

Increased expenditure on Associate Staff in schools and changes in student attainment

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Introduction

This study builds on previous research which focused on workforce remodelling and workforce reform. The first study by ¹Clark (2007) 'Beyond Workforce Reform: Towards Transformation' illustrated how some schools had deployed staff in creative and innovative ways that resulted in gains in student achievement. The follow on study by ²Harris, Goodall and Ghent (2008) looked in greater depth at the relationship between workforce reform and improved organisational and student learning outcomes. This report concluded that the 'Beyond Workforce Reform' practice 'was viewed by schools as making a positive difference in a wide range of other outcomes such as attendance, behaviour, rates of exclusion, staff morale, aspirations and extra-curricular activities' (p20).

This current study is an extension of the Harris, Goodall and Ghent (2008) study that looks at the deployment of staff in more depth, focusing particularly on the relationship between additional expenditure on associate staff and changes in attainment.

Summary

This report outlines the findings from an investigation into the relationship between increases in expenditure on Associate Staff and changes in attainment. To examine this relationship, data was gathered from 83 maintained secondary schools in England. The evidence included firstly, data on school expenditure (see method section for details) between 2005-6 and 2008-9, secondly, data on changes in staffing between 2005-6 and 2008-9 and thirdly improvement in attainment at Key Stage 4 (proportion achieving 5 or more GCSEs A* - C including English and Maths) over the same period.

The results showed a statistically significant relationship between increases in expenditure on Teaching Assistants (TA) and improved student attainment. The results also showed a stronger and more reliable relationship between increases in the actual number of TAs and improved student attainment. The analysis showed that the larger the number of TAs in a school, the stronger the relationship with improved attainment. Overall, the results suggest

¹ Clark, T. (2007) *Beyond Workforce Reform – Towards Transformation. Does it sell more beer?* London, SSAT

² Harris, A. Goodall, J. and Ghent, K (2008) *Beyond Workforce Reform: Raising Achievement*, London SSAT.

that greater expenditure on teaching assistants, more than additional expenditure on any other type of associate staff, is associated with gains in student attainment.

However, these results do not imply that only the quantity matters of TAs matter in a school. The research findings suggest that it is not just the number of teaching assistants that make a difference to learning outcomes but their quality and the nature of their deployment are critical components in contributing to improved student attainment.

Method

Schools were asked to provide details of the total spending on pastoral or curriculum staffing (in £s) during the financial year April 1st 2005 to March 31st 2006 and again for the financial year financial year April 1st 2008 to March 31st 2009. Schools were asked to include all regular annual income, irrespective of the funding source but including Standards Fund, SEN, Specialist School funds etc but not including one-off grants or capital funding. Pastoral Support Staff included Assistant House/Year Heads and Behaviour Support Workers and Technicians includes those working for ICT, Science, Technology, PE, Art and Music etc. School were asked not to include site staff.

Schools were also asked to provide details of the Full Time Equivalent (FTE) numbers of staff in 2005-6 and in 2008-9. This was calculated as the total number of hours provided by staff divided by the standard number of hours required in a full time contract (which is 25 hours) thus providing full time equivalent numbers.

Categories of staff included Teachers, Cover Supervisors, Technicians, Librarians, Teaching Assistants and Pastoral Support Staff. Certain categories of staff were aggregated together to form particular groups – for example, Curriculum support staff (Cover supervisors, Technicians, Library staff and Teaching Assistants) and Pastoral Support Staff (Assistant House/Year Heads who are not teachers, and Behaviour Support Workers etc).

School attainment was calculated from individual pupil data recorded in the National Pupil Dataset (NPD) by finding the proportion of pupils that achieved the national standard threshold of 5 or more GCSEs including English and Maths, enrolled in each school in 2005-6 and again in 2008-9 using data provided by the Data Service Group of the DCSF. This data provided accurate and objective figures allowing detailed statistical analysis to be

undertaken. School level achievement data was matched to school staffing data and the expenditure on staffing was provided by the school using the Unique Reference Number.

