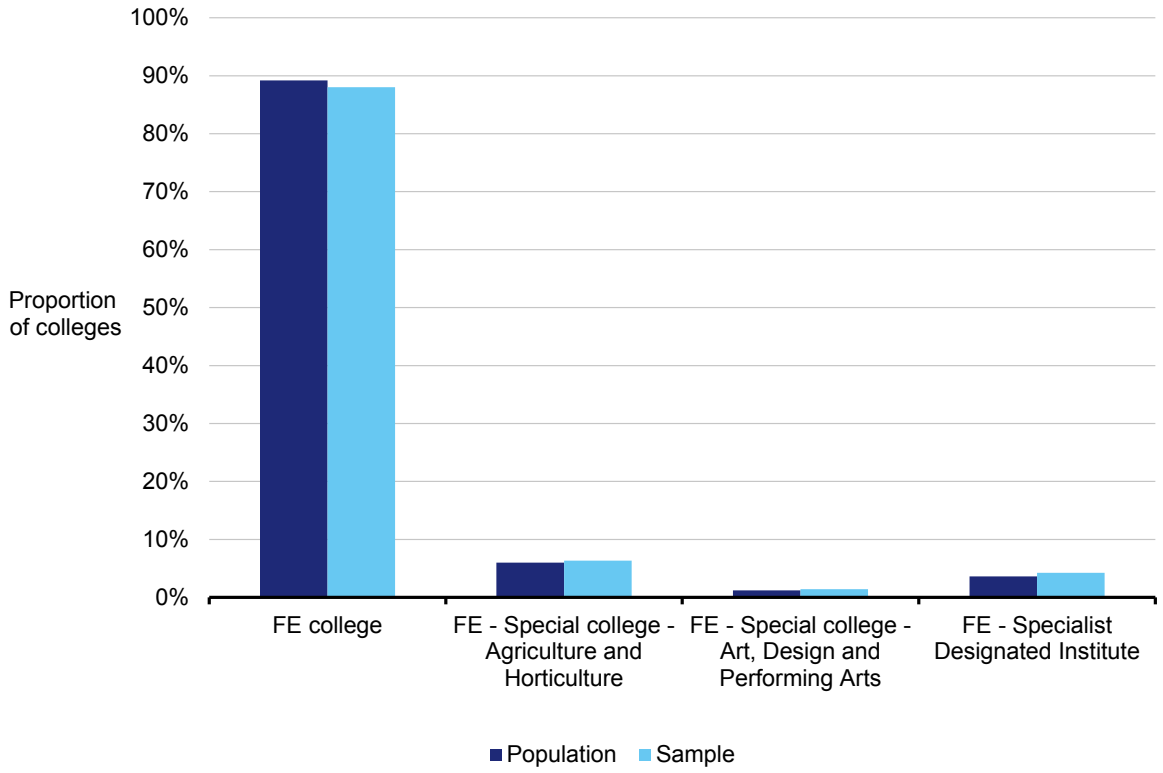
As can be seen in Figure 20 and Figure 21, there are no significant differences between the sample and the population in terms of the location of the college or the types of colleges. The colleges are located relatively evenly across all locations and are mostly FE colleges. There is unlikely to be sample bias.

Figure 20. Distribution of college locations



Source: Frontier analysis of Skills Funding Agency college contact details list

Figure 21. Distribution of types of college



Source: Frontier analysis of Skills Funding Agency college contact details list

Annex C: Technical discussion of displacement effects

When a college's participation changes as a result of capital expenditure, the change in learners at that college can be split into three groups:

a) brand new (additional) learners (i.e. those who would not have studied at all had the capital expenditure not taken place);
b) learners displaced *from* other colleges (i.e. those who would have studied at another college if the capital expenditure had not taken place); and
c) learners displaced *to* other colleges as a result of capital expenditure at these other colleges.

This annex considers the extent to which displacement effects might be driving the participation impact estimates estimated in this report. The amount of displacement that is picked up in the impact estimate will depend on the existence and interaction of two factors:

- the degree of **competitive overlap** between neighbouring colleges; and
- the **allocation pattern of capital expenditure** across colleges in the local area.
- The annex describes these two factors in turn and uses a simulation to illustrate how they may influence the impact estimates.

Overall, the conclusion of this annex is that the quantitative analysis undertaken in the main report largely controls for displacement. This means that the participation estimates reported are largely net, in the sense that they reflect net leaners rather than displaced learners.

From both the qualitative work and the census of colleges, it is clear that an important rationale for investment is to bring estate that is in poor condition back to an operational standard. This is different to a Treatment / Control group approach where a randomised allocation mechanism would give rise to unequal capital allocations and drive displacement flows. In fact, the analysis throughout this report shows that impacts are larger, not smaller when extremely large capital expenditure projects are excluded. This is the opposite of what would be expected if displacement effects were significant.

Competitive overlap

The level of displacement is dependent on the extent to which college catchments overlap in terms of both geography and case mix. If there is no overlap, there can be no displacement.

To see the importance of **geographical overlap**, consider a college in a large metropolitan area. There may well be thousands of potential students in the vicinity of College A, but they go to other colleges instead. A large capital expenditure project making College A more attractive would potentially displace many students from neighbouring colleges. But if College A were instead in a geographically isolated location, with no overlap with other colleges' catchments, no displacement would occur: there would not be any contestable students to attract.

The **mix of courses** is also important. Suppose there are two general FE colleges competing for the same pool of students and offering the same courses. In this case, large displacement flows in response to capital expenditure would be expected. Instead, suppose the colleges had very different course offerings, e.g. one was an agricultural college whilst the other was an art and design college. The potential for displacement would be much less, as prospective students would be unlikely to substitute one type of course for the other.

The population of FE colleges will span a range of degrees of competitive overlap, so there will be great variation for displacement potential across colleges. In theory, this displacement could be analysed in detail at a local level using colleges' and learners' addresses to estimate a choice model. This is well beyond the scope of the current dataset and analysis.

Pattern of capital expenditure

The pattern of capital expenditure across colleges is also relevant for understanding likely displacement. Since net displacement comprises learners displaced *from* other colleges and learners displaced *to* other colleges, net displacement will depend on what is happening at neighbouring colleges. Suppose there is a group of towns (local markets) and each town has two colleges. College A receives capex and college B does not. The estimated impact would include a large element of displacement. Now suppose instead that in each town the two colleges received similar amounts of capital expenditure. There is likely in this case to only be small displacement flows. If this situation happened across all towns of different sizes, the impact estimate would only contain a small element of displacement.

Clearly, the pertinent question here is how the funding bodies allocate capital expenditure. If the main purpose is to bring estate in poor condition back to operable standard, one would expect to see fairly even allocations across colleges and minimal displacement. On the other hand, if the purpose is to finance only a handful of very large projects, whilst not investing in neighbouring colleges, this could potentially drive large displacement flows.

It is worth noting that the participation results in this report seem to be driven more by smaller projects than the very large projects. The colleges receiving very large amounts of capital expenditure are precisely the colleges the discussion here would indicate would be expected to be driving displacement. But when these colleges are excluded the impact estimates are larger rather than smaller. This suggests displacement is not a key driver of the impact estimates in this analysis.

Simulations of displacement

This simulation example is intended to illustrate the factors discussed earlier. The parameter values are purely illustrative and are not intended to represent the authors' views of the underlying relationships.

Consider a town with two colleges. Assume that capital expenditure increases net participation by 10 students per unit capital investment. Also assume that capital expenditure can induce displacement.

There are a number of existing students in the town, of which a proportion are 'contestable'. The pool of contestable students is allocated between colleges in proportion to their share of the

capital stock $k_a=K_a/(K_a+K_b)$.[61] Capital expenditure alters a college's share of capital in the town, thereby driving displacement from one college to another.

If a regression that analyses the change in participation at these colleges against capital expenditure is run, the participation estimate will comprise net new students plus displacement. The regression estimates can be compared with the underlying increase in net participation to understand the degree of displacement.

Base case

College A and College B start with the same level of capital stock K_A = 200 and K_B = 200. Suppose there are 10,000 students in the town and half (5,000) are contestable. The colleges have shares of 50 per cent and 50 per cent respectively of the contestable pool (2,500 students each).

College A receives 100 units of capital expenditure. It now attracts (200+100)/(200+100+200)=60% of the contestable pool of students, which is 5000*60% = 3000 students. In making the capital investment, it has taken 500 students from College B.

As above, if it is assumed that capital expenditure is known to bring 10 students per unit of capital investment, the net increase (true impact) in students is 10*100=1000, as shown in Table 38.

Table 38. Displacement in the base case

	Capital				Contestable participation:			
College	before	added	after	**Students** before	before	after	**New students**	**Net change**
A	200	100	300	5000	2500	3000	1000	1500
B	200	0	200	5000	2500	2000	0	-500

Source: stylised example

The estimated impact is 20 students per unit of capital expenditure (1500-(-500))/100), but the true net impact is 10 students per unit of capital expenditure.

