

# The Teacher in Teacher-Practitioner Research: Three Principles of Inquiry

**Kate Wall<sup>1</sup>, Elaine Hall<sup>2</sup>**

<sup>1</sup>University of Strathclyde, Glasgow, UK

<sup>2</sup>Northumbria University School of Law, UK

## **Abstract:**

This chapter will distil three underlying principles of teacher practitioner research: autonomy; disturbance; and dialogue. These principles have emerged from a range of projects we have undertaken in partnership with teachers at all levels of education. This distillation is not so much about the details of the 'how' of teachers' research into learning and teaching in their own contexts - we (and many others) have written about this elsewhere – but rather about where the questions come from and how meaning is created and communicated. It is about the robust voices of teachers, and the diversity and richness of their research as harnessed through the process of practitioner enquiry. We will therefore explore how meaning is created and communicated by teachers involved and use the principles as a lynch-pin through which we explore their professional learning. The chapter will include some background to explain how we have worked with teachers, as well as narrative, case examples and analysis to illustrate important aspects of an inquiry approach. Most importantly, we'll include as many voices from our partnerships as possible to reflect the collaboration that made this learning possible.

## **Keywords:**

Inquiry, learning, autonomy, dialogue, disturbance

## **Introduction**

In 1904 Dewey first discussed the importance of teachers engaging in pedagogic enquiry to fully engage with processes and outcomes in their classrooms. Since then the concept has been in and out of fashion and more or less tied up with the concept of the research engaged practitioner. Underpinning these debates has often been an assumption that the practitioners' enquiry will lead to an engagement with research as a means to generate answers to questions (Nias & Groundwater-Smith, 1988). This could be research-informed and/or involve research processes on the part of the practitioner (Cordingley 2015, Hall, 2009). For many this position naturally involves the participation of university academics

to facilitate this engagement (Baumfield & Butterworth 2007; McLaughlin & Black-Hawkins, 2004). Models of teacher practitioner research can be largely traced back to the work of Stenhouse (1975) and as a result over recent years there has been sustained interest in the process and impact of developing a research-engaged teaching profession. Completing a systematic review on the topic, Dagenais et al. (2012) found that practitioners with an inquiry standpoint were more likely to have positive views of research and therefore were more likely to use it to inform their practice. In the same vein, McLaughlin and colleagues (2004) state three overlapping purposes evident in the teacher research tradition: (1) research and enquiry undertaken for primarily personal purposes; (2) research and enquiry undertaken for primarily political purposes; and (3) research and enquiry undertaken for primarily school improvement purposes. Where teachers are involved in these kinds of research engaged practices then the teachers can be seen to generate a more sophisticated and metacognitive (Wall & Hall, 2016) understanding of the ecology of learning, develop cultures of risk taking that move practice forwards, accept challenge and change, facilitate the change processes for others and develop an 'ecological agency' that is catalytic of change (Leat et al., 2014, p.8). But what does the process of facilitating this type of working look like?

This chapter focuses on how these ways of working manifest in real life practitioner inquiry projects. It will draw on what we have learned from working in partnership with teacher-researchers in schools, colleges and universities. As context, we are both teachers by background who started off researching our own practice. Now based in higher education institutions, we have jointly and independently undertaken a myriad of different education research projects over the last 15 to 20 years. Our experience spans a range of different methodologies, but by far our favourite thing to do is work in partnership with teacher-researchers; closing the gap back to our own practice experience, so to speak. We will focus on what we have learned from across this experience, and as such will be a reflection of our underlying principles of teacher practitioner research. These can be summarised as:

1. The Principle of Autonomy: the teacher knows which question to ask
  - a. Novice researchers may need assistance with methods but *they* still get to choose how to ask their inquiry question,
  - b. Teachers know what impact is and they get to say when/if the question is answered satisfactorily,
  - c. Only the enquirer can answer the question 'why did I want to know that?'
2. The Principle of Disturbance: good questions cause extra thinking
  - a. Cycles of inquiry are set off by success and failure in research,

- b. The complexity and connections in classrooms start to become more obvious,
  - c. All learners (students, teachers, managers and community) tend to become more metacognitive.
3. The Principle of Dialogue: ethical and robust research is communicated
- a. Especially when it hasn't worked as planned,
  - b. Particularly when all participants have a say,
  - c. Counter intuitively, communication is *even better* across contexts.

The chapter will begin by providing some background information on key projects exemplifying the process undertaken by the partners in operationalizing a teacher practitioner research methodology. In particular, a focus will be on the balancing act between the roles and responsibilities of practitioners and researchers when undertaking a partnership approach to research about practice. This will allow us to exemplify the principle of autonomy. Building on this, we will move to explore the intent with which projects like this are participated in and undertaken. Asking questions about how this influences the teacher's engagement with the research process. We will show how inquiry breeds further inquiry and, as a result, how participants need to accept feelings of dissonance; therefore enacting the principle of disturbance as a force to strive for improvement. Finally we will explore the principle of dialogue, suggesting that these processes are best not undertaken in isolation and the ways in which operating in dialogue with other inquirers is supportive of professional learning. This will allow us to demonstrate the importance of protected space and time for any of these principles to take effect. Of paramount importance to the discussion will be the voice of the teachers involved in these projects and their voices as represented in their write ups of their inquiries. With this in mind, and as a commitment to true partnership working, all schools and teachers are named throughout

### **The importance of agreeing how**

Co-constructed understandings of pedagogy and what effective learning looks like have emerged from three research projects: (1) the Learning to Learn (L2L) in Schools and (2) Learning to Learn in Further Education (FE) Projects coordinated by the independent UK charity, the Campaign for Learning (Higgins et al. 2007; Wall et al. 2010); and (3) the Equal Acclaim for Teaching Excellence (EQUATE) project funded by the University of Newcastle (Robson et al., 2010). All were run by researchers originally allied to the Research Centre for Learning and Teaching at Newcastle

University. These projects all used practitioner inquiry methodologies (Baumfield et al., 2009) and involved teachers from primary schools; secondary schools; special schools; further education colleges and universities in a model of school-university partnership (McLaughlin et al., 2008). All three comprised one of the only practitioner networks in England to include all sectors of the education system from early years through to postgraduate educators. These projects rested upon an approach to research and knowledge construction which emphasises partnership, trust and complementary role undertaken collaboratively by researchers, local authorities, schools and colleges. As such it represents part of a developing trajectory of a dispersed research-informed practice community (Lieberman & Grolnick, 1996). Full project reports, case studies and posters from the projects are available on the project pages of the Campaign for Learning's website: <https://goo.gl/p6D8Th>.

The structure of the projects was specifically designed to privilege opportunities for teachers to learn from each other through dialogue (Baumfield, et al., 2008; 2012). The traditional research model of central control by the University, of topic, research questions and methods, was dispensed with for two reasons: the motivation of teachers to keep engaged in cycles of inquiry requires them to have some ownership of the process (Day, et al., 2006) and (more crucially) teachers themselves have the most intimate knowledge of the pressing questions (Lieberman et al., 1988). This meant that the locus of control was with the teachers to choose a topic area, which was relevant to the project as well as relevant to the learning agendas important in their context. The University team retained a role in framing the structure and outcomes (Bernstein, 1990) of the project through choosing activities and inputs, organising meetings and taking the lead on the publications of the project. However, throughout we privileged the teachers' voice in case studies and prioritised joint publications (for example, Hall et al., 2005; Wall et al., 2009) thus representing the authentic partnership that underpinned the process. Indeed, within this chapter schools and practitioners are named to represent the fundamental role they played in the success and outcomes of this project. It would be unethical to anonymise them and take the full credit for ourselves.