An alternative method of investigating the effect of associate staff on attainment could have included collecting data on the actual deployment of staff e.g. the pattern of their working hours and the type of deployment e.g. whether they are providing support to individuals or groups; whether they are providing administrative support to the school generally; or whether they are responsible for the delivery of specific classes. However, to collect such data would require a wealth of detailed and retrospective data that is not readily available. Consequently, this research exploits data already held by schools as one way of gaining an insight into the effects of associate staff over time.

School Sample

The schools in this study were selected as an opportunistic sample of schools known to the researchers from previous work on workforce issues. An original sample of 319 schools (which were representative of national deprivation and performance indicators) were approached by letter and personal communication to take part in the study. Eighty three schools returned complete data on their expenditure on staffing in 2005 and 2008. This is a return rate of 25%. The relatively low return rate may relate to the workload involved in extracting and calculating spending from older records back in 2005.

The attainment of the 83 schools returning data and that were subsequently included in this study was substantially above the national average. The average proportion of pupils achieving 5 or more A* to C including English and Maths in 2008, in the schools in this study, was 63.2% whereas the average for all schools in England is 47% (see fig 1.). However, 15 of the 83 schools in the study are located in the bottom quartile of deprived areas in England as measured by the average Indices of Multiple Deprivation Affecting Children. However some care should be taken when generalising from this sample of schools to all schools in England. The study did not specifically explore the relationship between associate staffing and attainment in low or average achieving schools.

An alternative method of collecting data on school staff expenditure could have involved extracting expenditure history from financial records held by local authorities, as many

schools purchase accountancy support services from LAs. However, because of the time constraints of securing data sharing agreements with Local Authorities and schools an opportunistic sample was used.

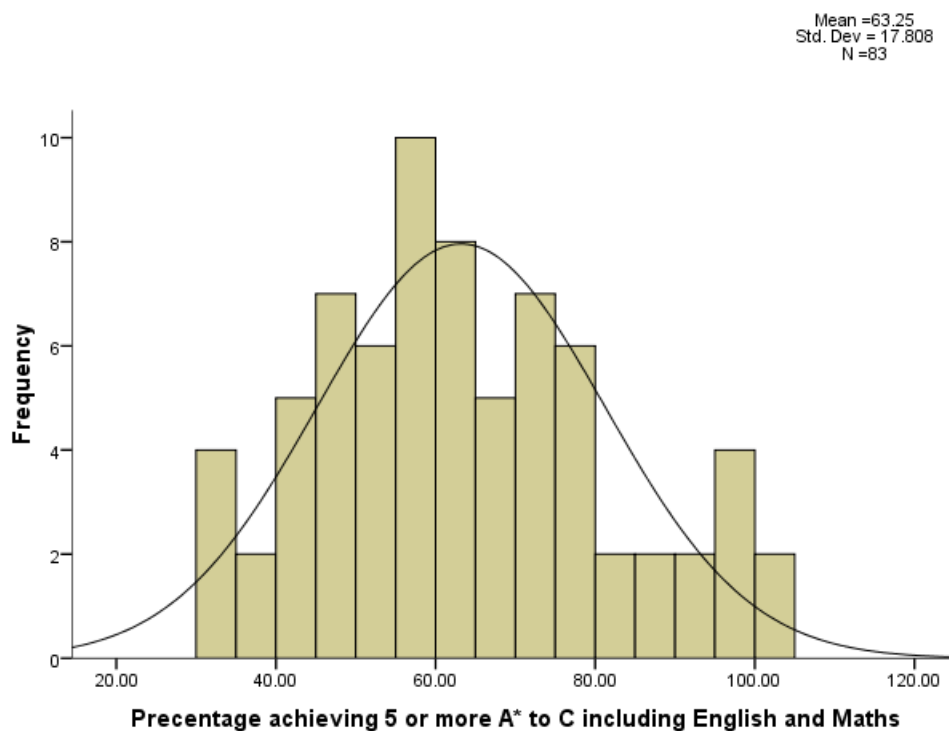


Figure 1. *The distribution of attainment in sampled schools*

Analysis

To assess the relationship between expenditure on associate staffing, numbers employed and attainment, *regression analysis* was used (Howell, 1985). Regression analysis is very similar to correlation analysis as it calculates the relationship between one factor and another. In this study regression analysis was used to look at the statistical relationship between increases in expenditure on associate staff and increases in attainment.

