

The impact of teaching assistants on improving pupils' academic achievement in mainstream schools: a review of the literature

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This paper discusses key findings from one aspect of a systematic review of the literature carried out by the Inclusion Review Group at Manchester University, on behalf of the Evidence for Policy and Practice Information (EPPI) Centre. The specific focus of this element of the review was on the impact of teaching assistants (TAs) (or their equivalent) on improving pupils' academic achievement that had been measured in some way before and after a period of intervention/support from a TA. The synthesis of findings from the review indicates that the academic achievements of primary aged pupils with identified difficulties in learning, typically in literacy, improve significantly following a period of targeted intervention from TAs. However findings from studies, where support is of a more general nature and not directed at pupils with identified difficulties, are more equivocal suggesting that the presence of TAs in mainstream classes may not have a positive impact on the achievements of all pupils. These findings have major implications for the ongoing training, management, support and deployment of TAs in mainstream schools.

Keywords: teaching assistants; academic achievement; mainstream schools

Introduction

In September 2009 a major research report was published on the deployment and impact of support staff in English schools (Blatchford et al. 2009). This research covered a broad range of areas including the characteristics of support staff, their conditions of employment, their training, deployment and impact. In relation to their impact, one of the report's key and disturbing findings concerned the negative relationship between the amount of support a pupil received and the progress they made in core national curriculum subjects. In essence "the more support pupils received, the less progress they made", Blatchford et al. (2009). Clearly this surprising finding raises a number of questions about the future employment and deployment of teaching assistants (TAs) in mainstream schools.

In order to inform the debate about how schools and policy-makers might respond to the outcomes of the Blatchford report, it is important to consider the findings of other research that has also studied the impact of support staff on pupils' academic achievement. In April 2009 we published the findings of a systematic review of the literature on the impact of support staff on pupils and mainstream schools (Alborz et al. 2009). This was carried out on behalf of the Evidence for Policy and Practice Information (EPPI) Centre, and was an update of a previous EPPI review (Howes

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et al. 2003). The 2009 review considered research literature on the impact of support staff on pupil academic achievement and social and emotional development, pupil participation in schools, teachers (role workload, job satisfaction, etc.) and school climate. In this paper we report on the findings of the review as they relate to studies on the impact of support staff on pupils' measured academic achievement in mainstream schools. Hence this aspect of the systematic review complements the findings from the entirely separate Blatchford study which was completed after we had published our report.

Background to the review

The rapid growth in the numbers of TAs working in mainstream schools in the UK has been well documented. The 1997 Green Paper, *Excellence for all children: meeting special educational needs* (DfES 1997), suggested that there were 24,000 full-time equivalent TAs working in mainstream schools and that this number was expected to grow. The subsequent Green Paper, *Teachers meeting the challenge of change* (DfES 1998), referred to the projected increase of 20,000 in the numbers of classroom assistants who would provide general support in mainstream schools, that is not restricted solely to pupils with special educational needs. In 2000, the Centre for Studies on Inclusive Education (CSIE 2000) estimated that there were as many as 80,000 TAs working in mainstream schools. This was followed by a Government consultation paper on the role of school support staff (DfES 2002) which indicated that this number now exceeded 100,000 – an increase of over 50% since 1997. The last six years has seen the continued expansion in the numbers of TAs with recent figures indicating that there are now 176,900 support staff in schools, the vast majority of whom are TAs according to (Blatchford et al. 2008).

For some years the Government has explicitly recognised the valuable and supportive role that TAs can play. At the turn of the century they published the *Good practice guide* (DfES 2000a); a consultation document (DfES 2002) and two sets of induction training materials for newly appointed TAs in primary and secondary schools (DfES 2000b, 2001). In addition, they supported the work of the Local Government National Training Organisation (LGNTO) which has devised a set of occupational standards for TAs (LGNTO 2001). Such documents recognised the increasingly valuable and supportive role that TAs can have in mainstream schools. Indeed, the Good Practice Guide referred to Her Majesty's Inspectorate (HMI) reports that have "confirmed the tremendous contribution that well trained and well managed teaching assistants (TAs) can make in driving standards up in schools". A further HMI report (Ofsted 2002) also suggested that the quality of teaching in lessons where TAs were present is better than in lessons without them. This evidence supports the view that TAs can help the government to achieve its objectives of raising standards for all pupils within an inclusive framework. The findings in these reports are supported by other publications (e.g. Lee 2002; Butt and Lance 2005) both of which express positive views about the impact of TAs on pupils' learning.