The model of practitioner inquiry adopted in these projects involved cycles of practitioner research (running across an academic year), with case studies completed and written up by the teachers using an approach based on Stenhouse's (1981) model of '*systematic enquiry made public*'. In each project, the teachers involved were encouraged to undertake research relevant to their context and to their interests:

*"The research process was beneficial in that it primarily gave us a platform for the development and implementation of the above strategies, whilst sparking the ideas and the motivations of the staff involved". (Jane Dale and Ann Saunders, Weaverham Forest Primary School)*

They also had to collect evidence. To prevent action research feeling like too much of an extra burden we located it alongside a reflective professional cycle, drawing on the model of plan, do and review which most teachers are familiar with. The additional provisos were firstly the need to collect systematic evidence: however, teachers were encouraged to think about what evidence was 'good' evidence rather than to conform to University or policy-maker norms. In asking them to conduct inquiry, we knew that teachers would have to become conscious of the many decisions that they make on a daily basis, so the quality criteria for each teacher's research was personal and the key question became 'What would be good enough evidence to convince you to continue/ change your practice?'. Teachers set themselves very high standards for this 'warrant' (Dewey, 1938) which meant that they were well prepared for the second proviso - 'to make their findings public, to gain feedback and codify their process and outcome against others'. In the first instance this constituted an effort within their school 'to convince a sceptical colleague' (Baumfield et al., 2008) of the value of their approach, then in the local and national project communities in face to face meetings, and then to the world beyond, through the published case studies on the internet.

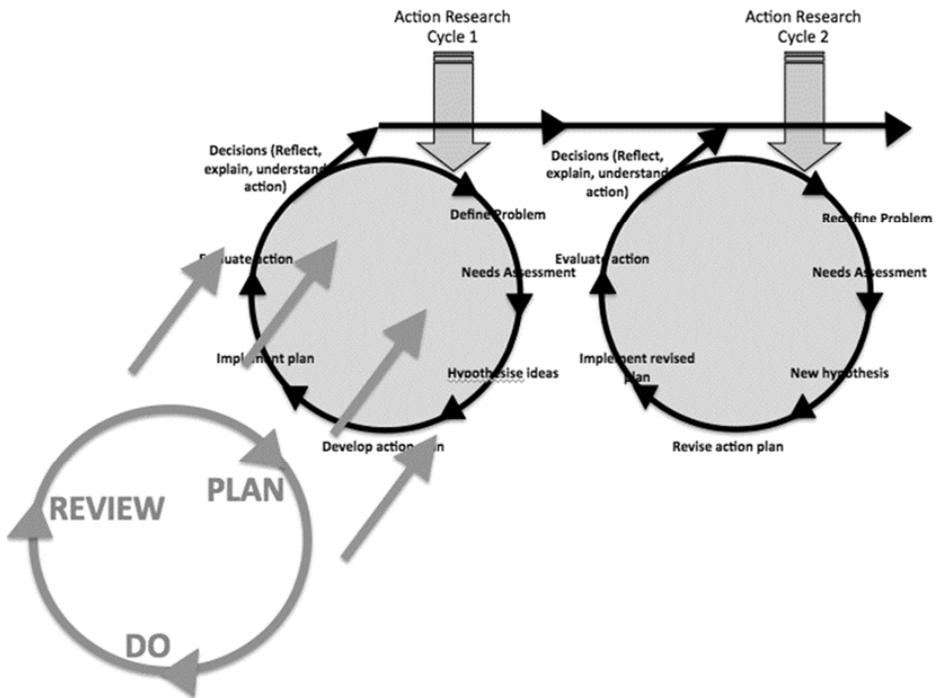


Figure 1. Alignment of action research and a reflective professional cycle (adapted from Baumfield et al., 2008)

The University team therefore took a coaching role to support the identification of success criteria and formulating or refining specific research questions as part of a dialogue with the teachers – this was often done as an element of a face-to-face meetings, but a range of electronic support was also available. An important element of this was checking that the project was realistic. In particular, with regard to the research question they wanted to answer, but also realistic in terms of the data they wanted to collect to answer it and realistic in the time commitment that the research tools needed for administration and analysis. The University team had good knowledge and experience of these aspects of the project, but each teacher needed to balance this with the individual pressures of the context in which they worked. The support was advisory and the practice that resulted was negotiated, with the principle of autonomy being upheld and the teacher always having the final say.

This was complemented by a commitment from the University team, through a ‘buddying’ system, to be available with assistance and answers to their questions via email or telephone: the project manager was available for teachers via email and telephone to provide support or to act as a conduit to other colleagues for specialist advice. Face-to-face support occurred once a term. In the autumn and summer the teachers gathered together in their local groups for a training day, the content of which provided a mixture of new ideas, research methods and opportunities to share problems and successes and to set their work in a wider context. Each January a two-day residential conference took place, with invited speakers, including those from other major research projects like the Teaching and Learning Research Programme (TLRP - for example, James & Brown, 2005). On all these occasions the University team took a lead role in providing input on different aspects of the project, as well as supporting dialogue between schools about Learning to Learn and the research process, although as the project progressed this became less direct and the emphasis became more about facilitating conversation. Through these systems systems, the University team gave guidance and opinion which may have had impact on the action research process in schools, however at no point was there any intention to wrest the locus of control away from the teachers and the context of the schools.

*‘L2L gave this research project and the three year study a sound framework in terms of methodology. The principle of exploring the potential of different strategies by measuring impact has been established throughout the school. The L2L aims and objective have given clarity to the projects outcomes. The sharing of information through the Newcastle University web site, emails and lead learner workshops also enabled’. (Martin Fleetwood, Woodford Lodge High School)*

Practical support in the development of questionnaires or other tools and in the analysis of data was offered to those schools who wanted it, with a commitment to swift response being a crucial component of the network. The input of the University team evolved as the practitioner inquiry process unfolded: the definition of the problem was wholly 'owned' by individual teachers or teams within schools and the University team scaffolded the development of hypotheses by encouraging close focus on *what will change* and *what change will look like*. The input on research methods informed the action plan and shaped it to the extent that schools were required to triangulate their data through the use of multiple evaluation tools. In this way, though we were imposing our values from the academic community on the teacher-researchers, we were simultaneously sharing the language and culture of research, giving procedural autonomy to teachers through a shared understanding of the expectations of this 'craft' (Ecclestone 2004; Lave & Wenger, 1991). This was achieved using common mediating tools which facilitated the research process and aided communication and learning (for example, Baumfield et al., 2009).

Each year the teachers wrote up their research as a case study. These reports followed a defined structure, based around a series of headings given to the teachers as a guide, with some prompts as to what should be included in each section. The teachers completed the write up with an open invitation for formative feedback on drafts from the university team (Higgins et al. 2007). Take up of this was variable depending on the individuals and their circumstances. The emphasis was on the teachers' version of the events and so a commitment was made not to change the 'voice' although suggestions might be made on, for example, where greater detail would add clarity. The final drafts were formatted by the university team into a pre-agreed template (see for example figure 2) that provided uniformity across the project outputs, enabling an overarching analysis across schools. In latter stages posters were also generated, in the style of an academic poster presentation, to facilitate sharing of process and findings across the project (at the annual residential attended by all teachers, from across sectors) and beyond (figure 4). The teachers were consulted throughout the process and their approval sought over any actions taken or changes made, before all of the attributed case studies were made freely available on the Campaign for Learning's website: [www.campaign-for-learning.org.uk](http://www.campaign-for-learning.org.uk).

It is important to note that the schools' and teachers' involvement was not explicitly funded by the research project and as such predominantly relied on volunteers and good will. The teachers needed time out to attend project events as well as space to undertake the practitioner inquiry process, including making changes to pedagogy and writing up their case study reports. There was

YEAR ONE PROJECT 2003/2004



Does Introducing Parents to Learning to Learn Techniques have a Positive Effect on Pupils' Achievement?



Linda Stephens and Irene Pooley  
St Meriadoc CofE Nursery and Infant School, Cornwall

◆ PROJECT AIMS

We aimed to discover whether involving parents and introducing them to various Learning to Learn (L2L) approaches will develop their children's self esteem and resilience as learners and so raise standards.

