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# A study of the impact of school federation on student outcomes

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Resource

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# Executive summary

“Federation has made us more outward facing... every member of the leadership team of both schools... sees themselves as leaders of education not leaders of institutions.”

Associate head

This study builds on our earlier study (Chapman, Muijs & Collins, 2009) of the impact of federation on student outcomes. This initial analysis identified six broad types of federation:

**Cross-phase federations:** federations consisting of two or more schools of different phases, eg, a primary and secondary school, or a first, middle and high school. Cross-phase federations accounted for 35 per cent of the sample in the first study and 23.5 per cent in the follow-up study reported here.

**Performance federations:** federations consisting of two or more schools, some of which are low- and others high performing, usually consisting of two schools. Performance federations accounted for 16 per cent of the sample in the first study and 56.8 per cent in the follow-up study reported here.

**Size federations:** federations consisting of two or more very small or small schools, or a small school and a medium-sized school. Size federations accounted for 19 per cent of the sample in the first study and 1.2 per cent in the follow-up study reported here.

**Mainstreaming federations:** federations consisting of one or more special schools combined with one or more mainstream schools. Mainstreaming federations accounted for 5 per cent of the sample in the first study and 6.2 per cent in the follow-up study reported here.

**Faith federations:** federations combining two or more schools of the same denomination. This type can overlap with one of the other four types, but in many cases doesn't. Faith federations accounted for 15 per cent of the sample in the first study and 3.7 per cent in the follow-up study reported here.

**Academy federations:** federations of two or more academies run by the same sponsor within a federation or chain. Academy federations accounted for 2 per cent of the sample in the first study and 8.6 per cent in the follow-up study reported here.

In summary, the findings of Chapman et al (2009) are as follows.

- There is evidence of impact of federation on student outcomes, in that while federation and comparator schools perform similarly at baseline, federation is positively related to performance in the years following federation.
- There is evidence to suggest that impact is strongest in performance federations and weakest in cross-phase federations.
- There is no relationship between federation and Ofsted judgements (grades).
- There is no evidence of differential impact on students from different socio-economic settings, differences in gender or with special educational needs

Where possible, this study has been designed to provide deeper analysis and insight into the impact of federation on student outcomes. In an attempt to develop a quasi-longitudinal map of the impact of federation we have used the same federations and comparator schools as the 2009 analysis. However, it is unsurprising to note that some federations have changed their governance arrangements, moving from 'collaboratives' (termed 'soft federations' in the 2009 study) to a 'formal federation' (termed 'hard federation' in the 2009 study).

The sample of federations has been adjusted to reflect changes in some of the federations' status since the previous analysis. We have also undertaken five case studies to illustrate federation practice. These accounts provide insights into the processes and structures emerging within the field.

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The key findings from the 2010-11 study are as follows:

## Impact on student outcomes

Performance and academy federations have a positive impact on student outcomes. However, there is a timelag of two to four years between formation of the federation and when their performance overtakes their non-federated counterparts. Secondary school federations outperform collaboratives.

The bulk of the federation effect on student attainment at GCSE occurs in school federations where higher performing schools partner lower performing schools. These performance federations have a positive impact on both the higher and lower performing schools in the partnership. There is some evidence of impact in academy federations and faith federations in primary schools. However, other than academy federations, this study found no evidence of impact on student outcomes in other types of federation in secondary schools. There were too few faith, mainstreaming and size federations to create a meaningful sample. Furthermore, this doesn't mean that these types of federations aren't effective in other areas not captured by school attainment data.

## Leadership

Strong leadership is a key feature of successful federations. There is considerable variation in the leadership and management structures found in federations. This study found secondary federations with executive leadership outperform federations with traditional leadership structures (one headteacher leading one school). This suggests those responsible for establishing secondary federations should consider developing executive leadership structures.

This study provides further evidence to support our argument that resistance to federation (see Lindsay et al, 2007) is decreasing and leaders increasingly view federation and collaboration as an opportunity to embrace change rather than a threat to their power and autonomy. It is worthy of mention the National Association of Head Teachers (NAHT) has recently changed its policy position of 'one head, one school'; this may be another indicator in a shift of mindset.

## Economic impact

Becoming a federation has an economic impact on schools. By definition, the size of a federation requires a larger budget than for an individual school. However, the increased costs are offset by greater resources and capacity for change.

This additional capacity provides opportunities for income generation and provision of additional services to schools within and beyond the federation. Economies of scale provide opportunities for joint continuing professional development (CPD), enabling a group of schools to engage in CPD activity that would have been problematic as a single school. Federations can also streamline their structures to offer other services for less cost. Further research using economic modelling is required to quantify the exact relationships and extent of this trend.

## Continuing professional development

Federating provides more opportunities for CPD, often at reduced cost, across the federation, and at times beyond the federation. Federal structures promote opportunities for collaboration.

In performance federations, the tight mission of raising standards naturally lends itself to a sharp focus on improving teaching and learning. Staff recognised the importance of sharing practice and presenting ideas and strategies to colleagues was often much more powerful than spending large sums of money to attend a one-off course, and could have a direct impact on their practice and that of their peers. Performance federations in particular use CPD to challenge orthodoxies of practice in schools and question the accepted norms and expectations of behaviour in staff and pupils.

In summary, we conclude that this study provides further evidence suggesting federations are an important mechanism to support systemic change and improvement. Furthermore, it would seem executive leadership combined with effective co-ordination and movement of resources and practice are key levers for change.

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# 1. Introduction

## Context

Since our initial analysis of the impact of federation on student outcomes (Chapman et al, 2009), interest in reforming leadership and governance arrangements to promote school-to-school collaboration has grown rapidly across several educational systems. The current government in England has continued to experiment with new approaches, and along with Sweden and the USA is at the forefront of developments. Independent state-funded schools (ISFS) such as academies, charter schools and free schools in these countries naturally lend themselves to the development of a system underpinned by federations and chains (Policy Exchange, 2009).

The white paper, *The Importance of Teaching* (HM Government, 2010) confirmed this position and the commitments to readjusting school autonomy and redefining notions of accountability through federations, groups and chains of outstanding schools, academies and free schools:

*Schools working together leads to better results. Some sponsors already oversee several Academies in a geographical group, or chains of Academies across the country, and already seven organisations sponsor six or more Academies. These chains can support schools to improve more rapidly. Along with our best schools, we will encourage strong and experienced sponsors to play a leadership role in driving the improvement of the whole school system, including through leading more formal federations and chains.*

HM Government, 2010:60

The direction of travel is clear and the pace of change is fast: Developing arrangements to free up schools from unnecessary central bureaucracy, handing over control for improvement to our best schools and sponsors and promoting collaboration across school boundaries are all key features of the next phase of educational reform in England.

These reforms may play an important role in the emergence of what Hargreaves has described as a self-improving school system where:

*“more control and responsibility passes to the local level in a spirit of mutual aid between school leaders and their colleagues, who are morally committed to imaginative and sustainable ways of achieving more ambitious and better outcomes.”*

Hargreaves, 2010:23

Given the pace of change, it is unsurprising that the evidence about what works and why in developing a self-improving school system lags behind both policy and emerging practice. We hope this study deepens our understanding of what works and why and reduces this timelag.