The assumption emanating from the literature referred to earlier is that the rapid rise in the numbers of TAs has contributed to raising academic standards in mainstream schools. However, some years ago Giangrecco et al. (2001) commented that there had been no systematic review of international literature which had focused on the key question of whether the presence of support staff in classrooms has an impact on raising standards. More recently Giangrecco and Doyle (2007) reiterate their

concerns about the failure of TA support to bring about improved learning and participation, reflecting the need for further systematic reviews of the literature in this area. Indeed in an earlier Department for Children, Schools and Families (DCSF) report Blatchford et al. (2008) comments that “the general view in schools was that support staff did have an impact on pupil attainment, behaviour and attitudes; the problem headteachers faced was proving it”. This reflects ongoing unease among teachers and researchers that, despite the rapid increase in the number of TAs now working in schools, which has broadly been welcomed, there remains continuing uncertainty about their impact in relation to raising academic standards.

Methodology

The methodology for the EPPI review (Alborz et al. 2009) followed the standard procedures adopted by the EPPI Centre. This involved the development of clear criteria for the inclusion and exclusion of potential studies that could be included in the review. The most important of these concerned the definition of support staff. Blatchford et al. (2008) suggest that there are seven groups of support worker. In this EPPI review we drew from this typology to define support in the following three ways:

- (1) TA equivalent (e.g. TA, learning support assistant [LSA], nursery nurse, para-professional, language assistant).
- (2) Pupil welfare (connexions personal advisor, education welfare officer, home-school liaison officer, learning mentor, nurse, welfare assistant and midday assistant/supervisor).
- (3) Technical and specialist staff (information and communication technology [ICT] network manager, ICT technician, librarian, science technician and technology technician).

However, the vast majority of studies that were included in the whole review, and all those that are discussed in this paper, commented on the work of TAs or their equivalent and hence the sole focus of this paper is on this group of professionals.

Other key elements of the inclusion criteria were that studies (articles, books, book chapters, research reports, dissertations) should be written in English, but could have been carried out in any country and at any time. We only included studies that provided empirical data that addressed the impact of adult support on pupil learning within mainstream schools between the ages of 3 and 16.

The initial phase of searching and screening involved evaluation of “raw” lists of papers generated through keyword searching on electronic databases, websites and other sources. Display lists were scanned to select only those which related directly, or could relate indirectly to support staff in schools. In this way, 2638 out of 3574 publications were excluded in the first phase because they were clearly irrelevant to the current review. Details of potentially relevant publications ($N = 519$) were stored in an Endnote database and then uploaded to the EPPI Reviewer database. This data set was combined with those that were obtained through a similar process carried out for the 2003 EPPI review (Howes et al. 2003) resulting in a total of 936 citations, all of which went through the second phase of screening which involved scanning the titles and abstracts. From this process 319 were considered to be relevant, or potentially relevant to the review. Where reviewers were unsure of the relevance of a study, the full text was sought to confirm its status. The earlier publications were combined

with 24 publications included in the 2003 review and three articles added through additional hand searching. Forty-eight duplicates were removed. The full text of the remaining 298 citations was sought. However, we were unable to obtain 66 of these in the timeframe available for the review. Full document screening proceeded, therefore, on 232 publications. A large number of these were not relevant to the review following inspection of the full text. The remaining 39 publications from five countries were included in the final systematic review and were reviewed in full in the final report (Alborz et al. 2009). Twenty-six of these studies were concerned with the impact of TAs on pupils' social and emotional development, their participation in schools, teachers (role workload, job satisfaction, etc.) and school climate. The remaining 13 focussed on the impact of TAs on pupils' academic attainments, the implications of which are discussed later.