Competitive overlap

Now suppose all 10,000 students are contestable. Displacement flows are larger and College A now displaces 1000 students from College B. This is shown in Table 39. The estimated impact is 30 students per unit of capital expenditure (2000-(-1000))/100), but the true net impact is still 10.

Table 39. Displacement with increased competitive overlap

	Capital				Contestable participation:			
College	before	added	after	**Students** before	before	after	**New students**	**Net change**
A	200	100	300	5000	5000	6000	1000	2000
B	200	0	200	5000	5000	4000	0	-1000

Source: stylised example

[61] This is consistent with the approach used in logit choice models. The capital stock of a college determines its attractiveness.

Similarly, if only a quarter of students were contestable, the displacement bias would be smaller. College A would only take 250 students from College B. Here the estimated impact would be 15 students per unit of capital expenditure (1250-(-250)/100) against a true net impact of 10 as shown in Table 40.

Table 40. Displacement with decreased competitive overlap

College	Capital before	Capital added	Capital after	Students before	Contestable participation: before	Contestable participation: after	New students	Net change
A	200	100	300	5000	1250	1500	1000	1250
B	200	0	200	5000	1250	1000	0	-250

Source: stylised example

Allocation mechanism

Now suppose there are two towns. Town 2 is the same as town 1 but everything is half the size. Students can be displaced within towns, but not between towns. This is shown in Table 41. The estimated impact is 19.1 students per unit of capital expenditure.[62] The cross-sectional variation itself has removed some of the displacement bias.

Table 41. Displacement with two towns and uneven capital expenditure

College	Capital before	Capital added	Capital after	Students before	Contestable participation: before	Contestable participation: after	New students	Net change
A1	200	100	300	5000	2500	3000	1000	1500
B1	200	0	200	5000	2500	2000	0	-500
A2	100	50	150	2500	1250	1500	500	750
B2	100	0	100	2500	1250	1000	0	-250

Source: stylised example

Compare this with a world in which capital expenditure is allocated more evenly between the colleges in a town. This is shown in Table 42. Here the estimated impact is 12.9 students per unit of capital expenditure.[63]

[62] This is calculated using the formula $b = \sum(Xi-X)(Yi-Y)/ \sum(Xi-X)^2$ where b is the estimate of impact, X is the amount of capital expenditure and Y is the level of participation. For more details, please refer to Damodar Gujarati "Basic Econometrics" 4th edition, McGraw Hill, Page 62.

[63] See Footnote 62.

Table 42. Displacement with two towns and more even pattern of capital expenditure

College	Capital before	Capital added	Capital after	Students before	Contestable participation: before	Contestable participation: after	New students	Net change
A1	200	60	260	5000	2500	2600	600	700
B1	200	40	240	5000	2500	2400	400	300
A2	100	30	130	2500	1250	1300	300	350
B2	100	20	120	2500	1250	1200	200	150

Source: stylised example

If capital were allocated evenly between the colleges in each town, the displacement would be zero. In this case, the estimated impact is 10 students per unit of capital expenditure, which equates to the pure additional impact of 10 students per unit of capital expenditure.[64] This is shown in Table 43.

Table 43. Displacement with two towns and even pattern of capital expenditure

College	Capital before	Capital added	Capital after	Students before	Contestable participation: before	Contestable participation: after	New students	Net change
A1	200	50	250	5000	2500	2500	500	500
B1	200	50	250	5000	2500	2500	500	500
A2	100	25	125	2500	1250	1250	250	250
B2	100	25	125	2500	1250	1250	250	250

Source: stylised example

[64] See Footnote 62.

Appendices

The following appendices reproduce the original quantitative and qualitative research tools that were used in the study:

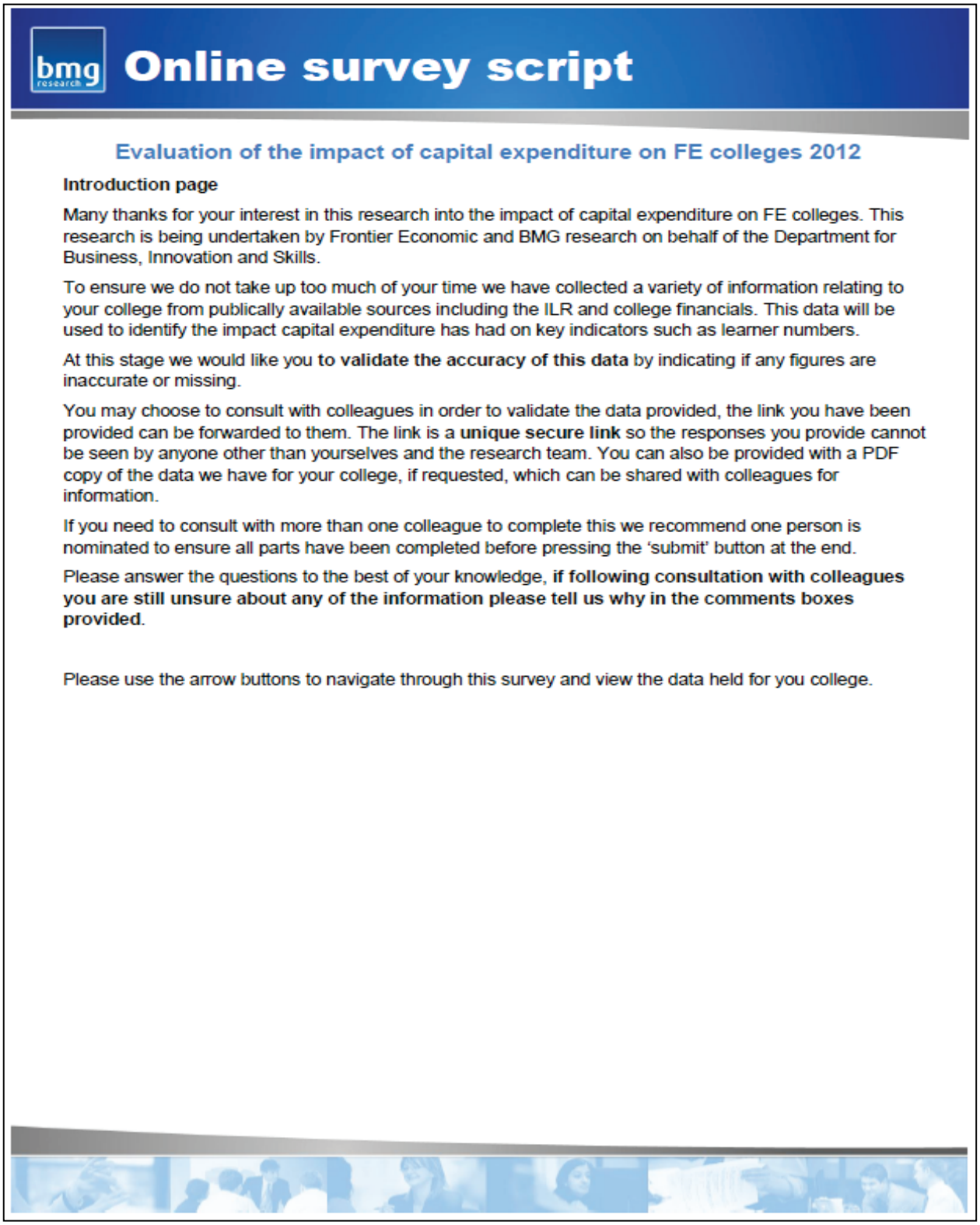
Quantitative research tools

- Appendix 1a provides the original template script for the quantitative census.
- Appendix 1b provides example web pages of the survey as they appeared online.

Qualitative research tools

- Appendix 2 provides the topic guide, which sets out the steps to carrying out the qualitative study, and includes the semi-structured questionnaire used at interviews with the case study colleges.

Appendix 1a – Quantitative survey script



Online survey script

Evaluation of the impact of capital expenditure on FE colleges 2012

Introduction page

Many thanks for your interest in this research into the impact of capital expenditure on FE colleges. This research is being undertaken by Frontier Economic and BMG research on behalf of the Department for Business, Innovation and Skills.

To ensure we do not take up too much of your time we have collected a variety of information relating to your college from publically available sources including the ILR and college financials. This data will be used to identify the impact capital expenditure has had on key indicators such as learner numbers.

At this stage we would like you **to validate the accuracy of this data** by indicating if any figures are inaccurate or missing.

You may choose to consult with colleagues in order to validate the data provided, the link you have been provided can be forwarded to them. The link is a **unique secure link** so the responses you provide cannot be seen by anyone other than yourselves and the research team. You can also be provided with a PDF copy of the data we have for your college, if requested, which can be shared with colleagues for information.

If you need to consult with more than one colleague to complete this we recommend one person is nominated to ensure all parts have been completed before pressing the 'submit' button at the end.

Please answer the questions to the best of your knowledge, **if following consultation with colleagues you are still unsure about any of the information please tell us why in the comments boxes provided.**

Please use the arrow buttons to navigate through this survey and view the data held for you college.