## Understanding federations and their impact

This study builds on our previous analysis of the impact of federation on student outcomes (Chapman et al, 2009). The overarching aim of this study was to determine the impact of federation and collaboration arrangements on student outcomes, leadership and management and efficiency. The research design involved a mixed-methods approach of two phases of data collection and analysis. The first phase, a quantitative analysis, involved multi-level modelling, while the second, qualitative phase involved case studies of federations and included the reflections of senior school leaders. The details of methods used are outlined in Appendix 1.

To date, federations of schools in England have taken various forms, and are adapted to suit local needs (Kerr & West, 2010). The diversity of federations and collaborations within the system and the extensive range of terms used to describe them led to some confusion in defining different types of federation. For the purposes of this study we use the term ‘federation’ to describe two or more schools operating under a single governing body.

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In line with policy at the time, this arrangement was termed a 'hard federation' in Chapman et al (2009). We refer to two or more schools working together under collaborative governance structures and joint committees, but maintaining their own individual governing bodies as 'collaboratives'. In our previous report these arrangements were referred to as 'soft federations'.

Federations and collaboratives are formed through structural changes in leadership, management and governance arrangements, in many instances making use of the joint governance arrangements invoked in the Education Act 2002. Some have executive headteachers in place, acting as chief executive officer (CEO) for the federation or collaborative. These leaders usually oversee the work of the federation or collaborative, leaving the day-to-day management of each school or site to an operational lead. Others have headteachers at each school or site. Other research we have conducted for the National College highlights the diversity of these arrangements and emerging practice in the field (Chapman et al, 2008).

It is recognised that strong levels of trust and confidence must be developed in order for schools to make the formal and binding commitments that federation requires (Chapman et al, 2010). Collaboration at all levels is encouraged in the understanding that schools need to establish sound working relationships to ensure the long-term impact and success of the federation (Muijs et al, 2011). It is also acknowledged that the move towards structured and sustainable collaboration is a gradual process and therefore the process of becoming a federation often happens in phases (Lindsay et al, 2007). There are many examples across the system of collaboratives evolving into federations, some of which can be found in the case study schools in this study.

## Structure of the report

This report is in four sections. This first has provided the background context, linking this study to our initial analysis and outlining the policy context and direction of travel. The following section presents quantitative findings of the difference federation and collaboration make in terms of cohort results. Section 3 presents the findings in respect of school structures and processes. Section 4 draws out the conclusions.

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## 2. Impact of federation: do federations and collaboratives make a difference?

### Introduction

The quantitative analysis is based on six questions:

1. Do schools in a federation or collaborative do better?
2. How much difference does being in a federation or collaborative make?
3. What types of federations and collaborations make a difference?
4. Is there any relationship with Ofsted grades for teaching and learning and leadership?
5. Are there any differences in impact on student outcomes between federations and collaboratives?
6. Are there any differences in impact between federations and collaboratives with executive leadership and those with traditional leadership structures?

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## Secondary schools

### 1: Do schools in a federation or collaborative do better?

We compared our federations/collaboratives to the matched sample (see Appendix 1) for every federation cohort from 2004 onwards. We put in the pupil background variables (see Appendix 1) in the first phase, and then added federation (ie, is the school in a federation or not) in the second phase. We started with a baseline model averaging the data over the three years prior to federation or collaboration, and then looked at the data for each subsequent year.

The full models, in Appendix 1, show that pupil background factors such as free school meal (FSM) eligibility, Income Deprivation Affecting Children Index (IDACI) score, special educational needs (SEN), and in some cases gender and ethnicity were all significant predictors of pupil achievement. In Table 1 we show that in some years, schools in federations outperformed those not in a federation. For each cohort<sup>1</sup>, an X indicates that in this examination year, students in federated schools outperformed their counterparts in non-federated schools (ie, being in a federation/collaborative was significantly, positively related to GCSE grades)

**Table 1: In which years do pupils in federation/collaborative schools outperform pupils in non-federation/collaborative schools**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
<b>2004 cohort</b>					X		X	
<b>2005 cohort</b>	NA				X	X	X	X
<b>2006 cohort</b>	NA	NA					X	X
<b>2007 cohort</b>	NA	NA	NA				X	X
<b>2008 cohort</b>	NA	NA	NA	NA				X

As we can see in Table 1, for the 2004 cohort, students in federation/collaborative schools outperformed students in non-federation/collaborative schools in 2007 and 2009. In the 2005 cohort, students in federation/collaborative schools outperformed students in non-federation/collaborative schools in 2007, 2008, 2009 and 2010. In the 2006 cohort, students in federation/collaborative schools outperformed students in non-federation/collaborative schools in 2009 and 2010. In the 2007 cohort, students in federation/collaborative schools outperformed students in non-federation/collaborative schools in 2009 and 2010. For the 2008 cohort, students outperformed their non-federation/collaborative counterparts in 2010.

What this suggests is that federation/collaborative schools start to outperform non-federation/collaborative schools after approximately two to four years.

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<sup>1</sup> A cohort refers to the year in which a federation was formed, so the 2004 cohort consists of all federations first formed in 2004, and so on.



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## 2: How much difference does being in a federation or collaborative make?

As well as needing to know whether students in federation/collaborative schools outperform pupils in matched non-federation/collaborative schools, we need to know how strong the effect is. As federation/collaboration is a school-level rather than a pupil-level factor, it makes sense to look at explained variance at the school level. Overall in the sample, school-level variance ranged between 15 per cent and 26 per cent. This means that between 15 per cent and 26 per cent of the variance in student outcomes is attributable to the schools they go to rather than to their own ability and background.

When we look at the size of the federation/collaborative effect, we therefore need to take into account that this is only in relation to these between-school differences, and that the largest part of the differences in student performance are still down to individual student factors such as their ability and social background

In Table 2 we show the percentage of school-level variance explained by schools being in a federation, for those years where a significant difference was found.

**Table 2: Between-school variance explained by federation/collaboration**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2004 cohort					12.5		20.8	
2005 cohort	NA				11.4	17.1	22.6	34.4
2006 cohort	NA	NA					26.4	29.5
2007 cohort	NA	NA	NA				30.9	35.7
2008 cohort	NA	NA	NA	NA				27.5

As can be seen in Table 2, federation/collaboration explains between 11 per cent and 36 per cent of between-school variance in student outcomes. There is a general trend that explained variance increases over time. There are differences between cohorts, with explained variance greatest in the 2007 cohort.

### 3: What types of federations and collaborations make a difference?

In our previous study (Chapman et al, 2009) we identified six types of federation/collaborative: size federations (where one or more small schools partner), performance federations (where a high-performing school partners one or more low-performing schools), faith federations (where schools from a similar faith background combine), cross-phase federations (primary and secondary, first and middle, middle and high, or first, middle and high schools forming a federation across school phases), mainstreaming federations (one or more mainstream schools partner a special school), and academy federations (academies with the same sponsor form a federation).

One question we looked at was whether or not the type of federation/collaborative was related to impact. In the secondary schools, this analysis was limited to a comparison of performance, academy and cross-phase federations. There were too few faith, mainstreaming and size federations to create a meaningful sample.