Results and discussion

The 13 papers that focussed on the impact of TAs in remaining pupils' academic attainments have been classified into the following two groups:

- (1) Targeted intervention studies. In these studies TAs were selected to work with a small specified group of pupils with an identified problem in learning and the impact on their attainments was measured, usually through a test of some kind, before and after TA involvement.
- (2) Non-targeted intervention studies. In these studies the mere presence of a TA in the classroom has been linked to the measured academic achievements of all children in a class, school or group of schools.

Targeted intervention studies

Table 1 provides a summary of all nine targeted intervention studies which formed the basis of this part of the systematic review.¹ All of them are methodologically similar in the following ways:

- (1) The attainments of pupils (typically Years 1 and 2) were tested before and after the introduction of TA support using direct and well known measures of pupil attainment.
- (2) In all studies the pupils' progress in the intervention group was compared with pupils in a carefully selected comparison or control group, where there was no TA support, where TAs undertook other work and/or where teachers also carried out the intervention.
- (3) The support offered was targeted at pupils who had an identified problem in basic attainments, either early literacy skills (Grek, Mathes, and Torgesen 2003; Miller 2003; Savage, Carless, and Stuart 2003; Savage and Carless 2005, 2008; O'Shaughnessy and Swanson 2000; Wang and Algozzine 2008; Vadasy, Sanders, and Peyton 2006; Vadasy, Sanders, and Tudor 2007), literacy and numeracy (Welch et al. 1995), numeracy (Muijs and Reynolds 2003) or a more general language delay (Boyle et al. 2007).
- (4) The size of intervention and comparison/control groups varied from 15 (O'Shaughnessy and Swanson 2000) to approximately 180 (Muijs and Reynolds 2003) with the majority ranging from 17 to 33 in each group.

- (5) All TAs received training in how to deliver the intervention and they were supported throughout the process.
- (6) There were systematic fidelity checks to ensure that the TAs carried out the interventions in the correct way.
- (7) Only one of these studies (Savage et al. 2003; Savage and Carless 2005, 2008), included a longitudinal follow up of the students' progress after the intervention period had ceased.

Full details about each of the studies referred to in Table 1 are available in the full EPPI review (Alborz et al. 2009). The overwhelming conclusion from all but one of them (Muijs and Reynolds 2003) is that trained and supported TAs, either working on a one to one basis or in a small group, helped primary aged children with literacy and language problems to make statistically significant gains in learning when compared to similar children who did not receive TA support. This is reflected in the comments made by several of the authors. For example O'Shaughnessy and Swanson concluded that "with adequate training and ongoing supervision, this study showed that paraprofessionals could successfully implement research-based reading interventions" (2000, 274). Vadasy et al. also comment that "The present study extends our previous findings on the beneficial effects of supplemental instruction, as provided by para-educator tutors, for low-skilled second and third graders" (2007, 520). In the one series of studies where there was a longitudinal follow up (Savage and Carless 2008) these differential gains were sustained after a 16 month period. They conclude that "CA (TA) delivered reading interventions clearly can contribute to raising literacy standards and have long-term effects" (Savage and Carless 2008, 379).

Given the similarity in the methodologies used in these studies, one might have expected the same positive outcomes to have occurred in all of them. Why then did the study by Muijs and Reynolds (2003) yield a different finding indicating that the children in both intervention and control groups made the same amount of progress? There are a number of minor differences in the methodologies that might go some way to explain this unexpected finding. First there were differences in the length and intensity of the interventions. Although the intervention in the Muijs and Reynolds (2003) study lasted for a year, the average amount of TA support offered to the experimental group was less than an hour per week. This is less than the pupils in the other studies, where the mean was one and a half hours per week. Another possible explanation is that the TAs were recruited from within the school and were not, as in the majority of other studies, recruited from outside solely for the purpose of carrying out an intervention. However, the most likely explanation is that the pupils in the Muijs and Reynolds (2003) study were not withdrawn from class during the intervention sessions as they were in most of the other studies. Hence the pupils and TAs may not have viewed the intervention as being particularly "high stakes" or unusual and this might have inadvertently reduced their investment in its success. This issue may also have been a factor in explaining the mixed findings from the Welch et al. (1995) study where all the pupils were taught in their mainstream class. Although pupils from two year groups in this study made progress in maths and reading following the intervention, children in other year groups did not. Hence the introduction of TAs was not an unqualified success.