Part 1 – participation data for college

Page 1

SHOW ALL

The figures below show the total number of Employer Responsive Learners for your college between 02/03 and 10/11 as sourced from the ILR.

DATA FIELDS FOR SEEDING SHOWN BELOW

02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
W	AB	AG	AL	AQ	AV	BA	BF	BK

Table 1

ASK ALL

Q1A. Are any of these figures incorrect or missing?

Yes ☐ GO TO Q1B

No ☐ GO TO Q1D if applicable

ASK IF Q1A=1

Q1B. Please provide the correct figures for the total number of Employer Responsive Learners for your college between 02/03 and 10/11 in the table below.

02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11

Table 2

ASK IF Q1A=1

Q1C. Please explain any differences between the original and corrected figures, or gaps in these figures in the box below

ASK IF FIELD G = 1

Q1D. Please can you clarify the variance in the total number of Employer Responsive Learners in the year(s) [INSERT FROM FIELD H]

ASK ALL

Q1E. If you have any further comments about this information please tell us in the box below

PLEASE PRESS THE 'NEXT' BUTTON TO PROCEED OR TO SAVE ANY RESPONSES SO FAR, YOU CAN RETURN TO THESE USING THE 'BACK' BUTTON IF REQUIRED

Page 2

SHOW ALL

The figures below show the total number of Apprenticeships for your college between 02/03 and 10/11 as sourced from the ILR.

DATA FIELDS FOR SEEDING SHOWN BELOW

02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
X	AC	AH	AM	AR	AW	BB	BG	BL

Table 3

ASK ALL

Q2A. Are any of these figures incorrect or missing?

Yes ☐ GO TO Q2B

No ☐ GO TO Q2D if applicable

ASK IF Q2A=1

Q2B. Please provide the correct figures for the total number of Apprenticeships for your college between 02/03 and 10/11 in the table below.

02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11

Table 4

ASK IF Q2A=1

Q2C. Please explain any differences between the original and corrected figures, or gaps in these figures in the box below

ASK IF FIELD I = 1

Q2D. Please can you clarify the variance in the total number of Apprenticeships in the year(s) [INSERT FROM FIELD J]

ASK ALL

Q2E. If you have any further comments about this information please tell us in the box below

PLEASE PRESS THE 'NEXT' BUTTON TO PROCEED OR TO SAVE ANY RESPONSES SO FAR, YOU CAN RETURN TO THESE USING THE 'BACK' BUTTON IF REQUIRED

Page 3

SHOW ALL

The figures below show the total number of Learner Responsive learners for your college between 02/03 and 10/11 as sourced from the ILR.

DATA FIELDS FOR SEEDING SHOWN BELOW

02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Y	AD	AI	AN	AS	AX	BC	BH	BM

Table 5

ASK ALL

Q3A. Are any of these figures incorrect or missing? *IF FIELD C=1 SHOW THE FOLLOWING TEXT (The data for **02/03** - **06/07** has been previously validated by your colleague in past research; however, if these numbers have changed at all or the figures for 07/08 – 10/11 are missing/incorrect please let us know)*

Yes ☐ GO TO Q3B

No ☐ GO TO Q3D if applicable

ASK IF Q3A=1

Q3B. Please provide the correct figures for the total number of Learner Responsive learners for your college between 02/03 and 10/11 in the table below.

02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11

Table 6

ASK IF Q3A=1

Q3C. Please explain any differences between the original and corrected figures, or gaps in these figures in the box below

ASK IF FIELD K = 1

Q3D. Please can you clarify the variance in the total number of Learner Responsive learners in the year(s) [INSERT FROM FIELD L]

ASK ALL

Q3E. If you have any further comments about this information please tell us in the box below

PLEASE PRESS THE 'NEXT' BUTTON TO PROCEED OR TO SAVE ANY RESPONSES SO FAR, YOU CAN RETURN TO THESE USING THE 'BACK' BUTTON IF REQUIRED

Page 4

SHOW ALL

The figures below show the total number of Learner Responsive learners, excluding franchised and long-distance learners for your college between 02/03 and 10/11 as sourced from the ILR.

DATA FIELDS FOR SEEDING SHOWN BELOW

02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
Z	AE	AJ	AO	AT	AY	BD	BI	BN

Table 7

ASK ALL

Q4A. Are any of these figures incorrect or missing? *IF FIELD C=1 SHOW THE FOLLOWING TEXT (The data for **02/03 - 06/07** has been previously validated by your colleague in past research; however, if these numbers have changed at all or the figures for 07/08 – 10/11 are missing/incorrect please let us know)*

Yes ☐ GO TO Q4B

No ☐ GO TO Q4D if applicable

ASK IF Q4A=1

Q4B. Please provide the correct figures for the total number of Learner Responsive learners, excluding franchised and long-distance learners for your college between 02/03 and 10/11 in the table below.

02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11

Table 8

ASK IF Q4A=1

Q4C. Please explain any differences between the original and corrected figures, or gaps in these figures in the box below

ASK IF FIELD M = 1

Q4D. Please can you clarify the variance in the total number of Learner Responsive learners, excluding franchised and long-distance learners in the year(s) [INSERT FROM FIELD N]

ASK ALL

Q4E. If you have any further comments about this information please tell us in the box below

PLEASE PRESS THE 'NEXT' BUTTON TO PROCEED OR TO SAVE ANY RESPONSES SO FAR, YOU CAN RETURN TO THESE USING THE 'BACK' BUTTON IF REQUIRED

Page 5

SHOW ALL

The figures below show the total number of LSC/SFA/YPLA funded Learner Responsive learners for your college between 02/03 and 10/11 as sourced from the ILR.

DATA FIELDS FOR SEEDING SHOWN BELOW

02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
AA	AF	AK	AP	AU	AZ	BE	BJ	BO

Table 9

ASK ALL

Q5A. Are any of these figures incorrect or missing? *IF FIELD C=1 SHOW THE FOLLOWING TEXT (The data for **02/03 - 06/07** has been previously validated by your colleague in past research; however, if these numbers have changed at all or the figures for 07/08 – 10/11 are missing/incorrect please let us know)*

Yes ☐ GO TO Q5B

No ☐ GO TO Q5D if applicable

ASK IF Q5A=1

Q5B. Please provide the correct figures for the total number of LSC/SFA/YPLA funded Learner Responsive learners for your college between 02/03 and 10/11 in the table below.

02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11

Table 10

ASK IF Q5A=1

Q5C. Please explain any differences between the original and corrected figures, or gaps in these figures in the box below

ASK IF FIELD O = 1

Q5D. Please can you clarify the variance in the total number of LSC/SFA/YPLA funded Learner Responsive learners in the year(s) [INSERT FROM FIELD P]

ASK ALL

Q5E. If you have any further comments about this information please tell us in the box below

PLEASE PRESS THE 'NEXT' BUTTON TO PROCEED OR TO SAVE ANY RESPONSES SO FAR, YOU CAN RETURN TO THESE USING THE 'BACK' BUTTON IF REQUIRED

Part 2 – Fee income data for college

Page 6

SHOW ALL

The figures below show the total tuition fee income for your college between 00/01 and 10/11 as sourced from college financials.

DATA FIELDS FOR SEEDING SHOWN BELOW

00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11

Table 11

ASK ALL

Q6A. Are any of these figures incorrect or missing?

Yes ☐ GO TO Q6B

No ☐ GO TO Q6D if applicable

ASK IF Q6A=1

Q6B. Please provide the correct figures for the total tuition fee income for your college between 00/01 and 10/11 in the table below.

00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
BP	BS	BV	BY	CB	CE	CH	CK	CN	CQ	CT

Table 12

ASK IF Q6A=1

Q6C. Please explain any differences between the original and corrected figures, or gaps in these figures in the box below

ASK IF FIELD Q = 1

Q6D. Please can you clarify any variance in the total tuition fee income for your college in the year(s) [INSERT FROM FIELD R]

ASK ALL

Q6E. If you have any further comments about this information please tell us in the box below

PLEASE PRESS THE 'NEXT' BUTTON TO PROCEED OR TO SAVE ANY RESPONSES SO FAR, YOU CAN RETURN TO THESE USING THE 'BACK' BUTTON IF REQUIRED

Page 7

SHOW ALL

The figures below show the total LSC/SFA/YPLA income for your college between 00/01 and 10/11 as sourced from college financials.

DATA FIELDS FOR SEEDING SHOWN BELOW

00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
BQ	BT	BW	BZ	CC	CF	CI	CL	CO	CR	CU

Table 13

ASK ALL

Q7A. Are any of these figures incorrect or missing?

Yes ☐ GO TO Q7B

No ☐ GO TO Q7D if applicable

ASK IF Q7A=1

Q7B. Please provide the correct figures for the total LSC/SFA/YPLA income for your college between 00/01 and 10/11 in the table below.