The results are shown in Tables 3-5, which again depict significant differences between students in federation and non-federation schools with an X

**Table 3: In which years do pupils in academy federation schools outperform pupils in non-federation schools?**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2005 cohort	NA							X
2006 cohort	NA	NA				X	X	X
2007 cohort	NA	NA	NA					X
2008 cohort	NA	NA	NA	NA				X

**Table 4: In which years do pupils in performance federations outperform pupils in non-federation schools?**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2005 cohort	NA				X	X	X	X
2006 cohort	NA	NA				X	X	X
2007 cohort	NA	NA	NA				X	X
2008 cohort	NA	NA	NA	NA				X

**Table 5: In which years do pupils in cross-phase federation schools outperform pupils in non-federation schools?**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2005 cohort	NA							
2006 cohort	NA	NA						
2007 cohort	NA	NA	NA					
2008 cohort	NA	NA	NA	NA				

These tables show clear differences between federation types. Students in cross-phase federations do not out-perform those in non-federation schools. The picture is different for both academy and performance federations.

In academy federations, for the 2005 cohort, students outperform students in matched non-federation schools in 2010. For the 2006 cohort this is the case in 2008, 2009 and 2010. In both the 2007 and 2008 cohorts, students in academy federations did better than those in matched non-federation schools in 2010.

For performance federations, more differences were found. Students in the 2005 cohort performance federations did better than students in comparison schools in 2007, 2008, 2009 and 2010. Students in the 2006 cohort performance federations did better in 2008, 2009 and 2010, those in the 2007 cohort in 2009 and 2010, and those in the 2008 cohort in 2010.

For academy and performance federations, the between-school variance explained by being in a federation is presented in Tables 6 and 7.

**Table 6: Academy federations: between-school variance explained by federation**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2005 cohort	NA							22.3
2006 cohort	NA	NA				6.6	16.9	20.0
2007 cohort	NA	NA	NA					24.6
2008 cohort	NA	NA	NA	NA				18.6

**Table 7: Performance federations: between-school variance explained by federation**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2005 cohort	NA				15.8	22.5	25.9	38.6
2006 cohort	NA	NA				22.4	30.8	35.2
2007 cohort	NA	NA	NA				34.1	39.3
2008 cohort	NA	NA	NA	NA				31.7

In academy federations, being in a federation explains between 6.6 per cent and 24.6 per cent of between-school variance. Percentages are far higher in performance federations, with up to 39 per cent of between-school variance explained.

Overall, the evidence suggests that the bulk of the federation effect on student attainment at GCSE occurs in performance federations, where high-performing schools partner weaker schools. Performance federations make up 56.8 per cent of our overall sample, indicating this is the most common type of federation. There is some evidence of impact in academy federations, but no evidence of impact in other federation types.

#### 4: Is there any relationship with Ofsted grades for teaching and learning, and leadership?

An analysis of the relationship between Ofsted grades and being in a federation/collaborative explored whether federation schools scored higher on grades awarded for teaching and learning, and leadership and management. This was found not to be the case, though the analysis is made complicated by the different years in which schools were inspected.

#### 5: Are there any differences in impact on student outcomes between federations and collaboratives?

In a further set of analyses, we looked at the question of whether there is a difference between federations and collaboratives. To study this question we separately analysed federations and collaboratives against their comparator schools. Secondary results are presented in Tables 8 and 9.

**Table 8: Secondary federations**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2004 cohort					X		X	
2005 cohort	NA				X	X	X	X
2006 cohort	NA	NA				X	X	X
2007 cohort	NA	NA	NA				X	X
2008 cohort	NA	NA	NA	NA			X	X

**Table 9: Secondary collaborations**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
<b>2004 cohort</b>								
<b>2005 cohort</b>	NA				X		X	
<b>2006 cohort</b>	NA	NA						X
<b>2007 cohort</b>	NA	NA	NA				X	X
<b>2008 cohort</b>	NA	NA	NA	NA				

As we can see in Tables 8 and 9, the impact of federation is greater than that of collaboration. While federation effects can be seen in each year, for collaboration this was only the case for the 2005, 2006 and 2007 cohorts, and then only in certain years. The pattern for federations is far clearer

In Tables 10 and 11, we look at the effect sizes, calculated as the percentage variance explained by being in a federation or collaborative as opposed to a comparator school, for those years in which significant differences were found. These tables again show greater explained variance for federations than for collaboratives in all the years for which both were significant.

**Table 10: Between-school variance explained by federation**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
<b>2004 cohort</b>					13.6		23.8	
<b>2005 cohort</b>	NA				13.1	17.9	25.2	36.5
<b>2006 cohort</b>	NA	NA				20.2	31.6	34.9
<b>2007 cohort</b>	NA	NA	NA				33.7	39.2
<b>2008 cohort</b>	NA	NA	NA	NA			19.1	31.4

**Table 11: Between-school variance explained by collaboration**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
<b>2004 cohort</b>								
<b>2005 cohort</b>	NA				10.3		19.4	
<b>2006 cohort</b>	NA	NA						24.6
<b>2007 cohort</b>	NA	NA	NA				28.1	27.4
<b>2008 cohort</b>	NA	NA	NA	NA				

## 6: Are there any differences in impact between federations and collaboratives with executive leadership and those with traditional leadership structures?

A similar strategy was undertaken to look at differences between federation schools with and without an executive head. To study this question we separately analysed both types against their comparator schools. Results for secondary schools are presented in Tables 12 and 13.

**Table 12: Federation schools with an executive head**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2004 cohort					X	X	X	X
2005 cohort	NA						X	X
2006 cohort	NA	NA				X	X	X
2007 cohort	NA	NA	NA				X	X
2008 cohort	NA	NA	NA	NA			X	X

**Table 13: Federation schools without an executive head**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2004 cohort								
2005 cohort	NA						X	
2006 cohort	NA	NA						X
2007 cohort	NA	NA	NA				X	X
2008 cohort	NA	NA	NA	NA				X

As we can see in Tables 12 and 13, the impact of federation is greater in schools with an executive head. Differences are most pronounced for the 2004 and 2006 cohorts.

In Tables 14 and 15, we see the effect sizes, calculated as the percentage variance explained by being in a federation with an executive head or without as opposed to a comparator school, for those years in which significant differences were found. Tables 14 and 15 again show greater explained variance for federations than for collaborations in all the years for which both were significant.

**Table 14: Between-school variance explained by federation with an executive head**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2004 cohort					14.5	9.7	23.9	8.8
2005 cohort	NA						23.0	33.1
2006 cohort	NA	NA				19.5	28.3	30.7
2007 cohort	NA	NA	NA				31.5	34.9
2008 cohort	NA	NA	NA	NA			18.5	28.7

**Table 15: Between-school variance explained by federation without an executive head**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2004 cohort								
2005 cohort	NA						18.6	
2006 cohort	NA	NA						23.6
2007 cohort	NA	NA	NA				29.0	30.2
2008 cohort	NA	NA	NA	NA				22.1

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## Primary schools

### 1: Do schools in a federation or collaborative do better?

As in the sample of secondary schools, we compared our federation/collaborative sample to the matched sample (see Appendix 1) for every federation/collaborative cohort from 2005 onwards for primary schools, as there were too few federations in the primary 2004 cohort for analysis. We put in the pupil background variables (see Appendix 1) in the first phase, and then added federation/collaborative (ie, whether the school is in a federation/collaborative or not) in the second phase. We started with a baseline model averaging the data over the three years prior to federation/collaboration, and then looked at the data for each subsequent year.