The major conclusion from the remaining studies is that TA intervention can help children experiencing difficulties in early literacy and language skills to make significantly more progress than similar pupils who did not receive TA support. This is an

Table 1. A summary of targeted intervention studies.

Study	Problem area	Age of children	Control/ comparison groups	Interval length	1:1 or group	Withdrawn from class	TAs' qualifications ^a	Training for TA	Fidelity checks	Outcome measures	Findings
Boyle et al. (2007) Randomised control trial of impact of speech and language therapy delivered by speech therapists and speech therapy assistants	Speech/ language	Year 1–6	Yes	30–40 minutes, three days per week, 15 weeks	Both	Yes	High	Yes	Yes	Standardised tests of receptive and expressive language	Positive
Grek, Mathes, and Torgesen (2003) A comparison of the impact of a reading intervention for “struggling readers” delivered by teachers and paraprofessionals	Literacy	Year 1/2	Yes	40 minutes per day, five days per week, 22 weeks	Group	Unclear	Medium	Yes	Yes	Standardised achievement test	Positive
Miller (2003) A comparison of the impact of a reading intervention for pupils with literacy difficulties given by teachers and classroom assistants	Literacy	Year 1	Yes	30–40 minutes, four days per week, for one year	1 to 1	Yes	Medium	Yes	Yes	Standardised literacy tests	Positive
Muijs and Reynolds (2003) Effectiveness of the use of LSAs in improving mathematics of low achieving pupils	Number	Year 1/2	Yes	37 hours over one year	Group	No	Unclear	Yes	Yes	Standardised test of numeracy	Neutral

(Continued.)

Table 1. (Continued.)

Study	Problem area	Age of children	Control/ comparison groups	Interval length	1:1 or group	Withdrawn from class	TAs' qualifications ^a	Training for TA	Fidelity checks	Outcome measures	Findings
O'Shaughnessy and Swanson (2000) A comparison of two reading intervention delivered by paraprofessionals for children with reading disabilities	Literacy	Year 2	Yes	30 minutes, five days per week, six weeks	Group	Yes	Low	Yes	Yes	Standardised achievement tests	Positive
Savage et al. (2003, 2005, 2008) The effects of rime and phoneme based teaching delivered by LSAs	Literacy	Year 2	Yes	20 minutes four days per week, nine weeks	Group	Yes	Unclear	Yes	Yes	Curriculum based literacy tests and SATs	Positive
Vadasy et al. (2006, 2007) Effectiveness of para-educator supplemented instruction for pupils with reading difficulties	Literacy	Year 2/3	Yes	30 minutes, four days per week, 20 weeks	1 to 1	Yes	Low	Yes	Yes	Standardised achievement tests	Positive
Wang and Algozzine (2008) Effects of TA delivered direct instruction on early literacy skills	Literacy	Year 1	Yes	110 lessons, 10/15 minutes each	Unsure	Yes	Unclear	Yes	Yes	Standardised literacy tests	Positive

(Continued.)

Table 1. (Continued.)

Study	Problem area	Age of children	Control/ comparison groups	Interval length	1:1 or group	Withdrawn from class	TAs' qualifications ^a	Training for TA	Fidelity checks	Outcome measures	Findings
Welch et al. (1995) The impact of a paraprofessional "pull-in" system for at risk children and those with mild academic disabilities in maths and literacy.	Literacy/ number	Year 1-5	Yes	"Every day" for a year	Group	No	Unclear	Yes	Yes	Standardised tests of maths and reading	Mixed

^aTA qualifications. In this column the rating of "High" is given when all the TAs in the sample had a university degree. A "medium" rating is given when the majority of the TAs had completed a college course of some kind. A "low" rating is given when the majority of TAs did not undertake further training having left school. The rating "unclear" is given when the authors did not provide information about the qualifications of the TAs.

encouraging finding and one which has major implications for the planning and delivery of services to children with learning difficulties in mainstream schools. On the basis of the findings from this review schools should be encouraged to employ TAs to work with small groups of children who are in need of extra support especially if they are provided with appropriate training and support.