◆ RESEARCH FOCUS

We are looking at the role of family learning in supporting Learning to Learn by arranging a series of evenings to introduce parents to the major Learning to Learn approaches. We will monitor the impact that the parent's involvement has on the confidence and capability of their children.

◆ DIMENSIONS OF THIS CASE STUDY

We are a nursery and infant school with a total of 155 full time pupils plus 38 part-time in the nursery. The invitation to the parents' sessions went to all parents and between 30 and 40 parents attended each of the 12 sessions representing 50 children.

◆ SUMMARY OF FINDINGS

- Sharing Learning to Learn approaches with parents raises their own self esteem and confidence as learners.
- Involving parents in Learning to Learn enables them to feel more able to teach and help their own children at home.
- The confidence of the parents communicates itself to the children.
- Even after only a few months improvements have been noticed in some of the children's performance.



Figure 2. Example of a case study front page giving the summary of their research project, (available from the Campaign for Learning website)

consensus about the inherent value of the project and its outcomes and most teacher researcher participants justified their involvement through the critical engagement with the learning and teaching process (Hall et al., 2006):

*'I have thoroughly enjoyed the opportunities that L2L has offered me. It has allowed me to research aspects of my career that I feel passionate about and has helped me map out a better understanding of myself not only as a teacher but also as a researcher.'* (Lucy Fisher, Carterhatch Primary School)

Despite the explicit focus on autonomy and clear contracts between partners about who would do what and when, there was still risk involved and professional courage (Alexander, 2010) was required to support the action needed to complete the practitioner inquiry process and particularly to make the findings public. We will return to this later.

## **Teacher intent and research design**

There was great variation in the research focus as put in place by each of the teachers. Each teacher implemented interventions under the umbrella term of *Learning to Learn* (L2L); a term that drew on ideas of metacognition, thinking skills, self-regulation, self-efficacy and self-esteem in relation to learning. But in that the project teachers were invited to explore the different approaches they understood as being encapsulated by this heading, the common aim was just a starting point:

*'The role of Learning to Learn and the Learning to Learn project has been the umbrella that has drawn together all our various initiatives, ensuring that we are all moving in one direction. The regular meetings and conferences have helped us to remain focused and on track with our research and helped keep Learning to Learn at the forefront of our School Improvement Plan.'* (Ann Webb and Pat Williams, Treloweth Primary School)

Due to teachers' instinct to innovate and, by the nature of their jobs, to be problem solvers, the project brief was interpreted and understood in diverse ways. This introduced a level of unpredictability for the university researcher; however this transfer of the locus of control regarding the focus and direction of the research to the teachers was paramount in achieving the project aims (Higgins & Leat, 2000). It was also, overtly linked to a model in which teachers adopt cultural tools (Boreham & Morgan, 2004) linked to research and embed them within their practice of learning and teaching. Thus the developmental process of action research; which for most teachers involved several research cycles; is much more than the acquisition of a research 'skill set', encompassing personal perspective transformation, cultural change within schools and the broadening of external networks of collaboration, communication and critical challenge.

In Timperley's (2008) robust review of the professional learning field she showed that the association of top down models of professional development with improvement is weak and often variable with little sustained impact, but with bottom up (teacher led) approaches a close association to student need that engages with practitioners' theories of practice (Argyris & Schön, 1974) increases

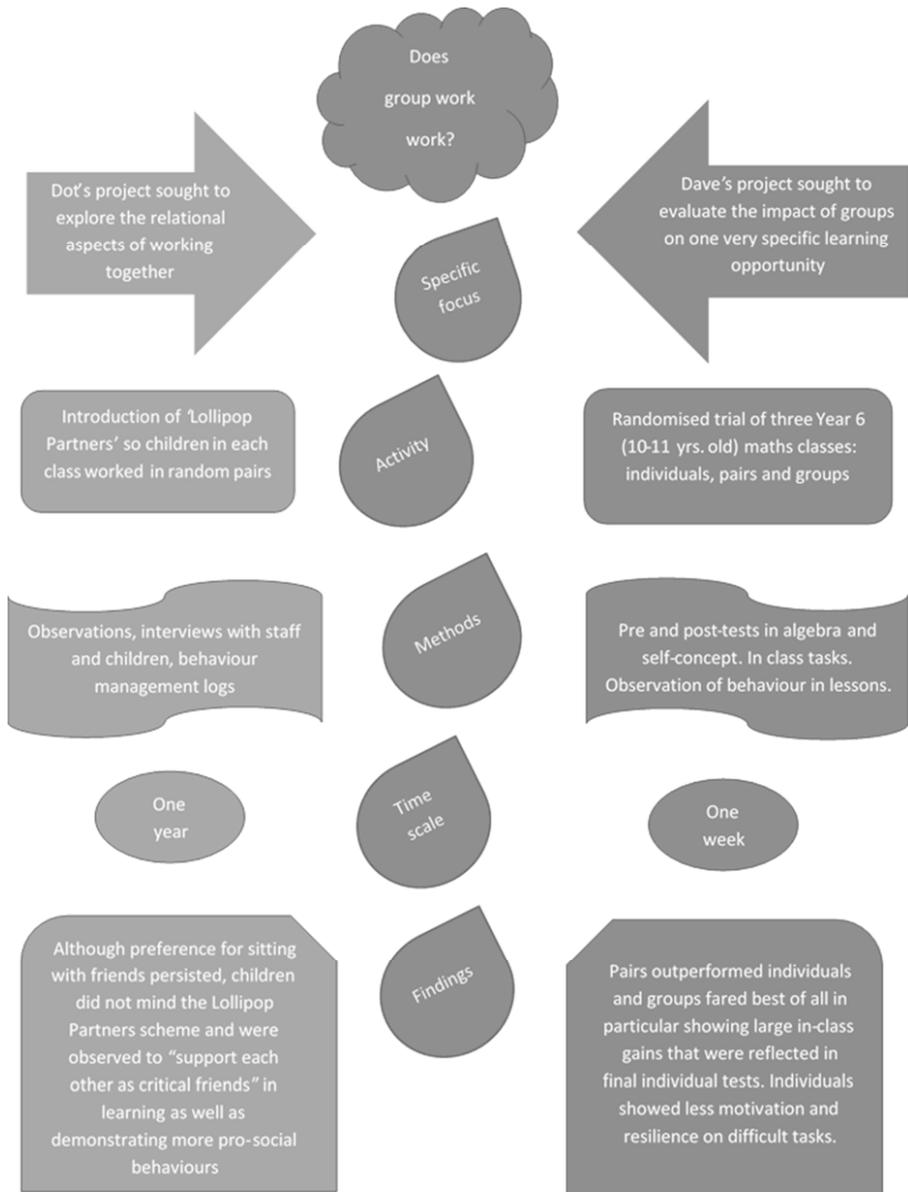


Figure 3. Comparison of research approaches

the likelihood of sustained impact on student outcomes. Indeed, in 2009 Timperley and colleagues showed what this could look like, using a 'teacher inquiry and knowledge building cycle' and produced student gains that were four times the national expectation in New Zealand. They concluded that there were crucial links between the teachers' active engagement in their own learning journey and the way in which this is associated to their students learning needs. In addition, Hattie (2009) has shown that teachers make a significant difference in learners' outcomes and provides some guidance on 'good bets' and areas for teachers to focus their energies on. However, we have already emphasised that we don't think telling teachers what to do or how to do it is either effective or defensible and that it is better (from both a pragmatic and ethical position) to have a dialogue in which different kinds of expertise can be shared. We are convinced that in practitioner inquiry the stimulus from the practitioner's own classroom is central and that the focus on particular content areas is a distraction from developing professional autonomy and research skills. This was christened the 'Bananarama Theory' by Professor Steve Higgins: "*it ain't what you do, it's the why that you do it*".

