NERF Bulletin
Evidence for Teaching and Learning

Issue 6 - Summer 2006

In this issue:

Plus

NERF
National Educational Research Forum

Comment

Welcome to the Summer 2006 *Bulletin* – the sixth issue in the series. We have followed our usual practice of looking for evidence about issues close to your concerns and interests so we hope you enjoy what we have featured and find it useful. There's something for everyone – from early years to adult education and topics range from basic skills to diagnosing students' preconceptions in science.

NERF came to an end in March 2006, so this is the last *Bulletin* to be funded by NERF. Further issues will be dependent on finding alternative funding sources or on a subscription service. If you have any ideas pleasecontact ***Deborah.WILSON@dfes.gsi.gov.uk***

Teachers engaging in and with research

As we started putting this issue together, hundreds of teachers were converging on Birmingham for the third National Teacher Research Conference. You will find summaries of their work on the web (see page 15 for the links). The Learning Skills Research Network will also be holding practitioner research conferences throughout 2006. At the same time, large numbers of teachers are coming together to encourage and support enquiry based professional learning, and recognition for it, in their new role as leaders of the GTC Teacher Learning Academy (TLA). We hope that you will find something in this *Bulletin* to inspire you to undertake your own enquiries into how evidence from large-scale research can be used to enhance day-to-day practice.

Teacher research ranges widely from creative learning to literacy, raising boys' attainment, projects to promote inclusion, maths, science and technology and collective worship. It seems that when we encounter practical classroom challenges in supporting learning some teachers will want to know what the larger scale evidence is and want to test it out in their own context. Teachers are also particularly interested in other teachers' research. That means that initiatives like the conference and TLA can and do encourage increasing numbers of practitioners to engage with research and evidence in their approach to teaching and learning.

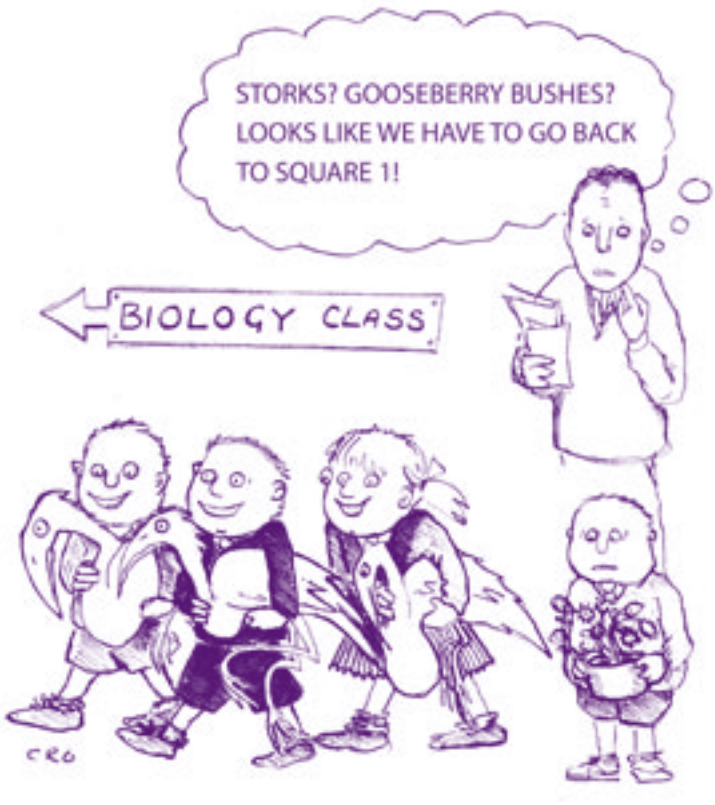
Teachers get involved in research in a variety of ways. Look at the article on page 7 for example. What makes this research special is the way in which university researchers and teachers worked *together* to improve students' learning in science. This project is only one of many in the massive Teaching Learning and Research programme (TLRP). The programme aims to support and develop research that leads to improvements in outcomes for learners of all ages and in all sectors of education, training and lifelong learning in the UK. Findings from these projects are starting to make their way into the public domain and we intend to keep you posted on their progress.

Also, in response to the groundswell of interest in teacher research and because we have lots of inquiries about how teachers can get involved, we've made teacher research the theme of our hot websites page this time. We're sure you'll find the sites we've put together on page 15 useful.

How can you use some of the evidence in this issue?

We think you'll find plenty of ideas inside this issue. Here are a few to start you off:

- the science project we report on page 7 highlights the importance of identifying students' misconceptions as a starting point for supporting learning. You might like to consider how the methods used by the science teachers could be adapted for use in other subjects?
- on page 13 we report evidence of how learning to play a musical instrument can enhance pupils' attainment in other areas, such as literacy and numeracy. Is your school one of the 80% or so that offer specialist instrument tuition to pupils? And could you do more to encourage more pupils to learn to play them?
- it's good to talk! Once again we've found a great deal of evidence about the power of conversation about and within learning – between parents and their pre-school children at home, and in structured groups with and without teachers at school. But how can we foster and structure high quality talking? Try looking at pages 8-9 for good examples of ways of scaffolding dialogue.
- it's very clear that there are some problems, such as managing anti-social behaviour (see page 14), we can't tackle alone. But the doors are opening wide now that the Every Child Matters agenda is rolling out across the country. Is your school investigating ways of working in partnership with other agencies? Want help in getting started? Why not check out the resources we suggest on the back page?



"...the importance of identifying students' misconceptions as a starting point for supporting learning..."

Cognitive Acceleration

What difference does it make to children's learning?

Children's learning has always fascinated educationalists. Recently, news in the press of Michael Shayer's startling research finding that children are apparently less able than they used to be, has fuelled interest in learning behaviours and the teaching strategies that promote learning. Michael, along with his colleague Philip Adey, developed an approach to teaching and learning based on 'cognitive acceleration', which has been influential in a number of subject areas including science and mathematics. Approaches to learning which involve cognitive acceleration or accelerated learning are often referred to as 'thinking skills'.

In previous *Bulletins*, we've featured evidence about the effectiveness of thinking skills approaches in improving reasoning and problem-solving skills for learners of all ages. There was also evidence to suggest that teaching thinking skills had an immediate, positive impact on students' attainment. Now, another systematic review (the second in the series) has quantified the impact of thinking skills interventions on students' attainment and attitudes.

What were the benefits to students?

The review found that the mean effect size of the programmes was 0.62 – an effect that would mean that a class ranked at 50th place in a table of 100 similar classes would improve its position to 26th place. Perhaps inevitably, the reviewers reported a large variation in the impact of thinking skills interventions; the effect size was relatively greater on tests of mathematics (0.89) and science (0.78) than reading (0.4).

The review also reported on the specific benefits of many different approaches. The Cognitive Acceleration through Science Education (CASE) programme, one of the best known examples of a thinking skills intervention, not only had an accelerating effect on children's learning; there was evidence that this increased with time. There was also evidence that students' attainment improved not only in science, but in English and mathematics too.

Other studies in the review found, for example:

- improvements in problem-solving such as more effectively identifying the appropriate schema (thinking patterns) for organising information, recognising that there may be more than one way to solve a problem and verifying solutions;
- that an 'across the curriculum' approach to teaching reasoning skills was effective when linked to reading comprehension; and
- slower learning children benefited more from training in thinking skills than other children in their class did.

There was some evidence that there was a 'ceiling effect' when it came to the number of thinking skills lessons teachers used. One study suggested a maximum of thirty in the school year. The findings led the reviewers to caution that the use of thinking skills approaches needs to be matched to the particular teaching and learning context and monitored to ensure their potential benefits are realised.

