Using Mixed Methods to Investigate School Improvement and the Role of Leadership: An example of a longitudinal study in England

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Abstract

Purpose – The purpose of this paper is to discuss the use of mixed methods research in a major three year project and focuses on the contribution of quantitative and qualitative approaches to study school improvement. It discusses the procedures and multiple data sources used in studying improvement using the example of a recent study of the role of leadership in promoting improvement in primary and secondary schools' academic results in England. Although the definition of improvement used was based on robust analyses of data on students' academic outcomes, the mixed methods design enabled a broader perspective to be achieved.

Design/methodology/approach – The study illustrates how the multilevel analysis of students' national assessment and examination results based on national data sets for primary and secondary schools in England were used to investigate the concept of academic effectiveness based on value-added methodology. Using three successive years of national results a purposive sample of schools were identified that could be classified as both effective and improving over the period 2003-2005. In addition, surveys and interviews were used to gather evidence of the role of stakeholder perceptions in investigating school improvement strategies and processes.

Findings – National student attainment data sets were used for the identification of improving and effective schools and revealed the importance of considering their different starting points in their classification of three distinctive improvement groups. The combination of quantitative survey data from headteachers and key staff with qualitative case study data enabled a range of analysis strategies and the development of statistical models and deeper understanding of the role of leadership.

Research limitations/implications – The limitations of a focus on only academic outcomes and "value-added" measures of student progress are discussed. The challenges and opportunities faced in analysis and integration of the different sources of evidence are briefly explored.

Practical implications – The study contributes to the knowledge base on the identification of school improvement and use of performance data. The findings on strategies and processes that support improvement are of relevance to policy makers and practitioners, especially school leaders.

Originality/value – The mixed methods design adopted in the study enabled the research to combine rigorous quantitative and in-depth qualitative data in new ways to extend and make new claims to knowledge about the role of school leadership in promoting school improvement based on the study of effective and improved schools' experiences.

Keywords Leadership, Primary schools, Secondary schools, School improvement, Mixed methods research

Introduction

School improvement is generally recognised not as a single activity but more as a series of overlapping processes that take place within a collective endeavour that significantly enhances the quality of teaching and learning and improves educational outcomes (Harris, 2002). Running parallel with classroom practice, school improvement is understood to be a means of developing a professional learning community in which teachers and students learn and progress together (Harris, 2002). Combining these characteristics, school improvement has been defined as:

> a distinct approach to educational change that enhances student outcomes as well as strengthening the school's capacity for managing change. (Hopkins *et al*., 1994, p. 3)

More recent research has drawn attention to the importance of considering school improvement as a journey that takes place over a period of time and highlights the role of contextual conditions. This is a dynamic perspective which places change, in outcomes and processes, at the heart of the investigation (Creemers and Kyriakides, 2008; Creemers *et al*., 2010; Hallinger, 2003; Hallinger and Heck, 2011a). There is a need to consider what a school's particular 'conditions' are, its features and composition, its external pressures and influences and importantly, where the school is starting from in its improvement trajectory (Hallinger and Heck, 2011a).

Among the different 'pieces' that may link to form a 'mosaic' of effective leadership practice is what has come to be recognised as a critical component of school improvement (Harris, 2003): the building of learning communities or 'communities of practice' (Sergiovanni, 2001). This in turn links to how relationships are then fostered within these communities and maintained between practitioners (Harris and Chapman, 2001). This leads further towards school leadership, sitting at the heart of how the different responsibilities of school development and change are shared among different practitioners and groups (Harris, 2003). Moving beyond internal schools' perspectives finally, the element of external accountability features highly, certainly in the English education system and indeed internationally (Hallinger and Huber, 2012, p. 362):

> The global trend of increased accountability of schools assumes that schools are capable of building their capacity for continuous improvement. While policymakers, scholars, and practitioners acknowledge the importance of building school-wide capacity for continuous improvement, empirical evidence to this effect remains thin. (Hallinger and Huber, 2012, p. 362-363)

A longitudinal study by Thoonen *et al*. (2012) conducted in elementary schools in the Netherlands attempted to measure school-wide capacity for improvement using a mix of components including leadership practices, school organisational features and teacher motivation and learning. Their findings suggested that efforts to improve leadership practices may be a critical first step in the development of school-wide capacity for improvement (Thoonen *et al*., 2012). School-wide capacity for improvement can be defined in this context as the conditions and features at school and teacher level that promote and facilitate teaching and learning, as well as teachers' professional learning and development (see for example Mulford and Silins, 2003; Heck and Hallinger, 2009; Beaver and Weinbaum, 2012).

Ultimately however, the argument returns to the relationship between school leadership and student outcomes. May *et al*. (2012) point to the complex relationships catalogued among

existing research studies, for instance the indirect influences of principals on student outcomes, mediated through other factors (again) such as teachers' pedagogy, motivation and working conditions and organisational context (see amongst others Heck and Hallinger, 2009; Louis et al, 2010). Indeed, Hallinger and Heck (2011) lament the abundance of research attempting to measure leadership effects on student outcomes using 'mediating effects' models and the dearth of studies exploring alternative methodologies such as 'reciprocal effects models' (eg Hallinger and Heck, 1996b) where leadership practices are themselves influenced by change over time in organisational context and teacher variables such as behaviour and practices. There is some evidence in support of reciprocal-influence models traced as far back by Hallinger and Heck (2011) to Wright's (1921) investigation of relationships between variables using path analysis methods. Nonetheless, Hallinger and Heck note certain limitations to reciprocal effects models in the differences found in the choice of time intervals, and the possibility of 'missing effects' between chosen discrete time points. In addition, they argue that stability in the causal structure is assumed and claim:

> It is also important to acknowledge that reciprocal-influence models may still not resolve issues of whether variable A causes B or variable B causes A, unless relevant limitations are minimized. (Hallinger and Heck, 2011b, p. 168)

The need to explore reciprocal effects is also echoed by Teddlie (2005), who also goes on to note the complexity of the relationship between leadership and school effectiveness because the research environment is contextualised and therefore "requires the skilful blending of several methodological approaches" (Teddlie, 2005, p. 216).

We will now go on to outline the purposes of the present paper which describes a longitudinal, mixed-methods study investigating leadership characteristics and student learning outcomes focussing on a sample of improving schools in England. The study (Effective Leadership and Pupil Outcomes project) was funded by the Department for Children, Schools and Families[1] (DCSF) and the National College of School Leadership[2] (NCSL) and involved collaboration between researchers at multiple universities in different international contexts. The study sought to establish the amount of variation in student outcomes accounted for by school leadership and the direct and indirect influences of leadership on teachers, school processes and student outcomes (Day *et al*., 2009). The chosen time points in this study were discrete as they partly relied on national data sets being published at more or less fixed points during each year of the project. One of the unique components of this study's methodology is the identification of the three school 'improvement groups' from statistical analyses of student attainment levels in 2003 and their change between 2003 and 2005. These groups were used to establish whether leadership and associated school improvement approaches differed depending on the starting point of schools in these different groups. Statistically and educationally significant differences related to leadership practices and features emerged between the three groups (Day *et al*., 2009). In addition, other factors were found to differ among the groups including headteachers' years of experience (in total and in their current school), the number of headteachers in post in a ten-year period, school sector and socioeconomic context (Day *et al*., 2007). Previous papers published on the study have described some of the main findings and analysis strategies from the project (Sammons *et al*., 2011; Day *et al*., 2010) and illustrate the quantitative strand of the mixed-methods research design employed (Gu *et al*., 2008).