The full models (Appendix 1) show that pupil background factors such as FSM eligibility, IDACI score, SEN, and in some cases gender and ethnicity were all significant predictors of pupil achievement. In Table 16 we show that in some years, schools in federations/collaboratives outperformed those not in a federation or collaborative. For each cohort<sup>2</sup>, an X indicates that in this year pupils in federation/collaborative schools outperformed their counterparts in non-federation schools at Key Stage 2 (KS2).

**Table 16: In which years do pupils in federation/collaborative schools outperform pupils in non-federation schools?**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2005 cohort	NA						X	X
2006 cohort	NA	NA				X	X	X
2007 cohort	NA	NA	NA				X	X
2008 cohort	NA	NA	NA	NA				X

As we can see in Table 16, for the 2005 cohort, students in federation/collaborative schools outperformed students in non-federation schools in 2009 and 2010. In the 2006 cohort, students in federation schools outperformed students in non-federation/collaborative schools in 2008, 2009 and 2010. In the 2007 cohort, students in federation/collaborative schools outperformed students in non-federation/collaborative schools in 2009 and 2010. 2008 cohort students outperformed their non-federation/collaborative counterparts in 2010.

This suggests federation/collaboratives start to outperform non-federation schools after approximately two to four years.

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<sup>2</sup> As in the analysis of secondary schools, a cohort refers to the year in which a federation was formed, so the 2005 cohort consists of federations first formed in 2005, and so on.



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## 2: How much difference does being in a federation or collaborative make?

As with the secondary schools, we looked at the strength of the federation/collaborative effect by looking at explained variance at school level. Overall in the sample, school-level variance ranged between 15 per cent and 26 per cent. This means that between 15 per cent and 26 per cent of the variance in pupil outcomes is attributable to the schools that pupils attend rather than to their own ability and background. When we look at the size of the federation effect, we therefore need to take into account that this is only in relation to these between-school differences, and that the largest part of the differences in pupil performance are still down to individual factors such as their ability and social background.

In Table 17 we show the percentage of school-level variance explained by schools being in a federation/collaborative, for those years where a significant difference was found.

**Table 17: Between-school variance explained by federation/collaborative**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
<b>2005 cohort</b>	NA						21.6	23.8
<b>2006 cohort</b>	NA	NA				11.1	16.7	27.6
<b>2007 cohort</b>	NA	NA	NA				23.5	26.2
<b>2008 cohort</b>	NA	NA	NA	NA				22.4

As can be seen in Table 17, federation/collaboration explains between roughly 11 per cent and 28 per cent of between-school variance in pupil outcomes, which is lower than in the secondary schools. There is a general trend that explained variance increases over time, though again this trend is less pronounced than in the secondary schools.

Overall, then, the relationship between federation/collaborative and pupil attainment is less significant in primary than in secondary schools.

### 3: What types of federations and collaborations make a difference?

In our previous study we identified six types of federations/collaboratives: size federations (where one or more small schools partner), performance federations (where a high-performing school partners one or more low-performing schools), faith federations (where schools from a similar faith background combine), cross-phase federations (primary and secondary, first and middle, middle and high, or first, middle and high schools form a federation across school phases), mainstreaming federations (one or more mainstream schools partner a special school), and academy federations (academies with the same sponsor form a federation).

One question we looked at was whether or not the type of federation was related to impact. In the primary schools there were too few mainstreaming federations to analyse these. The results for the remainder (Tables 18-21) therefore cover faith, performance, cross-phase and size federations, which again depict significant differences between pupils in federation and non-federation schools with an X.

**Table 18: In which years do pupils in faith federation schools outperform pupils in non-federation schools?**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2005 cohort	NA							X
2006 cohort	NA	NA				X		X
2007 cohort	NA	NA	NA					X
2008 cohort	NA	NA	NA	NA				X

**Table 19: In which years do pupils in performance federation schools outperform pupils in non-federation schools**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2005 cohort	NA					X	X	X
2006 cohort	NA	NA				X	X	X
2007 cohort	NA	NA	NA				X	X
2008 cohort	NA	NA	NA	NA				X

**Table 20: In which years do pupils in cross-phase federation schools outperform pupils in non-federation schools?**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
<b>2004 cohort</b>								
<b>2005 cohort</b>	NA							
<b>2006 cohort</b>	NA	NA						
<b>2007 cohort</b>	NA	NA	NA					
<b>2008 cohort</b>	NA	NA	NA	NA				

**Table 21: In which years do pupils in size federation schools outperform pupils in non-federation schools?**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
<b>2005 cohort</b>	NA							
<b>2006 cohort</b>	NA	NA				-X		-X
<b>2007 cohort</b>	NA	NA	NA					
<b>2008 cohort</b>	NA	NA	NA	NA				

Tables 18-21 show clear differences between federation types. Pupils in cross-phase federations do not outperform those in non-federation schools.

For faith federations, the 2005 cohort pupils outperform their peers in matched non-federation schools in 2010. For the 2006 cohort this is the case in 2008 and 2010. In both the 2007 and 2008 cohorts, pupils in faith federations did better than those in matched non-federation schools in 2010.

For performance federations, more differences were found. Pupils in the 2005 cohort did better than pupils in comparison schools in 2008, 2009 and 2010. Pupils in the 2006 cohort did better in 2008, 2009 and 2010, those in the 2007 cohort outperformed their peers in 2009 and 2010, and those in the 2008 cohort outperformed in 2010.

In size federations, we see a negative federation effect; pupils in non-federation schools in the 2006 cohort outperformed their peers in federations in 2008 and 2010.

**Table 22: Faith federations: between-school variance explained by federation**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2005 cohort	NA							16.3
2006 cohort	NA	NA				8.2		18.5
2007 cohort	NA	NA	NA					15.0
2008 cohort	NA	NA	NA	NA				13.9

**Table 23: Performance federations: between-school variance explained by federation**

Cohort/Year	2003	2004	2005	2006	2007	2008	2009	2010
2005 cohort	NA					12.7	24.9	26.7
2006 cohort	NA	NA				16.4	19.0	30.6
2007 cohort	NA	NA	NA				26.5	30.3
2008 cohort	NA	NA	NA	NA				26.4

In faith federations, being in a federation explains between 8.2 per cent and 18.5 per cent of between-school variance. Percentages are higher in performance federations, with up to 31 per cent of between-school variance explained.

Overall, the evidence suggests that the bulk of the federation effect on pupil attainment at KS2 occurs in performance and faith federations. The impact is weaker in primary federations/collaboratives than in secondary school federations/collaboratives.

#### **4: Is there any relationship with Ofsted grades for teaching and learning, and leadership?**

No significant relationship was found between federation/collaboration and Ofsted grades awarded for teaching and learning or leadership and management.