What do thinking skills approaches involve?

Most thinking skills approaches share the same general characteristics, including:

- making thinking skills explicit by providing explanations of the reasoning strategies in the tasks and by asking students to do this too;
- teacher intervention to create cognitive challenge or introduce ideas that are in tension with each other to deepen thinking (cognitive conflict); and
- pupils working on solving problems collaboratively, in ways designed to help them to make their thinking explicit and help them to learn from and how to work with others.

Jargon Buster

Effect size *– statistics used to measure the change in performance of one group over and above that of another group, taking into account differences within the groups. Effect sizes are used to measure the impact of an intervention. Generally, 0.3 is regarded as small, and 0.6 and above is large. Effect size quantifies the size of the difference between two groups, and may therefore be said to be a true measure of the significance of the difference.*

Cognitive challenge or conflict *– an experience or observation which students find puzzling and discordant with their previous understanding, i.e. it challenges students' current level of thinking. An example might be to give students examples of small heavy objects that sink (confirms students' idea that heaviness = sinking). When the teacher introduces a heavy object that has a much larger volume, it floats. (The students' current ideas are now challenged because the heavy object has not sunk).*

How do we know this?

A systematic review of the impact of thinking skills programmes on children's learning in primary and secondary schools. This review was conducted in accordance with the procedures established by the EPPI centre in which studies are assessed for relevance and robustness against explicit criteria. In this review the meta-synthesis was carried out on 29 empirical studies with quantitative evidence:

Higgins, S., Hall, E., Baumfield, V. and Moseley, D. (2005) ***A meta-analysis of the impact of the implementation of thinking skills approaches on pupils*** in Research Evidence in Education Library. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London. [Online] Available at: ***http://eppi.ioe.ac.uk/EPPIWebContent/reel/review_groups/thinking_skills/t_s_rv2/t_s_rv2.pdf***

Details of CASE methods and how they have been extended to other subjects and younger children can be found at: ***http://www.kcl.ac.uk/education/case.html***

Michael Shayer's latest research, which assessed 10,000 Year 7 children's performance on maths and science reasoning tasks involving volume and heaviness, is due to be published in the British Journal of Educational Psychology.

Research Round-up

Dyslexia and dyscalculia

Many readers have asked us about dyslexia and dyscalculia. In the absence of conclusive empirical research we have used a project that combined think pieces and empirical evidence with case studies of approaches to teaching and learning with dyslexic learners in adult literacy and numeracy provision to give you a current snapshot.

Dyslexia – a learning difficulty or a different way of learning?

About 4% of the population are believed to be affected to a significant extent by dyslexia and as many as a further 6% of the population may be affected to a lesser extent. Most teachers will have some dyslexic learners in their classes and, of course, the Disability Discrimination Act requires all teachers to adjust to their needs. But what help should non-specialist teachers give dyslexic students? The Learning and Skills Development Agency set out to find out. The outcome of the project was a framework for understanding dyslexia, which is based on a wide-ranging review of the literature about dyslexia, action research case studies and an examination of the approaches used by specialists to support dyslexic students.

As might be expected, a great deal of the research literature about dyslexia tends to dwell on the difficulties – how dyslexia affects information processing (receiving, holding, retrieving and structuring information) leading dyslexics to have difficulties:

- in organising work and carrying out instructions;
- in sequencing numbers, letters and mathematical procedures etc.;
- in reading text, caused by blurring or moving letters;
- with maps or finding the way to a new place;
- with remembering information, such as messages and phone numbers; and
- with controlling a pen – leading to untidy handwriting, that makes it difficult to get ideas down on paper.

But the traditional view of seeing dyslexia as a 'problem' is currently being challenged. There are now some who have suggested that the neurological differences found in people with dyslexia gives them advantages. This could explain the paradox that students who experience problems with reading and writing, can be highly gifted in other areas. The positive talents dyslexic learners have can include:

- being creative;
- being good at lateral thinking and making unexpected connections;
- an ability to see the 'big picture';
- an ability to think easily in 3D; and
- having good problem-solving, verbal and social skills.

Consequently, dyslexic students may be more likely to learn well when they:

- make personal, meaningful connections to secure things in their long term memory;
- remember patterns rather than sequences, and landmarks rather than directions;
- think holistically 'all at once' rather than step-by-step;
- learn to read and write by being interested in the subject; and
- learn from practical experience, rather than being told.

The research suggests that it is important to build on strength and successful learning experiences of students with dyslexia rather than focus exclusively on their difficulties. Teaching approaches that appear to be effective include using a range of tactile and multisensory methods, presenting information in different ways and giving opportunities for practice and revision in meaningful contexts. Asking students with dyslexia to talk about what helps them to learn, and creating an environment where making mistakes is seen as part of the learning process are important too.

What works for students with dyscalculia?

Present understanding of dyscalculia – a condition that affects the ability to acquire arithmetical skills – is much more limited than current knowledge of dyslexia. There is no means of even knowing how many learners may have dyscalculia, as there is currently no assessment tool available for identifying the condition, although one study of 9-10 year olds found that 1.3% of children with normal ability, and normal reading ability, had specific arithmetical difficulties.

There is also at present no research on the way that dyscalculic learners are taught and supported most effectively. The best that's on offer is evidence of what helps dyslexic learners – that is, structured, cumulative and multisensory teaching. What is known however, is that a strong predictor of an individual's performance in mathematics is the learner's self-confidence and self-esteem. A confident learner will be willing to take risks to solve a new problem. Learners with low self-esteem will only tackle problems they feel likely to be successful at, which means they may make little progress in learning. Therefore, for teaching to be successful, it needs to begin at the level at which learners feel they can succeed and move carefully into new or previously unsuccessful areas.

How do we know this?

The Learning and Skills Development Agency and NIACE on behalf of the Government's Skills for Life strategy (2004) ***A framework for understanding dyslexia*** London: DfES. Further details of the framework are available at: ***www.dfes.gov.uk/readwriteplus/understandingdyslexia***

This Framework was produced as part of a project to research approaches to teaching and learning with dyslexic and dyscalculic learners in adult literacy, numeracy and ESOL provision undertaken in 2003–04. Part of that project involved action research with organisations where approaches covered in the Framework are in use. The researchers warn that it is important to remember that research is ongoing and that our knowledge is still partial.

Confidence and self-esteem are important elements in adult learning

In recent years the provision of the national core curriculum, along with associated resources and guidance on teaching strategies, has ensured a national system of support for teachers of adult literacy and numeracy. Central to the 'Skills for Life' national strategy is the planning of programmes so that they are tailored to the individual circumstances and needs of the student. As a result, the individual learning plan (ILP) has become the focal document to guide teachers and students on how a programme is designed. But how far can and should teachers go in responding to adult students' personal concerns? How do they balance this with offering a whole group programme? The evidence suggests that it is not only 'functional life skills' that adults are acquiring from their basic skills classes. They are looking for and gaining something more from these courses.

One study, which investigated in depth what makes maths learning meaningful to adults, looked at their motivation for learning maths, and how useful they found their course on a day-to-day basis. Interestingly, their reasons for attending basic maths courses were not for the specific purpose of enabling them to function better in the home or at work, but for what can be regarded as broader objectives. The main motivations learners expressed for attending maths classes were:

- to prove that they had the ability to succeed in a subject which they saw as demonstrating a certain level of intelligence;
- to help their children; and
- for understanding, engagement and enjoyment.

