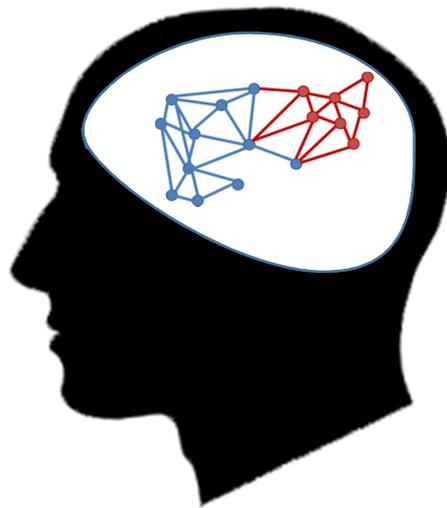




# **Leading Improvements in Teaching, Learning & Assessment**



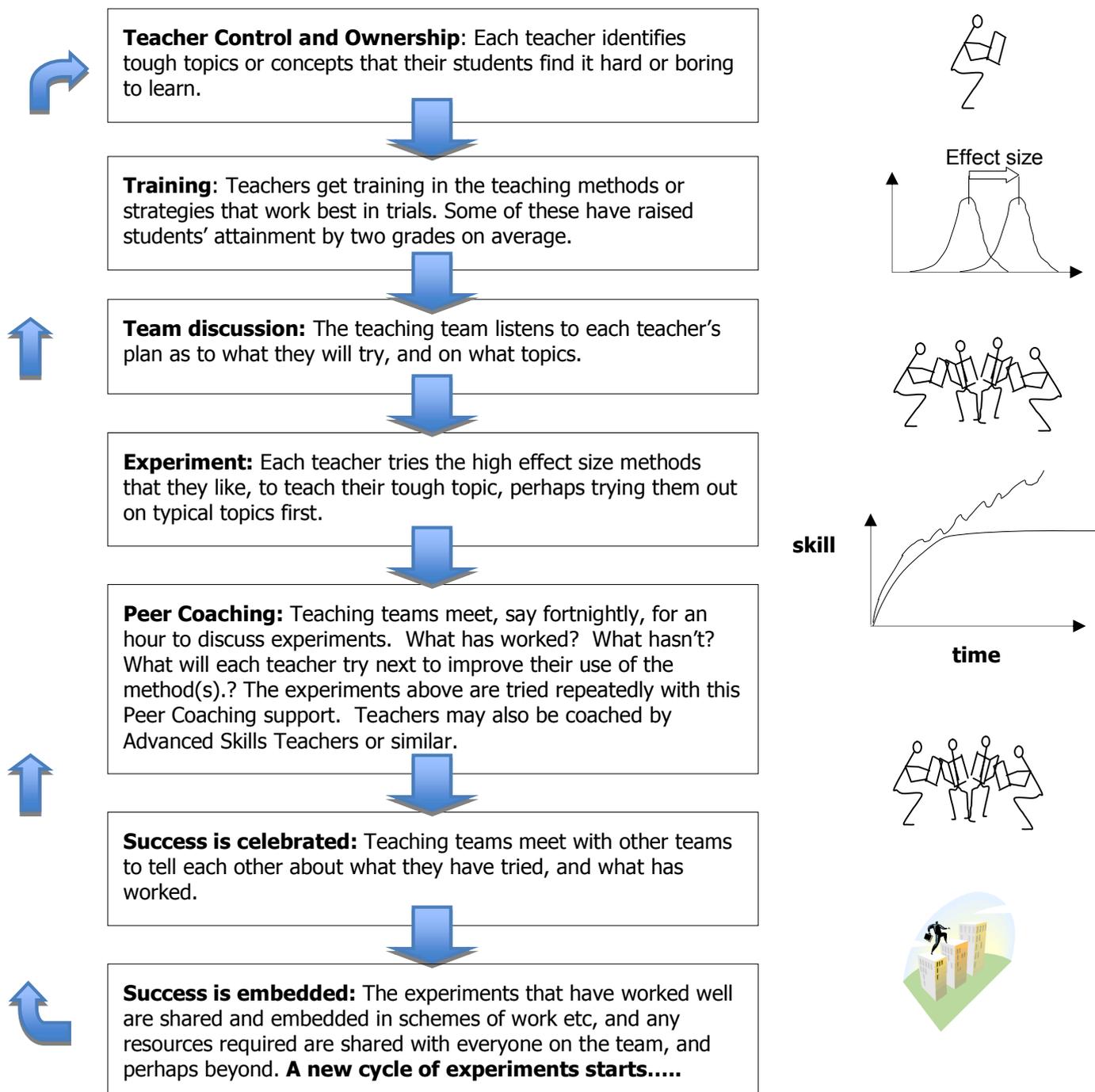
**Leading Further Education  
A National Conference, 21<sup>st</sup> March 2014**

**GEOFF PETTY**

## Supported experiments

Geoff Petty [www.geoffpetty.com](http://www.geoffpetty.com)

This is a continuous improvement strategy. Reviews of research show this strategy works best, and the teaching methods experimented with are also what works best.



### Why does this work?

Teachers are engaged because they are solving their own problems, and they are in control. They take the credit for the improvements they develop, and tell others about them - can create a real 'buzz'. Everyone improves, not just the weakest.

Major problems are solved and high performance teaching methods are used more often.