00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11

Table 14

ASK IF Q7A=1

Q7C. Please explain any differences between the original and corrected figures, or gaps in these figures in the box below

ASK IF FIELD S = 1

Q7D. Please can you clarify any variance in the total LSC/SFA/YPLA income for your college in the year(s) [INSERT FROM FIELD T]

ASK ALL

Q7E. If you have any further comments about this information please tell us in the box below

PLEASE PRESS THE 'NEXT' BUTTON TO PROCEED OR TO SAVE ANY RESPONSES SO FAR, YOU CAN RETURN TO THESE USING THE 'BACK' BUTTON IF REQUIRED

Page 8

SHOW ALL

The figures below show the total income for your college between 00/01 and 10/11 as sourced from college financials.

DATA FIELDS FOR SEEDING SHOWN BELOW

00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
BR	BU	BX	CA	CD	CG	CJ	CM	CP	CS	CV

Table 15

ASK ALL

Q8A. Are any of these figures incorrect or missing?

Yes ☐ GO TO Q8B

No ☐ GO TO Q8D if applicable

ASK IF Q8A=1

Q8B. Please provide the correct figures for the total income for your college between 00/01 and 10/11 in the table below.

00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11

Table 16

ASK IF Q8A=1

Q8C. Please explain any differences between the original and corrected figures, or gaps in these figures in the box below

ASK IF FIELD U = 1

Q8D. Please can you clarify any variance in the total income for your college in the year(s) [INSERT FROM FIELD V]

ASK ALL

Q8E. If you have any further comments about this information please tell us in the box below

PLEASE PRESS THE 'NEXT' BUTTON TO PROCEED OR TO SAVE ANY RESPONSES SO FAR, YOU CAN RETURN TO THESE USING THE 'BACK' BUTTON IF REQUIRED

Page 9

IF FIELD HP=0 SKIP THIS SECTION AND GO TO SUBMISSION PAGE

SHOW ALL

The table below shows information about recent construction and refurbishment projects that have taken place at your college.

DATA FIELDS FOR SEEDING SHOWN BELOW

Project number	Project description	Date of approval	Date of completion	Date of operational use	Total Cost of Project (initial projection)	Total Cost of Project (ex post)
CW	CX	CY	CZ	DA	DB	DC
DD	DE	DF	DG	DH	DI	DJ
DK	DL	DM	DN	DO	DP	DQ
DR	DS	DT	DU	DV	DW	DX
DY	DZ	EA	EB	EC	ED	EE
EF	EG	EH	EI	EJ	EK	EL
EM	EN	EO	EP	EQ	ER	ES
ET	EU	EV	EW	EX	EY	EZ
FA	FB	FC	FD	FE	FF	FG

FH	FI	FJ	FK	FL	FM	FN
FO	FP	FQ	FR	FS	FT	FU
FV	FW	FX	FY	FZ	GA	GB
GC	GD	GE	GF	GG	GH	GI
GJ	GK	GL	GM	GN	GO	GP
GQ	GR	GS	GT	GU	GV	GW

Table 17

ASK ALL

Q9A. Is any of this information incorrect or missing? *IF FIELD C=1 SHOW THE FOLLOWING TEXT (The data for projects approved before **06/07** has been previously validated by your colleague in past research; however, if this information has changed at all or the information for projects approved from 07/08 onwards is missing/incorrect please let us know)*

Yes ☐ GO TO Q9B

No ☐ GO TO Q9D

ASK IF Q9A=1

Q9B. Please provide the correct information for your college's recent construction and refurbishment projects. If a project did not go ahead or is duplicated in the list, please simply enter 'X' into all the boxes for that project

Project number	Project description	Date of approval	Date of completion	Date of operational use	Total Cost of Project (initial projection)	Total Cost of Project (ex post)

Table 18

ASK IF Q9A=1

Q9C. Please explain any differences between the original and corrected information, or gaps in this information in the box below

Q9D. ASK ALL

If you have any further comments about this information please tell us in the box below

PLEASE PRESS THE 'NEXT' BUTTON TO PROCEED OR TO SAVE ANY RESPONSES SO FAR, YOU CAN RETURN TO THESE USING THE 'BACK' BUTTON IF REQUIRED