The researchers found that almost without exception the students they interviewed said they wanted to know more about the subject itself – to understand the mathematical system, its principles and underlying relationships. One student expressed her sense of achievement at finally being able to understand algebra:

> *'When I got to be able to do algebra, it was such a sense of achievement. Because I can do it! And it brought back memories of school when we were doing algebra and I didn't understand what the hell they were on about.'*

The study revealed that whereas such students wanted to engage in mathematics learning for deeper insight, teachers were not necessarily aware of this motivation. In some cases they seemed to be trying too hard to tailor learning to individual circumstances. One entry-level student told his teacher during their termly review that he wanted to improve his ability to calculate his scores in darts. The teacher went on to develop worksheets around this topic for several weeks, only to be told later by the student that he had given up darts!

However, the authors warned against throwing the baby out with the bathwater: teachers' awareness of students' backgrounds and interests enabled teachers to understand students' starting points, and gave them insights into self-developed strategies and the way the individual students they encounter learn.

A more comprehensive survey of the impact of Skills for Life programmes underscores the message that the initiative is encouraging people to develop more than just functional skills. As well as improving literacy and numeracy skills (53% of learners had gained a qualification in their main course), 69% of the nearly 4,000 adult learners taking part in the survey identified increased confidence as a major benefit of attending Skills for Life programmes.

Importantly, the students also perceived that they were acquiring new skills, even in cases where their own perceptions about their level of progress was not reflected in test scores. Seventy-eight per cent of learners thought their literacy or numeracy had improved, and attributed this largely (or solely) to their Skills for Life course. According to the authors, this belief in itself, along with an identified greater commitment to education and training, would benefit learners' chances of employment in the long run. In effect, as well as delivering skills, the courses had the additional benefit of improving learner attitudes to education and work.

Both studies highlighted the desire among students to learn literacy and numeracy skills so that they would be in a better position to help their children. One mother was concerned that she would feel inadequate once her daughter was learning maths at secondary school, and described this as the spur for improving her numeracy skills. The Skills for Life survey found that 40% of learners with children felt that the course had helped them to help their children.

How do we know this?

This article draws on two sources of evidence.

Swain, J., Baker, E., Holder, D., Newmarch, B. & Coben, D. (2005) ***'Beyond the daily application': Making numeracy teaching meaningful to adult learners*** London: National Research and Development Centre for Adult Literacy and Numeracy.

In this interpretative and small-scale project, the researchers observed and interviewed a cohort of 80 adult students across three FE colleges.

Meadows, P. & Metcalf, H. (2005) ***Evaluation of the impact of Skills for Life learning: Report on sweep 2*** London: DfES RR701. [Online] Available at: ***http://www.dfes.gov.uk/rsgateway/DB/RRP/u014692/index.shtml***

This second survey forms part of a three year study, which used tests, interviews and questionnaires to establish the impact Skills for Life literacy and numeracy programmes had on 2,000 learners.

Pupil grouping

Does grouping by ability work?

Setting, streaming, tracking – whatever you call it, ability grouping is a common practice in many secondary schools and also in some primary schools, particularly in mathematics and science. It is popular with parents and generally viewed as a means of raising standards. But what impact does ability grouping actually have on pupils?

The effects of pupil grouping practices were explored by a recent comprehensive review of current research, which analysed and synthesised the evidence concerning the impact of a range of pupil grouping practices. At the extremes of attainment, low achieving pupils show more progress in mixed ability classes and high achieving pupils show more progress in set classes. However, the review found little evidence that ability grouping contributes to raising standards for all pupils.

The review also found evidence of inequities in setting. For example, lower sets contained a disproportionate number of boys, pupils from specific ethnic groups, pupils from lower social economic groups and pupils identified as having special educational needs. There was evidence that pupils in lower groups experienced poorer quality teaching, more changes of teacher and teachers who were not subject specialists – practices making students in these groups vulnerable to making less progress, to becoming de-motivated and to developing anti-school attitudes. By contrast, pupils in higher sets were more likely to have experienced and highly qualified teachers. The evidence also suggested that without careful planning, teacher's practices could favour higher attaining pupils in mixed ability groups too.

How do students view being set by ability?

Some studies have explored the practice of ability grouping from the pupils' perspective. One found that ability grouping affected primary pupils' awareness of their place in the 'pecking order'. They were very aware of the differences in work that were being undertaken by different sets:

> *'At lunch times sometimes they're talking about what they do and the rest of us are sitting there and we haven't even heard of the sums'.*

Ability grouping also affected the nature of teasing in school. Children of lower ability were at greater risk of stigmatisation, but higher ability pupils reported being teased too:

> *'There's this boy in our class and he says 'You're thick', and 'Why, you're in a lower group'.*

> *'I get teased and called the professor because I'm one of the cleverer ones'.*

A study investigating secondary school students' views reported how setting can have a negative effect on student attitudes and motivation at both lower and upper levels. Students in lower ability groups felt disaffected by low expectations and limited opportunity for attainment:

> *'He just writes down the answers for us on the board, and... we say we can do it, but he just writes them down anyway... [and we] just copy them down'.*

Whilst students placed in higher sets felt disadvantaged because of too high expectations, overly fast-paced lessons and pressure to succeed:

> *'I want to go down because they can do the same work but just at a slower pace, so they understand it better, but we just have to get it into our head the first time and that's it'.*

Which way forward?

So, if there is little advantage to setting pupils by ability or teaching them in mixed ability groups what kind of grouping practices do help? The review suggested that within-class grouping has the greatest potential to raise standards through personalising students' learning experience. Studies of primary schools have found that pupils' learning improved when they worked in pairs. The review gave examples of pairs being used in two types of learning: an expert/novice approach and a coming together of equals. Studies of secondary schools consistently showed that students' pro-school attitudes improved significantly in classrooms that fostered co-operative and collaborative group working. Co-operative and collaborative tasks were found to work best when undertaken in small groups (around four to six students). The tasks also needed to be specifically designed to encourage group working and social interaction. This involved breaking the tasks down into small components, such as planning and reaching a consensus, otherwise pupils could lose interest and direction.

For more detailed evidence about effective co-operative group work practices check out the article on page 8.

How do we know this?

A literature review of classroom based research on the effects of pupil grouping in both primary and secondary schools. The reviewers used some systematic methods including electronic searching and quality-assuring the studies. Kutnick, P., Sebba, J., Blatchford, P., Galton, M. et al. (2005) ***The effects of pupil grouping literature review*** London: DfES RR688. [Online] Available at: ***http://www.dfes.gov.uk/research/data/uploadfiles/RR688.pdf***

A study reporting on the attitudes towards ability grouping of 943 students in years 8 and 9 from six secondary schools, drawing on data collected through questionnaires, interviews and observations: Boaler, J., William, D. & Brown, M. (2000) ***Students' experiences of ability grouping – disaffection, polarisation and the construction of failure*** British Educational Research Journal 26(5) pp.631-648

Interviews with 134 KS2 pupils from six primary schools to find out their views of different forms of grouping:

Hallam, S., Ireson, J. & Davies, J. (2004) ***Primary pupils' experiences of different types of grouping in school*** British Educational Research Journal 30(4) pp.516-533

Diagnosing students' misconceptions

How have teachers used research evidence to develop children's ideas about science?