### How do we know it works?

Two comprehensive summaries of all good research on INSET have concluded this approach is by far the

## **Some methods with high effect sizes according to Marzano's meta-study**

These methods have some of the highest average effect sizes for content delivery.

### **When getting students to apply their learning**

**'Same and different':** (Average effect size 1.32)

Tasks that require the learner to identify similarities and differences between two or more topics or concepts, often one they are familiar with, and one they are presently studying. The best strategies involve students developing analogies that link new content with old. This is sometimes called 'compare and contrast'.

**Graphic organisers:** (Average effect size 1.24)

The student creates their own diagrammatic representation of what they are learning, for example in a mind-map, flow diagram or comparison table. They get feedback on this for example by seeing other students work, or peer assessment or self assessment against a teacher's model.

**Note Making.** (Average effect size .99)

Students create personal notes on the information being presented. Some strategies involve the teacher indicating key points and then leaving time for students to embed them in notes, others offer no assistance to the learner.

Peer explaining is verbal note making really and also has a very high effect size. Again students need feedback e.g. a self check against important points the teacher thinks they should have mentioned.

**Decisions-Decisions:** (Average effect size .89)

Students physically manipulate cards or objects or symbols which represent concepts or ideas they are learning about. E.g. 'Decisions decisions' see 'Teaching Today' by Geoff Petty. Some computer simulation activities have an effect size of 1.45.

**Cooperative learning (.78)** these are methods like jigsaw that require students to teach each other and to check each other's learning.

**Feedback (formative assessment) (1.13)**

Giving students information about what they have done well and what they need to improve either directly, or indirectly e.g. by requiring them to mark their own and each other's work against model answers or mark schemes and other 'formative teaching methods'. Stressing that achievement comes from effort not ability.

Medal and mission feedback Average effect size (1.13)

Medals alone (.74) (This is not praise but information about what was done well)

Stressing effort over ability (0.8) (formative teaching methods do this.)

Praise alone e.g. 'well done that is very good' has very little effect, about 0.08

### **Generating and testing hypotheses (0.79)**

These all require the students to use high order reasoning on material that has been presented to them. Essentially they are all evaluative thinking. They work best with 'assertive questioning'.

Testing hypotheses directly. You give students some basic ideas and principles, e.g. about photosynthesis in plants, and students work out ways of testing the hypothesis. They devise an experiment and carry this test out. Students need to state their hypothesis clearly.

"What would happen if ...." questions. E.g you teach students about a government system to improve employment and then give students questions in a what would happen if format and students must produce a reasoned response using their knowledge of the system. å

Problem solving students suggest a solution and test it or get feedback on their ideas in some other way

Historical investigation: students create a hypothesis and then look for evidence for and against it.

Invention: students use their knowledge e.g. of quality systems in order to devise one for a particular novel context.

Decision making: students use their knowledge to make a challenging decision.

### **When presenting new information, skills etc**

**Advance organisers:** (Average effect size from .48 to .78 depending on complexity)

Giving students summaries in advanced of what they are about to learn, they are like 'cues' above, but are much more detailed. They provide a means for students to structure

the topic. I don't know why the effect size is lower than for 'Cues', is it because Advance organisers are too detailed to be readily recalled? Any ideas!?

- The effect of Advanced Organisers on students' understanding of topics that require understanding of relations, connections etc shown by the organiser. .78
- It's effect on the the ability of students to recall facts, cause and effect sequences etc .56
- Using Advanced Organisers to teach mental skills such as data analysis, evaluating a historical document etc .60

(Note that Advanced Organisers have most effect when the learning is complex)

### **Relevant recall questions** (Average effect size 0.93)

These are questions designed to bring useful, and essential prior learning into the learner's short term memory, and to check it, before building the new learning upon these foundations.

Questions requiring students to recall what they already know about the topic or skill to be learned. For example recalling relevant learning from the previous lesson, or from a term ago.

Questions recalling prior experience that can be built upon. For example a maths teacher might get students to recall experience of '*cutting things up*' and '*sharing things out*' before teaching them the concept of division as described in chapter 2.

For best results these should be asked both *before* and *during* the lesson.

**Challenging goals** (Average effect size up to 1.21 for more complex topics) The highest effect size occurs if the goal/task is given in advance. Ideally the student also sets themselves a goal. Consider to what extent the goal has been met after and perhaps during the session.



You can download a great summary of Marzano's ideas here as a pdf file  
<http://www.mcrel.org/topics/products/110/>

Petty, G. (2009) "Evidence Based Teaching" 2<sup>nd</sup> Ed, Nelson Thornes [www.geoffpetty.com/experiments.html](http://www.geoffpetty.com/experiments.html)