#### **5: Are there any differences in impact on student outcomes between federations and collaboratives?**

No significant differences were found between federations and collaboratives in primary settings.

#### **6: Are there any differences in impact between federations and collaboratives with executive leadership and those with traditional leadership structures?**

No significant differences were found between federations/collaboratives with executive leadership and those with traditional leadership structures.

Section 3 reports the findings from the qualitative analysis and examines the impact of school structures and processes.

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## 3. Impact of federation on school structures and processes

This section of the report focuses on the findings from the qualitative analysis. This analysis is based on interviews with key stakeholders in five federations. It is structured under the key themes of:

- federation context
- federation structure and focus
- economic impact
- pupil attainment and school performance
- leadership
- teaching and learning
- continuing professional development

### Federation context

Schools formed federations with each other for diverse reasons and in a range of different ways. Some schools moved from collaboratives to federation, others federated without prior collaboration. Schools also had different reasons for initiating collaboration. For example, in one federation sharing good practice across schools to improve pupil and school performance across the federation was the key driver. In contrast, the main factor behind two other federations was the desire to support and learn from another school that shared the Catholic faith. For example, the executive head at Richard Road School explained that “the reason that we federated was that there was a feeling that another church school [in our parish that] needed our support”.

In another example, a federation of three small schools came together to make the most of their collective staff expertise and resources so as to extend the breadth and quality of curricular and learning opportunities for students and achieve economies of scale. The executive head of this federation explained that “federation gives you the advantage of a small school but all the opportunities of a large organisation”. These case studies highlight the importance of each federation’s own unique history and context in determining the approach, philosophy and agenda adopted. However, an important common feature of the case studies was that one or more of the federation schools faced the possibility of closure at the time the collaborative

or federation was set up. The executive head at Claymore Green Federation reflected that she had had to resist the agenda of a local authority keen to disband a school that was perceived to be failing, reporting that the local authority had told her:

“what we want is a federation...we are going to send that school a notice, we are going to disband the governing body, we’ll ship you in’...I said that is not how federations work...what we have to do is build a partnership”.

Executive head, Claymore Green Federation

The reasons for the threat of closure varied; sometimes it was due to issues of performance and sometimes for reasons not related to school standards, such as local authority restructuring or a combination of factors unrelated to standards.

### Federation structure and focus

Just as each federation had its own reasons for federating, each one also adopted its own specific structure and focus. Two of the federations involved only secondary schools, one was between a secondary and primary school and the other two were between two primary schools. All the federations now have shared governing bodies, but the secondary and primary federation does not have an executive headteacher. Some of the federations have also formed additional, less formal partnerships and collaborations with other schools. The executive head in one of the performance federations noted: “we are in great demand to support other schools”. While each of the federations had its own particular focus, as a group they were nevertheless united in having school improvement and raising pupil attainment as central objectives. Some of the main approaches that the federations had taken to improve performance included:

- developing the quality of school buildings and other facilities
- changing the leadership infrastructure and shifting staff onto federation rather than school employment contracts
- recruiting high-quality staff across the federation

- training and developing the capacities of current staff
- sharing best practice across the federation in terms of teaching and learning, leadership, school policy, finance and administration

Each federation placed emphasis on raising expectations in schools where performance could be improved, through the rigorous recruiting of good-quality staff and through development of the capacities of current staff. The executive head of Pilkerton School commented: “it is the staff that make the difference in terms of raising expectations”. Initially, this process of staff development and recruitment and changing employment contracts resulted in some anxiety among some staff. Indeed, each federation experienced a high staff turnover in the months after federation with one school changing more than half its teaching staff. However, in each federation it was reported that staff anxiety about change dissipated as the federation became more established and the benefits became more explicit.

## Leadership

*Federation has made us more outward facing... every member of the leadership team of both schools... sees themselves as leaders of education not leaders of institutions.*

Associate headteacher, Pilkerton School

There have been significant changes to the constitution of the senior leadership team in all but one of the case study federations. Perhaps more significantly however, these structural changes have been accompanied by a change in perception among staff about what it means to be a school leader. This is a significant development from previous qualitative findings that have found little evidence of school leadership taking responsibility for all the children in a locality; a more typical pattern was to prioritise their own school and pupils’ needs over those of the wider federation (Lindsay et al, 2007). One interviewee characterised this as a movement from being “institutional to educational leaders”. All the senior leaders interviewed at one federation suggested that their federation now had a moral purpose linked to the wellbeing of the wider community rather than just any individual school. An executive head in another federation commented that she felt a “moral imperative... to do the right thing” and support another school to improve.

It would seem federation leaders are now looking seriously beyond the immediate needs of their own school context and into the wider educational community. This broader perspective also seems to have provided leaders with more opportunity to develop fresh insight into how positive changes in school ethos and culture can be made possible. The executive head at the high-performing school Claymore explained that “the key to working with other schools is what you learn when you go there – it sharpens your practice.”

A number of the executive headteachers explained that the process of federating had been a powerful personal form of CPD. The executive head of Claymore Green reported that a sharpening of her practice was made possible through the federation process:

*I had been here 21 years and thought I knew everything... when I went there I realised I knew nothing... it was a completely different skills set that I needed and I had to learn it very fast... it was a massive learning curve for me.*

Executive headteacher, Claymore Green Federation

These new experiences may have helped her to shape and communicate her strong educational philosophy to her teaching colleagues.

*Here was the message. We are going somewhere. This is where the bus is going... if you want to stay on the bus that’s great... but you won’t lie in [the] way of it because it will run over you. I know that sounds ruthless but I was determined that change was here to stay... satisfactory (teaching) is not good enough... if you decide to step up, fantastic, I will support you, if you want to step off I will support you but you are not going to stay as you are... this is not working.*

Executive headteacher, Claymore Green Federation

The leaders of federations where improvement has been most marked all seem to have been able to support staff to raise their expectations about what was possible. While some staff undoubtedly seem to have found changes in ethos and practice challenging, the support and sense of purpose that an executive head could provide were perceived by staff interviewed as central to improvements made across their federations. An associate head in the Claymore Green Federation put it thus:

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“The key to our federation is the strength of the executive head. That person is modelling for you. You have their expertise to draw on... She is inspiring. She is exceptional.”

Associate headteacher, Claymore Green Federation

Notably, executive headteachers themselves all also indicated that they drew on the strengths of staff within their federation to help them overcome the new challenges they faced in their roles.

## Economic impact

“As a group of schools you are more powerful in terms of accessing funding – people are more interested in working with you.”

Executive headteacher, Pilkerton School

Federation had considerable economic impact in each of the case study contexts; overall this impact would appear to be positive. However, this overall positive picture has emerged in different ways in each federation. In some federations the additional cost of new leadership structures was more than offset by extra external funding secured because of new leadership expertise and capacity to generate income. One federation made considerable savings by having a more streamlined staff and leadership structure. However, this federation was less successful at generating external financial support. In general, the process of federating appears to have heightened the ability of schools to generate external funding to support improvement across the schools. Having a greater number of staff and pupils/students and a wider pool of resources and expertise seem to have been a key factor in successful bids for funding. A number of interviewees indicated that the federation liberated members of the leadership team to spend more time on and develop expertise in external income generation. The executive head at Claymore School remarked that the federation “does free up leadership capacity to generate income and to get best value”. Although respondents in two federations reported having difficulty in this area, they also speculated that this may be explained by the fact that neither federation had an executive headteacher or other member of staff able to devote time to making funding bids. One executive head stated: “in the early days... maybe we were not financially savvy... we didn’t have a bursar... if we did have a bursar [he or she] probably could have got the money for us”.