If we don't find out what our students think and believe before we start teaching them they will have more difficulty learning. That much we know from research in many disciplines. But how do we go about this? Recent research, which was part of a large-scale network of projects exploring how science education research informed teachers' practice, tackled just this issue. The starting point of the research was the suggestion, shared by educators in other subjects, including mathematics, that students draw on their existing concepts to explain simple scientific processes. Their ideas, from everyday life, are often very different from accepted scientific knowledge, and can be remarkably resistant to change. A key aspect of the projects was that teachers and researchers worked together to create tools and strategies for eliciting students' ideas and responding appropriately to them.

Why do students have difficulties with learning science?

The researchers started with the premise that research about students' talk about science indicated the following types of problems:

- using everyday ideas and processes to explain science – for example, regarding photosynthesis as plants 'feeding' rather than building their own food;
- lack of consistency in using models and applying scientific ideas; and
- having gaps in knowledge – such as not regarding air as a real substance with a mass.

How did the teachers identify their students' difficulties?

In project one, teachers and researchers worked together to create different kinds of diagnostic probes to help find out students' starting points. One type of probe was made up of questions, each of which had two parts. The first part asked students to say what they thought would happen in a given situation; the second part asked them to select the best explanation. Teachers then looked for patterns of understanding in the answers. They found significant gaps in understanding; for example, fewer than 50% of students at age fourteen appreciated that electric current is the same at all points of a series circuit. Variations in the students' responses to related questions in different contexts provided insights into how students were thinking and what was causing them problems. The probes helped teachers develop new approaches to their teaching:

> *'[using diagnostic probes has given me] a much more interactive, discursive approach...a style of teaching I prefer...perhaps I haven't been confident in physics before to risk it. This has given me an impetus.'*

And how did they help students to overcome their difficulties?

In the second project, teachers planned lessons which started with students' everyday understandings of science and then worked towards more scientifically accurate concepts, using an appropriate blend of activities for learning. In work on photosynthesis students were first given an opportunity to talk about it on the basis of their existing knowledge. In the second lesson, the teacher introduced scientific ideas about photosynthesis which students explored in groups. Aspects they found difficult, such as, how a gas and a liquid can combine to form a gas, were then fed back to a whole class discussion. The teacher tackled these problems in later lessons. The evidence suggested students' learning was enhanced by this approach. In fifteen of the seventeen intervention classes, up to 74% more students offered explanations more consistent with science principles than students in control classes.

Talking helped

The researchers analysed the interactions between teachers and their students during lessons. They found dialogue helped, specifically where teachers asked questions and gave responses directed at helping students develop and fine-tune their ideas. In the third project, students in one school carried out experimental work in which they measured the current in different parts of a series circuit. Afterwards the teacher approached a group and asked questions about electric currents which prompted the students to think about what was happening in the experiment:

Teacher:	*Can you explain what current is?*
Student:	*Electrons*
Teacher:	*And what happens to them when they get to the bulb?*
Student:	*They light up the bulb but they still carry on...*
Other students come in:	*...but they spend their energy in the bulb*
Student:	*Maybe it's like a flow of electrons – there's not less electrons but they've got less energy.*

How else have teachers used diagnostic probes?

One teacher analysed KS2 children's drawings, lines, arrows and annotations to find their ideas about the senses of sight, hearing and smell. The teacher concluded that the students' formal learning about the senses was significantly influenced by their existing alternative conceptions. He suggested that teachers should present children with evidence that challenges their conceptions and so provide an opportunity for creating more accurate understandings.

How do we know this?

Projects involving around ninety teachers and their classes in twenty schools from ***The Evidence-based Practice in Science Education (EPSE) Research Network*** [Online] Available at: ***http://www.tlrp.org/proj/phase1/phase1bsept.html.***

- Using diagnostic assessment to enhance learning (led by Robin Millar, University of York)
- Developing and evaluating evidence-informed teaching sequences (led by John Leach, University of Leeds)
- Teaching pupils 'ideas-about-science' (led by Jonathan Osborne, King's College, London)

Data were collected from student tests, classroom observation, interviews with teachers, questionnaires and focus groups.

Cuthbert, A. (forthcoming) ***Do children have similar models of understanding for seeing, hearing and smelling?*** [Online] Available soon at: ***http://www.standards.dfes.gov.uk/ntrp/***

Co-operative group learning

Supporting students to promote effective learning behaviour

We have featured the positive effects of co-operative learning and structured small group discussion as a means of promoting learning in several previous issues of the NERF *Bulletin*. The evidence in this field is already strong and it is growing fast so we'll continue to keep you up to date. In this issue, we focus on how teachers can support pupils to get the most out of small group discussions.

How does co-operative group work differ from small group work?

In co-operative groups the need to co-operate has been built into the requirements of a structured group task. By contrast, in small group work, there may be no specific requirement that students work together and, in fact, they may work individually on tasks for their own ends.

What does effective co-operative group work require from teachers and students?

In co-operative learning, students are expected to:

- work together as a group;
- exchange ideas and resources;
- contribute to group discussions;
- challenge others' reasons and understandings;
- discuss alternatives; and
- accept responsibility for the group's decisions.

Students need support to develop the types of conversations that are useful in collaborative learning. As well as setting tasks in which interaction is necessary in order to solve a problem, teachers need explicitly to teach interpersonal and small group skills to help group members interact well.

One study found that, when children were used to working co-operatively with one another and did so regularly, they 'tuned in' to one another and provided information when it was needed. Children trained to work in co-operative groups were good at giving explanations that their peers understood. They expressed themselves more frequently and used more words in each turn of speech than students simply working in groups who had not been taught to cooperate. The trained students gave extended explanations that helped to reorganise and clarify their own understanding.

In contrast, students with less practice in co-operative group work tended to offer shorter explanations that did not help to restructure thinking as much. They were also more likely to offer unsolicited explanations that did not actually help the recipients.

How might we improve the quality of discussion in co-operative groups?

In one study, thirty teachers were trained to use co-operative learning in their classrooms. The two-day workshop included information on how to establish open problem solving tasks that required children to share ideas and information and discuss how they would proceed as a group. Some of the teachers also learned about and practised particular communication skills to challenge children's thinking and to encourage them to get involved with the task. They used a variety of expressions and questions that were intended to scaffold learning. These included:

Type of scaffolding	*Example*
• Reflecting meaning	*'It sounds as though...'*
• Challenging students to identify problem issues	*'So what have you decided is the main problem here?'*
• Probing and clarifying to extend students' thinking	*'What makes you think it might be...?'*
• Confronting discrepancies in students' thinking or reframing statements to help them consider an alternative perspective	*'On the one hand, I hear you saying that you're stuck, but on the other, you seem to be indicating that you've found the solution. I wonder what it is?'*
• Tentatively offering suggestions	*'Have you thought about...?'*
• Acknowledging and validating students' ideas and efforts	*'You've worked that part out after a lot of hard work.'*
• Focusing on key issues and solutions	*'I wonder what you might need to do now if you want to find the solution?'*

These interjections did not tell the students what to do, but challenged their current points of view and helped them to focus clearly on the problem to be solved.

The study found that teachers trained in these communication skills challenged the students' thinking more. They used more friendly, personal and supportive language and asked questions nearly twice as often as other teachers. They spoke to the children in ways that were likely to foster learning and made far fewer disciplinary comments than teachers who just implemented small group work without scaffolding their discussions.

"...children trained to work in co-operative groups were good at giving explanations that their peers understood..."