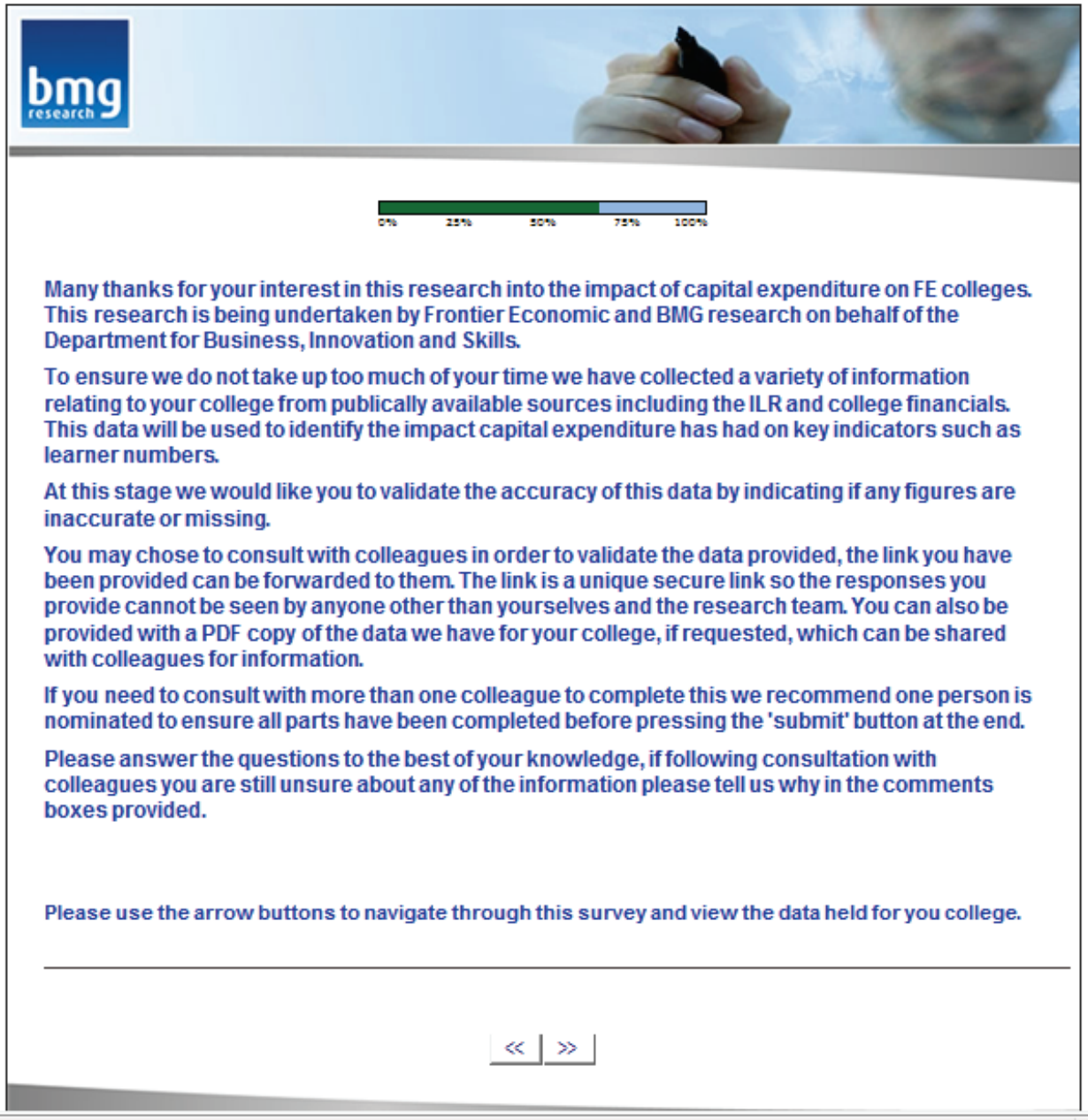
Submission page

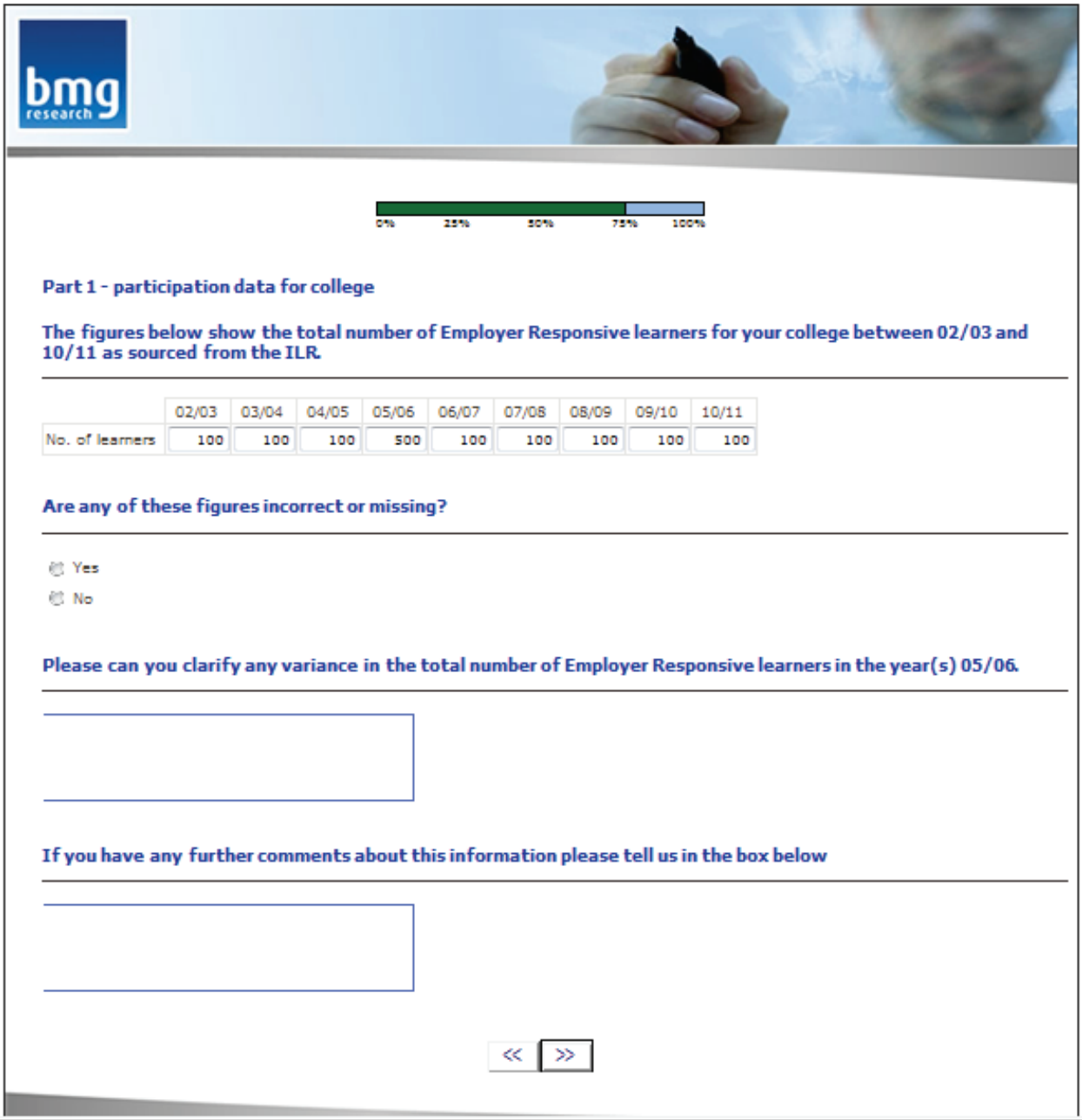
IF YOU ARE STILL WAITING FOR INFORMATION FROM COLLEAGUES TO VALIDATE ANY OF THE DATA THEN PLEASE PRESS THE 'BACK' BUTTON. IF FOLLOWING CONSULTATION WITH COLLEAGUES YOU ARE STILL UNSURE ABOUT ANY OF THE INFORMATION PLEASE TELL US WHY IN THE COMMENT BOXES PROVIDED BEFORE SUBMITTING YOUR SURVEY.

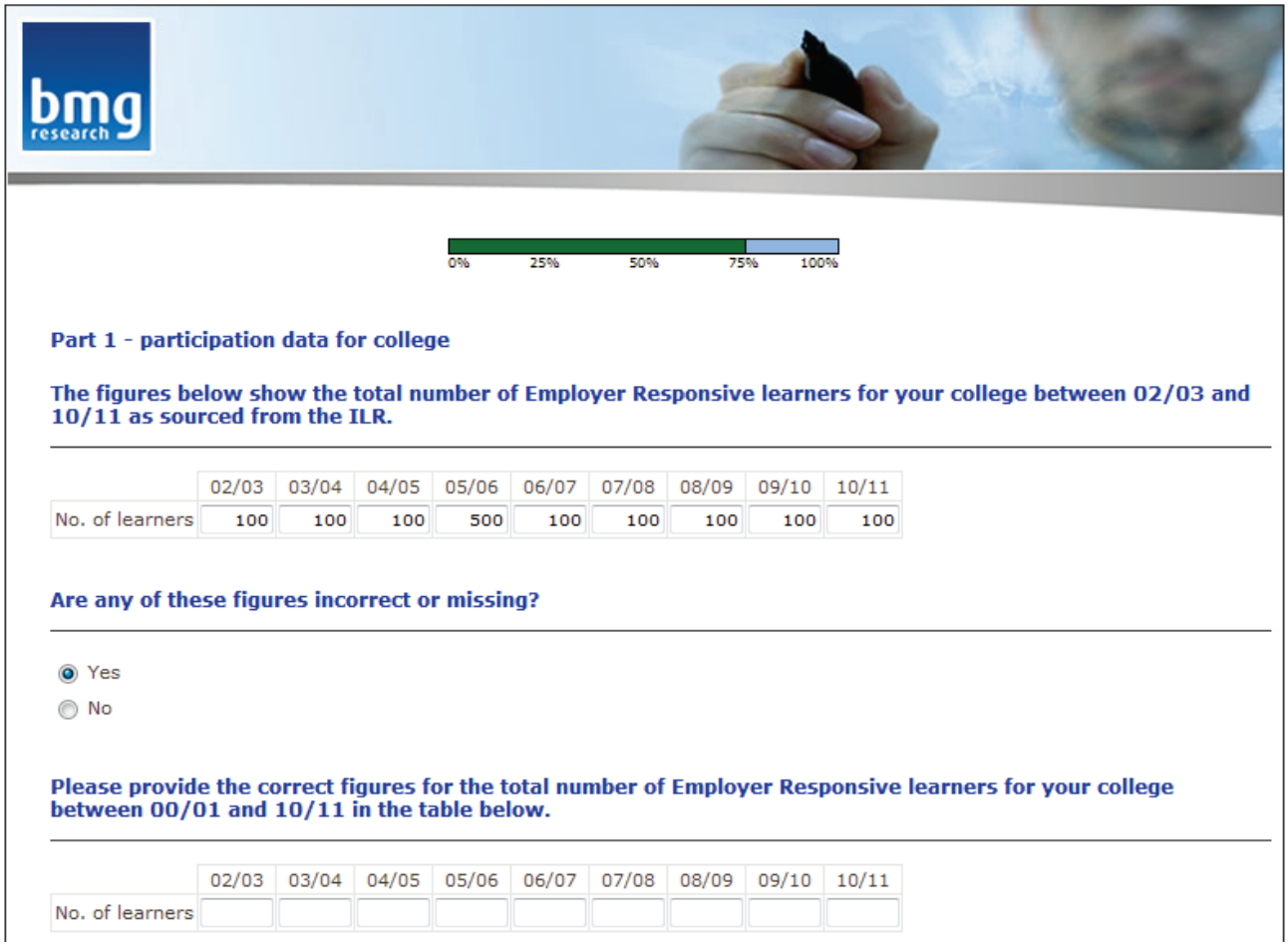
IF YOU ARE HAPPY THAT THE INFORMATION YOU HAVE PROVIDED IS ACCURATE TO THE BEST OF YOUR KNOWLEDGE PLEASE PRESS 'SUBMIT'

Many thanks for taking the time to complete this form. If you have any queries then please contact Elizabeth Davies on 0121 333 6006 or Elizabeth.davies@bmgresearch.co.uk

Appendix 1b – Online quantitative survey example web pages




bmg
research
0%
25%
50%
75%
100%
Part 1 - participation data for college
The figures below show the total number of Employer Responsive learners for your college between 02/03 and 10/11 as sourced from the ILR.
02/03 03/04 04/05 05/06 06/07 07/08 08/09 09/10 10/11
No. of learners 100 100 100 500 100 100 100 100 100
Are any of these figures incorrect or missing?
Yes
No
Please can you clarify any variance in the total number of Employer Responsive learners in the year(s) 05/06.
If you have any further comments about this information please tell us in the box below
<< >>