The new federation structures have also helped some federations to reduce their budget on CPD while at the same time improving its overall quality and relevance. The head of geography in Snetterton Road Federation remarked that “[in-service training] is a lot more purposeful now”, adding:

“CPD is a lot cheaper... but it also feels a little bit more real because the people standing up in front of you have tried the techniques they are suggesting with the children that you teach.”

Head of geography, Snetterton Road Federation

Two of the federations have made considerable savings on staff costs: one federation went from spending £180,000 on agency supply teachers for one school in one year to spending none on both schools the next, while another is now in a position to make £450,000 of savings a year on the support staff budget and approximately £300,000 in relation to teaching staff. A lot of the savings made in one federation have involved efficiency savings where one person often became employed across the federation to perform a role previously carried out by separate individuals in each school. Making such changes of personnel was not always easy on the staff or federation concerned. As one executive head put it: “through the federation we could make considerable savings... through redundancy... this was... most difficult”. However, he added that the federation had enabled necessary savings to be made while still keeping a school open, thus preserving continuity of education and reducing the “level of disruption for those students”. As he put it:

“I suppose you could have still made the savings without a federation simply by the closure of a school but it’s the impact upon educational provision for those students in that school [that counts].”

Executive head

In these challenging economic conditions, tough decisions about staffing are not the preserve of federations; they are having to be made across the system. It would seem federations offer economies of scale, maintaining provision of services that might disappear or drain capacity from elsewhere within individual schools.



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## Pupil attainment and school performance

“We were coming from a school that knew what outstanding looked like and we were taking that understanding to a school that was in danger of going into special measures.”

Associate headteacher, Pilkerton School

In general, the staff interviewed thought that federation had positively influenced school performance and pupil attainment and they thought that it had done so in a sustainable way. Indeed, in all but one of the case study federations, both student outcomes and school inspections or self-evaluations actually showed discernible and often marked improvement overall. We have identified four key factors associated with this positive trend in federation performance:

1. **Purposeful leadership** has provided staff with a clearer sense of federation identity or philosophy. Such leadership effort has helped teaching staff to raise expectations about what they and their pupils can achieve.
2. **Increased collaboration** raises expectations and has been supported by the new federation structures themselves which naturally tend to afford teachers more opportunity to share good practice across the federation and into the wider educational community.
3. **Improved efficiency** appears to have enabled schools to draw upon better resources and a wider pool of expertise and this has in turn led to a broader curriculum being offered to pupils that can be taught in a more engaging way.
4. **High-quality CPD** which is more relevant seems to have benefited the overall quality of teaching and learning.

The only school where performance markedly deteriorated after federating was also the only federation involving a primary and secondary school and it was the only one that did not have an executive headteacher. A possible explanation for this might be found in the four factors above. First, there was no executive head with overall responsibility to provide staff with purposeful federation leadership to promote a strong federation identity or federation philosophy across the schools.

Second, the sharing of good practice in this federation may have been more challenging due to the different challenges presented by a cross-phase federation (eg, curricula, pedagogy and cultural). This said, even in this case, staff expressed confidence that results would improve in a sustainable way across the federation after they had moved to a new school site. The common building that was planned would seem to offer a significant opportunity for sharing best practice and forging a federation identity and shared philosophy in the longer term.

## Teaching and learning

“What works works if it works in this school, it works in that school... it took me a little bit of time to learn that but that is the thing I had to hang on to.”

Executive headteacher, Claymore Green Federation

Although the quantitative analysis did not identify a relationship between federation and inspection grades, in general, the staff interviewed took the view that the quality of teaching and learning had improved since federation and this would seem to be borne out by Ofsted inspections and school self-evaluations covering these respective periods of time. Although some federations might be initially perceived as duplicating good practice across schools so as to bring about school improvement, there was also recognition among virtually all the staff interviewed that there were occasions when strategies ought to vary to suit the particular context of each school. The associate head at Pilkerton School commented that:

“In the early days we had to be mindful of big-brother syndrome, of Pilkerton telling Elm [School] what needed to be done. Now the relationship has much more synergy, with staff from Elm also leading learning in Pilkerton.”

Associate headteacher, Pilkerton School

There was a strong sense among staff interviewed that all schools benefited from the wider collective pool of expertise and resources made available through federation. In one federation, the head of geography remarked: “federation, basically gives you the opportunity to ‘cherry pick’ what each of the sites does best... It has been fantastic as far as sharing good practice is concerned.”



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In two federations this collective pool of expertise and resources enabled smaller schools in the federation to offer a broader curriculum to pupils than they would have otherwise been able to do. In these federations, access to more than one school building and set of staff also enabled greater continuity in education at times when there was risk of interruption. In one federation, the loss of up to eight weeks of education due to emergency closure of a building was averted because of the new federation structure. The executive head commented: “the reason why lessons were not interrupted was because of the federation structure – it gave us the flexibility to move students into one of the partner schools with their parents’ consent, very, very quickly without missing out on any of their education.” The other federation has been able to reduce greatly exclusions by placing pupils in another school within the federation.

“One of our big success stories is inclusion... rather than being excluded for a few days, a child goes to one of our partner schools for a few days and is still engaged with the curriculum... rather than sitting at home watching television which is what some of the [other] schools do.”

Associate headteacher, Pilkerton School

Three of the case study schools have also seen benefits in this area. One federation routinely transports pupils to different sites for lessons, while the other two have had specific projects where staff and learners alike have worked in a different school context from normal. Significantly, these more fluid approaches to teaching and learning seem to have encouraged co-operation rather than competition between the schools in question. The associate head in one federation commented:

“20 or 25 years ago if your school was doing well and the school down the road was doing badly... you would almost revel in another school’s failure, which obviously is not right... the league tables do not help this sort of thing – they encourage competition but [we have] this moral purpose of wanting the best for all young people no matter which school they go to.”

Associate headteacher

School leaders perceived that federation initiatives had created a more outward-looking team of staff with more capacity to offer school-to-school support outside the federation. One of the associate headteachers at Pilkerton reflected.

“In the early days there was not an outward-looking spirit but the landscape has changed now... our staff see school-to-school support as the norm... a spirit of connectedness pervades the federation.”

Associate headteacher, Pilkerton School

A number of the staff interviewed in this federation saw this shift in moral terms, as a movement away from narrow concerns about pupils in one school to a broader concern about the education of pupils in all the schools in the federation, and to pupils beyond the federation.

## Continuing professional development

“If you want to find out how good teaching happens, well you can go on a course and spend two hours on a train and at the end of it wonder what that was about... or you can go next door but one and spend a day in someone’s classroom... you have got the theory or you have got the reality and in terms of professional development, people learn by seeing it in reality.”