[1] Known as the Department for Education as of 2010
[2] Known as the National College for Teaching and Leadership as of 2013

The primary purpose and remit of this paper is to discuss the study's mixed methods research design and methodology and show how quantitative value-added and attainment measures of student outcomes were used in a longitudinal study to identify national patterns in England of schools' effectiveness and improvement trajectories over three years to obtain a sample of schools for further research. There is a particular focus on identifying school improvement strategies and actions and the role of leadership. It is also important to note the period during which the study commenced in 2006. There was a strong accountability context with pressure on schools to improve (see for example Sammons, 2008) which shaped the remit of the research commissioned by the then DCSF. There was particular policy interest in developing an increased understanding of identifying practices of improving schools as opposed to schools on different trajectories (i.e. schools that were not improving or were declining). The study did however focus on the three groups of improving schools, including those that had been low performing in the beginning but had shown significant improvement over a three year period. Hence, the study was explicitly designed to focus on improving and effective schools and explore the role of leadership practices and their effects on school processes and teaching in shaping those trajectories.

Aims of the Effective Leadership and Pupil Outcomes study and methodology

1. To collect and analyse national student attainment data sets linked to school membership in order to explore the relationship between school leadership characteristics and student outcomes in England.
   Analyses of these national data adopted value added measures based on school effectiveness techniques produced by Fischer Family Trust (FFT). They identified a substantial proportion of highly improved and effective schools across the country (Day *et al*., 2007). (See the section describing the quantitative strand for details on the FFT measures used).
2. To collect evidence on leadership practices associated with effective schooling.
   A nationally-representative sample of improving and effective primary and secondary schools was identified (from the national data sets noted above under Aim 1) for a questionnaire survey of headteachers and key staff[3]. This investigated leadership characteristics and behaviours such as types, qualities, strategies, skills and contexts and leadership practices, defined as "overt behaviours - or properties of the organization - aimed at direction setting and influence" (Leithwood and Levin, 2005, p. 12)
3. To study the extent of variations in student outcomes accounted for by these leadership practices using both quantitative and qualitative approaches.
4. To create models of the direct and indirect effects of leadership on changes in schools' results over a three period using Structural Equation Modelling (SEM).
5. To provide robust and reliable data on the links between leadership and school improvement that would inform the work of central government (the DCSF), NCSL, local authorities and schools.

[3] Key staff were made up of middle managers eg key stage coordinators in primary schools and subject department heads in secondary schools

The longitudinal nature of the study is illustrated in Table 1 below. The three distinct but overlapping phases took place as part of a "fully integrated" mixed model approach (Tashakkori and Teddlie, 2003) where both the qualitative and quantitative strands were given equal weight (Day *et al*., 2009).

	Activity	Time
Phase One	- Review of the relevant literature - Contact researchers on related projects - Production of Literature Survey Report - Analysis of national datasets, using Fischer Family Trust (FFT) indicators to identify highly improved and highly effective schools - Identification of a sample of these for a questionnaire to heads and key staff of a nationally representative sample of improved schools - Design of research instruments - Recruitment of 20 heads and key staff for case study schools - Administration of questionnaire (Wave 1) - Analysis of questionnaire data (Wave 1) Production of initial report of survey analysis - Integration of emerging qualitative (round 1 and 2) with phase 1 analysis - Interim Report production	January 2006 - August 2007 August 2007
Phase Two	- Year 2 data collection in case study schools (rounds 4-6 of case study visits) - Final analysis of Year 1 data (rounds 1-3) - Further analysis of Wave 1 questionnaire data - Design and administration of questionnaire (Wave 2) - Analysis of questionnaire data (Wave 2) and SEM - Analysis of Case Study Year 2 data (rounds 4-6)	September 2007 November 2007 - January 2008 March - August 2008
Phase Three	- Integration of Year 1 and 2 quantitative and qualitative data - Final report	September 2008 - January 2009 January 2009

Table 1: Overview of research phases (Day *et al*., 2009, p. 8)

The initial review of international literature (Leithwood *et al*., 2006; Leithwood *et al.*, 2008) put forward seven "strong claims" associated with successful leadership. Figure 1 shows the research design incorporating qualitative and quantitative strands which were informed by the initial literature review. The choice of a mixed methods approach was seen as the best design by which further evidence could be gathered in order to test how far the "seven strong claims about successful school leadership" (Leithwood *et al*., 2006) fitted the English context and helped explore improvement in a national sample of schools.

> The use of mixed methods was seen to increase the possibilities of identifying various patterns of association and possible causal connections between variation in different outcomes indicators of school performance (as measured by data on student attainment and other outcomes) and measures of school and departmental processes. . . By incorporating both extensive quantitative and rich qualitative evidence from participants about their perceptions, experiences and interpretations of leadership practices and of school organisation and processes with that on student outcomes, it was possible to conduct analyses in parallel and to allow

evidence from one source to extend or to challenge evidence from another source. (Day *et al*., 2009, p. 31)

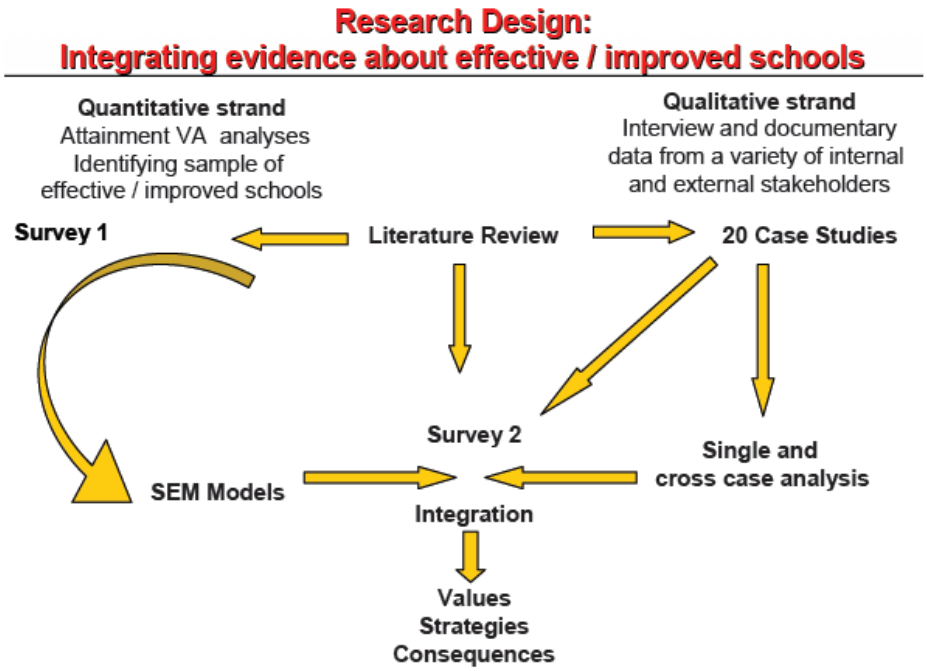

Figure 1: Research design (Day *et al*., 2009, p. 17)

Mixed methods approaches are increasingly being used in larger-scale research attempting to unpick the complexities and finer detail entangled within social and educational experiences and events (Sammons *et al*., 2011; Tashakkori and Teddlie, 2003; 2010). In the case of the present study, the use of mixed methods brought together multiple areas of expertise and perspectives which increased the possibilities of:

> ...identifying various patterns of association and possible causal connections between variation in different indicators of school performance and measures of school processes and the way these are linked with different features of leadership practices. The sequencing of the study facilitated the integration of evidence and attempts at synthesis and meta-inferences. (Sammons *et al*., 2011, p. 85)

It is argued that mixed methods studies also have great potential for the testing and development of Educational Effectiveness Research (EER) theories. They are also necessary to inform and support closer links with applied research and evaluations that can promote evidence-based school improvement (SI) initiatives and teacher development programs. While school effectiveness research (SER) is generally associated with the quantitative paradigm - making statistical predictions as explanations of variance in student outcomes - SI research is viewed as more qualitative, with a heightened focus on generating "thick" descriptions and seeking to establish understanding of school and classroom 'processes' and participant perspectives. Mixed methods therefore provides the opportunity to try and achieve both theory verification and theory generation, and more resilient foundations on

which to make stronger inferences which stem from both data 'triangulation' and 'complementarity' (see a more detailed discussion by Teddlie and Sammons, 2010).