Teachers given additional training in scaffolding student discussions were able to model helpful interventions. Their students picked up some of these modelled comments and used them in their own conversations. These students were trying to create a light ray that would illuminate a treasure cave:

Student contribution	***Scaffolding behaviour copied from teacher***
'We'll have to make something glow for exactly one minute... We need to decide how we're going to do it.'	Seeks group consensus
'We're not allowed to touch it ...We could use batteries?'	Seeks group's opinion
'We can use those'.	Validates other child's idea
[Later in discussion] ...'The only trouble with that is...'	Challenges another's perspective
'We could try...'	Tentative suggestion
'I was thinking that...'	Making his thinking explicit
'If we put it in, the instrument is mechanical and it would turn it off'.	Tentative suggestion

In the above discussion, students demonstrated many of the features of helpful interjections that had been modelled earlier by their teacher.

Co-operative group learning and ICT

A recent study from Australia offers a good example of the use of ICT in co-operative learning. Science students from Years 10 and 11 starting a new topic on force and motion watched sixteen digital video clips of experimental situations that would be difficult to replicate in the classroom. These included a person on a swing releasing a ball just before reaching the maximum height of the swing and a ball being released from the top of a mast of a sailing ship in motion. Students were asked to predict what they thought would happen to the flight-path of each projectile. They then compared their predictions with what actually happened and discussed any discrepancies. The students were familiar with both the process of predicting, observing and explaining and with co-operative learning.

The researcher wanted to find out the extent to which tasks promoted meaningful discussion between the students about their ideas. He looked at the extent to which the students:

- articulated, justified and reflected on their own ideas;
- reflected on the viability of their partners' ideas; and
- built new ideas and shared meanings together.

Making ideas explicit and justifying them

Pairs of students predicted what they thought would happen in each situation. They articulated their views by making drawings of the predicted flight path and discussed the reasons for their prediction with their partner. Disagreements gave students the opportunity to justify and defend their viewpoints. Michelle and Cath disagreed with each other in the 'Swing' task, in which a child was moving forwards on a swing and passively released a ball.

M: 'So he's travelling up, then just lets it go so I think it [the ball] will just go straight down, won't it?' (Michelle shows Cath her drawing of the predicted pathway that shows the ball moving forwards before falling vertically downwards)... 'Maybe a bit sharper'.

C: 'No, I don't think that's right. Because the swing is still moving so it's giving the ball a bit of (forward) velocity' (defending her own views).

M: 'OK' (in agreement).

As the students defended their views, their drawings often became a focus for discussion and students frequently edited these drawings as their understanding changed. The students didn't always manage to negotiate a new, shared meaning when they disagreed. Nevertheless, their discussions showed that they listened attentively to one another and thought about each other's point of views. Their dialogues included questions and frequent pauses for thought.

Building new ideas and shared meanings

When pairs of students did not reach agreement about their predictions, evidence from the digital video sequences added new information to their subsequent discussions. In a few instances, students managed to negotiate new, shared meanings through discussion before watching the clips. One member of a pair who reached a new understanding through discussion, reflected on this process:

> *'Because we were both working together, it made us think about things [the problem] a lot more because we had differing opinions... But if we were just by ourselves, we'd go: 'Oh yes – that's right because I'm me!'*

The predict/observe/explain process is one of many that can be used to structure collaborative discussions. An article in Issue 2 summarises a variety of other strategies that can be used to structure productive discussions between small groups of students.

(If you want to read more about discovering pupils' starting points in science, see page 7 of this *Bulletin*).

How do we know this?

Gillies, R.M. (2004) ***The effects of co-operative learning on junior high school students during small group learning*** Learning and Instruction 14 pp.197-213

Gillies, R.M. & Boyle, M. (2005) ***Teachers' scaffolding behaviours during co-operative learning*** Asia-Pacific Journal of Teacher Education 33(3) pp.243-259

Kearney, M. (2004) ***Classroom use of multimedia-supported predict-observe-explain tasks in a social constructivist learning environment*** Research in Science Education 34 pp. 427-453

The study took place in two different schools in Sydney, Australia. The data was collected from interviews, student survey responses and classroom observations, including video footage.

Research Round-up

Getting physical goes mental

'Few studies in the area of movement intervention fulfil the basic requirements of scientific evaluative research' according to researchers of a recent comparative study of the progress of 683 children over a two year period. This lack of evaluative research, they say, has allowed critics of movement interventions to conclude that 'the treatment of children with developmental disabilities has been plagued throughout its history by a variety of unproven and irrational treatment approaches'. In contrast, the researchers carried out a robust, tightly controlled evaluation of a particular movement intervention – the Primary Movement Programme (PMG) – and found that the children who undertook the PMG significantly improved their achievement in reading and mathematics. We think there's lots in this study to interest practitioners – and parents too. In the next issue we'll feature a full report of the PMG and its impact. Meanwhile, for those who can't wait, here's the reference.

Jordan-Black, J. (2005) ***The effects of the Primary Movement programme on the academic performance of children attending ordinary primary school*** Journal of Research in Special Educational Needs 5(3) pp.101-111

Playing the numbers game

Remember the review finding in the last *Bulletin* about the impact on achievement of interactions between parents and children at home? Another, Australian, study explored the links between home, school and community partnerships that support children's numeracy development. The study found that there was a wide range of programmes and initiatives which brought adults and children together in numeracy related activities. Yet, according to the researchers, there was very little awareness amongst practitioners and policy makers of the numeracy learning opportunities within informal activities such as playgroups or after school care. It seems we still have some way to go before the learning power of adult child interactions at home or in informal settings is recognised and harnessed.

University of Queensland (2004) ***Home, school and community partnerships support children's numeracy*** Canberra, ACT: DEST. [Online] Available at: ***http://www.dest.gov.au/sectors/school_education/publications_resources/profiles/home_school_community_partnerships.htm***

Presentation and pedagogy in mathematics teaching

In Issue 3 of the *Bulletin*, we presented early research into the effective use of interactive whiteboards (IAWs). Since then, as the authors of a recent evaluation of this technology report, whiteboards have become flavour of the month and there has been considerable investment in their use in maths teaching. Among other things, IAW technology offers access to many presentation techniques or 'manipulations.' Used effectively, these can enhance understanding and learning – but is there more to interactivity than this?

The researchers analysed and evaluated practice in the classrooms of those teachers who were making extensive use of IAWs. They used video recordings and semi-structured interviews to gather and synthesise data from 37 mathematics lessons. They found that the teachers who had been using the technology consistently for at least a year tended to use the manipulations *(drag and drop, hide and reveal, colour and highlighting, matching items, animation, immediate feedback)* to foster interactivity and not just to enhance presentation.

Observations of the manipulations that were seen to be effective included interaction between teacher and pupil, were based on focused questioning and appropriate follow-up responses. *Drag and drop* and *hide and reveal* appeared to be particularly well suited to maths lessons. They were helpful tools for demonstrating equivalence or working out the solutions to problems. *Colour, shading and highlighting* were used 'extensively and effectively' in graph work and fractions.

The researchers found that the learning context changed when the teacher moved away from what they term the 'supported didactic' approach and the IAW becomes the focus for the development of learning. They found that the major features for enhancing learning fell into three groups: *intrinsic stimulation* (combining visual, kinaesthetic and auditory ways of learning), *sustained focus* (by the teachers' management and orchestration of skills throughout the lesson) and *stepped learning* (through constant challenges and intermittent assessment as a stimulus to further involvement.)

When pupils were asked why they thought they were learning more effectively they identified all the presentational aspects such as colour, dynamics, hide and reveal and demonstration. They also highlighted the way they could revisit earlier concepts and examples in underpinning understanding.