Executive headteacher, Claymore Green Federation

Almost all the staff interviewed expressed the view that federation had created professional and career development opportunities that “would not have been there” if their federation had not emerged. An associate head at Pilkerton remarked that the federation had provided:

“great experience as a school leader across two very different contexts... to develop a much greater breadth of different leadership styles... this I would not have been able to [do] if I had just stayed in one school.”

Associate headteacher, Pilkerton School

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Opportunities to develop professionally do not seem to have been restricted to leadership roles, but have been filtered throughout federations. There has been a snowball effect. An associate head (also at Pilkerton School) remarked:

“Federation has opened doors for... staff at all levels of the school in terms of curriculum development and curriculum design.”

Associate headteacher, Pilkerton School

There was a common perception that by working in more than one school, teaching staff were able to explore professional pathways that would not have been open to them otherwise. One federation (Snetterton Road) also freed up the time of a deputy head to focus on co-ordinating CPD across the federation and this seems to have both reduced the cost of CPD while also improving its overall quality and relevance. The assistant head in charge of arranging CPD in this federation remarked that since federation the school achieves much better value for money by providing most in-service training (Inset) days in-house. He explained that Inset days were now delivered by staff in the federation for staff in the federation and in a targeted way to meet both the practical needs of individual staff members and the wider educational needs of the federation as a whole.

This approach seems to have been very successful; the deputy head of the same federation spoke of the professional pride staff took in presenting to their colleagues. Inset days have for example successfully focused on issues of teaching and learning as they been led by staff identified as being able to deliver outstanding lessons. The head of the geography department commented: “Inset is a lot more purposeful now”, adding that with “colleagues delivering to colleagues... it is cheaper...but it also feels more real”. Indeed, all the federations we looked at now have at least some joint Inset days focused on professional development where staff from different schools collaborate.

There was also a sense among interviewees that the real strength of professional development in a federation lay in the frequency of opportunity to watch, learn from and model successful educational practices across contexts. An executive head stated that inside a federation “you can train people up, as you get bigger you can do that, you can switch people across, you can do a lot of work-shadowing and job swaps”. Built into daily life in a federation it seems is the opportunity for work-shadowing of good practice and a number of the

staff interviewed suggested that this learning in a practical context offered invaluable continuing professional development. In Claymore Green Federation, teaching staff operating in climate of low expectations in one school were able to observe routinely the lessons of staff identified as outstanding by Ofsted in another school. The executive head of the federation thought that this role modelling greatly benefited the staff in the former school by showing them what a good and outstanding teacher does. She added: “if you do not have good role models, how do teachers and children know how to behave?” Successful mentoring and modelling also seemed to be occurring in situ for leadership staff. On her executive head at Claymore School, one associate head commented: “I don’t need to go on a course. I live and breathe it. I have a mentor on hand”.

The sharing of good professional practice did not only take place within the federation. Both Pilkerton and Claymore federations were more widely involved in school-to-school support beyond their particular federations, for example by working with other schools in City Challenge initiatives to support improvement efforts within and beyond their own locality.

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## 4. Conclusions

This study builds on our previous analysis conducted in 2008-09. The current analysis confirms a number of the patterns and trends; identifies some important new relationships and offers new insights into the relationship between federation and school improvement. We are now developing a longitudinal perspective on the impact of federation. The strength of evidence is growing and the level and nature of impacts of federation is becoming clearer. Impact can be distilled into four key areas:

- student outcomes
- leadership
- economic impact
- continuing professional development

Each area is discussed in turn below.

### Student outcomes

There is evidence to suggest that some types of federation and collaborative outperform their non-federated counterparts. As with the previous analysis, this is statistically significant for performance federations and to a lesser extent academy federations. However, this study identifies a timelag of two to four years between formation of the federation and the point when their performance overtakes their non-federated counterparts.

Federations explain between 11 per cent and 36 per cent of between-school variance in student outcomes, and this tends to increase over time. This trend suggests the federation effect strengthens over time. The relationship between federation and pupil attainment is smaller in primary than in secondary schools.

Students in cross-phase federations do not outperform those in non-federated schools. Overall, the evidence suggests that the bulk of the federation effect on student attainment at GCSE occurs in performance federations, where high-performing schools partner weaker schools. This is the most common type of federation arrangement, making up 56.8 per cent of our overall sample. There is some evidence of impact in academy federations in secondary schools and of faith federations in primary schools but no evidence of impact in other federation types.

This, of course, doesn't mean that these types of federations aren't effective in other areas not captured by school attainment data.

Secondary school federations outperform collaboratives. However, this is not the case in primary schools where no statistically significant differences were found. This may suggest that the more formal governance structures promote school improvement in secondary schools. Alternatively, it may be that most of these arrangements are found in performance federations. This relationship is an area for further study.

### Leadership

Strong leadership is a key feature of successful federations. This study shows secondary federations with executive leadership outperforming federations with traditional leadership structures in secondary schools, suggesting executive leadership arrangements should be seriously considered when establishing a secondary federation. A likely explanation for this is the ability of one executive headteacher to articulate a coherent purpose for the federation and a united philosophy about what is important and how things should be done, rather than a number of headteachers attempting to imprint their individual school philosophy on the federation.

The findings from this study lead us to reflect on our programme of work on federations that spans almost a decade. This study provides further evidence to support our speculations that school leaders' resistance to federation and more generally school-to-school collaboration is decreasing and leaders are increasingly viewing federation and collaboration as an opportunity to embrace change rather than a threat to their power and autonomy. This is an important shift from school leaders being primarily concerned with their school and their children to school leaders thinking in terms of the community's schools and the community's children, with a commitment to share expertise and practice across and beyond the federation.

The potential importance of federations has been recognised by one of their staunchest critics, the

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National Association of Headteachers (NAHT).

At its 2011 annual conference, three-quarters of delegates voted to abandon the policy of 'one head, one school' and NAHT formally recognised that new models of leadership can raise educational standards, prevent school closures and solve recruitment problems (Barker, 2011). Perhaps this is the first indication of a real shift from organisational to true systems leadership?

## Economic impact

Becoming a federation has an economic impact on schools. It is unsurprising that federations cost more to run than individual schools: they are bigger operations. However, the increased costs are offset by increased capacity for change. This additional capacity provides opportunities for income generation and provision of services to schools within and beyond the federation. Economies of scale provide opportunities for joint CPD, enabling a group of schools to engage in CPD activity that would have been impossible as a single school. Federations can also streamline their structures to offer other services for lower cost. Some federations have been able to create efficiency savings by reducing staffing costs through restructuring and creating shared appointments. The findings in this area indicate that federations provide value for money. However, further research using economic modelling is required to quantify the exact relationships and extent of this trend.

## Continuing professional development

Our findings suggest that federation provides increased opportunities for CPD, often at reduced costs, across the federation, and at times beyond the federation. Federal structures promote opportunities for collaboration. In performance federations, the tight mission of raising standards naturally lends itself to a sharp focus on improving teaching and learning. This often involves working collaboratively to transfer more effective practices to less effective settings, both within and across schools. Even the most successful leaders recognised that higher performing schools have much to learn from the less effective schools they are partnering. This is unsurprising, given we know that within-school variation is approximately four times greater than variation between schools (Teddlie & Reynolds, 2000).

