Evaluating the impact of capital expenditure in further education
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Executive summary

The Learning and Skills Council (LSC) has invested substantially in the further education estate in recent years. Since 2001 the LSC has invested over £1.8 billion in 632 projects. Planned expenditure in 2007-08 is anticipated to be £500 million, while expenditure by 2010-11 is likely to be around £750 million.

In the light of this investment, the LSC commissioned Frontier Economics to assess the impact that capital investment has on college outcomes, including participation and attainment. Specifically, Frontier Economics has carried out two analyses. The first, in 2005, used data on investment and outcomes for the period 1999-00 to 2003-04. The analysis was updated in 2006 to include an additional year of data (2004-05).

It is impossible to observe what would have happened to a college if it did not receive investment, which is ideally what we would like to do to be able to reliably understand the impact of capital expenditure on college performance. To address this issue we have developed an analytical framework that given the data limitations gets as close as possible to this idealised observation. Our framework has identified two key outcomes of interest:

- participation; and
- attainment.

Our approach has been to compare the change in performance of colleges with capital investment with colleges that did not receive capital investment over a given period, while at the same time taking into account differences in the characteristics of colleges that might have impacted on their performance.

The impact of capital investment on participation

The main participation measure used in the study is the change in the number of students in each college between 1999-00 and 2004-05. This measure allows one to compare the change in participation of colleges that have received capital investment between 1999-00 and 2004-05 with the change in participation of colleges that have not received any.

Before any statistical evaluation was carried out, the sample was examined to see if there was any correlation between the amount of capital investment received and changes in participation, for colleges that received capital investment over the period. Figure 1 below shows this relationship. The figure shows that there is a positive correlation between capital investment and increased participation. This analysis shows that participation is associated with an increase of 82 students, on average, for every additional £1 million capital expenditure.
The second stage of the work uses multiple regression analysis to test to see whether there is a statistical difference in the participation outcomes for colleges that received capital investment than for those that did not. It also looks to test the strength of any relationship between capital investment and changes in participation, while controlling for factors such as college type, region and size of college.

Table 1 below presents a summary of the relevant results from the main regression analysis. It shows that there is a positive statistical relationship between capital investment and participation. Colleges that have received capital investment of at least £1.5 million between 1999-00 and 2004-05 have increased participation in absolute terms by more than colleges that have never received any capital investment. Also, every additional £1 million over this threshold level increased learner numbers by 92 learners.

These results are statistically significant and appear to be robust to changes in specification, for instance, changes in the college characteristics controlled for in the analysis or the number of colleges included in the sample.
Executive summary

The impact of capital investment on attainment

The main attainment measure used is the percentage point change in attainment (as measured by the average proportion of aims completed per student) between 1999-00 and 2004-05 and the value of capital investment received between 1999-00 and 2004-05.

Initially, we looked only at those colleges that received capital investment over the period, to see if there is any relationship between the amount of capital investment received and changes in attainment. Figure 2 below shows this relationship. The Figure shows that there is a positive correlation between capital investment and increased attainment, but that it is very weak.
Again, the analysis above does not take account of the counterfactual – one does not know what the change in attainment would have been for these colleges had they not received capital investment. Consequently, it is necessary to use regression analysis to test to see whether there is a statistical difference between outcomes for colleges that received capital investment and those that did not.

When the regression analysis is run on all colleges (including the controls we discussed earlier), the analysis shows that there are no statistically significant effects of capital investment on the percentage point change in attainment. This is consistent with the analysis from the first study, which also suggested it was hard to identify a statistically significant relationship between capital investment and attainment – i.e. we cannot say that outcomes are different in those colleges that receive capital investment from outcomes in colleges that do not receive capital investment.

However, further data analysis has identified that there may in fact be a statistically significant relationship between capital investment and attainment for a sub sample of colleges.

Specifically, the analysis has identified that:

- colleges with high attainment in 1999-00 are less likely to experience large changes in attainment between 1999-00 and 2004-05; and
- colleges with higher than average attainment in 1999-00 are also more likely to receive capital investment than those with below average attainment.

This implies that colleges that are most likely to receive capital investment are also those that are least likely to experience large percentage point changes in attainment, which may impact negatively on the results. Consequently, the analysis was rerun, using data only for colleges with starting attainment below average. For these colleges the analysis suggests a statistically significant and positive relationship between capital investment and attainment – attainment increases more in below average colleges that receive capital investment than in those that do not.

A summary of the key regression results for those colleges that had below average attainment in the beginning of the sample period are set out in Table 2 below. It shows that:

- colleges that have received more than £9.2 million capital investment may experience an increase in attainment; and
- every additional £1 million over the threshold lead to an increase in proportionate attainment of 0.36%.

For a £10 million project these results show an increase in the attainment rate of 0.3% points. For a £20 million project the increase is 3.9% points. This finding is statistically significant and robust to different specifications.
Conclusions

The key finding from this work is that capital investment has a positive impact on college outcomes. Specifically, the analysis finds that:

- **Capital investment is associated with positive changes in student participation:** The most recent analysis shows that projects costing more than £1.5 million are associated with positive changes in participation. Every £1 million over the £1.5 million threshold increases participation by 92 learners per year.

- **Capital investment is associated with positive changes in attainment for colleges with below average attainment:** The most recent analysis shows that capital investment can have a positive impact on attainment, but not for all colleges. Rather, colleges with below average attainment that have received more than £9 million of capital investment experience an increase in attainment of 0.36 percentage points for every additional £1 million of capital investment over and above the initial £9 million.

Finally, this study has attempted to estimate the impact of capital expenditure in FE colleges on college performance. While the study has identified a strong statistical relationship that suggests capital investment is associated with improved participation and attainment, it has been limited by the amount of data available and in some cases by its reliability.

A key conclusion of this study is that the LSC should look to develop a planned research programme for the evaluation of capital expenditure in the learning and skills sector. We describe in this report what the research programme could look like.