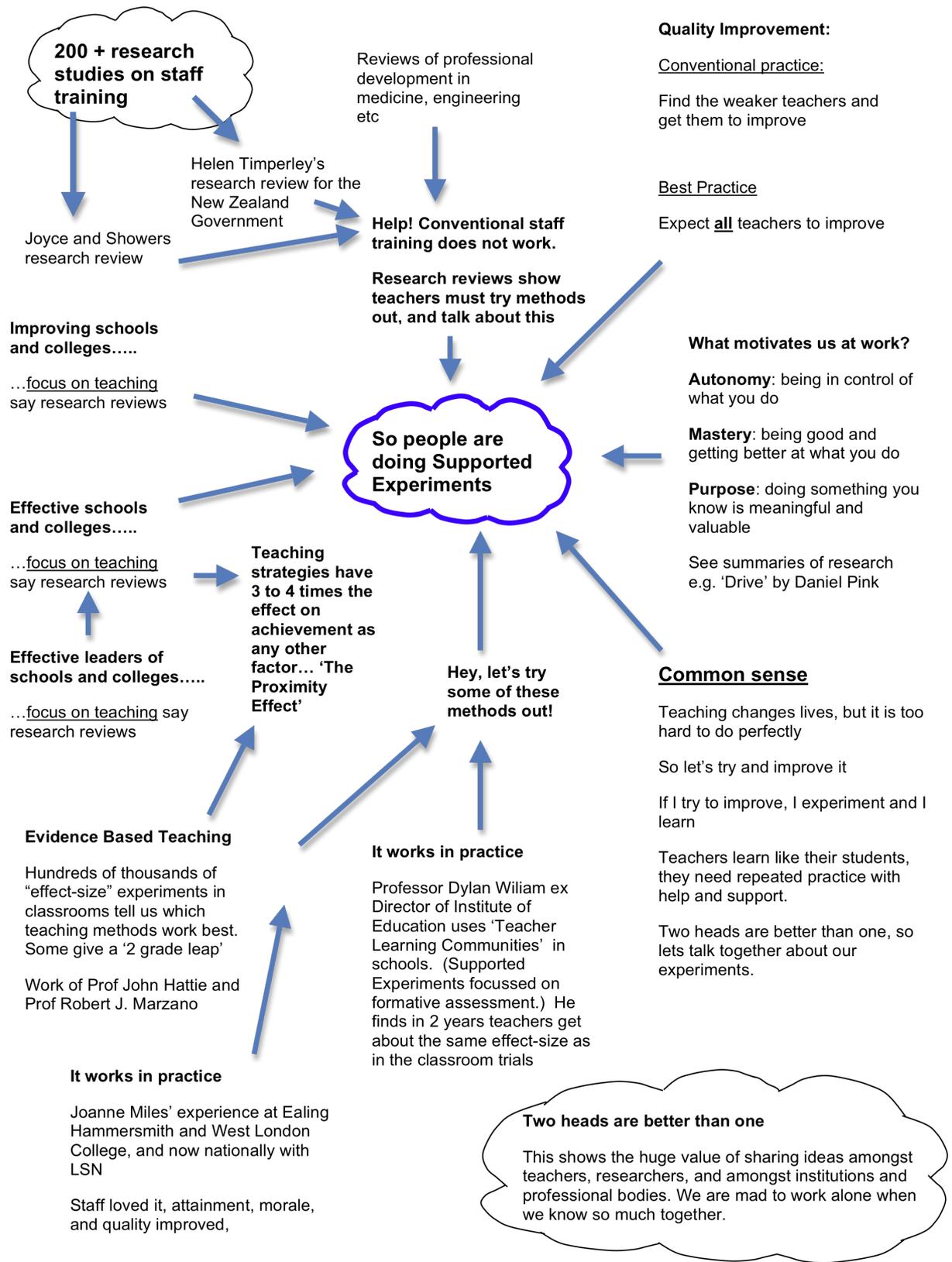
Joyce and Showers (2002) 'Student Achievement through Staff Development' 3<sup>rd</sup> ed. ASCD [www.ascd.org](http://www.ascd.org)

Maynard and Martinez (2002) "Pride or Prejudice? College Teachers' Views on Course Performance" London LSDA. Free download from [www.lsneducation.org.uk/pubs/pages/021296.aspx](http://www.lsneducation.org.uk/pubs/pages/021296.aspx)

Timperley H et al (2007) "Teacher Professional Learning and Development"  
[www.educationcounts.govt.nz/publications/series/2515/15341](http://www.educationcounts.govt.nz/publications/series/2515/15341)

Hattie, J. (2009) "Visible Learning: a synthesis of over 800 meta-analyses relating to achievement" Routledge

Marzano R. Pickering, D. Pollock, J. (2001) "Classroom Instruction that works" Alexandria: ASCD



See 'Evidence Based Teaching' Geoff Petty and [www.geoffpetty.com](http://www.geoffpetty.com) for the detail

## Student Achievement Through Staff Development

Geoff Petty: author of 'Teaching Today' and 'Evidence Based Teaching' [www.geoffpetty.com](http://www.geoffpetty.com)

This paper is a summary and discussion of the seminal text on improving student achievement: Joyce and Showers (2002) '*Student Achievement through Staff Development*' 3<sup>rd</sup> ed. ASCD [www.ascd.org](http://www.ascd.org)

### Overview

Teaching has at least three times the effect on student achievement as any other factor, and teaching in every type of educational institution can be improved, regardless of its present performance. But it is not enough to run staff development sessions on learning and teaching. Research shows that change in classroom practice requires teachers to **experiment** with new methods, and to **discuss** resulting difficulties with colleagues, along with other improvement issues. Otherwise most teachers try ideas suggested in training only once or twice at best, and then revert to their usual practice.

So managers must encourage experimentation, and provide opportunities for teachers to meet in teaching teams.

The result is a continuous improvement model based on collaborative Action Research – 'the teacher as researcher'.