The researchers found changes in the ways in which lessons were being managed. Teachers shared materials they had developed and recorded, for example. They also used visual recall from lesson to lesson to build on earlier learning. Overall they suggest that the evidence points to an increased understanding of the presentational and pedagogic gains from IAW use in maths lessons – but only when basic technological 'fluency' and pedagogic understanding enable teachers to overcome the 'novelty factor.' They found that there is an initial period when it's the 'cleverness' of the IAW that excites interest. But after a while pupils are able to articulate three main gains:

- brighter and clearer presentation of the material;
- stepped learning and the ability to recall earlier material; and
- rapid responses to interactive examples so that learning is reinforced or revisited.

Miller, D., Glover, D., & Averis, D. (2005) ***Presentation and pedagogy: the effective use of interactive whiteboards in mathematics lessons*** in Hewitt, D. and Noyes, A. (eds.) Proceedings of the sixth British Congress of Mathematics Education University of Warwick. [Online] Available at: ***http://www.bsrlm.org.uk/IPs/ip25-1/BSRLM-IP-25-1-14.pdf***

How long do the benefits last?

Interactions between adults and children have consistently been found to have a beneficial impact on children's development. In our first issue, we reported on a large-scale study into effective pedagogy in early years, which found that adult/child interactions were most effective when they took place both in the classroom and at home. And in our last issue, we reported on a major review of research about parental involvement, which found that adult/child conversations at home can have a major impact on achievement and suggested that schools could do more to help parents expand their involvement in talking to children about their learning.

These findings are given further support by another study published recently, which evaluated an early years intervention called the Peers Early Education Partnership (PEEP). This study emphasises the crucial role played by parents during early childhood and highlights the importance of the first five years of life on children's development.

The PEEP programme and its impact on children aged 0-5 years

The PEEP programme aimed to promote parental interest and involvement in their children's learning, establish parents as positive role models and show the importance of giving praise. Crucially, it also aimed to facilitate connections between home and school to help parents support their children's transition to formal education.

The programme had a specific curriculum with supporting materials designed for babies and children up to age five and their parents. All families living in an economically disadvantaged catchment area were given the opportunity to attend PEEP groups with their young children and receive home visits. Each year, parents were also given a folder of materials and ideas for activities to do with their children at home. PEEP was available in pre-schools and primary schools too, where a group leader or trained teacher offered PEEP activities for families one day a week.

All PEEP sessions involved:

- *circle time* – songs and rhymes;
- *talking time* – discussions between parents and PEEP staff to share ideas, experiences and offer support;
- *story time* – PEEP staff demonstrated stimulating ways of sharing books with children;
- *book sharing* – books for parents to share and borrow;
- *borrowing time* – 'playpacks' containing a book and play materials were available to borrow; and
- *home activities* – practical suggestions for games that support the curriculum.

The PEEP programme was highly successful. The researchers' statistical analyses revealed a significant impact on the quality of parents' interaction with their children and on their children's progress in a number of literacy skills and cognitive development from birth to age five years. It also had a strong impact on the children's self-esteem. But the benefits of early years education don't end when children start school. Other studies have found that they continue throughout school and into adulthood.

Evidence of the enduring effects of early childhood education

A study, which took place in New Zealand found that children who had had three or more years of early childhood education, tended to have higher scores at age ten for mathematics, communication, logical problem solving and reading. Again, what was crucial was that the early learning environments provided opportunities for adult/child interactions as well as the practical development of skills. Most of the children's learning was informal, through play. Games and activities such as pattern-matching, counting and shape sorting helped develop mathematical understanding. Literacy understanding was developed through making books and print available and through conversations between adults and children.

Another study which followed a cohort of children from birth to age 42, found that pre-school education (taking place mainly in nurseries or playgroups) had even longer lasting effects. It found attending pre-school:

- had a positive impact on cognitive development in maths and reading ability at age 7 through to age 16;
- made gaining HE qualifications more likely particularly for girls; and
- resulted in 3-4% higher income at age 33.

The study noted how these effects were more pronounced for vulnerable children, providing further evidence of just how important children's early experiences are.

How do we know this?

An evaluation of an early years programme which compared families living in the catchment area of the programme with families living in a matched comparison area. Altogether 604 families were studied. Data, including interviews with parents and socio-economic information, were collected annually from birth to age five.

Evangelou, M., Brooks, G., Smith, S. & Jennings, D. (2005) ***Birth to school study: a longitudinal evaluation of the Peers Early Education Partnership (PEEP) 1998-2005*** Nottingham: DfES. [Online] Available at: ***http://www.dfes.gov.uk/research/data/uploadfiles/SSU2005FR017.pdf***

A longitudinal study of 300 children. Interview, observational and test data were collected when the children were aged 6, 8 and 10 years.

Wylie, C., & Thompson, J. (2003) ***The long-term contribution of early childhood education to children's performance – evidence from New Zealand*** International Journal of Early Years Education 11(1) pp.69-78

A longitudinal study tracking the impact of pre-school education on academic achievement and progression to employment for around 12,500 children in the UK from birth in 1958 to age 42.

Goodman, A., & Sianesi, B. (2005) ***Early education and children's outcomes: how long do the impacts last?*** Fiscal Studies 26(4) pp.513–548

The gender gap

Tackling boys' underachievement

Debate about the extent of boys' academic underachievement has raged throughout the last decade. But is anxiety about the 'gender gap' between boys and girls misplaced? What is the extent of this gap in different subjects and at different ages? Is a gender gap increasing? Studies on raising boys' achievement have found that there is a gender gap in some subjects at some levels – particularly for mid to high attaining boys – and in English, especially writing, at all ages. This gap is not increasing, but it is persisting and seems to have stabilised at around 10 percentage points. So what can be done about it?

A recent DfES funded study examined how effective different approaches were for 'solving the gender gap'. Inevitably, there was no 'magic dust' – the evidence showed that narrowly focused, short-term interventions did not work. But the researchers found some strategies that were effective.

How might we improve achievement in English?

One successful strategy helped boys to become more satisfied readers by giving them a wide choice of reading matter and promoting meaningful discussions about what they read. The triad of schools involved in this project made a variety of texts available and encouraged readers to talk about the text and what was interesting about it. They involved parents at an early stage and also paired up unmotivated boys from Year 6 with underachieving boys in Year 3 as reading buddies. Increased opportunities to talk about their reading motivated the boys to read more and their performance improved greatly:

> *'Reading is fun. I like reading long books and comics... and books from films'.*

Two other triads of contrasting schools focused successfully on improving writing. One project encouraged paired and group talk about story lines, plot, setting, character and vocabulary:

> *'When you're talking it makes you have more ideas and if you have a partner it makes you feel more confident'.*

The second group of three schools used drama as a creative context for teaching literacy and to stimulate imagination. Pupils were encouraged to write 'in role' from their first-hand experiences. Analysis of the boys' writing showed marked improvements in story structure, character depiction and use of dialogue. A teacher from the project said:

> *'We do a bit of drama, then a bit of writing – fast – a diary entry – do it fast. Then you get the immediate effects of the feelings they've been exploring'.*

Did single-sex classes help?

Where they were taught effectively and sensitively, students who had experienced single-sex classes:

- were less afraid of ridicule from their peers;
- had fewer concerns about the need to conform to expectations about image and appearance;
- were more prepared to discuss emotions and feelings; and
- achieved better results.

Do boys and girls *really* have different learning styles?