During Phase One of the study, the claims and findings from the initial review informed the design of the 'first wave' of questionnaires sent to headteachers and key staff of sample schools identified to be both improved and effective (defined by quantitative value added measures of student attainment). The use of mixed methods then "sought to identify features linked to this initial framework using both quantitative and qualitative components" (Day *et al*., 2009, p. 17). The quantitative and qualitative methods employed and sampling decisions taken will now be explored in more detail.

Quantitative strand

This strand of the study was made up of four components. The first component involved:

- An initial analysis based on national-level student attainment data sets across three years (2003-2005) of all primary (n = 14672) and secondary schools (n = 3115) in England (excluding private and special schools)[4]. This was used to identify schools that were 'effective and improving' in their academic results over a three-year period. Multiple sources of data were used including raw indicators such as the percentage of students achieving nationally-published performance benchmarks (eg % that achieved 5 or more A* to C grades at GCSE or General Certificate of Secondary Education examinations) and value-added indicators of student progress. The primary school value-added measures tracked student progress from earlier stages of schooling (age 7) up to at the end of primary education (age 11 years) using national assessment data. For secondary schools student progress was tracked from age 11 to the end of compulsory schooling at age 16 when national GCSE examinations are taken. Successive cohorts of students for whom outcome data at age 11 (for primary schools) or age 16 (for secondary schools) in 2003, 2004 and 2005 were used so that school improvement could be studied across three successive years for each sector.
  The value-added measures used were created by the Fischer Family Trust, a non-profit organisation that analyses student attainment data for schools, local authorities and central government.

Box 1 shows how three school improvement groups that were identified according to raw and value-added measures of school performance (Sammons *et al*., 2011, p. 86); those that:
(1) improved from low to moderate or low to high in attainment and were identified as highly effective in national value-added analyses (the "low start" group);
(2) improved from moderate to higher moderate or high in attainment and were identified as highly effective in value-added (the "moderate start" group); and
(3) had stable high attainment that were also highly effective in value-added (the "high start" group).

An initial hypothesis was made in which schools that make rapid improvement over a short time period that began in a 'low attainment group' were likely to present distinct leadership

[4] National Pupil Database available from the then Department for Children, Schools and Families (DCSF)

profiles and school improvement processes compared with schools in a more stable high effectiveness group. This hypothesis formed part of the basis of the use of improvement groups as comparison points with which to explore leadership effects and their relationship with student outcomes.

Box 1

Based on three years of data, schools were classified according to the statistical significance of differences of raw results and value-added measures. Value-added models comprised both 'simple' or 'PA' which took mainly into account prior attainment (along with gender and month of birth) and 'contextual' or 'SX' ('School extended') which included various school and pupil contextual factors (eg level of economic deprivation, special needs status, mobility, ethnicity, English as an Additional Language status). Results were flagged as 'Trend 3' if there had been a significant change (95% confidence limits, 1.96 SD; $p<0.05$) over the three-year period.

"Thus, 'Improving' over a three-year period could be any one of:

(i) significant improvement between Year 1and Year 2 and followed by no significant change between Year 2 and Year 3;
(ii) "no significant change Year 1→Year 2 and significant improvement Year 2→ Year 3; and
(iii) significant improvement Year 1→Year 3." (Sammons *et al*., 2011, p. 62)

Improvement flags were derived by counting the number of 'Improving' Trend 3 flags between several stages of schooling. Schools with at least one 'improvement flag' would have seen significant improvement based on a mixture of raw, simple and contextual value-added measures between 2003 and 2005. Hence, the more 'flags', the greater the level of significant improvement seen by the school. 34% of primary and 37% of secondary schools for which national data was available fitted the sampling criteria as having 'improved' over the three-year period.

The remaining three components comprised (Day *et al*., 2009, p. 18):

- An initial wave of questionnaires to headteachers and key staff in the nationally-representative sample of improving schools determined by the criteria outlined above. The survey asked participants to report on the extent of change in different features of school activity and practice over the same three-year period
- A follow up round of questionnaires to the same participants exploring in more detail particular strategies and actions that were perceived to relate to improvement). The second wave was informed by the interim results from the first wave of questionnaires and emerging case study findings.
- A round of questionnaires to a sample of year 6 and year 9 students in 20 schools chosen as case study sites was also analysed. The aim here was to collect data across two successive years in order to obtain students' view and perceptions of teaching and learning, leadership and school culture and climate.

Schools were stratified further into 'free school meal' (FSM) bands again based on national data for all English schools[5]. The FSM indicator denotes the percentage of students in a school who are eligible for free school meals and provides a proxy indicator of the level of

[5] Data made available in the National Pupil Database by the DCSF

disadvantage of the student intake of a school. The distribution of disadvantage based on this indicator is highly skewed reflecting the geographical concentration of poor families in particular communities (eg inner city locations). Nationally, it was found that a greater proportion of English schools were in Free School Meal (FSM) band 1 (0- 8% students eligible for FSM) and band 2 (9-20% eligible) than in FSM band 3 (21-35% eligible) and Band 4 the most disadvantaged group (36% + eligible). Table 2 shows the distribution of schools by their FSM bands (these bands are based on the % of student intake in the school recorded as eligible for FSM) in the national population of maintained, mainstream primary and secondary schools in England. For example, 6150 primary schools nationally had 0 to 8% of their students eligible for FSM. So 42% of the primary school group were in FSM Band 1.

FSM Band	Primary Schools (Nationally)		Secondary Schools (Nationally)	
	N	%	N	%
FSM1 (0-8%)	6150	42%	1159	37%
FSM2 (9-20%)	3896	27%	1097	35%
FSM3 (21-35%)	2359	16%	520	17%
FSM4 (36%)	2267	15%	339	11%
Total	14672	100%	3115	100%

Table 2: Distribution of schools by FSM bands in England

The research deliberately over-sampled schools from Bands FSM 3 and 4 in order to achieve a sample less skewed towards lower levels of disadvantage. Students in schools with higher levels of disadvantage tend to start from lower attainment levels, hence the sampling frame chosen provided opportunities to secure a group of schools that saw progress and attainment improve from 'low to moderate' or 'low to high' and explore the relationship between leadership and student attainment outcomes in schools experiencing challenging circumstances (Day *et al*., 2009).

Figure 2 shows the sampling strategy employed during the study. This shows links with the qualitative component of the mixed methods research.