## The research

The Joyce and Shower's book cited above is a review of research on attempts to improve student achievement by staff training on learning and teaching. It finds that only one broad approach works, but that it works very well indeed. Huge improvements in achievement have been created using this model, improving pass rates and grades greatly even in high performing institutions. Expensive national initiatives not using this model have failed to make any improvements.

The model is collaborate action research, structured in this way:

### 1. Training needs are identified.

This is done democratically. The team of teachers asks itself:

'What do we feel are our most pressing needs?'

'What do our results tell us?'

A list of ideas for improvement is drawn up, 10 to 20 items probably. These are combined, compromised and prioritised down to **one common goal** to change curriculum, teaching methodology, or student culture etc so as to raise attainment.

(The common goal needs to focus on a process, designed to produce better outcomes etc. It must affect the **student experience** if it is going to have an effect) so 'raising achievement' won't do.

Neither will 'improve course record keeping'

### 2. Staff Training is devised

This is on the process designed to achieve the common goal. Training outcomes are agreed for knowledge, attitudes, skills, and (the hardest part!) transfer to the classroom.

### 3. Training is delivered on the following pattern. It is extensive, e.g. a dozen days:

**Knowledge:** explaining theory and rationale etc using lectures, reading, video etc

**Demonstration and modelling:** showing how, giving examples, seeing it done on video or live, watching simulations etc.

**Practice** this is mainly simulated practice usually

**‘Peer Coaching’:** This is collaborative work by teachers and managers to solve the problems or questions that arise during implementation and to plan responses. It is not lesson observation with expert feedback. The ‘coaching’ teams are formed at the training event. All the teaching and management staff agrees to take part in a peer coaching team. Coaching skills may be taught in training. If lessons are observed the teacher is the coach, the observer the learner. During training the team agree when and how to meet for this collaborative work.

Organisational support is vital for Peer Coaching to take place. The organisation and the individuals in it, must value this collaborative planning and learning, and make time for it. The Peer Coaching must not lead to ‘lethal mutation’ of the teaching methods explained in the training, that is, the methods must not be adapted to the point that they do not work.

Summary table on research on hundreds of INSET initiatives:

Percentage of participants achieving the training outcomes at different stages through the training			
	Outcomes		
	Knowledge (thorough)	Skill (strong)	Transfer (executive implementation)
<b>Study the theory</b>	10%	5%	0%
<b>Demonstration/modelling</b>	30%	20%	0%
<b>Practice</b> (usually simulated during training)	60%	60%	5%
<b>Peer Coaching</b> during and after training)	95%	95%	95%

### What do these findings tell us about how we should work?

I will now look at what Joyce and Showers had to say about the role of the teacher, the manager and senior managers, and the leader of teaching teams if teaching is to improve.

Clearly this whole process needs managing. In particular

### What must teachers do to improve? - Supported Experiments

Research summaries\* all stress that teachers have more effect on student achievement than any other factor, including school management, resources etc. To improve achievement we must improve teaching, and only teachers can do this. So we must get teachers to experiment.

Joyce and Showers have found that teachers must practise with a new method 20-25 times to learn to use it as effectively as their usual methods. The first few attempts with a new method may fail, and the teacher may then be tempted to abandon further experiments – this is where the support provided by peer coaching is so vital. Teachers are very capable learners, but all learning requires time, practice and support, and the time for change has been greatly underestimated.

Over time teachers can adapt the methods to their context, and learn to use them appropriately and successfully, and embed their use into their usual practice, and in to schemes of work. But this takes time and support.

Students also need to learn how to respond to the new methods, effective methods are always more demanding of students than conventional teaching. They need to know why these new methods are being used, what it demands of them, and how to respond.

### The teacher’s responsibility

It really helps the above learning process if teachers:

- **Practice the use of the new methods repeatedly in a relatively short period of time, say five times a month.** At first experiments should probably be short but frequent.
- **Monitor the effects of the new method on the learners – Did they learn? Could they cope? What did they find most difficult? Etc What would help them cope better?**

- **Ask students for their support during these experiments, for example ask for their opinions of the methods, and for their suggestions.**
- **Bring issues and difficulties to their peer coaching team for discussion**
- **Help and support the experimentation of other teachers in their team.**

Experimentation has been shown to significantly benefit the 'ethos' or 'culture' in a college or school. As teachers experiment more, both their problem solving skills and their morale improves, and their team becomes more cohesive and responsive to difficulties of all kinds.

If a teacher experiments successfully with an unfamiliar and highly effective method, but only uses this one method once a term students will hardly benefit. It is possible for improvements in teaching to have very substantial effects on students' achievements however. Joyce and Showers quote effect sizes of 2.0 or more! But this was achieved by well-designed training, which included Peer Coaching, and the monitoring of the degree of implementation of the new methods.

## **What must middle managers do? Monitoring implementation**

The aim of monitoring is not to control teachers but to find what prevents effective use of the new methods, and to address these difficulties. It is an integral part of Peer Coaching, ideally teachers and their managers are all involved in monitoring, in a weak team the manager might need to take most of the responsibility though. Key questions are: 'How are the experiments going?' and 'How can I help?'