Using regression analysis it is possible to test and trace the strength of statistical relationships. For example, if there was perfect match between increased expenditure on

associate staff and attainment, plus a 100% increase in expenditure over three years, this would produce a 100% increase in attainment over three years. The correlation in this case would be $R = 1$. If a 100% increase in expenditure was associated with a 10% increase in attainment over three years the correlation would be $R = 0.1$. Regression analysis also calculates how much each school differs from the average trend in a relationship, and so provides a measure of how well the average trend accounts for the observed data. This is particularly helpful as it provides information on how well the trend fits all the data and thus gives an estimate of how influential a factor is in explaining an outcome.

If many schools differ by a large amount from the average, the trend is signified as a poor match to the data and the relationship is regarded as weak. How well the trend matches all the individual schools is signified by Rsq , if increases in expenditure on associate staff was associated with exactly the same increase in attainment in all schools the match would be 100% and the Rsq would be $Rsq = 1$, which would suggest that expenditure on associate staff was a single most powerful factor explaining all rises in attainment.

Results

The results showed that there was a statistically significant relationship between increases in expenditure on teacher assistants and improvements in attainment $R = .19$ $p = .092$ $Rsq = .034$. It also showed that schools with increased spending on teaching assistants between 2005 and 2008 also improved student attainment (see fig 2). The study showed that there was no significant relationship between additional expenditure on staff other than TAs, including teachers, and subsequent improvements in attainment. Also there was no associated rise in student attainment with increased spending on any particular grouping of associate staff (i.e. all curriculum, all pastoral and all curriculum and pastoral). These findings suggest that it is the increased spending on **teaching assistants per se**, rather than **by particular grouping**, that is associated with **increases in attainment over a three year period**.

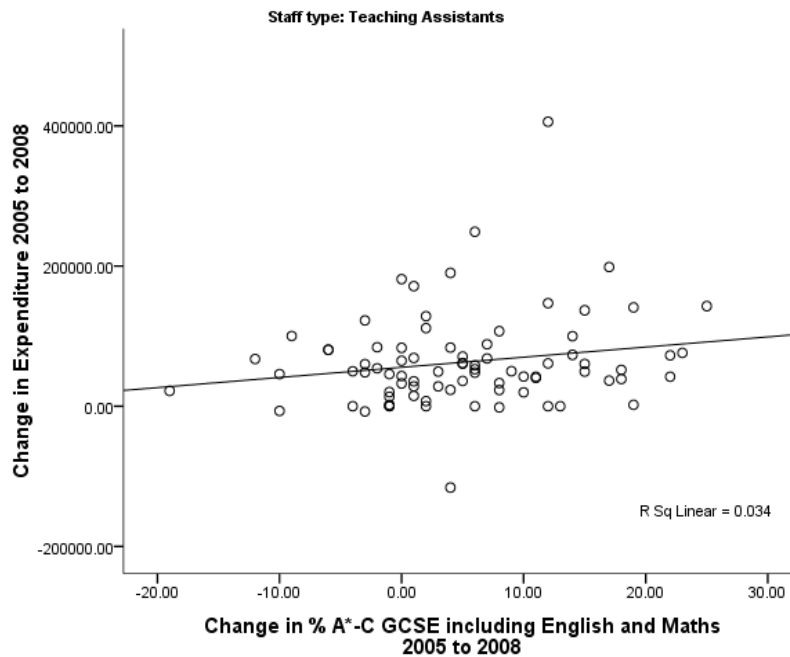


Figure 2. *The relationship between change in expenditure on teacher assistants and change in attainment 2005 to 2008 in 83 maintained schools.*

Sixty two schools in this study increased overall expenditure on staffing but particularly increased expenditure on TAs thus increasing the number of full time equivalent posts in the school. Alternatively, other schools increased expenditure on staffing without this increase translating into proportionately greater numbers of FTEs. In the latter case, it is possible that schools increased staff expenditure by paying TAs more or by recruiting HLTAs at higher rates of pay and therefore not increasing the number of FTE posts in the school.