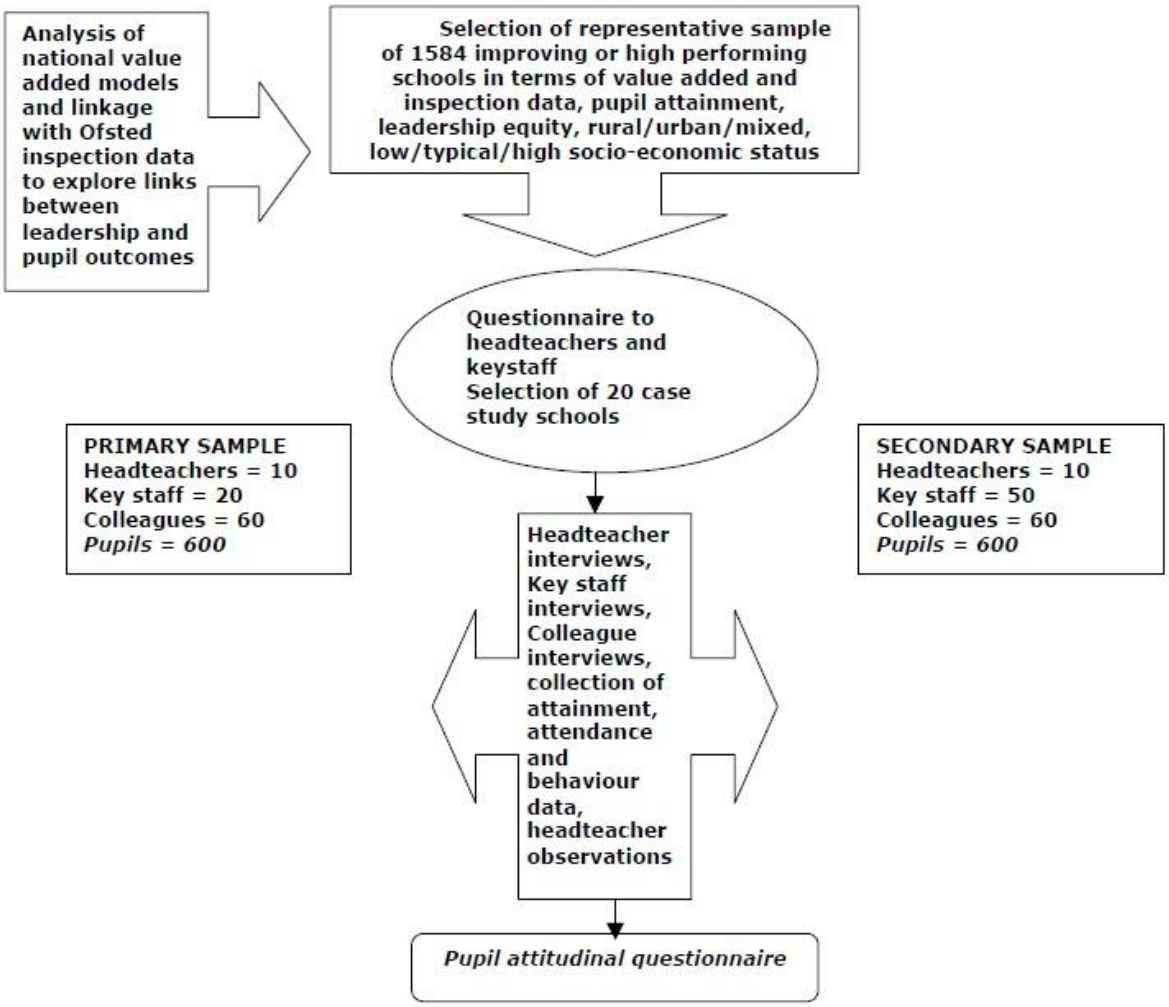

Figure 2: Sampling strategy (from Day *et al.*, 2009)

Qualitative strand

This strand involved in-depth case studies in selected schools chosen from the questionnaire sample. The case studies comprised three visits per year over two years. Interviews took place with headteachers and a range of key staff and various stakeholders and observations were carried out looking specifically at features of practice identified by schools as important in their efforts to improve. Case study sites were chosen to represent schools in the primary and secondary sectors, and their different contexts (including levels of advantage and disadvantage based on FSM band and ethnic diversity).

> Interviews with heads and key staff prompted them to speak about those issues that were most significant to them in relation to the research aims and objectives and aspects identified as important in the literature review. Interviews with other colleagues in the school provided insights outside the formal school leadership into perceptions of the nature and impact of the practice and effectiveness of participating heads in the role of school (and departmental) leadership, including the involvement of the Senior Leadership Team (SLT) and middle managers (e.g. Key Stage Leaders). (Day *et al.*, 2009, p. 18)

Twenty headteachers were interviewed (10 at primary and 10 at secondary schools); and engagement at different levels with 70 key staff, 120 colleagues (interviews) and over 600 students surveyed. Interviews with headteachers and key staff allowed participants to speak at greater length and depth about issues most significant to them linked to the study's aims and objectives (Day *et al*., 2007). Specific questions and prompts were asked related to leadership values, strategies and skills, moderating factors (such as school context – including location, size and culture) and mediating factors (such as teaching and learning, classroom climate and student and staff engagement). Interviews with their colleagues provided additional insights into the nature and impact of particular leadership practices. Participants in the 'colleagues' category comprised a member at each school of non-teaching staff, teaching staff, developing leaders, SLT and middle-management and the chair of governors or parent governor (Day *et al*., 2007).

In summary, table 3 illustrates the relationships (and associated complexity) between the study's main research aims, methods and outcomes (after Day *et al*., 2007, p. 21-22).

Table 3: Research aims, methods employed and outcomes

Research aim	Method of data	Outcome
1. Collect and analyse attainment data at national level in order to explore the relationship between leadership and pupil outcomes *Research Question 1: what does the analysis of attainment at a national level tell us about effectiveness features and leadership of schools?*	Collection of pupil attainment School Ofsted data	Identification of key quantitative indicators of effective schools and associations with leadership judgements
2. Collect evidence to identify and describe variations in effective leadership practice (types, qualities, strategies and skills) in order to relate these changes to variations in student, teacher and organisational outcomes. *Research Question 2: what are the variations in effective leadership practices in schools in different phases, in different socio-economic contexts and with differential effectiveness?*	Interviews with headteachers Interviews with colleagues Observation in school (and classes) School Ofsted data Pupil attitudinal survey	Summary and synthesis of effective leadership practices in schools

Research aim	Method of data	Outcome
3. Explore to what extent variation in pupil outcomes is accounted for by variations in types, qualities, strategies and skills of leadership *Research Question 3: how much variation in pupil outcomes is accounted for by variations in types, qualities, strategies and skills of leadership?*	Interviews with headteachers Interviews with colleagues Collection of pupil attainment data School Ofsted inspection judgments Pupil attitudinal survey	Mapping of relationships between variations in qualities, strategies and skills of leadership and their impact on student outcomes
4. Identify which variables significantly moderate the effects of leadership practice on both short and long term pupil outcomes *Research Question 4: which variables significantly moderate the effects of leadership on both short and long term pupil outcomes?*	Headteacher questionnaire Interviews with headteachers Interviews with colleagues Collection of pupil attainment data	Mapping the variables that significantly moderate the effects of leadership in different contexts on both short and long term pupil outcomes
5. Identify which variables significantly mediate the effects of leadership practices on both short and long term pupil outcomes *Research Question 5: which variables significantly mediate the effects of leadership on both short and long term pupil outcomes?*	Headteacher questionnaire Interviews with headteachers Interview with colleagues Collection of pupil attainment	Mapping the variables that significantly mediate the effects of leadership in different contexts on both short and long term pupil outcomes
6. Provide guidance on relationships identified between leadership practices and outcomes that will help to inform the work of central government, local authorities and leadership bodies and schools. *Research Question 7: how can findings inform work of schools, government and the NCSL and suggest foci for subsequent fieldwork?*	Headteacher questionnaire Interviews with headteachers Interview with colleagues Pupil attitudinal survey	Production of a final report for government

Analyses

> There is no single model of the practice of effective leadership. However, it is possible to identify a common repertoire of broad educational values, personal and interpersonal qualities, dispositions, competencies, decision making processes and a range of internal and external strategic actions which all effective heads in the study possess and use. Such a common repertoire is necessary but insufficient in itself to secure effectiveness. It is the particular combinations of strategies based upon the heads' diagnoses of individuals, the needs of schools at different phases of performance development and national policy imperatives which are influential in promoting improved - student outcomes. (Day *et al*., 2009, p. 2)

One of the main foci of the data analysis in the study was to explore similarities and differences in headteacher and key staff questionnaire responses between schools in the three 'school improvement groups' discussed earlier. 'Improvement profiles' were also generated for the 20 case study schools in the sample in order to examine in more detail the characteristics and practices of leadership associated with each school and also to support qualitative comparisons by context and school improvement groups. Examples from one of the 20 case study schools can be seen in Figures 3 and 4. One hypothesis of the study was that school organisation history and context would influence approaches to leadership taken to promote and sustain improvement (Day *et al*., 2009, p. 23). This is an important feature of the research project; evidence for this was synthesised from the analysis of questionnaire data and later via the 20 individual school improvement profiles.