This conclusion, that TAs are effective in improving the attainments of children with learning difficulties, does not, of course, tell us whether teachers would be even more effective. It could be argued that teachers' higher level of qualification would result in them being more successful than TAs in helping children who are experiencing problems.

The findings from three of these studies shed light on this issue as, in each of them, pupils' academic outcomes, when taught by a "qualified" group (teachers – Grek, Mathes, and Torgesen 2003; Miller 2003), or speech and language therapists (SLTs) (Boyle et al. 2007), were compared with pupils' academic outcomes when taught by a less qualified group [TAs or speech and language therapy assistants (SLTAs)]. In all three studies the pupils made significant progress but there were no differences in the progress made by pupils taught by the TAs or SLTAs when compared to those taught by their qualified colleagues. This suggests that trained and supported interventions from TAs (or SLTAs) for children with literacy or other difficulties can be just as effective as support provided by teachers. The implication from this finding is that TAs are just as capable as teachers in providing effective targeted support to pupils with learning difficulties.

However, before claiming that these three studies show that TAs can be as effective in delivering interventions as teachers, it is worth bearing in mind that TAs and SLTAs in the Boyle et al. (2007) and the Miller (2003) studies were more qualified and experienced than is often the case. For example, the majority of TAs in the UK do not have a university degree and many hold no qualifications above a grade C in GCSE (General Certificate of Secondary Education) (Blatchford et al. 2008). In the Boyle et al. (2007) study all the SLTAs had a psychology degree and experience of working with children. In the Miller (2003) study four of the seven TAs were certified teachers who were working as assistants. It is possible that the higher than usual level of qualification and experience of the TAs and SLTAs in these studies was the key factor in enabling them to be just as effective as teachers or SLTs in helping the children to make progress. However this conclusion is tempered by the outcomes of the Grek, Mathes, and Torgesen (2003) study where only one of the eight TAs had a degree and the profile of the remainder was similar to that found in the Blatchford et al. (2008) and similar studies.

An additional and intriguing aspect of the Grek, Mathes, and Torgesen (2003) study concerns the fidelity of the interventions. Although all three studies included robust checks to determine the quality of the interventions, in the Boyle et al. (2007) and Miller (2003) studies no concerns were raised about the ability of the TAs or SLTAs to deliver the interventions correctly. In the Grek, Mathes, and Torgesen (2003) study, however, although fidelity checks on the teachers and the TAs provided high scores (above 80%), the quality of the intervention delivered by the teachers was judged to be significantly better than that of the TAs on five of the eight quality indicators. Hence teachers were judged to be better than TAs in delivering the intervention. However, there were no differences in pupil outcomes between the two groups, indicating that TAs and teachers were equally as effective in raising the literacy levels of these students. The authors offer possible explanations for this finding, one of which is the suggestion that the high level of scores on fidelity checks for both TAs and

teachers (above 80%) might have been sufficient to ensure pupil progress and that scores above 80% might be more cosmetic in relation to delivering better outcomes for the children. Furthermore the difference in the quality of the interventions was mainly explained by the poor performance of only three of the eight TAs who only taught 16% (30) of the students. The quality of the interventions delivered by the remaining five TAs was similar to the teachers.

Despite some differences in the qualifications of the TAs and the fidelity of the interventions, the overall conclusion from the Grek, Mathes, and Torgesen (2003), Miller (2003) and Boyle et al. (2007) studies is that pupils with learning difficulties who are taught by TAs learn as effectively as similar groups taught by “qualified” staff, in this case SLTs. Hence schools and local authorities should have no concerns about appointing TAs, who are less expensive to employ and less well qualified than teachers, to support children who are experiencing problems.

Non-targeted intervention studies

There were four non-targeted intervention studies that were included in the EPPI review (Frelow, Charry, and Freilich 1974; Loos, Williams, and Bailey 1977; Blatchford et al. 2001; Gerber et al. 2001). In these studies academic achievements of all primary aged children in a class, school or group of schools were linked to the numbers of TAs who worked in these schools. The key question underpinning all the studies was whether the pupils’ attainments in classes, schools or local authorities containing large numbers of TAs, would be higher than they would be in similar settings with fewer or no TAs, and when other potential confounding variables have been taken into account. In this sense the aims of these studies are similar to those of the recent DCSF study (Blatchford et al. 2009).