This is best exemplified by two case studies where the same 'problem area' was attacked in completely different ways by teachers with differing intent. Group work contains complex relational skills, variation in cognitive challenge and differentiation in knowledge or skill outcomes, even before one considers the problems of assessment. A traditional research project about group work might attempt to disaggregate one or more of these elements and study them systematically in several contexts. Teachers in these contexts would volunteer because of their interest in group work but they would not get to set the questions, choose the research methods or evaluate the results. They would undoubtedly learn something from the experience but perhaps not what they really wanted to know – indeed, they might not know exactly what they wanted to know until some way into the process. Two teachers in primary schools produced case studies that looked at group work and they were both in response to a similar experience of negative feedback. Dot Charlton's 4-9 year old pupils (Hipsburn First School, Northumberland) and Dave Archer's teaching colleagues (at Carterhatch Junior School, Enfield) had both questioned the value of students working together – it seemed to be problematic for the learners and not particularly productive of quality learning. Their responses to this feedback represent common pedagogical beliefs – both had a hunch that group work was a valuable experience- and very different research approaches.

In exploring these examples in detail, the principle of disturbance can be seen in action at multiple levels: for example, in the individual schools at the point where the teachers' hunches were in conflict with the beliefs of colleagues or students; or at the project level, around how best to explore the impact of group work, with two projects exploring the same technique but in different

ways. In both examples it is possible to see the dissonance created between ideal and real life teaching and learning, and the impetus for inquiry that was created, as well as the way different approaches can facilitate productive talk about what works and how we know it did. Dot's whole-school intervention of Lollipop Partners – in which children's names are written on lollipop sticks and partners drawn at random – was initially devised as both a short-term and long-term solution to the relational problems of group work. Random assignment and short periods working on defined tasks minimised immediate 'fuss' and also sent a signal about expectations – everyone has something to offer. Children and adults began to experience new groups and to challenge their assumptions both about what they liked and what was useful for their learning. The year-long study used a range of observational and qualitative interview data, triangulated with the school's existing behaviour management logs to track incidents of conflict, bullying or social isolation. Meanwhile Dave conducted a classic experiment, using pre- and post-tests of algebra to track the knowledge and skills gained by individuals compared to the completion of the in-class tasks, test of self-concept to exclude the possibility that one class had a stronger or weaker 'maths identity' and observations of the classes. One study produced rich qualitative data, the other a significant effect size, both shed light on the value and process of group work and highlight the complementarity of practitioner research case studies.

Each teacher was encouraged to use at least three different data collection tools. These tools ideally included both qualitative and quantitative data sources and also ideally encompassed different 'stakeholders' within the proposed area of inquiry, for example, teachers, pupils and parents. This may appear to be excessive and potentially overwhelming but teachers *were also* encouraged to look at sources of information which were routinely collected within the school as sources of research evidence (for example, attainment data or attendance records) and also to look at more traditional research tools as useful for teaching and learning, by for example, making the learning explicit to the pupils. In this way, research methods and teaching approaches were transformed into pragmatic tools for teaching, learning and inquiry (Baumfield et al., 2009). The rationale for this approach was to avoid some of the possible problems that have been identified with action research, particularly in terms of the influence of the individual practitioner (Somekh, 1995).

*'By achieving these aims, we aim to increase the Readiness, Resilience and Resourcefulness for learning of both pupils and staff. We hope a whole school approach to developing ... an active repertoire of approaches to learning, will enable pupils, staff and parents to engage more fully with their learning, thus improving attainment and motivation in school and in life.'* (Helen Hughes, Alverton Primary School)

The research process was therefore constructive in that the act of researching itself impacted upon the wider environment and culture and not limited to the research 'results' and student outcomes. While such results and the impact on learners were an essential component of the research process and provided useful answers to practical questions, they seem no more significant than the impacts of the processes or the acts of undertaking research and the sustainable implications of this. When the action research process was developed effectively throughout the school, research and inquiry becomes integrated with a focus on learning. This suggests that metacognition becomes a more explicit part of the talk between teachers and students and between the teachers themselves. As an individual example of the 'virtuous cycle' on the part of a teacher-researcher, we see a larger-scale iteration extending this process outwards to create a research and metacognitive culture in classrooms (Wall & Hall, 2016). The capability to develop reflection about learning at teacher and student levels was empowering for teachers, schools and students. This appears to be a key component of how the Learning to Learn and Equate programmes supported metacognition across schools through design and focus. Perhaps an important component lay in the combination of teacher's research and practice reflected and modelled through learning that was being explicitly developed with the students.

The experience teachers underwent and the positive impact of these on their own professional development seems to have motivated them to share this with students. They came to perceive this development through the language, frameworks and learning experiences they were themselves using to support their students. This suggests an iterative process of learning at teacher and student levels, supported by the inquiry process. As well as the deliberate sharing of these ideas, the research process produced a natural 'modelling' of metacognition from teacher to student and then from student to teacher. Within our networks we have encouraged teachers to engage with the needs of their students (and what would improve their learning) and have facilitated a process of participatory inquiry at all levels.

In a diverse network of practitioners, however, working in a range of contexts then this essential focus on what your students need adds to the complexity and could arguably ensure that different silos would emerge within the wider group – primary teachers over here, geography teachers over there etc. – but this hasn't happened. We believe that there is something powerful about the focus on learning, through the inquiry into pedagogies that develop metacognition, that has helped maintain coherence to the group while revelling in the difference, another aspect to our principle of disturbance. Learning to learn as an umbrella term was sufficiently inclusive and fundamental to teaching and learning practices that participants regardless of background had sufficient commonality in their

shared values and beliefs about the objectives of the project and education to talk effectively about practice. Indeed the difference inherent in the network was essential in taking the teachers away from the contextual detail and facilitating a move to think about what was happening at a more theoretical level, with the teachers working together to create theories of practice as envisioned by Argyris and Schön (1974).

### **Learning from others and with others**

Vocabulary and how we talk about teaching and learning should by now be obvious as fundamental to our understanding of the inquiry process at all levels, but how the principle of dialogue emerges is something more nuanced than simply talk. The way opportunities for dialogue were approached by participants was highly influenced by the interaction between the principles of autonomy and disturbance. Teachers needed to have ownership and confidence in their project while also being open to challenge and the disturbance created through dialogue with others' inquiries. Understanding the way that the network supported this dialogue and helped the process of making it relevant to the teachers' day-to-day existence in the classroom was paramount. It has to be useful.

Networks to support innovative pedagogy are traditionally organised by bringing together teachers from particular subject disciplines or from specific phases of education. These networks are strengthened by the similarities of context and the common language that participants share. However, they may also be weakened by the inability of participants to access broader perspectives or to recognise the role of accustomed and unexamined practice in limiting their pedagogic options- to be challenged. Cordingley and colleagues (2005) point to the value of studying learning across boundaries when researching how educational networks operate and evolve. Central to our understanding of how definitions and agendas for Learning to Learn emerge and evolve was the extent to which learning takes place across professional as well as organisational boundaries (Hall, 2009). Of importance to us was gaining an understanding as to the nature of boundary spanning relationships within the network- as Little (2005) puts it, knowing 'What's in the arrow?' that links nodes together. Specifically, we were interested in the potential for projects based on teacher and learner inquiry to stimulate innovative pedagogy and ideas about pedagogy that could cut across primary, secondary and further education contexts, as well as the ability of teachers to recognise the research implications as well as the pedagogic potential presented in the case studies of colleagues. At the heart of this problem is the means by which practitioner inquiry, supported by the university, might

move from being that of personal interest, to one that was acknowledged and owned by the community of practice (McLaughlin & Black-Hawkins, 2004).

We tested this by analysing the data collected when we re-framed our annual residential conferences. Starting in 2009, we placed much more emphasis on teachers sharing their work and much less on presentations from academics. We were rather pleased with ourselves about this; fortunately we had formative feedback from one of our teachers – “Oh, a conference where we get to confer!” which helped us to realise that the teachers had been ready to be autonomous dialogic researchers for some time. Our contribution was to convert each teacher’s case study document (typically 12-30 pages long) in to an A2 poster (an example in Figure 4). In this way, teachers could make presentations without the need for time-consuming additional preparation. Participants in residential gatherings could access each other’s work outside of the presentation times and those teachers unable to attend could both have their work represented and access the posters via the website.