Some managers set a target for how often their teachers should use the new methods, say at least once or twice a week. Some managers ask their teachers to give a brief account of each experiment in a log, others just rely on memory and discussion in Peer Coaching meetings, and create a log themselves. Questions that need answering include:

- **Which methods are being experimented with, why, how, a by whom?**
- **How often are they being tried?**
- **Do teachers know how to use the method well, that is:**
  - **Do they set appropriate and challenging goals directed at important conceptual ideas,**
  - **Do all students participate?**
  - **Do learners and the teacher get highly informative feedback?**
- **Has the use of the method been low or high quality? That is:**

**Low quality:** The teacher just imitates an example shown during training, and goes through the motions without much understanding of why the method works.

**High Quality:** the teacher has developed a sophisticated understanding of the method and why it works, and implements it effectively with imagination

**It is practice followed by Peer Coaching rather than teacher talent that makes the difference. It might take twenty or more trials to get from low to high implementation of the method, only high quality implementation is likely to get the maximum effect size for the methods.**

- **How do students respond?**
- **What are the obstacles – what have teachers found most difficult?**
- **What help do we/they need?**

It takes time to adapt methods and students' responses so don't be disheartened if the process takes some time, terms or years rather than weeks. Indeed, if change happens easily, expect low quality implementation! In the meantime it is crucial to encourage risk-taking, and to adopt a no-

blame policy. Early on, and where difficulties are encountered, experiments should be **short** (say ten minute activities maximum), and frequent.

You might also look to data such as student achievement, student satisfaction, retention, improved behaviour, less complaints etc as measures of success. These are likely to be your goals, so check they improve over time.

Effective methods are demanding of students, who may initially resist – “can’t we just copy off the board?” - “I wasn’t taught like this at school, do we have to?”

However, once students get used to the new methods, and develop the skills to respond to them, they nearly always prefer them to more conventional methods.

## **Senior Managers’ and leaders’ responsibilities**

Joyce and Showers have found that leadership which supports the improvement of teaching must avoid a ‘maintenance’ style, and move towards an ‘improvement and renewal’ style. See also Maynard and Martinez (2002) “Pride or Prejudice” for a brilliant empirical study, which verifies this in FE. A leader is someone who inspires others towards positive change, so an enthusiastic novice can be a better leader than their manager! We perhaps all have a leadership role. But designated leaders need to adopt the ‘improvement and renewal’ approach to effect positive change.

**Maintenance style:** acceptance of present standards. E.g. student achievement is as good as can be expected. This attitude is often associated with a strong tendency to believe that the factors that affect student achievement are not in teachers’ or managers’ control. E.g. achievement depends only on family background, social class, innate talent and intelligence etc.

**Improvement and renewal style:** An emphatic belief that it is always possible to improve. Also that the factors that affect student achievement are mostly in the students’ and teacher’s control: good teaching, effort, practice, support, time etc.

Realisation that factors which can’t be controlled such as underperformance due to low socio-economic backgrounds or family or ethnic background etc is best addressed by high quality teaching methods. (See Joyce and Showers for strong evidence on this.)

Leaders can help the improvement of teaching and learning by:

- **Acknowledging and promoting the need for collaborative work, e.g. Peer Coaching in meetings.**
- **Ensuring that meetings are frequent and long enough and sufficiently well attended.**
- **Expecting a high standard of Peer Coaching**
- **Expecting that trials of new methods are sufficiently informed by evidence, and sufficiently self-critical to learn from.**
- **Monitoring the middle manager’s role described above. Are they being effective in maximising the degree of implementation of strategies for example?**
- **And throughout being positive, and inspiring, by promoting the view that improving teaching is both vital for the learners, and possible. This is ‘culture management’, see chapter 25 of ‘Evidence Based Teaching’ by Geoff Petty.**

Who is likely to implement and who not? Joyce and Showers have researched this thoroughly and find some surprising negative findings and one positive one:

- Enthusiastic teachers who are ‘buzzing’ after a staff development session may not implement the ideas, those who are critical and unconvinced may do so with enthusiasm! It is not the training, but the teacher’s own implementation that convinces them, this points

again to the crucial role of Peer Coaching. If their own implementation works they persuade themselves, and may even surprise themselves!

- Younger teachers are not more likely to implement ideas presented in staff training.

The authors found that if teachers are active in their personal lives, actively reaching out for experiences such as entertainment, hobbies, and social activity then they are also active in their professional lives. In terms of Maslow's hierarchy of needs these people are 'self-actualising' and they are much more likely to implement new ideas.

In a fascinating research study Joyce and Showers found teacher's personal 'Growth States' using a questionnaire, and found this variable best predicted whether teachers implemented or not, accounting for about three quarters of the variance! However people with high growth states encourage and inspire more passive members of their team to implement. The great majority of teachers are more passive, they are amiable, conforming dependent, and seldom initiate the implementation of new teaching methods. However they will if they are encouraged by those with higher 'growth states'. We need to ensure most teams have a self-actualising member!

A very small proportion of teachers have a very low growth state, and actively push away opportunities in their personal and professional lives, this may be a way of rationalising their fear, they often see change as a conspiracy against them. These may never change, or will be the last to do so.

I looked up paranoid in the dictionary and it said 'why do you want to know?'

## Sharing and Embedding

Joyce and Showers do not make the following suggestions but they might be worth considering, I have certainly seen them help in many colleges. The aim of these methods is to ensure that successful experiments are available to the whole team and to other teams in the college.