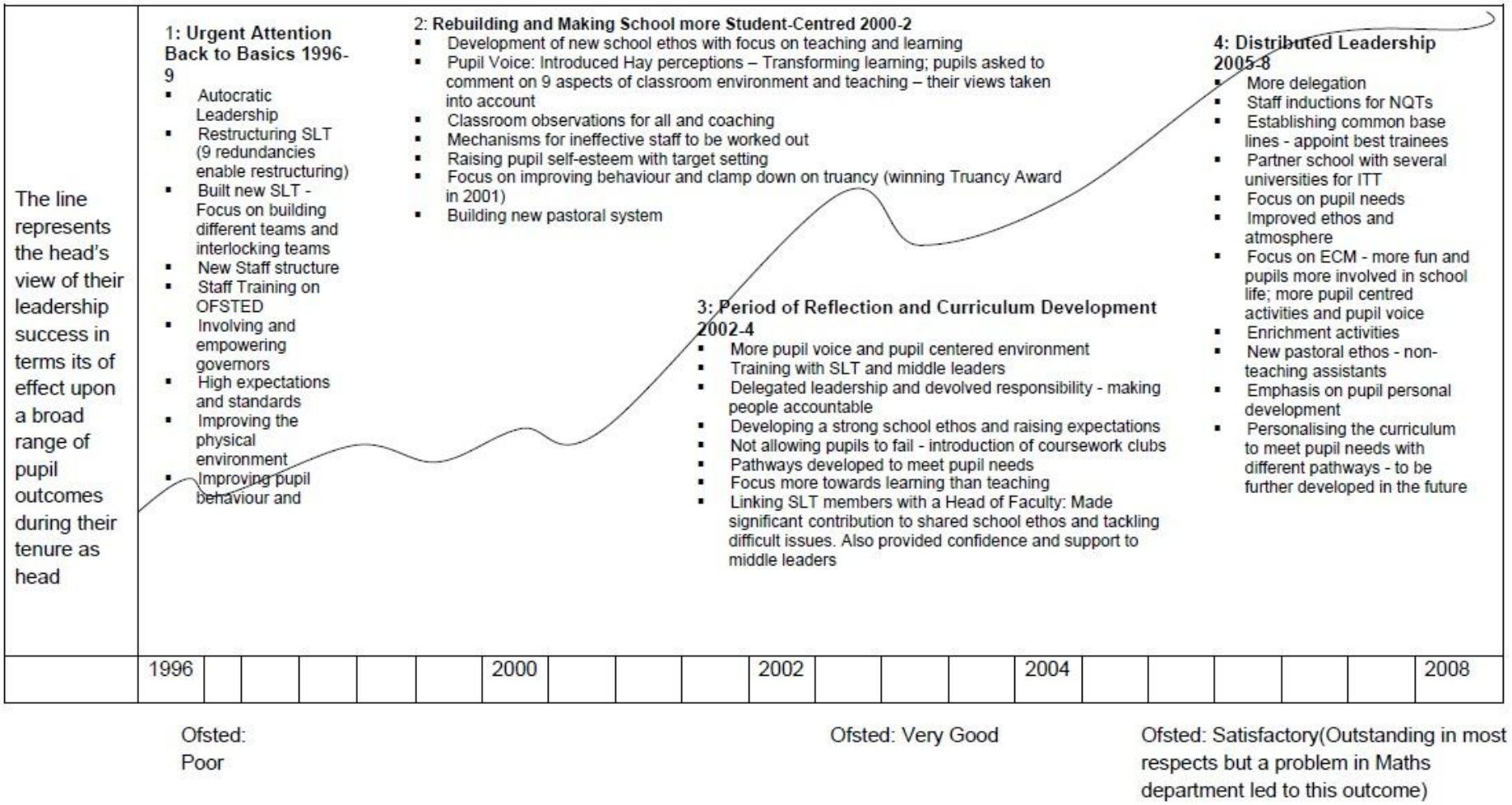

Figure 3 Headteacher's 'line of leadership success' (sample school A)

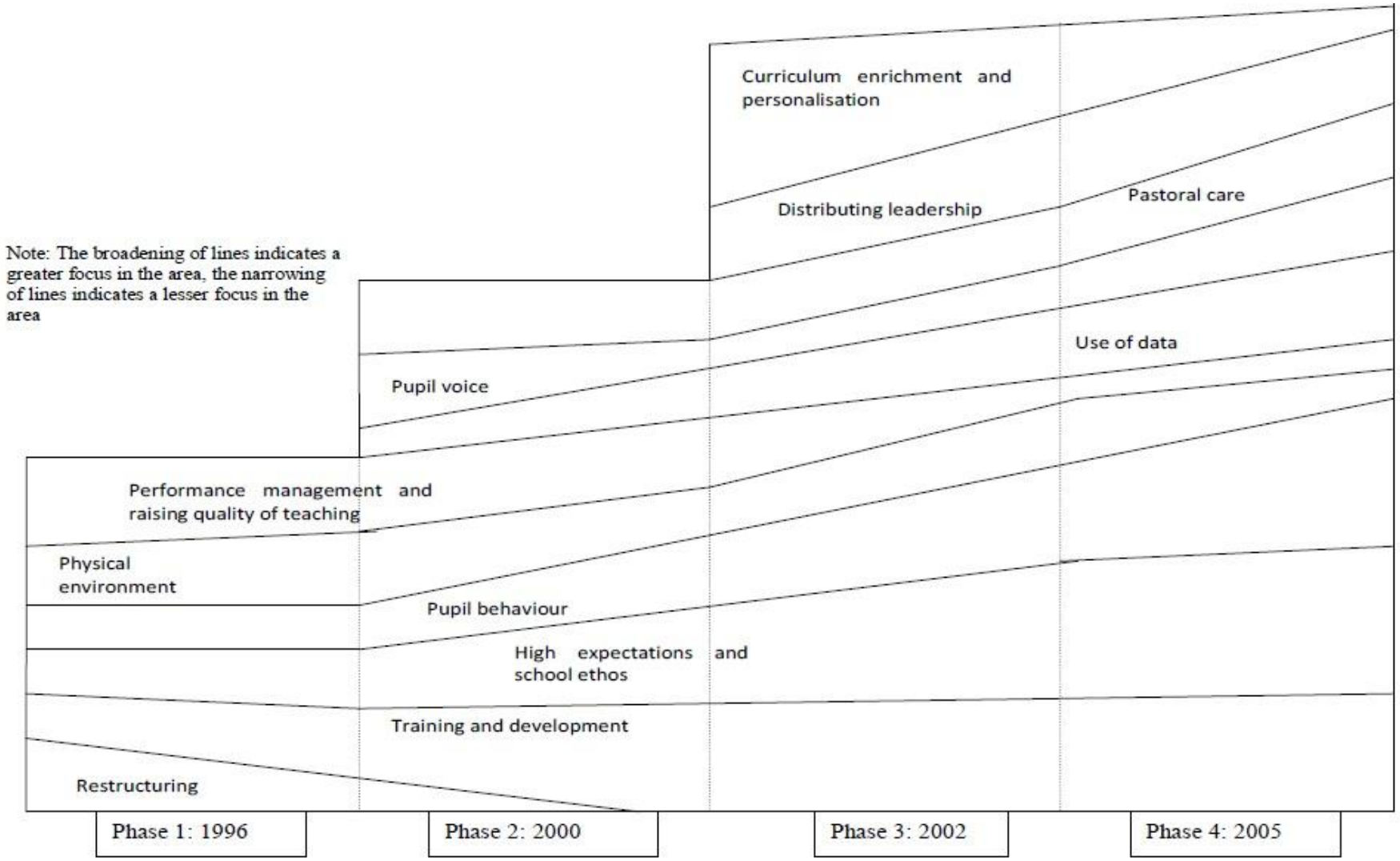

Figure 4 Sample school A's depiction of 'layering of leadership'

Exploratory and confirmatory factor analysis (CFA) were used to investigate the possible structures underpinning the questionnaire data from headteachers and key staff, and to test theoretical models about the extent to which leadership characteristics and practices identified in the earlier literature review could be confirmed from the sample of effective and improved schools in England (Sammons *et al*., 2011). Figures 5 and 6 show the underlying leadership factors identified for both primary and secondary schools from the questionnaire data collected from principals. They largely accord with the conclusions of Leithwood *et al*'s (2006) literature review. The only difference between sectors was the emergence of a separate 'Use of Observation' factor linked to Managing the Teaching Programme for secondary schools.