Staff recognised that sharing practice and presenting

ideas and strategies to colleagues were often much more powerful than spending large sums of money to attend a one-off course, and that this could have a direct impact on their day-to-day practice and that of their peers.

Performance federations in particular use CPD to challenge orthodoxies of practice in schools and question the accepted norms and expectations of behaviour in staff and pupils. This offers an explanation for the significant impact performance federations have on student outcomes. This is not a one-off questioning of practice, or a termly inspection visit but rather a day-to-day focus on the values, beliefs and behaviours that support changes in practice. As Michael Fullan (1992) argued, almost 20 years ago, educational change is dependent on changing how teachers think and what teachers do. On the surface, this is a relatively simple undertaking but on closer examination an incredibly complex task. It would seem federations provide the structure and opportunities for deep and sustained professional development that can shape teachers' values, beliefs and behaviours and therefore change what they think and do.

Federations also provide interesting opportunities for leaders at all levels to step up and engage in new challenges within their current post. Some take on mentoring and coaching roles across the federation, while others have the opportunity to develop collaborative CPD across schools and departments within the federation. This is a form of succession planning, and more than ever federations are growing their own leaders and moving them around the federation. For experienced headteachers, federations present the opportunity and challenge to lead and manage a complex initiative across a group of schools. This can reignite the spark and passion for leadership, management and change.

In summary, the findings from this study confirm our initial analysis, suggesting that federations have a role to play in raising school standards. This is at its most acute in situations where tackling underperformance is a priority, and in academies and secondary school settings.

Reflecting on the evidence, it is our view that federations have a key role to play in supporting a self-improving school system. However, it would seem we have only scratched the surface in terms of understanding the full potential of federations and chains to drive systemic improvement. We know that at any one time more schools have greater capacity and knowledge than they use. The key challenge remains to unlock this potential and resource and use them for both school and system renewal.

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# Appendix 1: Methodology

## Introduction

The overarching aim of this study was to determine the impact of federation and collaboration arrangements on student outcomes, leadership and management and efficiency. Specifically, the overarching research questions underpinning this study are:

- Do school federations impact on student outcomes?
- Do different types of federation have a differential impact on student outcomes?
- What leadership and management arrangements are in place in federations?
- Is there any evidence to suggest federating has an economic impact on schools?
- Are there any differences in impact on student outcomes between federations and collaboratives?
- Are there any differences in impact between federations and collaboratives with executive leadership and those with traditional leadership structures?

The research design of this study involved a mixed-methods approach involving two phases of data collection and analysis. The first phase, a quantitative analysis, involved multi-level modelling, while the second, qualitative phase involved case studies of school leaders reflecting on their federations. The details of the methods conducted are outlined below.

## Phase 1: A quantitative analysis of the impact of federation on student outcomes

A quantitative methodology was used to explore the relationship between school federations and student performance. National pupil- and school-level datasets were collected from the Department for Education (DfE) to allow us to look at performance measures controlled for student background over time.

Data from the pupil-level annual school census (PLASC) and the national pupil database (NPD) was requested from and provided by the Department for Education for this purpose. Data was collected for each year from 2001 to 2010. All schools in the 2008 study were contacted to ascertain whether any structural changes had taken place during the timescale of the two studies.

In order to look at the impact of federation on performance, we opted for a quasi-experimental design where each federation school was matched to a school as similar as possible on key characteristics prior to federating. A new matched sample was drawn. National datasets were used to match schools on a number of criteria, including:

- **phase** (eg, primary, middle, secondary)
- **type of school** (eg, voluntary aided, voluntary controlled, academy)
- **gender intake** (co-educational, single-sex boys, single-sex girls)
- **performance levels** (eg, per cent achieving key stage threshold levels in English and maths)
- **pupil intake characteristics** (percentage of pupils identified as having SEN, percentage of pupils eligible for FSM)
- **location** (this measure went beyond traditional rural/urban identification, and attempted to match areas that were as similar as possible on socio-demographic characteristics, eg Cambridge would be matched to York, Salford to Gateshead)
- **school size** (as indicated by pupil roll)

Clearly, no schools could be matched identically on these criteria. However, as close a match as possible was sought in all cases using propensity score matching methods<sup>3</sup>. No statistically significant differences were found between federation and control schools on any of these variables following matching.

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<sup>3</sup> Propensity score matching, which essentially uses logistic regression to create propensity scores that allow each subject (in this case, a school) to be matched to its closest statistical neighbour, is particularly suitable in cases where no identical matches can be found (as is the case here).

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The final secondary sample consisted of 73 federation and 73 control schools. The 73 federation schools were divided over 28 federations. The final primary sample consisted of 176 federation and 176 control schools, in 73 federations.

12.1 per cent of schools were Catholic, 16.5 per cent were Church of England and 7.4 per cent were academies.

To analyse the impact of federations, multi-level models were constructed in which first pupil background variables and then federation were added. These were calculated for every year from baseline, which was taken as the year before the school joined the federation.

Two-level multi-level statistical models, with pupils nested in schools, were used to look at the impact of federation on performance. This was done for the cohorts of federations formed in 2004, 2005, 2006, 2007 and 2008, as no impact is to be expected for those federations formed after 2008 in the light of previous research on the length of time it takes for federations to become fully operational (see Lindsay et al, 2007). As the data relates to different cohorts in different years, analysis of each year was done separately.

Models were tested for the year of formation and three years' prior data combined (the baseline model), and for subsequent years up to 2010. A null model was formulated with no predictors. In the next model, federation was added, while in the final model for each year, other correlates of achievement were included, such as gender (percentage of boys), SEN status (percentage of pupils in each of four SEN categories), age, percentage of pupils eligible for FSM (a measure of poverty) and percentage of speakers of English as an additional language (EAL). Outcome variables were pupil-level achievement. For primary schools we used the level attained at KS2. For secondary schools, the total points score at GCSE was used. As our variable of interest was a school-level variable, all predictors in the analyses are school-level variables.

## Phase 2: A qualitative analysis of the impact of federation

The purpose of this small-scale qualitative strand of activity was not to seek statistical generalisations as in the first phase of the work but to seek analytical generalisations and deeper understanding of the structures and processes in operation (Yin, 1992). The focus of this phase of research was to explore the structures and processes associated with federating and to explore issues of leadership and management, economic impact of federating, school improvement and opportunities for professional development.

The research in this phase of this study involved a series of telephone interviews with school leaders in five schools. The schools were not selected to provide typical sites. Rather, our introductory telephone conversations with schools were used to identify what we considered to be interesting cases in terms of performance, structure and federation activity.

Data collection involved a series of telephone interviews with senior and middle level leaders in each school (n=20). Interviewees were selected purposively so respondents had sufficient experience and insight to discuss the key issues for exploration. Four interviews were conducted at each site and each interview lasted between 30 and 45 minutes. To ensure coverage of the key issues, the interviews were guided by a semi-structured schedule and audio-recorded. The interviews were then analysed to identify key themes, patterns and trends in the data (Miles & Huberman, 1994). Selective transcriptions were made to provide illustrative quotations to support the narrative presented in section 3 of this report.

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