- **Sharing good practice:** Teams meet to describe their experiments to teach other, each teacher gives a very short presentation of what they have done along with evidence that it has worked. You could make this a 'bring and buy' session, where every teacher brings an experiment, but every teacher must 'buy' one, that is try it out a few times themselves until they have decided whether it works for them or not. This is useful when experiments have been going for a year or so.
- **'Active Scheme of Work'**. The creation of an Active Scheme of Work can be the focus for Supported Experiments. An Active Scheme of Work has a highly effective student activity for every topic or subtopic on the scheme of work. The teaching team meets to discuss each topic in turn and to share the active methods they use for each one. The best activities are agreed and go on the scheme and resources required for them are shared. Teachers are not dictated to by the scheme, alternatives are allowed if they are agreed to be effective. This takes at least four terms, but has been remarkably popular with staff in my experience. See Evidence Based Teaching chapter 25 and [www.geoffpetty.com](http://www.geoffpetty.com)

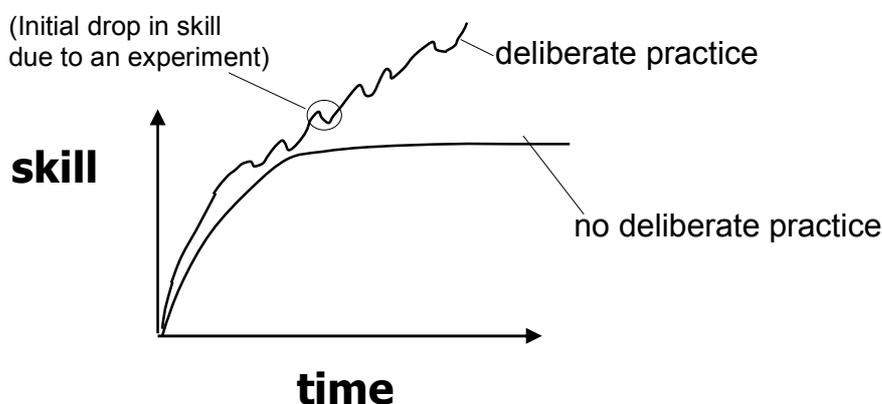
### Why Teachers must experiment to improve.

Joyce and Showers do not consider this but Research Reviews\*\* on the development of excellence in every field of human endeavour show that skill is not dependent on innate talent, but on the total time spent on 'deliberate practice' to improve the skill. Charles Desforges, Professor of Education at Exeter University has stressed the relevance of this finding to the improvement of teaching.

Ericsson found that the most able scientists, engineers, musicians, chess players, athletes, etc, make use of “deliberate practice” of about four hours a day. This is not just “doing it again”. Deliberate practice involves deliberately getting out of your ‘comfort zone’ to do things differently, and better. It means learning about what works and then trying it, it means improving weaknesses. It’s personal research and development. During ‘deliberate practice’ skill levels drop for a short time as that skill is learned, but rise thereafter because of the benefit of the new skill. E.g. a two finger typist becoming a touch typist will be slower - at first.

Those who achieve excellence continually experiment like this, pushing themselves to learn and to improve. Researchers regard deliberate practice as by far the main cause of excellence in every domain. Incredibly, ‘talent’ or IQ has hardly any measurable effect, even in areas like music or academia – (unless it is a talent for deliberate practice!) World-class performers in every domain have behind them a total of about 10 years of deliberate practice at about four hours per day. No exceptions have been found.

Deliberate practice is hard work, four hours a day is about as much as anyone can manage. I suggest up to one hour a week for teachers.



Those who only achieve low standards at work use deliberate practice only during initial training, and probation. Then they settle into a fixed mode of working. They stop practising, and as a consequence their skills ‘plateau’. This is because: *“If you always do what you’ve always done, you’ll always get what you’ve always got!”*

To improve, we must change. And only teachers can change their teaching. So how can we encourage teachers to carry out at least some ‘deliberate practice’ to improve their teaching? How can we get them to experiment with new approaches for a short time every week, practice these until they work well, and then embed them in their normal practice? ---- By ‘Supported Experiments’ --- but experimenting is not enough. Peer Coaching is vital.

#### Why use supported experiments?

- They model and develop a culture of continuous improvement without resorting to a deficit model. Teachers are experimenting to further their professional development, not because their teaching has been pronounced weak. There should be an expectation that every teacher is experimenting, not just those considered weak.
- They include all teachers in continuous improvement, including very able staff. Able staff have a great deal to offer, they can experiment with courageous and innovative approaches, debug them, and so make them available to the whole team, or whole college. They can be inspiring leaders, but deficit minded colleges leave them alone, saying they are ‘not a problem’.
- They provide the blame-free culture needed to encourage and support risk-taking and development.
- They prevent teaching skills from ‘plateauing’ and becoming stale.
- They provide the blame-free support needed to really change classroom practice
- They encourage the development of teaching strategies that respond to known difficulties
- They are inspiring for staff and can even reinvigorate quite jaded teachers

The important thing is this: To be able at any moment to sacrifice what we are for what we could become."  
--Charles DuBois, artist and painter

### **Notes and Further Reading:**

Joyce and Showers (2002) 'Student Achievement through Staff Development' 3<sup>rd</sup> ed. ASCD  
[www.ascd.org](http://www.ascd.org)

Maynard and Martinez (2002) "Pride or Prejudice? College Teachers' Views on Course Performance" London LSDA. Free download from [www.lseducation.org.uk/pubs/pages/021296.aspx](http://www.lseducation.org.uk/pubs/pages/021296.aspx)

Petty (2006) 'Evidence Based Teaching' Nelson Thornes. This describes hundreds of exceptionally effective methods, chapter 25 deals with Supported Experiments and leadership.