## WAYS OF PROMOTING A PRO-ACTIVE SKILLS CURRICULUM IN YEAR 6

Paula Ross  
Marlborough Primary School, Cornwall



*What are the optimum ways of promoting a pro-active skills curriculum in order to positively impact on children’s learning, teacher skills and teacher and pupil motivation?*

### PROJECT AIMS

Children will be enthusiastic to learn, be more self motivated, have more responsibility for their learning, and reflect and make decisions on future learning.

Teachers will be more innovative in their planning, willing to let children lead the learning, more confident to try out new ways of working – keeping things fresh – so less of the ‘half life’ syndrome, and developing strategies which have worked in the past in new ways e.g. exciting writing – so again less of the ‘half life’ syndrome.

### DIMENSIONS OF THE PROJECT

This is Year One of the project at Marlborough and involved in this project were two teachers and their relevant classes (30 pupils in Year 1 and 31 pupils in Year 6). In this case study we will look at Year 6 undertaking a number of approaches including: speaking and listening (discussion, questioning, presentation), drama (Mantle of the expert, Forum theatre, etc.), ICT (Use of Digi blue cameras, IWB etc.), media (film), and Learning

### SUMMARY OF FINDINGS

**Beneficial Strategy:** Mantle of the Expert for developing independence and feeding into all other aspects under consideration. **Strategies which didn’t work:** Some aspects of reflection – mood board.

**Benefits from research:** Broadening our knowledge and range of techniques has enthused us and excited the children.

**Adaptations:** Different approaches to adding children’s reflection.

### CONTACT INFORMATION

Marlborough School  
Ferndale Road  
Falmouth  
Cornwall  
TR11 4HU  
01326 314636  
www.marlboroughschool.co.uk

For over 25 years I have worked in “traditional” classrooms, where in the main I had been “in control” of the workspaces, groupings etc. In 2006, I received a class with 37% of the children having special needs including some pupils with physical disabilities. A rethink was required to accommodate the extent and variation of the difficulties in learning and particularly in peer relationships. I started to explore classroom management. The outcome was “no set places” with children being required to move after each break in the day which stopped the constant needing behaviour towards each other. From here, I wanted to move on towards a classroom which is organised primarily by the children.

- The plates which needed juggling at the beginning of the year were:
  - Giving children more responsibility for their learning and learning space – collaboratively setting their own ground rules
  - Providing a space in order to use speaking and listening approaches particularly drama more efficiently.
  - Providing resources which were easily accessible especially ICT resources such as digi blue cameras for reflection.



The result: I defined a quiet reading corner and then I removed all the furniture (tables and chairs) except for a block of 4 to one side of the room, a small coffee table and an art table near the sink. Laptop space was already in place due to the requirement for them to be added for the network. Stacking stools of various sizes (some bought others purloined) were available and yoga mats. I bought a class set of A4 and A3 clipboards.

His set ground rules. Sometimes I would need the children to be in a particular group for an activity but in the main they were treated to select own learning partners. If they chose to abuse this responsibility, I would select their partner/group/workspace. We also used the Hat: a simple utility that offers an easy way to automatically determine a random order from a list of names (<http://www.harmonychow.com>). In this way pupils

were learning with peers who they wouldn’t have necessarily chosen themselves and through hearing different views able to formulate their own rather than copy a more dominate friend.

### Evidence collected

**Learning Logs**  
Variety of methods of feedback within the learning logs, gives children more opportunity to be truthful about what works for them. Reflection sheets give a scaffold – free writing was more limiting for many.

### Setting own targets and generating questions

Very good results in developing the Dragon’s Den project but not sustained for the Sports topic in the first term. However once this was changed to a Theatre Challenge, it was easy to see how they were building on previous learning. What was extremely pleasing was the extent to which it was pupil initiated.

The use of film was very successful – seen in how much more thinking went into their first films than in the earlier ones. It led to greater use of the school video player in lessons with children’s suggestions for location, type of shot etc. (Spring and Summer term) and stopped the “ambiguism – I’m being filmed” scenarios. Children were more natural and took no notice of the cameras.

### Interviews

Where possible these were carried out by people not linked to the class so that the children could feel free to express their feelings.

### Summary

•Children are capable and keen to direct their own learning when given the opportunity.

•Children’s ideas often mirror and extend what the teacher would have put in place anyway.

•Play through, for example, Mantle of the expert/drama strategies, helps the children to have a real purpose for their learning and results in a clearer understanding of the topic.

**The impact on the school:** 2 more classrooms have been refurbished to facilitate this approach. A further classroom is on track for refurbishment during 2009/10.

**The impact on the teachers:** From September 2008 over half of the teaching staff will be following a similar format

**The impact on the children:** Greater motivation and enthusiasm to learn.

**The impact on the wider community:** Prospective parents viewing the school for the first time comment on how much they would have liked to have learned in this atmosphere and how different it is to other schools in the area.



Figure 4. An example of a poster generated from a case study

Although the participants could identify a poster's sector of education by colour, there were no other differentiations made: presentation groups were organised to include all sectors and the main display was randomly generated. With the case studies as the stars, we were able to focus on what participants were drawn to and what they might use. Analysis of the data would reveal whether this was enough to produce sufficient 'identity congruence' to enable collaborative learning to take place (Hughes, 2010).

Data collection tools were identical in 2009 and 2010, consisting of a simple survey with seven categories (Figure 5.).

Name	From
<i>The case study that</i>	<i>Came from</i>
Had the best Learning to Learn idea	
Broadened my horizons	
Had the L2L idea I'm most likely to use in my own teaching	
Entertained me the most	
I will use/ adapt the data collection methods	
Application for a range of curriculum areas and ages	
I would recommend to other teachers	

Figure 5. Data collection instrument with categories

There were two key findings that emerged from the 2009 data that were confirmed in 2010:

- Influence was not mediated by sector
- Influence was not mediated by time in the project

Although the most popular posters were from primary schools, there was an overall even distribution of popularity by sector in both 2009 and 2010. Being new to the project was also not a disadvantage.