Next, structural equation modelling (SEM) was used to explore links between leadership features and practices and changes in student outcomes. The models developed are seen as more dynamic in nature due to the focus on change in student outcomes used to measure improvement. This draws on but extends the cross-sectional approach that predicts student outcomes adopted in the earlier Leadership and Organisational Learning (LOSLO) study in Australia by Silins and Mulford (2004) – as the factors identified in this research in the English context relate to improvement in school performance (as measured by change in student outcomes and progress) (Sammons *et al*., 2011).

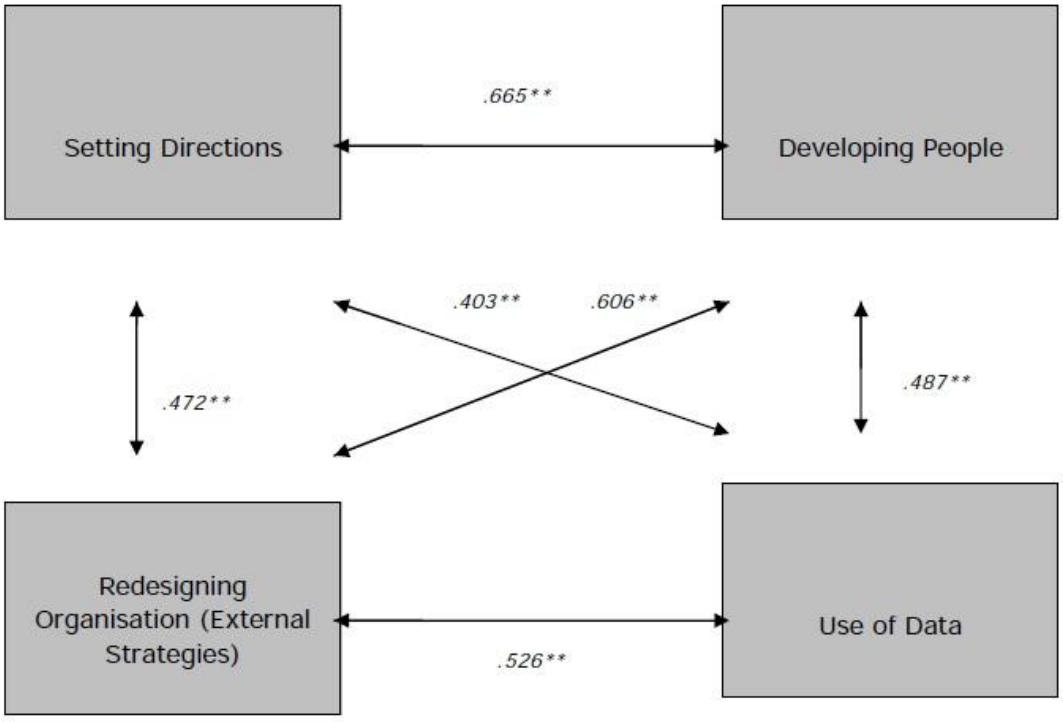

Figure 5 Correlations between the four dimensions (latent variables) in relation to leadership practice (primary) (N=378)

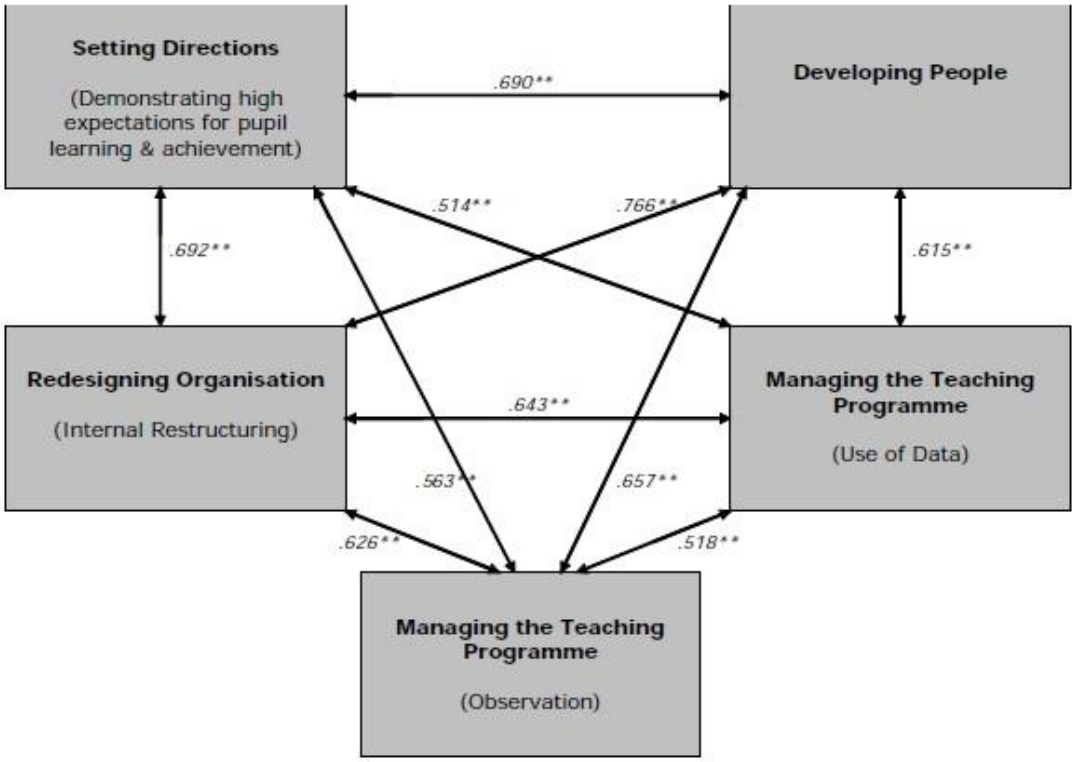

Figure 6 Correlations between the five latent variables in relation to leadership practice (secondary) (N=362)

The data collected in the qualitative strand were coded and analysed thematically using NVivo7. In line with the mixed methods strategy results from the first wave of questionnaires informed subsequent rounds of interviews. Over the two years, six rounds of interviews with headteachers and key staff took place. In the penultimate round, an innovative instrument was designed in order to generate graphical representations of headteachers' perceptions of strategies that might have influenced their schools' success. The same instrument was administered to key staff and one long serving teacher; they were asked to provide their own perceptions of the school's trajectories of success and the role of the headteacher (Day *et al*., 2009).

Data from the in-depth interviews and observations in the 20 chosen schools was coded and analysed in order to construct Analytical Case Study (ACS) representations. These ACS also included indicators based on the quantitative datasets such as school FSM band, school improvement group (a form of categorising or qualitising the quantitative data) Four main sections were identified as part of the initial grouping procedure (Day *et al*., 2009, p. 25):

- school context
- key leadership strategies
- headteacher attributes and leadership styles and
- transitions in leadership practices.

A grid or 'matrix' was generated that attempted to match leadership strategies undertaken by headteachers and their perceived consequences and outcomes.

Headteachers' answers to a specific question about the three strategies they had adopted that had the biggest impact on pupil outcomes were analysed to identify the most important strategies. These are shown below for both sectors.