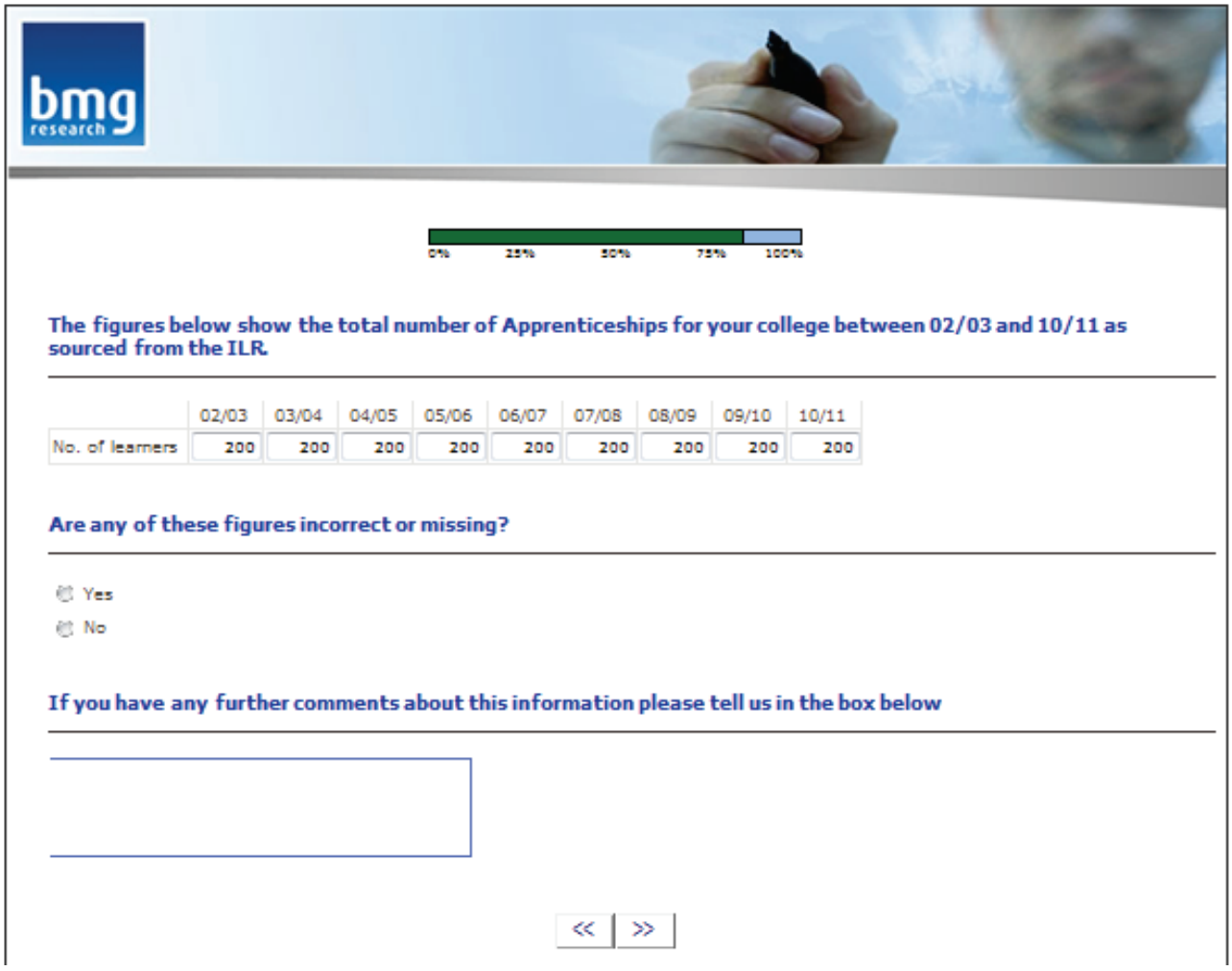


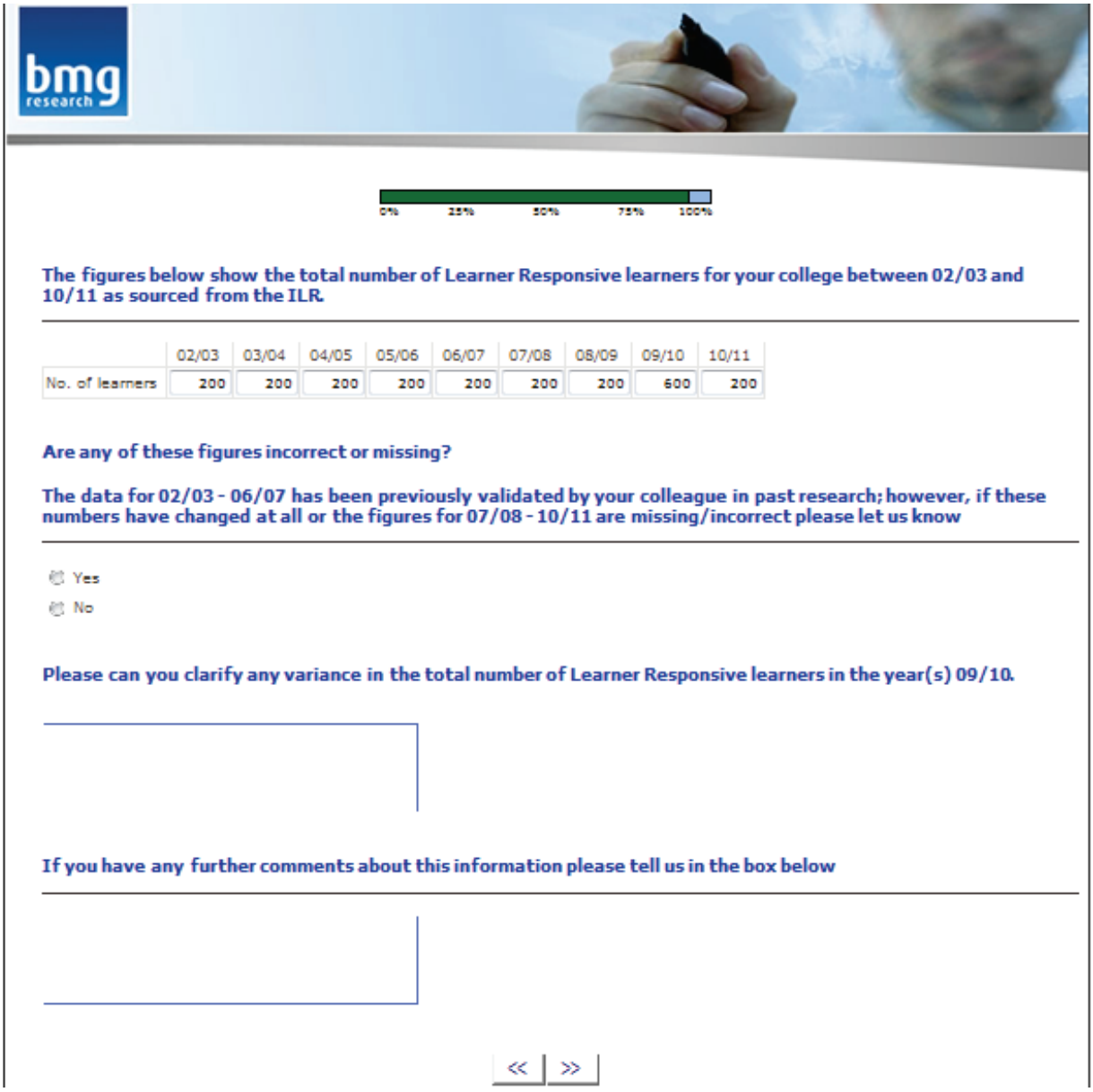
Please explain any differences between the original and corrected figures, or gaps in these figures in the box below

Please can you clarify any variance in the total number of Employer Responsive learners in the year(s) 05/06.

If you have any further comments about this information please tell us in the box below

<< >>


bmg
research
0%
25%
50%
75%
100%
The figures below show the total number of Apprenticeships for your college between 02/03 and 10/11 as sourced from the ILR.
02/03 03/04 04/05 05/06 06/07 07/08 08/09 09/10 10/11
No. of learners 200 200 200 200 200 200 200 200 200
Are any of these figures incorrect or missing?
Yes
No
If you have any further comments about this information please tell us in the box below
<< >>


bmg
research
0%
25%
50%
75%
100%
The figures below show the total number of Learner Responsive learners for your college between 02/03 and 10/11 as sourced from the ILR.
02/03 03/04 04/05 05/06 06/07 07/08 08/09 09/10 10/11
No. of learners 200 200 200 200 200 200 200 600 200
Are any of these figures incorrect or missing?
The data for 02/03 - 06/07 has been previously validated by your colleague in past research; however, if these numbers have changed at all or the figures for 07/08 - 10/11 are missing/incorrect please let us know
Yes
No
Please can you clarify any variance in the total number of Learner Responsive learners in the year(s) 09/10.
If you have any further comments about this information please tell us in the box below
<<
>>

Appendix 2 – Qualitative topic guide and semi-structured questionnaire

Developing criteria for selecting the case studies

INITIAL THINKING TO THE APPROACH

The key objective of the case studies for this study is to understand the processes that helped projects to be successful and to explore and inform on non-quantifiable indicators of impact.

We are carrying out 10 case studies at the FE college level.

There are 6 main steps to carrying out each case study.

- Clarify the objectives of the case study and define the research questions;
- Select the cases;
- Articulate the information gathering techniques;
- Prepare and collect data in the field;
- Evaluate and analyse the data for each case study; and
- Develop case study themes and links with statistical analysis.