Two of the studies were large scale (Blatchford et al. 2001; Gerber et al. 2001) and focused on the impact of TAs on the academic attainments of all children in a number of primary schools. The Frelow, Charry, and Freilich (1974) and the Loos, Williams, and Bailey (1977) studies, however, focused on the impact of TAs in one school.

Gerber et al. (2001) and Blatchford et al.’s (2001) studies were part of larger projects whose main aim was to investigate the relationship between class size and pupil attainment. A secondary finding from both studies was that the presence of TAs in a classroom had no clear and consistent effect on the pupils’ average attainments when other variables were taken into account. Any differences were judged to be idiosyncratic and possibly due to a chance combination of other factors.

There are several important caveats to the message that the presence of TAs can have little impact on pupil attainment. First, unlike the targeted intervention studies, neither of these studies attempted to look at the impact on particular individuals or small groups of children within a class, who may be the focus of the support given. Gerber et al. (2001), for example, suggested that TA support may be beneficial to specific students and affect individual but not class test scores, a finding that is supported in the discussion of the targeted intervention studies earlier.

Second, the precise nature of the TA support was not described in these studies, and hence they did not say much about the impact of TAs who undertook prescribed tasks. However, correlations of teacher duties with student achievement suggest that “greater contact between aides and students had an adverse effect on performance, while students benefited academically if aides performed more administrative tasks” (Gerber et al. 2001, 137).

Third, there is an issue of the difference between qualitative and quantitative findings in these studies. Qualitative data in the Blatchford et al. (2001) study, also reinforced in the recent DCSF study (Blatchford et al. 2009) indicated that teachers considered that the presence of TAs resulted in increased attention by pupils, more effective support for their learning, increased teacher effectiveness *and* improved learning outcomes. Hence there is a difference in the findings between the statistical data from end of year assessments, which is not encouraging, and the overall perception of TA effectiveness held by teachers, which is almost universally positive.

The findings discussed earlier, suggesting that TAs have no impact in non-targeted intervention studies, are contrasted by Frelow, Charry, and Freilich (1974) and Loos, Williams, and Bailey (1977), whose studies of the impact of TA support in two separate schools indicate that the presence of TAs had a positive outcome on academic learning. Although these studies were carried out over 30 years ago, their findings are still relevant to this review. The Loos, Williams, and Bailey (1977) study looked at the impact of TAs in two open plan classrooms containing four class bases. The findings indicate that the presence of a TA had a positive impact on academic learning, particularly when the TA was assigned a “helping”, rather than simply a “discipline” role. In this study, data was collected by trained non-participant observers who were present in the classes throughout and the authors do not acknowledge the possible confounding effect on the findings that might have resulted from their presence in the classrooms.

Although the Frelow, Charry, and Freilich (1974) study focussed on changes in academic learning over a one year period for children with difficulties in literacy (in the lowest quartile), it has been classed as a non-targeted intervention study as the TAs were not specifically directed to work with this group. They were unaware that the study was taking place and there was no control group. (Pupils’ progress was compared with figures for similar groups in previous years.) As in the Loos, Williams, and Bailey (1977) study, the findings indicated that the presence of the TA resulted in the pupils making more progress in literacy and numeracy than they had done in previous years when TAs were not present. Despite some methodological weaknesses in both studies (unacknowledged observer effects and the lack of a control group), the overall findings suggest that locally based non-targeted intervention studies might yield more positive findings in relation to the impact of TAs than do larger studies of the type reported by Gerber et al. (2001) and Blatchford et al. (2001).

Summary and conclusions

The findings from this review suggest that, where properly trained and supported, TAs can have a positive impact on primary aged pupils’ academic progress, particularly for pupils with literacy and language difficulties although the findings were less positive for pupils with numeracy difficulties. However findings from large-scale studies linking the presence of TAs in primary schools with pupils’ academic progress suggested that TAs had no impact. This latter finding mirrors one of the key outcomes from the Blatchford et al. (2009) study.