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Primary headteachers

Encouraging the use of data and research	(28%)
Improved assessment procedures	(28%)
Teaching policies and practices	(26%)
Changes to pupil target setting	(20%)
Strategic allocation of resources	(20%)
Providing and allocating resources	(19%)
Promoting Leadership Development and CPD	(16%)

Secondary Headteachers

Encouraging the use of data and research	(34%)
Teaching policies and practices	(28%)
Change school culture	(21%)
Providing and allocating resources	(20%)
Improved assessment procedures	(19%)
Monitoring of departments and teachers	(16%)
Promoting leadership development and CPD	(15%)

Although the primary and secondary head teachers showed considerable similarity in their priorities, for secondary heads only, changing school culture was accorded a high priority for their improvement efforts (Gu *et al.*, 2008). This fits with school effectiveness literature on school turnaround that suggests improving the school's behaviour climate and other features of culture is an important step for struggling secondary schools (Sammons *et al*., 1997).

Integration of findings

The final step in the synthesis of results was to create a 'cross-case matrix' which represented the most important leadership strategies that emerged from the quantitative and qualitative strands of data.

> This matrix was created by an iterative process of discussion within the whole research team. During this time there was extensive, ongoing collaboration between the qualitative and quantitative researchers. This ensured that the themes arising from the qualitative data were confirmed and supported by the quantitative findings and vice versa. (Day *et al*., 2009, p. 25)

Eight headings were identified, which coalesced with the eight themes that emerged from the analysis of qualitative data:

1. Defining the Vision

2. Improving Conditions for Teaching and Learning

3. Redesigning organisational roles and functions

4. Enhancing teaching and learning

5. Redesigning the curriculum

6. Enhancing teacher quality

7. Establishing relationships within the school community

8. Building relationships outside the school community

In summary, the findings across the different strands of the research indicate that the leadership of the head must be seen as a key component in the success and sustained improvement of the school but school context also shapes leadership approaches. The authors argue:

> Whilst there was no 'blueprint' model of effective leadership practices, the heads demonstrated similar values and used a similar range of strategies. However, each head used combinations of strategies in ways and at times most suited to the particular context of the school. (Day *et al*., 2009, p. 110)

Some of the main findings from the combined analyses of quantitative and qualitative data in this study are presented below and the implications for policy and practice are noted.

School improvement groups: Key findings

- The categorisation of schools into three distinctive groups reveals that there are statistically and educationally significant differences in certain leadership features and practices.
- There were important relationships between school context and the school improvement group, and between school context and headteachers' time in post.

- More change was identified for the Low start group of schools and more stability for the High start.
- There is strong evidence that schools in the Low start group had made greater improvements in changing school culture, climate and addressing teaching and learning and use of performance data during the last three years
- Respondents to the survey and those in the case study schools were significantly more likely to report substantial improvement in pupil behaviour, attendance, attitude and motivation in schools in the Low start group.
- Head teachers from schools in the Low to Moderate / High Group were more likely to report they prioritised strategies to improve teaching and learning and the use of data than those in the Stable High effective group.

The associations between headteachers' educational values, attributes and strategic actions and student outcomes and school improvement were found to be both statistically significant and qualitatively robust. These findings "confirm and go beyond" the successful leadership practices identified in the initial literature review. The deliberate focus of the design to study improving and effective schools therefore adds to the school improvement and leadership knowledge base.

Table 4 illustrates the seven original claims (Leithwood *et al*., 2006) and explores the links with and contributions made to these claims by this mixed methods study. It shows that the research on effective and improving schools in England supports but also extends these claims.

Confirmed and added claims in present study (Day *et al*., 2009)	Relationships between two sets of findings	Seven claims (Leithwood *et al*., 2006)
A. Headteachers can make a significant difference to pupil behaviour, engagement and attainment outcomes, regardless of experience, sector, size and socioeconomic status of school.	Confirms claim 1 from original seven claims	1. School leadership is second only to classroom teaching as an influence on pupil learning.
B. Successful leaders show many similarities in both their values and what they do. How they act varies according to school context, organisational history, current performance & sector.	Confirms claims 2 and 3 (B) Adds knowledge to these claims (C)	2. Almost all successful leaders draw on the same repertoire of basic leadership practices.
C. Social context and leadership judgments about organisational history affect their priorities and emphases.		3. The ways in which leaders apply these basic leadership practices – not the practices themselves – demonstrate responsiveness to, rather than dictation by, the contexts in which they work.

<table>
<tr><th>Confirmed and added claims in present study (Day et al., 2009)</th><th>Relationships between two sets of findings</th><th>Seven claims (Leithwood et al., 2006)</th></tr>
<tr><td>D. Headteacher values, predispositions, attributes and strategies make a difference to conditions, motivation, commitment and competences for teachers and pupils and their achievements.</td><td>Advances claims 4 and 7</td><td>4. School leaders improve teaching and learning indirectly and most powerfully through their influence on staff motivation, commitment and working conditions.</td></tr>
<tr><td>E. The nature and form(s) of distributed leadership reflect the level of leadership and organisational trust</td><td rowspan="4">Advances claims 5 and 6 (E)

Adds knowledge (F, G and H)</td><td>5. School leadership has a greater influence on schools and students when it is widely distributed.</td></tr>
<tr><td>F. Trust is both a value, predisposition; calculated process and consequence and is associated with distributed leadership.</td><td rowspan="3">6. Some patterns of distribution are more effective than others</td></tr>
<tr><td>G. Building and sustaining person-centred trust is essential.</td></tr>
<tr><td>H. School improvement groupings and sectors count.</td></tr>
<tr><td colspan="2">Supported by new claim (D)</td><td>7. A small handful of personal traits explains a high proportion of the variation in leadership effectiveness</td></tr>
<tr><td>J. Successful leaders are those who are able to diagnose, initiate and adapt. It is the ‘layering’ of combinations of ‘fit for purpose’ values-led strategies over time which make a difference to pupil outcomes.</td><td colspan="2">New claim</td></tr>
</table>

Table 4: Seven strong claims about successful school leadership (Leithwood *et al*., 2006) and added knowledge/new claims from present study (Day *et al*., 2009)

Each claim is discussed in turn below based on the initial literature review and new evidence gathered and analysed from the present study.

Claim 1: School leadership is second only to classroom teaching as an influence on pupil learning

Although seen as controversial at the time it was first made, other studies have made inroads into further substantiating this claim via, for example, reviews of quantitative research (eg Hallinger and Heck, 1996a; Waters *et al*., 2003) and studies examining the role of leadership in schools facing challenging circumstances (eg Reitzug and Patterson, 1998; Keys *et al*., 2003). Evidence for this claim continues to grow. Leithwood and Jantzi (2005) in their review of 18 studies found evidence of positive effects on student outcomes and engagement. It should be noted at this point that earlier studies attempting to understand the relationship between school leadership and student outcomes tended to look more at direct causal links, whereas more recently, researchers have started to use ‘mediated effects’ models that represent outcomes as following more indirect paths (Bruggencate *et al*., 2012). The use of SEM in the quantitative strand of this study points to moderate to strong leadership effects on school processes but only indirect effects on student outcomes (Sammons *et al*., 2011). Hence, while

the independent effects of school leadership may appear modest, these effects should be viewed in comparison with the effects of other school variables. Day *et al*. (2009) point to the "synergistic effects" or the accumulation of small effects and specific combinations that are created within successful organisations. The role of leadership in the 'bringing together' or synchronisation of different contributions towards school improvement processes can be further strengthened by Huber's (2004, p. 670) argument that:

> For all phases of the school development process, school leadership is considered vital and held responsible for keeping the school as a whole in mind, and for adequately coordinating the individual activities during the improvement processes...

Sergiovanni (1990, p. 24) goes as far as saying leaders promote an awareness and "consciousness" where the vision:

> [E]levates school goals and purposes to the level of a shared covenant that bonds together leader and follower in a moral commitment.

Kurland et al (2010, p. 19) in their study of organisational learning and leadership styles found evidence demonstrating that school leaders generate "enthusiasm and commitment" (ie a more transformational leadership style) which in turn influences how teachers perceive vision and direction being inculcated and followed in schools.