In Issue 2, we reported on a research review which cautioned about the dangers of learning styles stereotyping students. In a similar vein, this study warned against gender stereotyping, either in single-sex or mixed-sex classes. There was little evidence that boys and girls had different preferred learning styles and attempts to first discover, then teach in different styles for groups of boys and girls could do more harm than good.

What is the gender gap really like?

What's the truth behind the headlines about the nature and extent of the gender gap? One study aimed to get a clear understanding of the nature of the difference between boys' and girls' achievement and carefully scrutinised six years of public examination results from KS1 to 'A' level. It found that any problem was not one of low achieving boys, but rather one facing mid to high attaining boys. The study found no significant differences in any subject between boys' and girls' achievement at the lowest grades and very little difference between their achievement in science and mathematics at any level. However, at higher levels of attainment in some subjects, a gap in attainment between boys and girls appeared and widened with each increasing level or grade. In English, for example, boys did less well than girls at KS2 and this gap widened at KS3 and at GCSE. At KS2, similar proportions of boys and girls achieved level 3, but more girls achieved level 4 and there was a big gap in favour of girls at level 5. At GCSE, more girls achieved higher grades (A* to B) and more boys achieved middle grades than might be expected, but the gap in attainment in English disappeared at 'A' level.

How do we know this?

A study that assessed whether the interventions would lead to similar results in different contexts by involving triads (groups of three) schools, each offering a contrasting range of socio-economic contexts and school phases. Evidence was also gathered from case studies of over 50 primary, infant, secondary and special schools via surveys with parents and carers, interviews, observations, analysis of pupil work, quantitative data and teacher assessments.

Younger, M. & Warrington, M. et al. (2005) ***Raising Boys' Achievement*** London: DfES RR636. [Online] Available at: ***www.dfes.gov.uk/research/data/uploadfiles/RR636.pdf***

Gorard, S., Rees, G. & Salisbury, J. (2001) ***Investigating the Patterns of Differential Attainment of Boys and Girls at School*** British Educational Research Journal 27(2) pp.125-139

Specialist music tuition

Which pupils are involved and how do they benefit?

Few practitioners would disagree about the many benefits to pupils of learning to play a musical instrument. Learning how to play an instrument can be fun and therapeutic. It can also give pupils an opportunity to work collaboratively with their peers in ensembles and the confidence to perform in front of others. But to some of us, instrumental tuition at school may seem to come at a price. Learning to play a musical instrument at school often involves pupils missing other equally important lessons, or parts of lessons, such as literacy and numeracy. We worry about the possible impact that withdrawing pupils for instrumental tuition may have on their attainment in the subjects they miss. Are there any grounds for this concern?

There's good evidence that withdrawing pupils from class for instrument lessons does not have an adverse affect on their academic performance in other subjects, such as literacy and numeracy. In fact, learning to play a musical instrument can actually enhance their attainment. In one study for example, a group of pupils withdrawn for tuition in stringed instruments performed better on reading tests than the similar ability group that remained in class, and more pupils in the group withdrawn for stringed instrument tuition reached the average standard expected in mathematics (76% of pupils learning an instrument compared with 65% who weren't) and citizenship (93% compared with 87%).

Why did the pupils learning to play musical instruments do better in other subjects too?

According to the researcher, one reason why the pupils learning to play stringed instruments scored higher in their reading, mathematics and citizenship tests may have been because the pupils were able to transfer the skills they gained from reading musical symbols to those required for comprehending linguistic symbols and interpreting maps, graphs and charts. And he suggested that when pupils are learning to play rhythm on stringed instruments, they also learn about fractions and their relationships to each other in a practical way. For example, pupils learn that they have to move the bow twice as far on half notes (minims) as quarter notes (crotchets). Evidence such as this points to the value of giving all pupils the opportunity to learn to play a musical instrument.

Who's playing what?

According to a recent national survey, most schools (76% of primary schools and 88% of secondary schools) provide specialist music provision, and the proportion of pupils taking advantage of the opportunity is increasing. The biggest increase is at KS2 where currently 13% of pupils are learning to play an instrument – 6% more than the researchers found three years earlier. And it seems, pupils from a variety of backgrounds are having a go – 17% of those pupils learning an instrument are from minority ethnic groups, 9% have special educational needs, and 12% are in receipt of free school meals. Learning to play an instrument is more popular with girls than boys at all key stages (for example, 60% of those learning an instrument at KS2 are girls and 40% are boys) a finding that may reflect the choice of instrument tuition that is available to them. The instruments most commonly taught in schools are the violin, trumpet, flute, cello and clarinet. But whilst the violin, flute, clarinet and cello are popular with girls, boys show a preference for the trumpet, cornet, trombone, guitar and drum kit.

"...Learning to play a musical instrument can actually enhance attainment in other areas..."

What can we do to encourage our pupils to learn to play musical instruments?

Evidence from a literature review of research about the development of pupils' musical skills indicates that parental support (or at least taking an interest) is important for the development of instrumental expertise, particularly up to the age of eleven. After this age, competent adolescent musicians are likely to be intrinsically motivated to continue to practise and develop. But teachers play a critical role too, through giving pupils time for creative musical activities, practice and performance in a supportive context.

How do we know this?

A study which compared the attainment in literacy, mathematics and citizenship of 148 pupils aged 9-10 years who received tuition in stringed instruments for 30 minutes twice a week with the attainment of 148 pupils of the same ability who remained in class using statistical analysis.

Wallick, M.D. (1998) ***A comparison study of the Ohio proficiency test results between fourth-grade string pullout students and those of matched ability*** Journal of Research in Music Education 46(2) pp.239-247

A national survey of Local Authorities music provision: Hallam, S. et al. (2005) ***Survey of Local Authority Music Services 2005*** London: DfES RR 700. [Online] Available at: ***http://www.dfes.gov.uk/research/data/uploadfiles/RR700.pdf***

A review of UK and related international research: Welch, G.F. & Adams, P. (2003) ***How is music learning celebrated and developed?*** (BERA Professional User Reviews) Southwell: British Educational Research Association. [Online] Available at: ***http://www.bera.ac.uk/publications/pdfs/MUSICP~1.PDF***

Every Child Matters: What can schools do to reduce exclusions, truancy and antisocial behaviour?

There are some problems that are beyond the sole agency of individual practitioners or even whole schools and extreme antisocial behaviour is one of them. We know that youngsters who persistently truant, or who are excluded from school, are likely to behave antisocially and take part in street crime. An Australian study published last year found that youngsters who were persistently antisocial were also less likely than other young people to have completed secondary schooling or further education. The majority of young people who persistently showed high levels of antisocial behaviour during adolescence continued to behave antisocially as young adults and had difficulties building relationships with their peers. But the problem isn't only in adolescence. Problem behaviour for the most persistently antisocial adolescents usually started early in their childhood. Clearly, we need to find effective ways of making sure youngsters attend school and of intervening early to avert the development of antisocial behaviour. What can schools do? And who else should be involved?

Evidence of what works

A recent study investigated a behaviour improvement programme that was piloted in 700 schools (primary and secondary) from 34 LEAs selected on the basis of their truancy and crime figures. During the two-year programme the schools made greater improvements in attendance than the comparison schools that were not involved in the programme. The number of fixed period exclusions was also reduced. But there was a considerable variation between schools – whilst 50% showed a reduction in permanent exclusions, 16% showed no change.