Further analysis was undertaken to investigate the relationship between increases in staff expenditure, increases in FTEs, and changes in student attainment. To test whether changes in the absolute number (FTE) of teaching assistants between 2005 and 2008 was associated, to some degree, with attainment a statistical analysis was undertaken which examined the effect of the absolute change in the numbers of teaching assistants on attainment.

Once again, there was a statistically significant relationship between overall increases in the absolute number (FTE) of teacher assistants and attainment $R = .37$ $p < .001$ (see fig 3). Conversely, the analysis found that an increase in the (FTE) numbers of any other type of associate staff or teachers was not associated with improvements in attainment. The

relationship between increases in the total number of TAs and attainment **was much stronger and more reliable** than the relationship between increases in overall staff FTEs and attainment.

The probability the results occurred by chance was 100 times lower for increases in the number of TAs ($p < .001$) than increases in the number of other associate staff ($p = .092$). Additionally, the number TAs was more closely related to attainment than the amount of expenditure on TAs. Increases in the (FTE) number of TAs accounted for approximately 14% $Rsq = .141$ of all variation between schools, compared to 3% or $Rsq = .034$ of variation in expenditure. This indicates that the (FTE) number of TAs employed was more closely associated with improvements in attainment than the overall amount of expenditure spent on all staffing.

In summary, **increasing the absolute (FTE) number of TAs in the school**, more than any other category of associate staff, was positively associated with **increased student attainment**. This finding suggests that increasing the absolute number of teacher assistants rather than just increasing spending on **all staff** has the greatest potential to increase student attainment.

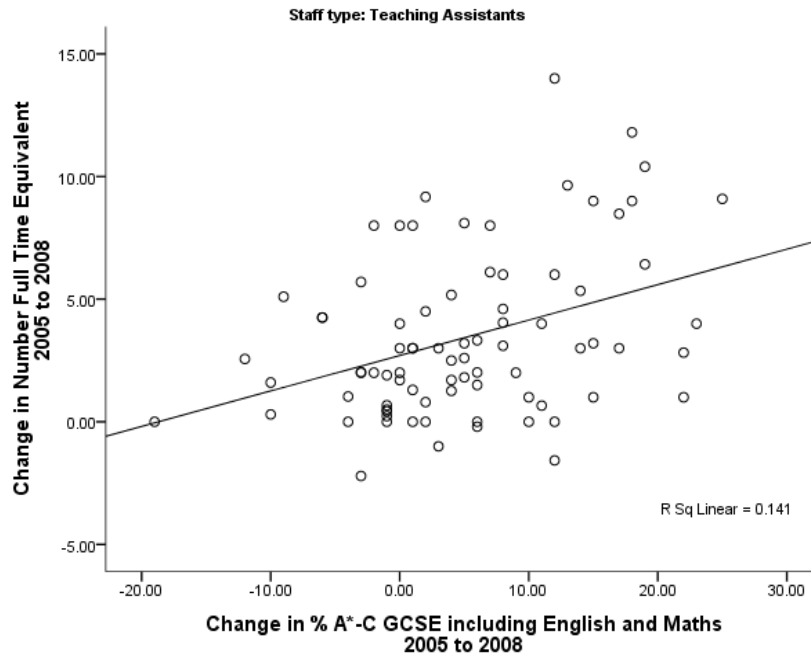


Figure 3. *The relationship between change in full time equivalent number of teacher assistants and change in attainment 2005 to 2008 in 83 maintained schools.*

One potential problem in analysing whether increases in TAs are linked to increases in attainment is that the analysis does not take into account those schools that may already have high numbers of TAs and do not increase this number. To test whether the absolute number of TA's already working in the school was associated with improved attainment; a regression analysis was carried out looking at the association between the number of TAs in 2005 and increases in attainment. A further analysis was carried out on the number of TAs in 2008 to test if simply having more TAs in schools, by the end of the period, was associated with increases in attainment.