There are a number of implications for policy, practice and research from these mixed set of findings.

- (1) The fact that trained and supported TAs can help children with learning difficulties to make significant progress in their attainments is, perhaps, not all that

surprising. After all in these studies they provided direct help to children on a one to one or small group basis, using an approach with which they were familiar and they were monitored throughout the intervention period. But even though this may not be a surprising finding, it is none the less important. Parents of children with learning difficulties, for example, should have no cause for alarm when being informed that the specialized help is being provided by a trained and supported TA and not by a teacher.

- (2) Despite the fact that we only found three studies which directly compared the performance of TAs (or SLTAs) with that of teachers (or SLTs), the clear message from these studies is that TAs are just as successful in raising the attainments of pupils with learning difficulties as are their better qualified colleagues. Hence schools and local authorities should have no qualms about employing non-teachers to do this work provided they are trained and supported in how to use the techniques needed to help the children for whom they are responsible.
- (3) The neutral (or sometimes) negative outcomes reported in the non-targeted intervention studies in relation to making a differential and positive impact on raising pupils' attainment, suggest that, by simply increasing the numbers of TAs in a school, the attainments of all pupils will not necessarily improve.
- (4) We would suggest that schools and local authorities need to have clear objectives in mind when appointing TAs. There is abundant evidence in other studies, most notably in the recent DSCF funded study (Blatchford et al. 2009) but also from other studies that we reviewed in the recent EPPI review (Alborz et al. 2009), that TAs are welcomed in schools, that teachers value their support in a whole range of ways and that they feel their job has been made easier with the rapid increase in the employment of TAs. If the aim of having TAs in a school is to increase teachers' levels of job satisfaction and to provide more general support to the teacher, then TAs appear to be doing an effective job.
- (5) However, when comparing the findings for the targeted and non-targeted intervention studies, we would suggest that, if the aim of appointing TAs is to raise the academic attainment of pupils, TAs should only be appointed if they have a specific set of tasks to perform with an identified child or small group of children and they are provided with sufficient training, support and monitoring at all times.
- (6) There are implications from this review for improving the pre- and in-service training for teachers and TAs. Gone are the days when the teacher was the only adult in the classroom. Trainee teachers need to be trained in how to work and collaborate with TAs so that they can be fully prepared when they begin work. Staff in schools need training on how to develop effective teams of TAs and teachers, and teachers need to be skilled in offering support and mentoring to their TAs, as well as their pupils.
- (7) There are a number of areas where further research is needed. This includes the evaluation of targeted interventions for pupils with learning difficulties in secondary schools. All the studies we reviewed were with primary aged pupils, the majority of whom had literacy initiatives. There is a clear lack of evidence on the impact of TAs on the wider curriculum in both primary and secondary schools. In addition further work is needed on the impact of TAs in supporting pupils with behaviour problems. The few controlled studies that have addressed this area tend to report mixed findings (Alborz et al. 2009). Finally,

few high quality studies have addressed the impact of TAs in raising the academic attainments of pupils with identified special educational needs, for example autism, Down's syndrome, specific learning difficulties. In the recent DCSF study (Blatchford et al. 2009) there were insufficient pupils falling into these and other categories to make it possible to undertake a meaningful statistical analysis of the impact of TAs in raising the attainments of these pupils.

In conclusion the findings from this review suggest that TAs can have an impact in raising the academic achievement of specific groups of pupils with learning difficulties provided they are trained and supported in this process. This finding is particularly welcome in view of the less encouraging outcomes from more general non-targeted intervention studies. As the number of TAs working in mainstream schools continues to grow, it is important for senior staff in schools, local authority officers and academic researchers to draw from these and other research studies so as to find further ways of improving the quality of support offered to all children in schools and ensure that this brings the maximum possible benefits.

Notes

1. The studies by Savage and colleagues (Savage, Carless, and Stuart 2003; Savage and Carless 2005, 2008) and Vadasy and colleagues (Vadasy, Sanders, and Peyton 2006; Vadasy, Sanders, and Tudor 2007) have each been grouped together as one study since they refer to the same data set but report on slightly different aspects in each paper.

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