Clarify objectives and define research questions

The timeframe for our analysis is 2003-04 to 2009-10. We are interested in capital projects approved and completed within that timeframe and the outcomes associated with those projects.

We are interested in the following outcome indicators:

- Local economic impacts;
- Staff retention and recruitment;
- Environmental sustainability;
- Participation, retention, success and achievement rates;
- Employer engagement, including Apprenticeships;
- Learner satisfaction; and
- Estate condition and efficiency.

Despite the number of potential questions/issues to be discussed across the different areas, our focus will be on discussing project outcomes and impacts,

and keeping in mind the outcome indicators as much as possible. We expect to spend around 30 minutes of each 1 hour interview focusing on project outcomes and impacts.

In drawing out the relevant information for the above indicators, our approach will involve asking questions on:

Key considerations

- **Contextual and background descriptive information of the college and the project(s)** – e.g. its main activities, its sites, its previous experience with capital projects etc.
- **Project rationale and objectives** – e.g. the main rationale for the project and its success criteria, how the objectives were set, how the design would meet the objectives, who were the main stakeholders that needed to be involved and consulted? This should also explore the use of investment for capital maintenance versus creation of new buildings.
- **Project evaluation and impact** – were you able to assess whether the project met the original objectives that had been set out in the rationale, in terms of college performance what has been the impact, and have there been wider impacts? Were there evaluation assessments on impacts on the local economy and the college's environmental sustainability?

Secondary considerations

- **Project planning and procurement** – who were the key decision makers, what was the project consultation process, what where the main features of the contract, what outside advice was drawn on etc.
- **Project implementation** – e.g. issues about the time frame and stages, issues about assessing process performance, issues of disruption on staff retention and recruitment during the project, issues of disruption on other aspects of college operations, end game evaluation issues.

Select the cases

The criteria for selection of the 10 case studies should include the following:

- A reasonable regional representation;
- A spread across value of project – important here to know what the likely average size of project will be going forward. If policy is for larger projects in the future this may influence selection;

Developing criteria for selecting the case studies

- A spread across the level of impact the project appears to have had – e.g. where data from the quantitative survey indicates notably high, or notably low, levels of impact – if at all possible in this study;
- Project type e.g. physical size (square feet), value, redevelopment, retrofit, new, acquisition, conversion etc. What are the key project types we want to inform about?; and
- Project execution – was delivery of the project phased, or conducted in a single stage?

Information gathering techniques

The approach in these case study analyses will be to use a semi-structured questionnaire technique to inform analysis based on the 5 main research questions set out above. Our experience from the previous similar studies is that the use of a fixed questionnaire can lead to insufficient information due to interviewees not always seeing the questions as relevant to their knowledge and/or role and in given the time frames we are dealing with it can sometimes be difficult for interviewees to offer specific answers to direct questions.

The information gathering technique for this study is to use experienced researchers to carry out semi-structured questioning around the 5 main research questions. The researchers will need to be flexible and empathetic listeners, while at the same time attempting to yield reliable responses that support the research questions. As such, the interview questions contained in this guide will be used as prompts rather than a question list. We expect interviewees to have different areas of expertise and we will select relevant sections of the topic guide to suit each interviewee.

We are also following a sequential approach to the case studies exploring the experiences of the colleges in an end-to-end manner, and will not conduct more than one case study in a single day – here we are able to learn from the experience of earlier case studies and adapt the approach if required.

Prepare and collect data in the field

We will look to spend between 3 to 4 hours in each college interviewing the college leadership team (usually the Principal, Deputy Principal or senior project sponsor), Estates Director, Finance Director and Curriculum Director. We will also consider whether the project rationale and objectives lead us to want to talk to other stakeholders. The college leadership may also suggest we speak to other stakeholders.

The format will vary by college, but the usual format is about 3 meetings with different participants for approximately 1 hour duration.

For the pilot case study, and a further case study there will be researchers from both Frontier and BMG (no recording/transcription; notes only). For a further two case studies conducted by Frontier, two researchers will conduct the interviews (no recording/transcription; notes only); for the remaining case studies conducted by BMG one researcher will conduct the interviews (with recording/transcript). We will ensure that where recording is not undertaken, we can provide verbatim quotations from our notes.

Advance information pack for colleges

In advance of visits to colleges, we will prepare a short note providing a project summary, an overview of interview questions, and the quantitative data on essential indicators for the college, which together will be used both as background preparation for both interviewers and interviews, and as a reference point for the interviews. In particular, our notes will indicate the timeframe of interest for this study and the capital projects that therefore fall within scope. Our notes will also provide reassurance on confidentiality, on the lines set out below, and that our research is carried out in accordance with both the Freedom of Information and Data Protection Acts.

Note on confidentiality

We will respect college confidentiality. It is not our intention to identify specific colleges in the research part of the publicly available report. The reporting of the case studies will follow a thematic anonymised approach, where information is drawn together from the 10 case studies in a general form, making use of anonymised quotations and examples. However, we would like to be able to list the 10 case study participants in explaining our approach.

The interview may be recorded or verbatim notes will be taken. The recording will be used solely for the use of researchers, who will use it to recall particular facts or parts of the discussion from the interview. The recordings will be destroyed at the end of the study.

Evaluate and analyse the data for each case study

Each case study will be transcribed by the researcher(s) involved at the interview and will follow a thematic approach. The method of coding of the information collected will be established at the pilot stage by both Frontier and BMG researchers and this will provide the basis for the further case studies. The general approach will be to provide well evidenced statements to support the 5

Developing criteria for selecting the case studies

research questions and to summarise what the evidence informs us on the two key objectives of the study, which is to understand the processes that helped projects to be successful and to explore and inform on the essential indicators of impact.

The case study write-ups will be reviewed by the project director and project manager.

Develop case study themes and links with statistical analysis

The case study analysis and quantitative analysis, although independent pieces of analysis, will have some overlaps. The most obvious is the need to check any trends or key facts from the case studies with what we find in the quantitative analysis.

The interview questions

At the outset of the interview, we will briefly reiterate/summarise the follow points:

- Aims and objectives of study;
- Consent and confidentiality;
- How the interview will be recorded; and
- How the data will be reported and used.

As discussed above, the interview questions are structured under five research headings:

- background questions;
- project outcomes;
- project evaluation and impact;
- Project planning and procurement; and
- Project implementation.

As we have indicated above the aim of the interviews is to generate evidence that inform the 5 research questions. The interview questions we have set out below are guides to stimulate the respondent to focus on the research questions. Not all of the questions need to be answered (and indeed could not be in the time limit for the interview). Our experience is that quite senior people will want to talk at a high-level about the projects and will not be able to answer questions of details. On the other hand Estate people will focus on the detail and may not be so aware of some of the high-level of goals of the senior team. We will select questions from the topic guide to select the experience of each interviewee, making sure we cover the key questions of impact across the interviews.

We will introduce the concept of additionality in our questioning from time to time.

Background questions

We will start the interview with some questions to understand the activities of the college and the role and knowledge of the people we are interviewing and their role in the project, and to get some initial context on the college environment and the nature of the capital expenditure project.

Exploring the staff's roles and knowledge of the projects

- What are each of your current roles in the college?

- What is your knowledge of each of the college's capital expenditure projects? [explore which projects and at what stage the individual became involved]
- Are there any staff who used to work at the college that it would be worth speaking to?

College activities

- What activities were carried out at the college prior to the capital expenditure occurring?
- Who used these facilities?
- What has changed in the use of facilities before/after capital expenditure projects?

The local environment

- Where do most students come from? [e.g. from local schools, another college, unemployment – note these are possibilities, and it maybe a complex issue, but the question is designed as a starting point for the interviewee to expand upon]
- Are there any active stakeholders in the area, and what are their interests?
- Which employers does the college have formal regular contact with?
- Does the college have links with these groups?

Gaining an overview of the project(s)

- Is there a strategic plan for the college estate? Is there a copy of any documentation we can have?
- Are you able to provide any local records which might help inform the aims, design, management, or impacts of the capital expenditure, such as documentary or MI evidence?
- When did each of the projects start and when did they complete?
  - When did the college start thinking about the project?
  - What, if any, disruptions were there, and when did these disruptions start and finish?

- When were students and staff able to start using the new facilities?

- What was the value of the total investment? [we can use this to check our information on this]

- How would you describe the area/buildings that were affected by the capital project, before the project began? [for example was this an empty plot, or were there existing buildings, were any buildings in use, what were they being used for and by whom and what state of repair were they in?]

- What did the project entail in terms of demolishing, building and refurbishing?

- Were there any major incidents or unforeseen events during the term of the project? [e.g., staff leaving, discovery of knotweed]

Project planning

We start by exploring the rationale for the project, the project's objectives and how they were set, why the particular project was chosen to meet these objectives and finally, how the college decided how to carry out the building works.

Project rationale

- What motivated the college to think about carrying out a capital expenditure project? [can prompt with: building condition and/or building function suitability, need to change curriculum, out of date equipment, existing buildings too small, location a problem, problems attracting learners, lack of educational provision of a particular kind in the local area, health and safety concerns].