The analysis found that there was a significant relationship between the total number of TAs in the school 2005 and again in 2008 with increases in attainment, for 2005 $R = .216$ $p = .057$ $Rsq = .046$, for 2008 $R = .339$ $p = .002$ $Rsq = .114$

These findings show that:

- The proportion of curriculum/teaching staff who were TAs significantly increased from 13.4% to 17.8% or over 4 % in three years 2005 to 2008

- The proportion of all school staff who were TAs increased from 10% in 2005 to 13% in 2008
- The number of full time equivalent TAs increased by 40% from 754 in 2005 to 1058 in 2008
- The number all other school full time equivalent staff also increased by 8% from 6507 in 2005 and 7063 in 2008
- The ratio of TAs to teachers increased substantially over the period from one TA shared between 7.4 teachers in 2005 to one TA for every 5.6 teachers in 2008
- the absolute number of TAs in a school is associated with higher attainment;
- the number of TAs in 2008 is more strongly related to increasing attainment than in 2005.

The closer relationship between number TAs and attainment in 2008 compared to 2005 may relate to higher numbers of TAs in 2008 in schools, but may also be explained by improvements in TAs effectiveness from better training or deployment in schools since 2005.

Overall the analysis shows that increasing the number of TAs is **strongly associated** with improved student attainment. It shows that schools that have fewer TAs do less well than schools that have a high density of TAs. In short, the larger the number of TAs in a school the more possibility there is of improved student attainment.

Higher Level Teaching Assistants (HLTAs)

An important factor in the effectiveness of teacher assistants is the level of skill and experience they can offer pupils and teachers. In an attempt to provide more skilled and experienced associate staff Higher Level Teaching Assistants been introduced. To assess the impact of Higher Level Teaching Assistants on attainment the numbers of registered HLTAs and the numbers achieving HLTA status between 2005 and 2008 in each school was compared to the amount attainment rose over this period.

The analysis showed that there was no significant relationship between the number of registered HLTAs in a school and rises in attainment over three years when taking into account increases in the total number of all types of TAs in the schools $R = .475$ $Rsq = .225$ *Change in Number of Normal TAs* $p = .032$ *Number of Registered HLTAs* $p = .21$. The analysis showed that increasing the number of **all** types of TAs accounted for the changes in attainment more consistently than increasing the number of HLTAs. Taking into account only HLTAs as opposed to the total number of all types of TAs in the school, there is no significant relationship between the number of HLTAs and increases in attainment $R = .235$ $Rsq = .055$ $p = .101$. There is also no significant effect on subsequent rises in attainment for TAs becoming HLTAs. The critical factor, it would seem is the density of TAs in the school and the nature of their deployment.

Further analysis could investigate the association between additional expenditure and numbers of TAs and contextual value added data. However analysis of the relationship between expenditure and CVA was not carried out owing to resource and time constraints.

Discussion

This study has found a significant relationship between increases in the number of TAs and improved attainment over a three year period in 83 schools. The largest effects on student attainment were found in increasing numbers of TAs rather than in a relative increase in expenditure on all Associate Staff. This seems to indicate that the **density or absolute number** of teacher assistants in a school **is most strongly related to rising attainment**.

These results also suggest that it is not just the quantity of TAs that matter but the nature of their deployment. This finding is supported by supplementary case evidence that has been collected but will be reported separately. The increased attainment across the schools could be explained by the TAs allowing the teacher to focus, without distraction, on other students. Research confirms that increases in student attainment are highly correlated with 'time on task' and that effective teachers engage the whole class in purposeful learning for the duration of the lesson (Creemers, 1998). It is possible that TAs may have the largest effects on the attainment of the pupils **they do not directly support** by allowing the teacher to have more undisturbed interaction with the whole class

A stronger relationship was found between the number of TAs in a school and attainment in 2008 than in 2005. This stronger association may relate to the difference in number and proportion of TAs in schools and per teacher between the two periods. One explanation for this is that the density and proportion of support staff in schools is now greater, plus the nature of their deployment is now more effective i.e. schools are using the TA support more effectively to support teaching and learning. Also a higher proportion of associate staff in schools has the effect of freeing up teaching staff from more routine duties to focus more on improving the quality of teaching and learning. Improvements in training for support staff plus the improvement in their prestige and status could offer another explanation for the differences in attainment between 2005 and 2008.