\*\*Ericsson K. A. (1993) The role of Deliberate Practice in the Acquisition of Expert Performance. Psychological Review Vol 100 No 3 pp363 – 406. This is a highly influential review of research on expert performance. Download 'Ericsson' from 'chapter 2 downloads' from: [www.geoffpetty.com/evidence\\_based\\_downloads.htm](http://www.geoffpetty.com/evidence_based_downloads.htm)

**Notes** (top of page 2 under 'What must teachers do to improve?')

\*such as reviews of research on school improvement, school effectiveness and effect size reviews such as those by Professor John Hattie or Professor Robert Marzano

### **Useful books for teachers on evidence based teaching**

Evidence-based Teaching by me! Well I would recommend that wouldn't !!

Visible Learning for Teachers by John Hattie, John's other book on visible learning would also be of benefit to the trainers, though it is academic it does answer queries that people might ask.

Teach Like a Champion, Dug Lemov

Classroom Instruction That Works Bob Marzano et al, but do get the first edition, the second edition is very disappointing indeed,

Embedded Formative Assessment by Dylan Wiliam

Assessment for Learning: putting it into practice Paul Black et al

What Really Works in Special and Inclusive Education by David Mitchell

Commonsense Methods for children with special educational needs strategies for the regular classroom: Peter Westwood

Collaborative Learning in Mathematics Malcolm Swan

Peer Instruction a user's manual Eric Mazur

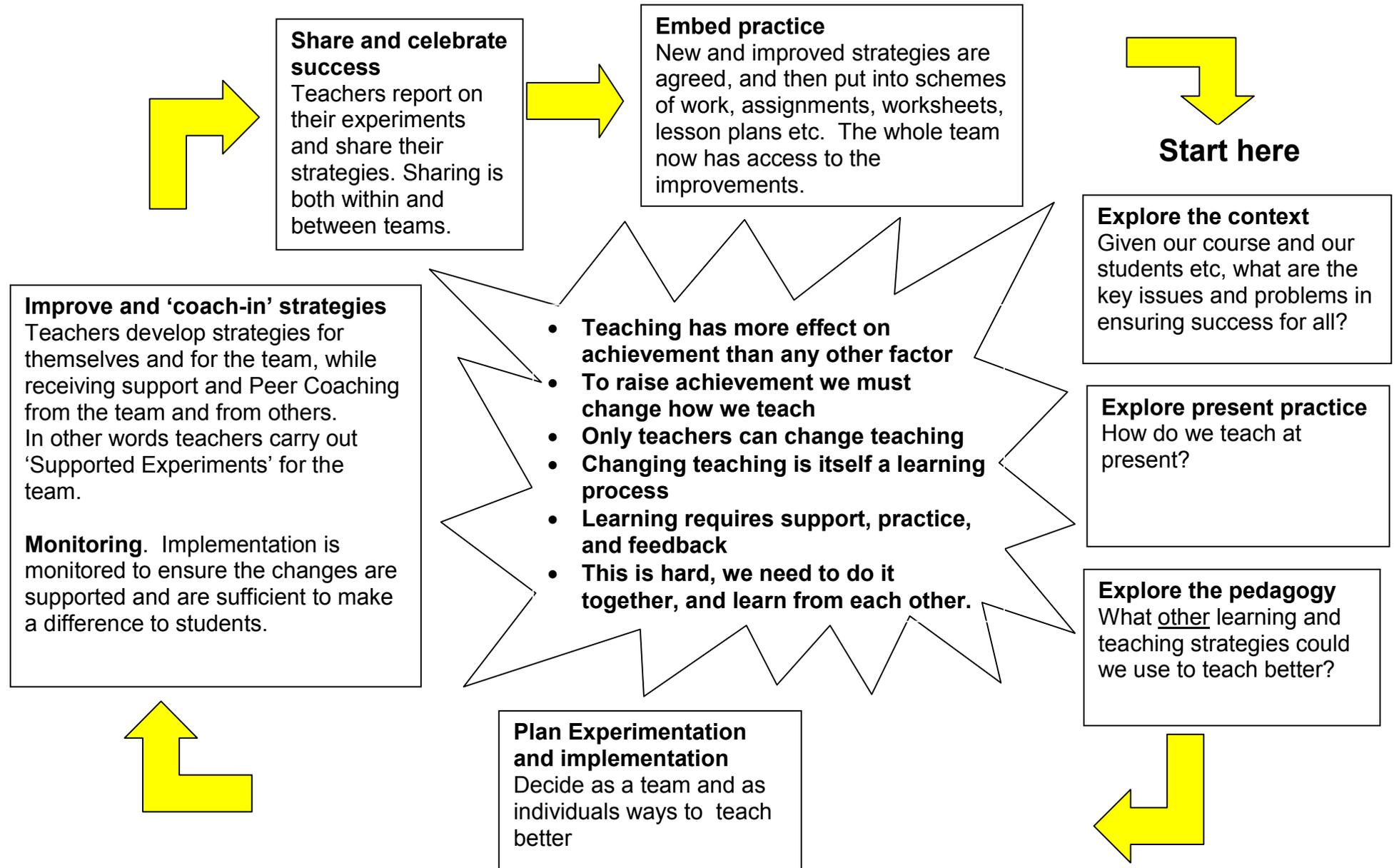
How2Teach guides by Oliver Caviglioli of train visual is an interesting resource but it is expensive