To find out what measures or combinations of measures were most successful in improving standards of behaviour and reducing truancy and exclusions the researchers examined the practices of ten secondary schools and their feeder primary schools in more detail. They found that the programme was most effective where:

- a multi-agency approach was adopted through the operation of Behaviour and Educational Support Teams (BESTs);
- the focus was on preventative initiatives;
- emphasis was given to change at whole school level through the implementation of behaviour audits;
- Lead Behaviour Professionals (LBPs) and learning mentors were appointed; and
- effective management and good communication between all parties existed.

The programme had most impact when it focused on pupils' experiences in school – leading them to want to attend. Initiatives that focused solely on improving attendance (such as truancy sweeps and rewarding pupils for good attendance etc) had a more limited impact because they tended not to address the underlying causes of non-attendance, such as bullying.

How did the behaviour audits, LBPs and BESTs help?

The behaviour audits provided data to support the development of behaviour improvement plans and a baseline for monitoring progress. They helped schools identify where they needed to focus their resources. One school for example, identified a group of girls with low self-esteem and put together an eight-week programme run by the Head of Year and the Learning Mentor. Part of the programme involved training the girls to mentor other girls in the school.

The recruitment of LBPs raised the status of pastoral support and behaviour management in schools. Their impact was greater where they were members of the Senior Management Team who were able to challenge and influence whole school policy.

The BESTs brought teachers together with a range of professionals, such as educational psychologists, social workers, Education Welfare officers, and also sometimes police officers, giving them opportunities to share ideas and think about alternative approaches to problems. Basing BEST in schools made it possible to provide multi-agency services more speedily than had previously been the case.

How multi-agency working helped one youngster

Chris had come to the UK from Jamaica in Year 3. He had a low level of literacy, found it difficult to communicate with his peers and was frequently involved in fights. On one occasion he was excluded for several days. Working closely with a social worker and a counsellor on social skills, managing anger, and how to cope in different situations helped curtail his antisocial behaviour:

> *'School is a lot better ... I don't get so angry now and I don't start a fight ... I have lots of friends now and I enjoy playing football with them'.*

How do we know this?

Research that drew upon questionnaire data collected as part of the Australian Temperament Project – a longitudinal study which followed the development of over 2,000 children from infancy to early adulthood.

Smart, D. & Richardson, N. et al. (2005) ***Patterns and precursors of adolescent antisocial behaviour: outcomes and connections*** Melbourne, VIC: Australian Institute of Family Studies and Crime Prevention Victoria. [Online] Available at: ***http://www.aifs.gov.au/atp/pubs/cpv/report3.pdf***

Interviews with LEA personnel, teachers, TAs, pupils and parents, exclusions and attendance data, and visits to case study schools.

Hallam, S. et al. (2005) ***Research and evaluation of the behaviour improvement programme*** London: DfES RR702. [Online] Available at: ***http://www.dfes.gov.uk/research/data/uploadfiles/RR702.pdf***

Hot websites

Many readers have wanted to know more about practitioner research; where to find it and how to get support. We looked for websites which we thought would help.

British Educational Communications and Technology Agency

http://www.becta.org.uk/research/display.cfm?section=6

Although BECTA is the Government's lead agency for information and communications technology (ICT) in education, this site is a great one for teacher researchers from all disciplines; whether you are new to research or an old hand. It's set out clearly and simple to follow, starting with an overview of action research followed by guidance on how to prepare an action plan. The sample planning sheet is a gem for assisting researchers to organise their thoughts. There's also information on choosing your methods and research ethics, plus links to information about publishing your research and best practice in teacher research.

National Teacher Research Panel

http://www.standards.dfes.gov.uk/ntrp/

The National Teacher Research Panel (NTRP) website offers guidance to teacher researchers and examples of teacher research. Look at the Teacher Research Conference and click on the 'Publications' link in order to access teacher research summaries with links to the full text – more than thirty additional summaries written by teachers for other teachers have recently been added to this already extensive collection. There's also a page on the importance of research informed practice in schools and the NTRP's own plain language criteria for assessing the quality of research to help you weigh up the credibility of the evidence you encounter.

Creativity Action Research Awards

http://www.creative-partnerships.com/projects/70838/

The Creativity Action Research Awards (CARA) website gives innovative ideas about how you might collaborate with creative practitioners to improve your teaching practice. The CARA project, under the aegis of Creative Partnerships, brings together classroom teachers and creative practitioners in order to investigate the effect creativity has on pupil motivation and learning. This research award was first made available for the school year 2004-2005 and a new award is available in 2006.

Gatsby Teacher Fellowships

http://www.gtf.org.uk/index.htm

If you teach maths, science or design and technology you might want to take a closer look at this site. You'll find innovative case studies that showcase effective and inspirational teaching as well as detailed information about how to apply for the one-year Gatsby research fellowships. Visitors to this site should also check out the links to other websites which contain lots of useful strategies for learning and teaching.

What do you know about Every Child Matters?

We have had many requests for access to more information about key policy issues. The Every Child Matters (ECM) agenda is being rolled out nationally and affects all practitioners. We have featured research about one key problem affecting the life chances of many young people on page 14 of this issue, which shows that collaboration between schools, social workers and counsellors had an impact on the levels of anti-social behaviour in 34 Local Authorities. Young people's failure to prosper in our schools can have many causes. Here are some of those listed on the Neighbourhood Renewal website ***http://www.renewal.net/*** which presents an evidence-based approach to tackling these issues:

- low attainment on entry to school;
- low levels of motivation;
- poor attendance;
- poor behaviour and high exclusion levels;
- lack of parental support;
- high mobility amongst pupils; and
- high numbers of pupils whose first language is not English.

The website is well worth a visit. Evidence comes from a number of different specialisms, which are all involved in working with young people in deprived areas. They include Health, Crime and Housing as well as Education. You'll find links to research in many of the areas listed above, as well as policy documents and evidence-based accounts of successful strategies for overcoming or improving targeted problems – from low attainment to truancy and exclusions. There are numerous case studies too, many of them researched and validated by external researchers. They range from imaginative collaborative partnerships to tackle the literacy levels of looked after children to cross agency mentoring

The facts

The ECM agenda was introduced in 2004 following the horrific case of Victoria Climbié, who was abused and eventually killed. This case highlighted the failure of the services responsible for childwelfare to ensure the wellbeing of children:

> *'The fact that a child like Victoria Climbié can still suffer almost unimaginable cruelty to the point of eventually losing her young life shows that things are still very far from right. More can and must be done...we are proposing here a range of measures to reform and improve children's care – crucially, for the first time ever requiring local authorities to bring together in one place under one person services for children, and at the same time suggesting real changes in the way those we ask to do this work carry out their tasks on our and our children's behalf'.* (Tony Blair preface to Every Child Matters Green Paper, 2003).

For more information about the ECM agenda and links to a range of carefully selected websites visit ***www.curee.co.uk***

About this publication

The *Bulletin* has been produced for teachers, lecturers and all the professionals who support learning, wherever it takes place. It is a pioneering publication in the field of education, which aims to bring research evidence to the attention of practitioners to help them directly in their work. It does this by identifying matters of practical concern and selecting reliable research that addresses them.

Further copies of the *Bulletin* are available free of charge before the end of June by emailing ***nerf@prolog.uk.com***, writing to NERF publications, PO Box 5050, Sherwood Park, Annesley, Nottingham, NG15 ODJ, or phoning 0845 6022260. Please quote reference code NERFB6 for this issue, NERFB5 for Issue 5 NERFB4 for Issue 4, NERFB3 for Issue 3, or NERFB2 for Issue 2. Issue 1 is now out of stock, but is available on our website. Bulk orders are also available free of charge to any organisations or institutions wishing to make use of the *Bulletin*.

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