Recently, a large scale DSCF research project examined the effect of TAs on individual pupil progress. The research found that individual children with more hours of TA support made *less progress* (Blatchford et al., 2008). In schools, many TAs are deployed to spend more time with children who are in need of greater support and who have acute behavioural, emotional or cognitive challenges that can impede their progress. It seems likely that therefore that the degree of the challenges facing young people might mean that progress with such pupils, even on a one to one basis, may be minimal. Conversely, it could be argued that TA support may actually have the greatest benefit for **other children in the class** because it allows them to concentrate their attention on learning without disruption or distraction.

In this research, the analysis showed that the absolute increase in expenditure on teachers was not necessarily associated with rises in attainment. Increased expenditure on teachers in the sample schools was £422,578 over three years, representing an increase of 11% in real terms. Whereas the average expenditure on Teacher Assistants in 2008 – 9 was £200,366 and the average increase in spending on them was £63,000 or 31% increase in real terms. The additional expenditure on TAs was approximately **three times** the expenditure (in real terms) on teachers, thus the number of TAs increased substantially over this period whereas teacher numbers did not increase commensurately.

It is likely that higher qualified, more experienced and higher paid TAs such as Higher Level Teacher Assistants (HTLAs) provide more skilled support than other TA's for individual learners, yielding better outcomes. However it is beyond the scope of this study to measure any such affects on individuals. This analysis cannot conclude that increases in teacher assistants **directly result** in increases in student attainment. However, it shows that the trend between greater numbers of TAs in schools and increases in student attainment is a positive and consistent one.

To conclude, this study shows that increasing the relative expenditure on teacher assistants and increasing the absolute number of teaching assistants in schools is **strongly associated** with improved student attainment.

Next Phase

In February 2010, case study data was been collected from a sub sample of 10 schools in the overall sample to identify the ways in which support staff are being deployed. This qualitative evidence will provide illustrations of the ways in which schools are using support staff to support teaching and learning. The sub-sample includes schools that are in more challenging circumstances and while it is not a representative sample, the schools are diverse and are located in very different socio-economic contexts.

Appendix A

Table 1. *Schools in the top twenty five most highly correlated relationship between increases in the numbers of Teaching Assistants and improving attainment*

School Name	Change in % A*- C GCSE including English and Maths 2005 to 2008	Change in Number Full Time Equivalent Teaching Assistants 2005 to 2008
Challney High School For Boys And Community College	25	9.1
Birchwood Community High School	23	4.0
Haslingden High School	22	1.0
Ryedale School	22	2.8
The Castle School ¹	19	6.4
Tudor Grange School	19	10.4
Little Heath School	18	11.8
Sir John Cass Foundation And Redcoat Church Of England Secondary School	18	9.0
Pleckgate High School Mathematics And Computing College	17	8.5
St Edmund Arrowsmith Catholic High School	17	3.0
Alder Grange Community And Technology School	15	3.2
Hornsea School And Language College	15	9.0
Small Heath School	15	1.0
Lampton School	14	3.0
The King Edward Vi School	14	5.3
Westfield Technology College	13	9.6
Crown Hills Community College	12	14.0
Huntington School	12	6.0
Park View Community School	12	0.0
The Radclyffe School	12	-1.6
Kirk Hallam Community Technology College	11	0.7
The Priory School	11	4.0
Langley Park School For Girls	10	1.0
The Hayfield School	10	0.0
St Paul'S Catholic College	9	2.0

References

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