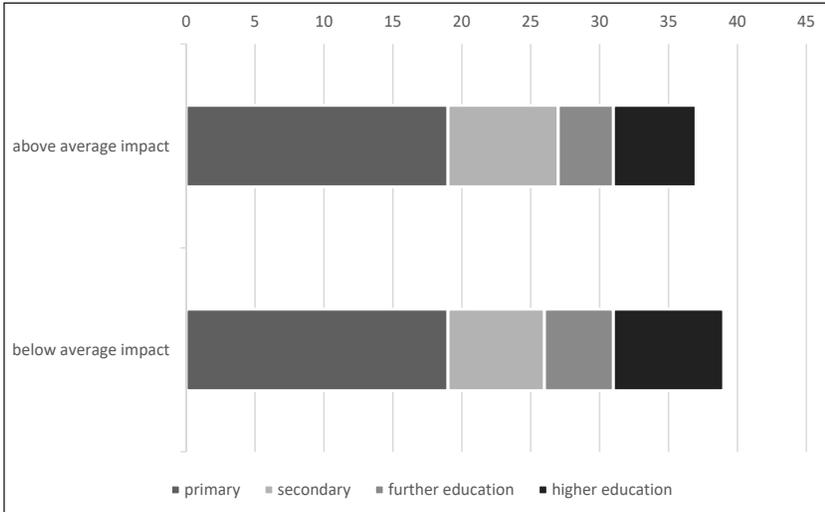


Figure 6. Impact by sector 2009 and 2010

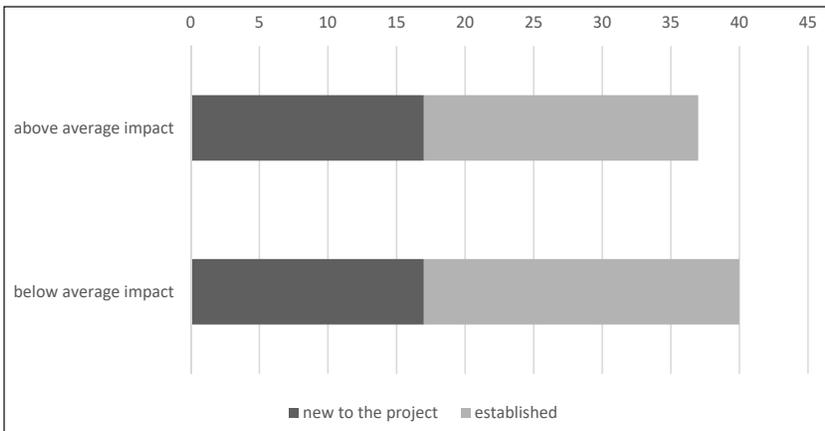


Figure 7. Impact of length of time in the project 2009 and 2010

Nvivo software was used to map the connections between presentations, posters and participants. The individual participants, their votes in the different categories and the relationships between them were mapped, as the diagrams below show. The network diagrams again show that the reasons people were drawn to a piece of work were quite diverse and that both the very popular and the more moderately attractive presentations and posters elicited a range of responses (original data colour versions are available in Towler, et al., 2009).

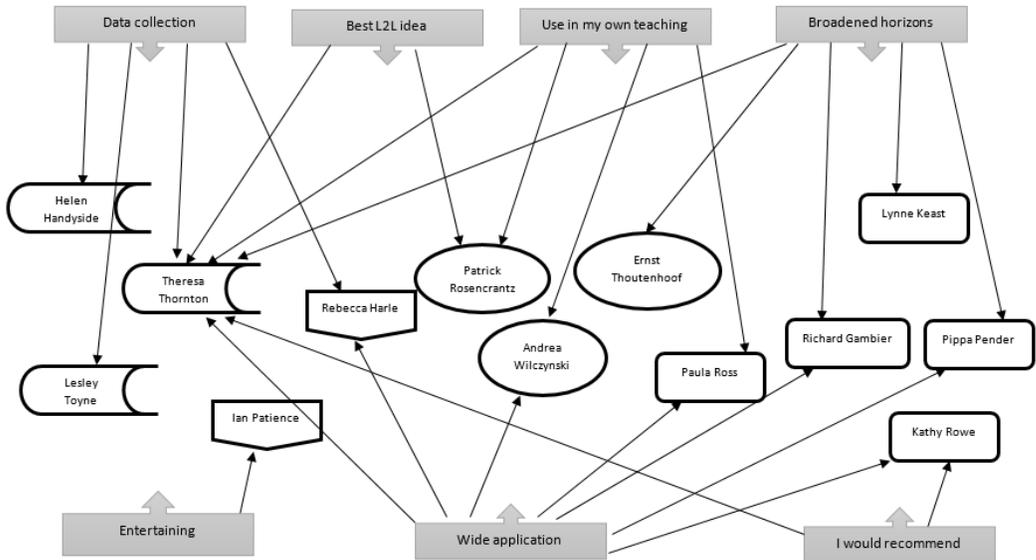


Figure 8. Jarka Glassey (EQUATE) influence

In Figure 8 the impact of a presentation given by a University participant can be seen. Colleagues from EQUATE (ovals) plan to *use the ideas in my own teaching* but so does a teacher from a primary school (rectangles). The *data collection methods* used find particular favour with colleagues from the FE sector (cylinders) and also from a secondary teacher (envelopes). Jarka's presentation attracted votes in every category, unsurprisingly getting multiple 'hits' for *broadening horizons* and *application for a range of curricula and ages*. Her broad appeal could probably be attributed to the important and universal pedagogical problems she addressed in her study: student engagement and the use of feedback. At the level of the project, Jarka was evoking key Learning to Learn themes about the role of student feedback in stimulating teacher interest and action. As we have discussed elsewhere, (Hall, 2009; Baumfield et al., 2009), the work of the network, focusing on tools and inquiry was the catalytic element, rather than its' components.

In Figure 9, we have an example of a presentation from FE, which attracted a mainly older crowd: only one of the respondents worked with primary aged children (rectangle). However, although (as a traditional homogeneity model might predict) the University, FE and secondary teachers were attracted to this presentation, they were drawn to different aspects, so whilst it might be possible to predict for some presentations *who* might be interested, it would be very hard to predict *why*.

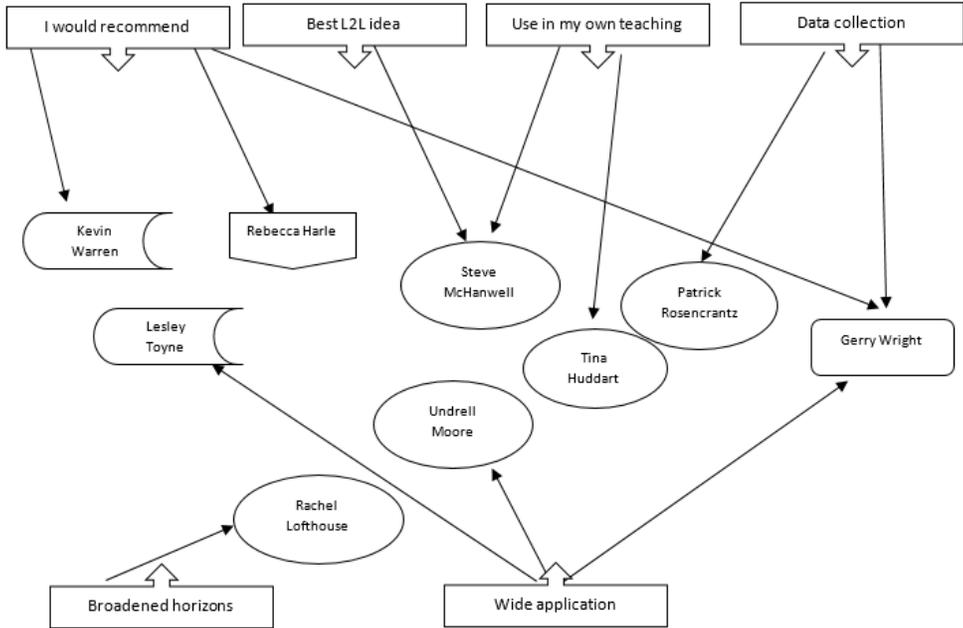


Figure 9. Tanya Paget and Mark Young (L2L in FE) influence

Overall, only a small number of participants (n=6/ 51) voted for presentations only from their own sector of education. This data does seem to support our belief that teachers can see beyond the details of context to grasp ideas about pedagogy to take away with them. However, this raised a further question – once they have got the ideas home, do they use them?

**Is there evidence of influence in this heterogeneous network?**

30 posters from 2009	36 respondents in 2009	31 2010 posters produced by 2009 respondents
-------------------------	---------------------------	--

Figure 10. Tracking influence: the data set over two successive years

In order to explore this, we looked at the ten most popular presentations from the 2009 residential and at the people who said they had been impressed by this work. With seven categories in play, this quickly became quite complex and so,

for the first level analysis, we decided to focus on those categories which might leave a more obvious trace in a future case study: *Had the L2L idea I'm most likely to use in my own teaching* and *I will use/adapt one of the data collection methods for my own research*. We have looked for evidence in the 2010 case studies that elements have crossed over. Of course, these elements could have been inspired elsewhere and their presence in the case study may have pre-dated the Residential. However, these categories on the questionnaire were explicitly about intent, so we feel justified in suggesting a potential influence.