- Specifically, on the rationale of capital maintenance versus new build ask whether and in what way investment is split between maintenance and new buildings?

Setting the project's objectives

When asking questions on project objectives, keep the outcome indicators in mind:

- Local economic impacts;
- Staff retention and recruitment;
- Environmental sustainability;
- Participation, retention, success and achievement rates;

- Employer engagement, including Apprenticeships;
- Learner satisfaction; and
- Estate condition and efficiency.

- What were the overall objectives for the project? [explore areas such as increasing participation and attainment (and whether this relates to particular learner types), sustainability and employer engagement]
- Who did you consult when setting these objectives? [for example, were learners, staff, sector skills councils, local employers, local stakeholders or the local LSC office involved in this process]
- How did you carry out the consultation process? [for example, did you hold meetings, plan an event, survey learners]
- How long did the information gathering process last?
- How was the information fed into the decision making process?
- Who was responsible for deciding on the objectives? [for example, one individual or a committee]
- Did they feel they had all the information they needed to make the decision?
- Were there any conflicts, and if so, how were these resolved?
- How long did it take in total to finalise the project objectives?

Designing the new space

- How did you go about deciding which approach and design would best meet the objectives for the project?
  - Did you consult with other colleges that had undertaken similar projects?
  - Did you consult with the LSC?
  - Did you consult with anyone else?
- How many options were considered for achieving the objectives?
  - (if more than one) What were these options?
  - (if more than one) How do these options differ?
  - (if only one) Why was only one option considered?

- Was there a consultation process, who did it involve and how long did it last?
- What process was used to assess each of the options, taking into account stakeholder views? How well did this work?
- Why was this site, building and refurb/new build chosen as the preferred option?
- Was there any opposition to the decision, and if so, what was this and how was it addressed?
- Did the college make any changes to plans as a result of feedback from the LSC?

Project financing

[Note, these financing questions may be asked alongside the questions about what the college decided to do]

- What was the original total budget for the project?
- How was it intended to be financed?
- Was the final budget different? [discuss why if yes/no]
  - How were costs confirmed, funding secured, budgets managed?
  - What challenges, if any, did you face in securing funding?
  - Which factors influenced the size of the budget? [ability to sell off buildings, value of LSC (or other) grant]
- What impact do you think LSC grants had on being able to finance the project? [use to probe issues on access and application for these grants]
- What specific impact do you think LSC grant/other Government funding has on the *maintenance* of the college estate?
- Did you finance the project as originally intended? [if no, discuss why]
  - Were any grants or loans dependent on gaining other sources of finance?
- How long did the budgeting and financing process take?
  - Who was consulted?
  - Was this long enough?

The interview questions

- Were you able to get hold of all the information you needed?

Project outcomes

This key part of the interview asks college staff to reflect on how well they think the project is performing against its original objectives and the LSC's wider objectives for Capital Expenditure projects. It also explores whether there were any unintended benefits (or costs) and how the lessons from each phase of the project have been (or could be) used to benefit future projects.

Overall performance

- Overall, has the project achieved what was expected?
- Have you surveyed staff or students to find out how well the space and equipment/technology are working?
- With hindsight, would you have made any changes to the original plans (e.g., more staff space, different design of teaching and learning, different equipment, new build rather than refurbishment – and with regards balancing maintenance needs with new developments, what would you consider the impact of not investing to be on the overall college estate quality)?

Meeting the college's high level objectives

- At the start of the interview we discussed the overall objectives of this project as being the following: [read objectives – e.g. increasing participation (note – explore whether participation elsewhere has declined as a result of displacement), attainment, sustainability (e.g., maintenance and fuel), employer engagement]
  - Are any improvements in attainment or participation due to displacing good students from other courses or colleges?
- Have you been able to measure the project's performance against these objectives?
  - How have you done this for each objective? [explore measures used, people consulted and whether a formal appraisal has been conducted]
  - Is there any other information which, with hindsight, would have improved your ability to measure performance?
- How has the project performed?
  - Has performance changed over time?

- (if yes) Why do you think that performance has improved/worsened over time? [explore whether due to: external factors (e.g., other college investing) or internal factors (e.g., reputation improving over time, college facilities starting to date).
- Could the college have done things differently to improve performance?

- What do you think will be the impact of the spending in the medium and long term future?

Wider LSC objectives

- Now thinking about the LSC's wider objectives, do you know how well the project has performed in terms of the following: [probe on all of the following, particularly those that fall outside of college specific objectives]
  - Local economic impacts
  - Staff retention and recruitment
  - Environmental sustainability
  - Participation, retention, success and achievement rates [discuss for different curriculum areas and types of student – also discuss why participation has increased (e.g., displacement from other courses or colleges or is this additional?)]
  - Employer engagement, including Apprenticeships
  - Attainment and learner satisfaction [discuss for different curriculum areas and types of learner]
  - Estate condition and efficiency
- Is there any research or evidence to support any suggested positive or negative impacts to the above?
- How is performance against each of these being measured?
- With hindsight, what changes would have improved performance against these wider LSC measures?

Other benefits

- Have there been any unexpected benefits or costs? [discuss]

The interview questions

Disseminating good practice

- Do you think there are valuable lessons coming out of this project that this and other colleges could benefit from?
  - (if yes) What are these lessons?
- How have you fed your experiences from earlier stages of the project to later stages of the project? [explore formal and informal communications such as reports, committees and structuring project teams)
- What aspects of these later projects have been affected most by your earlier experiences?
- Have you (or have you plans to) disseminated your knowledge outside of the college?
  - Ideally, how do you think this should be done? [seminars, reports, questionnaires, website, best practice guides, supplier lists – Note: some of this may have been covered earlier on in the interview]
  - Do you have any further comments about the project and its impact for the college?

Project planning and procurement

- Which types of organisations did the college contract with to carry out the building work and to supply equipment? [for example, architects, construction contractors, a project manager, technology consultants and equipment suppliers, cost consultants]
- For each of these groups [architects, construction contractors, equipment suppliers etc.]:
  - How did the college attract bids?
  - How many bids were considered?
  - Which firm was chosen?
  - On what basis was the decision made? [price, time scale, previous experience, recommendation from another college, quality of the plans]
  - How long did the decision making process take?
  - Does the college feel it was able to make a fully informed decision?

- Was there any opposition to this decision and if so, how was this dealt with?

- What were the key features of each contract? [fixed price, staged payments penalty clauses, ongoing maintenance agreement, lease hire (for equipment)]
- With hindsight, is there information that the college would have benefitted from, but didn't have which would have enabled it to make a better decision?
- Has the college used its experience to assist other projects or colleges? [for example, do they have a database of potential contractors, a good practice guide, or did they hold meetings after the process to discuss lessons learned and to communicate these lessons to other staff?]

Project implementation

The project implementation questions focus on whether the plans that were laid out in the initial stages of the project were realised. In particular we will explore whether the various aspects of the project were completed on time and to budget, how disruptions to staff and students were managed and whether the college would do things differently now.

Time frame

- What were the time scales for the various aspects of the build and installing equipment?
- Did any stages take longer than planned?
  - Why was this?
  - With hindsight, could this delay have been avoided?
  - Did you receive any compensation for this overrun?
- Did any stages take less time to complete than planned?
  - Why was this?
- What costs were attributable to any delay/overrun?

Budget (build and equipment)

- To what extent were you able to fix the price for each stage of the build?
- Did any stages cost less or more than anticipated?

- For those that cost more:
  - With hindsight, could this have been avoided?
  - How did you manage this within the overall budget? [more finance, cutbacks in other areas of the build]

Disruptions to staff and students

- How was business activity managed alongside delivery of the project? Did the building works have any impact on learning or extra-curricular activities?
  - (if yes) What were these impacts and how long did they last for?
  - Did the works put a stop to any classes (and if so, how was the situation managed?)
  - Did you notice any significant negative impacts as a result of disruption? [prompt for morale, attendance, attainment]
- Were staff and students kept informed of the project and its progress?
  - (if yes) Do you think this lessened the negative impacts of the disruption?
- Were the disrupted groups likely to benefit from the building works?
  - (if yes) Do you think this lessened the negative impacts of the disruption?

Activities which went well

- Did any aspects of the building process go better than expected?
  - Why do you think this was?
  - What was the quality of professional services provided to the college?

Activities which you would have done differently

- With hindsight, is there anything that you would have done differently? [prompt for contract design, who was contracted, more upfront planning, different arrangements for staff and students]

End of interview – thank interviewee for their time and inputs

The interview questions

This publication is also available on our website at www.bis.gov.uk

Any enquiries regarding this publication should be sent to:

Department for Business, Innovation and Skills
1 Victoria Street
London SW1H 0ET
Tel: 020 7215 5000

If you require this publication in an alternative format, email enquiries@bis.gsi.gov.uk, or call 020 7215 5000.

URN 12/1315