Claim 2: Almost all successful leaders draw on the same repertoire of basic leadership practices and;

Claim 3: Successful leaders enact the core leadership practices in contextually appropriate forms

The original literature review that provided a framework for the present study found that there were four main categories of leadership practices that formed a 'repertoire' of common practices for school leaders: "setting directions, developing people, redesigning the organisation and managing the teaching and learning". Meanwhile, Robinson *et al*. (2008) found significantly larger effects for "instructional leadership" – practices that engaged teachers more directly associated with student learning – than "transformational leadership" – practices that are more teacher than student focused.

> New evidence for the enactment of these same core leadership practices in contextually sensitive forms can now be found in relation to not only school turnaround contexts – typically schools serving highly diverse student populations. . . - but also highly accountable policy contexts. (Day *et al*., 2009, p. 12)

In terms of the present study, similarities were found between the effects of leadership practices on primary and secondary schools in the sample. However, the senior leadership team (SLT) had more direct influence upon learning and teaching standards in primary schools compared to secondary (Day *et al*., 2009).

Also, while a common repertoire is necessary, it is not sufficient in itself to promote effectiveness.

> It is the particular combinations of strategies based upon the heads' diagnoses of individuals, the needs of schools at different phases of performance development and national policy imperatives which are influential in promoting improved - student outcomes. The study shows how school improvement trajectories evolve over time in several phases. These strategies are underpinned by clearly articulated sets of values

> which focus upon promoting individual and social well-being and raising standards of achievement for all pupils. Taken together these effect cultural change, as well as changes in school classroom practices. (Day *et al*., 2009, p. 1)

Here, one might question how these common repertoires might be developed. Blackmore (2011, p. 210) suggests there may be an "untapped dimension" around emotional intelligence and competence which can:

> facilitate leaders to do things faster and better through emotional management is promising ground to nurture and mine.

Blackmore also cites Goleman (1998) who lists the array of skills and attributes that successful leaders may have to develop during their careers and subsequent 'ascent' into leadership roles. The "new yardstick" as he phrases by which leaders are being judged focuses on "personal qualities, such as initiative and empathy, adaptability and persuasiveness" (Goleman, 1998, p. 3). In a related vein, Krüger and Scheerens (2012, p. 25) point to the concept of "integral leadership", the overlap between instructional and transformational leadership where leaders are able to:

> [I]ntegrate all domains (eg education, personnel, finance) within their schools, mostly by developing school-wide strategic perspectives that integrate them all.

The concept of integral leadership links strongly with Claims 4 and 7 discussed next.

Claim 4: School leaders improve teaching and learning indirectly and most powerfully through their influence on staff motivation, commitment and working conditions and;

Claim 7: A small handful of personal traits explains a high proportion of the variation in leadership effectiveness

As indicated previously, claims 4 and 7 from the initial review are closely related to claims 5 and 6. The present study found the following in relation to headteachers' broadening of participation and distributing leadership within their schools:

- Effective Leadership relies upon an increasingly close and collaborative relationship between headteachers and the SLT
- The creation of new 'distributed' leadership roles and patterns was a consistent feature of the effective schools
- The level of leadership experience of the headteacher has an association with the level of change implementation to structures in the school and over time (see layered leadership and case study trajectories illustrated in Figures 3 and 4)

Claim 5: School leadership has a greater influence on schools and pupils when it is widely distributed and;

Claim 6: Some patterns of distribution are more effective than others

These findings also link with new evidence gathered as part of the present study:

- The practice of leadership distribution is common among schools
- distributed sources of leadership co-exist alongside more focused, overt 'individually-enacted' sources of leadership; and
- the 'distribution of leadership' responsibility and power tends to vary in response to contexts or challenges found in different school settings.

Hulpia *et al*. (2009, p. 310) in their study exploring the relationship between the perception of distributed leadership and practitioners' job satisfaction and commitment concluded that school leadership may be better served by a "cohesive leadership team, with strong support in schools and limited formal distribution of leadership functions". Implicit in this configuration of distributed leadership is the perception of trust, seen as a critical concept for leaders to understand and develop (Handford and Leithwood, 2013, p. 194) as it allows for "less time to be spent on details, planning and attending to messages, and more time to be spent on actions that contribute to organizational improvements". One can see already the mosaic of practices emerging from the complex range of tasks associated with leadership tasks and management of resources. Indeed, Huber (2004) brings the argument back to the "amalgam of school leadership competence", presupposed in the different approaches applied and domains occupied by school leaders:

> Competence can be seen and defined in the context of the position to be filled, as the ability to effectively execute the activities and functions which are part of the position, It can be regarded as a fundamental characteristic of a person, which results in an effective and/or above average achievement. (Huber, 2004, p. 672)

Concluding comments: studying school improvement and the contribution of leadership in improving student attainment outcomes

In order to define school improvement, the current research used national data sets on students' academic attainment and examination performance. The structure and composition of these national pupil data sets are unique to England in that an identifier (known as the Unique Pupil Number or UPN) allows the linking of data across key phases of education as students move through different 'end of stage' examinations at ages 7, 11, 14 and 16. This meant the research could select schools for the questionnaire survey based on extensive analysis of school effectiveness research and contextual value added approaches. The focus on changes linked to improvement over time fits with the Dynamic Model of school effectiveness and improvement (Creemers and Kyriakides, 2008).

The use of value-added measures of performance based on student progress and improvement in raw results derived from key national performance indicators means that improvement focuses directly on the extent to which schools were successful in raising academic outcomes. Of course, this provides a relatively narrow perspective, though of prime importance to policy makers in many countries, particularly in the English context at the time the research was undertaken where accountability for raising educational standards was seen as the top priority for school leaders (Sammons, 2008). Nonetheless, a mixed methods design enabled a broader picture to emerge of successful leadership of these academically effective and improving schools through tapping the perspectives of different stakeholders and including their evidence on other student outcomes (including changes in student behaviour, attendance, motivation and engagement) and improvements in schools' internal conditions and processes.

The research made use of national student attainment data sets for the identification of improving and effective schools and revealed the importance of considering their different starting points. This was done by creating a classification of three distinctive improvement groups based on schools' starting points for improvement (Low, Moderate or High start). The combination of quantitative survey data from headteachers and key staff with qualitative

case study data enabled a range of analysis strategies and the development of statistical models and deeper understanding of the role of leadership. The statistical models revealed strong leadership effects on school processes and internal conditions but only weak indirect effects on changes in student attainment outcomes. In addition, the qualitative case studies provided powerful evidence of the perceived importance of leadership in the accounts of school improvement provided by different stakeholders. These different sources of evidence should not be necessarily seen as inconsistent. Leaders seek to set directions, develop staff and take actions that improve internal school conditions. These will have direct effects on the work of various stakeholders, particularly senior and middle leaders. They are also likely to influence teachers and teaching and learning practices.

The research confirms the importance of leadership in shaping school processes in this study on effective and improving schools. However, the quantitative models point to weaker and indirect effects of leadership in the improvement of student outcomes, whereas the qualitative evidence reveals the prime importance to attached leadership by stakeholders in their accounts of how their schools improved and promoted better outcomes for students.

The research has a number of implications for policy makers and practitioners who seek to promote school improvement. In particular it points to the possibilities of using national data sets to study school improvement in academic outcomes and the importance of school context (level of disadvantage of student intake) and history, particularly the importance of the concept of a 'starting point' for identifying improvement trajectories. For example, the emphases in leadership priorities, strategies and actions in the Low start group of schools in this research in England differed from those of schools the Medium and High start groups. School leaders require confidence in using data and research to support improvement, and awareness of the key factors identified in the literature review and supported by the research findings in this study (Setting directions, Redesigning the organization, Developing people and Managing the teaching and learning programme, including the use of data and observation as part of this). The research also highlights the need for skills in diagnosing their schools' needs. The case studies reveal changes in emphasis in leadership approaches and improvement strategies and foci over time. Evidence from research and such case studies can be used to support professional development and training for current leaders and those aspiring to leadership. Linking 'stories and statistics' in mixed methods research offers more powerful explanations and increased understandings that help to extend the school improvement knowledge base (Teddlie and Sammons, 2010).

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