Presentation from	Respondent n=	Trace of influence?		
		Yes	No	No case study
Archbishop Benson Primary	3	2	1	0
Carterhatch Primary	2	1	0	1
Hazelbury Infants	1	0	1	0
Kathy (Marlborough Primary)	0	0	0	0
King Edward VI High	5	2	2	1
Learning Space	3	2	1	0
Paula (Marlborough Primary)	2	0	0	2
St Meriadoc Nursery and Infants	1	1	0	0
Tytherington High	2	1	1	0
Wooler First	4	2	1	1
Total	23	11	7	5

Table 1. Links between responses to presentations at 2009 Residential and content of 2010 case studies (use the idea in my own teaching)

Where respondents in 2009 (n=23) liked the notion of using an L2L idea for their own teaching, we felt we could detect influence in almost two thirds of the 2010 case studies (n=11 from 18, since 5 did not produce a case study). Arguably, since we were looking within the case studies we were only glimpsing those aspects of teaching which immediately pertained to the activity of Learning to Learn: exploring, data collection, analysing and reporting. We have extensive interview data about the extent to which Learning to Learn transfers into practice but this is beyond the scope of this current chapter. We are sufficiently confident, however, to regard the data presented here as an *under-representation* of impact. Given these caveats, it is not surprising that in terms of data collection, the pattern was more distinct, with seven out of ten respondents making use of the method they had liked (details in Table 2).

Presentation from	Respondent n=	Trace of influence?	
		Yes	No
Archbishop Benson Primary	1	1	0
Carterhatch Primary	2	1	1
Hazelbury Infants	0	0	0
Kathy (Marlborough Primary)	0	0	0
King Edward VI High	1	1	0
Learning Space	1	1	0
Paula (Marlborough Primary)	0	0	0
St Meriadoc Nursery and Infants	0	0	0
Tytherington High	4	2	2
Wooler First	1	1	0
Total	10	7	3

Table 2. Links between responses to presentations at 2009 Residential and content of 2010 case studies (a data collection method I'll use)

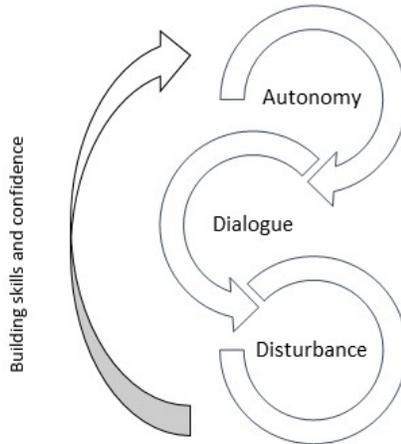
As we have observed earlier, the range of influence transcends contextual background and it was very difficult to predict just what a participant would take from a poster: Michelle from Northumberland FE college took from the Archbishop Benson Primary poster the idea and practical process of using learners as researchers, whilst Victoria from Wooler took the 'primary- friendly' idea of using animals to represent dispositional concepts into her classroom of eight year olds. Meanwhile, her colleague Deborah from the same school chose to focus on the interviews used in the project.

What clearly emerged from these maps and webs of influence was a picture of our 'network about pedagogy' as a complex organism. As Meirink and colleagues (2010) have found, simple models of interdependence and mutuality in teacher learning are not an accurate reflection of the way in which teachers use and share their knowledge. We can state with confidence that teachers of undergraduates are provoked and informed by teachers of five year olds and that methods of engaging reluctant vocational learners have been enthusiastically greeted by teachers of ten year olds. Teachers from all sectors value the opportunity to explore the common underpinning ideas of pedagogy, which in homogenous networks can become obscured by 'shop talk' of the details of curriculum or assessment procedure.

## **Conclusion**

Teachers are busy people; to engage in research then they have to be interested and see relevance in the process and outcomes for improving teaching and learning for their students. The Principle of Autonomy is fundamental to our model of practitioner inquiry; everything else flows from this ownership. By giving control of their research intent to the participants then we were demonstrating a trust in their knowledge of their students needs and the best way for them to be addressed. This did mean that on occasion teachers explored pedagogic innovations that we might not agree with, such as learning styles (a particular challenge for one of us in particular), but we had to trust them and also the process of inquiry to ensure a quality process of improvement (Groundwater-Smith & Mochler, 2007). The research process mostly proved us right, but not always, and as with any tool based on the Bananarama theory, the 'why' that you are using it might overtake any original assumptions about impact.

The impact of this approach was to tap into teachers' potential as innovators and so the project brief was interpreted and understood in a number of ways, producing a complex map of innovation approaches with the connecting theme of improving pedagogy in order to support learners to become resilient, independent



*Figure 11. The interaction of our practitioner inquiry principles*

and metacognitively aware. As detailed elsewhere (Baumfield et al., 2008; 2012; Lofthouse, Hall & Wall, 2012) we do not consider that this diversity was a threat to the project's overall validity, since the quality of each individual project was judged on its particular methodological merits rather than competing with others. Rather, it led to a dynamic of friendly challenge and dissonance, the Principle of Disturbance, that we now see as fundamental to effective inquiry and the development and evaluation of teachers' theories of practice (Argyris & Schön, 1974).

Within the case studies we see parallel learning processes in operation: the students' learning and thinking, as represented by the teachers' developing insight, understanding and confidence in their ability to meet the students' learning needs, alongside the teachers' learning and thinking, with a developing proactive perspective on their own professional learning journey and a belief in their agency to make change happen (Priestley et al., 2015). The former was always our initial target; the latter naturally emerged over time as it became more and more apparent to the project community that for students to become more metacognitively aware then the teachers needed to undergo a similar learning transformation. Arguably by combining these parallel pathways within the same project 'ecology' (Dewey, 1938) then we have started to close the gap noted by Vermunt and Endedijk (2011), certainly this was the case within the teachers' thinking and in some cases in the students' (Wall 2012; Wall & Hall 2016). This has been supported by genuine and risky conversations, as set out in the Principle of Dialogue.

The action research process allowed the practitioners not only to be reflective about their classrooms, but also to be strategic about changes that they felt appropriate, to be metacognitive about their practice (Wall & Hall, 2016). The collection of data, to inform whether the action worked, helped to legitimize the process and the codification of their thinking with their peers validated the findings and their associated thinking. This was particularly the case because these were not simple 'good news' stories – the Principle of Disturbance meant that evidence was inconclusive or contradictory and fundamental ideas had to be re-examined. The close feedback loops created by the action research process helped the teachers to be reflective and strategic thinkers: to be effective practitioner enquirers. It meant that they were being metacognitive about their teaching and learning practices and about their own professional learning, building skills and confidence to generate new autonomous questions. This in turn meant they were more likely to be metacognitive about their own learning lifelong and life-wide.

## References

- Alexander, A. (2010). *Children, Their world, Their Education: Final report and recommendation of the Cambridge Primary Review*, Abingdon: Routledge.
- Argyris, C. & Schön, D. (1974). *Theory in practice: Increasing professional effectiveness*, San Francisco: Jossey- Bass.
- Baumfield, V., & Butterworth, M. (2007). Creating and translating knowledge about teaching and learning in collaborative school-university research partnership. *Teachers and Teaching*, 13(4), 411-427.
- Baumfield, V.; Hall, E. & Wall K. (2012). *Action Research in the Education: Learning through Practitioner Enquiry (2<sup>nd</sup> Edition)*. London: Sage.
- Baumfield, V., Hall, E., Higgins, S. & Wall, K. (2009). Catalytic tools: understanding the interaction of enquiry and feedback in teachers' learning. *European Journal of Teacher Education* 32(4), 423-436.
- Baumfield, V., Hall, E., & Wall, K. (2008). *Action Research in the Classroom*. London: Sage.
- Bernstein, B. (1990). *The structuring of pedagogic discourse: Class, codes & control*. Volume IV. London: Routledge
- Boreham, N. & Morgan, C. (2004). A sociocultural analysis of organisational learning, *Oxford Review of Education*, 30, 307-325.

- Cochrane-Smith, M. & Lytle, S.L. (2009). *Inquiry as Stance: Practitioner Research for the Next Generation*, London: Teachers College Press.
- Cordingley, P. (2015). *Evidence about teachers' professional learning and continuing professional development*. In McLaughlin, C., Cordingley, P., McLellan, R. and Baumfield, V. (Eds.) *Making a Difference: Turning teacher learning inside-out*, Cambridge University Press, 53-75.
- Cordingley, P., Bell, M., Thomason, S. & Firth, A. (2005). The impact of collaborative continuing professional development (CPD) on classroom teaching and learning. Review: How do collaborative and sustained CPD and sustained but not collaborative CPD affect teaching and learning? In: *Research Evidence in Education Library*. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
- Dagenais, C., Lysenko, L., Abrami, P. C., Bernard, R. M., Ramde, J., & Janosz, M. (2012). Use of research-based information by school practitioners and determinants of use: a review of empirical research. *Evidence & Policy: A Journal of Research, Debate and Practice*, 8(3), 285-309.
- Day, C., Kington, A., Stobart, G., & Sammons, P. (2006). The personal and professional selves of teachers: stable and unstable identities. *British Educational Research Journal*, 32(4), 601-616.
- Dewey, J. (1904). The Relation of Theory to Practice in Education. *The third NSSE yearbook part one*, 9-30. Chicago, IL: University of Chicago Press.
- Dewey, J. (1938/1991). *Logic, the theory of enquiry. The later works of John Dewey*. Volume 12, ed. Jo Ann Boydston. Carbondale and Edwardsville: Southern Illinois University Press.
- Ecclestone, K. (2004). Learning in a comfort zone: cultural and social capital inside an outcome-based assessment regime. *Assessment in Education: Principles, Policy and Practice*, 11(1), 29-47.
- Groundwater-Smith, S. and Mockler, N. (2007). Ethics in practitioner research: an issue of quality, *Research Papers in Education*, 22(2), 199-211.
- Hall, E. (2009). Engaging in and engaging with research: teacher inquiry and development. *Teachers and teaching: theory and practice*, 15(6), 669-682.
- Hall, E., Wall, K., Higgins, S., Stephens, L., Pooley, I. & Welham, J. (2005). Learning to Learn with Parents: lessons from two research projects. *Improving Schools*, 8(2), 179-191.
- Hattie, J. (2009). *Visible Learning: a synthesis of over 800 meta-analyses relating to achievement* London: Routledge.
- Higgins, S. & Leat, D. (2000). *Horses for courses or courses for horses: what is effective teacher development?* In J. Soler, A. Craft & H. Burgess (eds.) *Teacher Development: Exploring our own Practice* (pp. 57-68). London: Paul Chapman Publishing.

- Higgins, S., Wall, K., Baumfield, V., Hall, E., Leat, D. & Woolner, P. (2007). *Learning to Learn in Schools Phase 3 Evaluation Year Three Final Report*. London: Campaign for Learning.
- Hughes, G. (2010). Identity and belonging in social learning groups: The importance of distinguishing social, operational and knowledge-related identity congruence. *British Educational Research Journal*, 36(1), 47-63.
- James, M. & Brown, S. (2005). Grasping the TLRP nettle: preliminary analysis and some enduring issues surrounding the improvement of learning outcomes. *The Curriculum Journal*, 16(1), 7-30.
- Lave, J. & Wenger, E. (1991). *Situated learning: legitimate peripheral participation*. Cambridge: Cambridge University Press.
- Leat, D., Lofthouse, R., & Reid, A. (2014). *Teachers' views: Perspectives On Research Engagement*. *Research And Teacher Education: The BERA-RSA Inquiry* London: British Educational Research Association.
- Lieberman, A. & Grolnick, M. (1996). Networks and reform in American education. *Teachers College Record*, 98 (1), 7-45.
- Lieberman, A., Saxl, E. R., & Miles, M. B. (1988). Teacher leadership: Ideology and practice. In A. Lieberman (Ed.), *Building a professional culture in schools*. New York: Teachers College Press.
- Lofthouse, R., Hall, E. & Wall, K. (2012). *Chapter 12: Practitioner Enquiry*. In A. Briggs, M. Coleman, & M. Morrison (Eds.), *Research Methods in Educational Leadership and Management*. (pp. 170-187). London: SAGE.
- McLaughlin, C. & Black-Hawkins, K. (2004). A Schools-University Research Partnership: understandings, models and complexities. *Journal of In-Service Education*, 30(2), 265-284.
- McLaughlin, C., Black-Hawkins, K. & McIntyre, D. (2004). *Researching Teachers, Researching Schools, Researching Networks: A review of the literature*. Cambridge: Networked Learning Communities.
- McLaughlin, C., Black-Hawkins, K., McIntyre, D. & Townsend, A. (2008). *Networking Practitioner Research*. London: Routledge.
- Meirink, J. A., Imants, J., Meijer, P. C. & Verloop, N. (2010). Teacher learning and collaboration in innovative teams. *Cambridge Journal of Education*, 40 (2), 161-181.
- Moseley, D., Baumfield, V., Elliott, J., Gregson, M., Higgins, S., Miller, J., & Newton, D. P. (2005). *Frameworks for thinking: A handbook for teaching and learning*. Cambridge: Cambridge University Press.
- Nias, J. & Groundwater-Smith, S. (1988). *The Enquiring Teacher: supporting and sustaining teacher research*. London: Routledge.
- Somekh, B. (1995). The contribution of action research to development in social endeavours: a position paper on action research methodology. *British Educational Research Journal*, 21(3), 339-55.

- Stenhouse L. (1975). *Introduction to Curriculum Research and Development*. London: Heinemann Education.
- Stenhouse, L. (1981). What counts as research? *British Journal of Educational Studies*, 29(2), 103-114.
- Timperley, H.S. (2008). *Teacher Professional Learning and Development*. Geneva: The international Bureau of Education.
- Timperley, H.S., Parr, J.M. & Bartanees, C. (2009). Promoting Professional Inquiry for Improved Outcomes for Students in New Zealand. *Professional Development in Education*, 35(2), 227-245.
- Towler, CS, Hall, E & Wall, K (2009). Developing an understanding of how network diagrams can represent and support communication across schools and colleges investigating learning to learn. Paper presented at 1st International Visual Methods Conference, Leeds, United Kingdom, 15/09/09 - 17/09/09, full text available at <http://www.ncl.ac.uk/cflat/news/documents/networkpaper.pdf>
- Vermunt, J.D. & Endedijk, M.D. (2011). Patterns in teacher learning in different phases of the professional career. *Learning and Individual Differences*, 21(3), 294-302.
- Wall, K. (2012). "It wasn't too easy, which is good if you want to learn": An exploration of pupil participation and Learning to Learn. *The Curriculum Journal*, 23(3), 283-305.
- Wall, K. & Hall, E. (2005). *Learning to Learn: Exploring how teachers can learn about innovation in their own classrooms*. Paper presented at the BERA Conference, Glamorgan University.
- Wall, K. & Hall, E. (2016). Teachers as Metacognitive Role Models, *European Journal of Teacher Education*, 39 (4), 403-18.
- Wall, K., Hall, E., Baumfield, V., Higgins, S., Rafferty, V., Remedios, R., Thomas, U., Tiplady, L., Towler, C. & Woolner, P. (2010). *Learning to Learn in Schools Phase 4 and Learning to Learn in Further Education Projects: Annual Report*. London: Campaign for Learning.
- Wall, K., Higgins, S., Glasner, E., Mahmoud, U. & Gormally, J. (2009). Teacher Enquiry as a Tool for Professional Development: Investigating Pupils' Effective Talk While Learning. *Australian Educational Researcher*, 36(2), 93-117.

**Learning to Learn Case Studies** are all available:

<http://www.campaign-for-learning.org.uk/cfl/learninginschools/projects/learningtolearn/index.asp>

Cited in this chapter:

Dot Charlton How will Co-operative Learning Strategies Impact on Social Interactions? <http://www.campaign-for-learning.org.uk/cfl/assets/documents/CaseStudies/Yr1Hipsburn.pdf>

Dave Archer The Impact of Individual, Pair and Group Work on Performance in Algebra <http://www.campaignforlearning.org.uk/cfl/assets/documents/CaseStudies/Carterhatch2.pdf>

ISBN 978-83-65644-28-2