**Geoff Petty 2007**

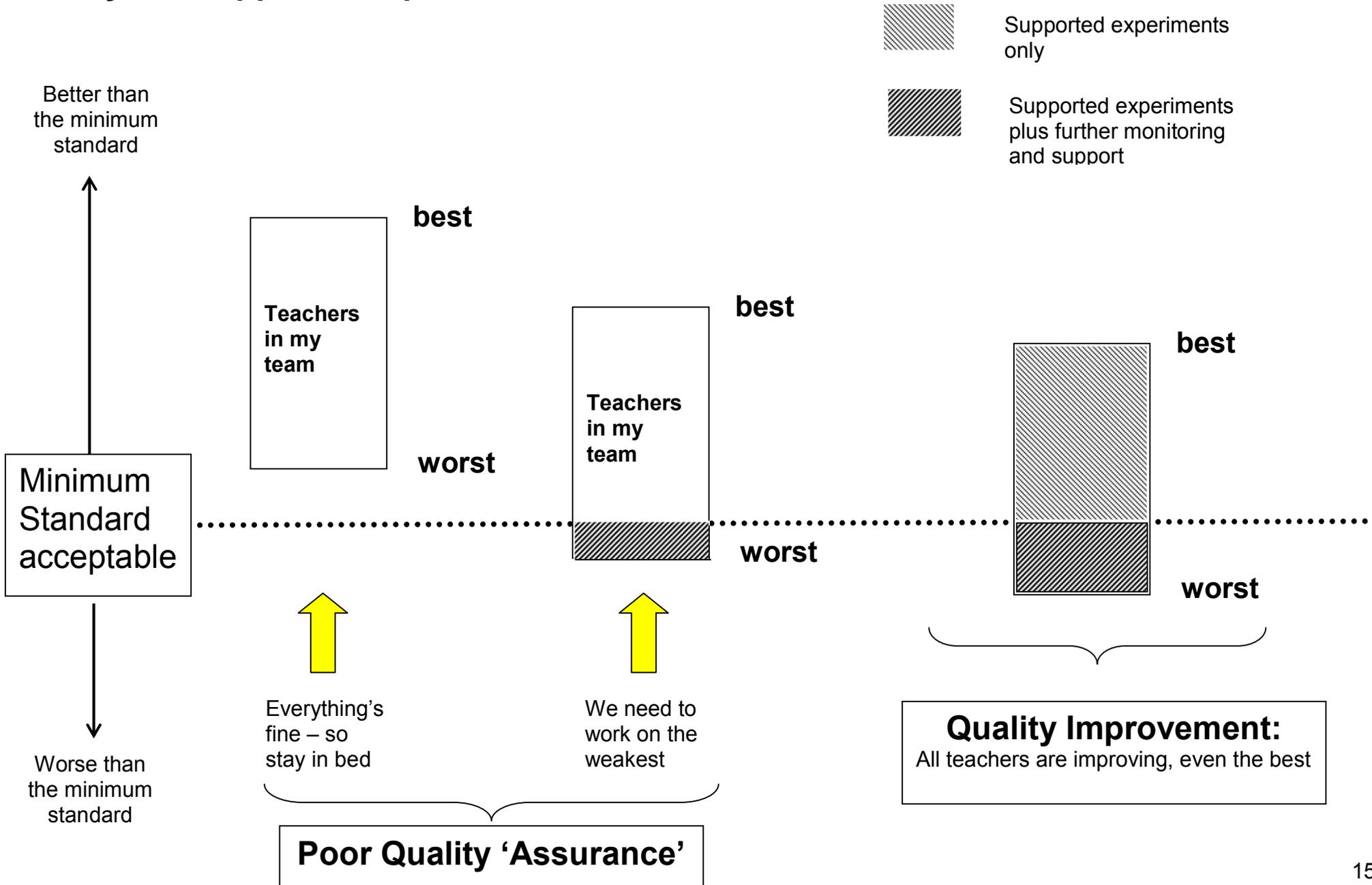
How can you make best use of Technology in the classroom? The use of of technology does not guarantee learning. Here is a paper showing how to get strategic about the use of ILT or ICT. Download Evidence Based ICT from the link below:

[http://www.geoffpetty.com/evidence\\_based.htm](http://www.geoffpetty.com/evidence_based.htm)

**Making it Happen: five steps to improve teaching.... Explore -> Experiment -> Improve -> Share & celebrate -> Embed**



# Why use supported experiments?



## "Teacher Professional Learning and Development": summary of a very large review of research.

This paper summarises Helen Timperley et al (2007) "Teacher Professional Learning and Development" which reviews studies of attempts to improve student learning through the Professional Development of teachers. (She includes 97 excellent research studies on INSET, CPD, staff training programmes etc). I will call all this 'CPD' in this document, but bear in mind Timperley only includes studies aimed at improving teaching and hence student achievement. (Not all CPD is like this!)

Timperley's report was produced for the New Zealand Ministry of Education and is available free on-line: [www.educationcounts.govt.nz/publications/series/2515/15341](http://www.educationcounts.govt.nz/publications/series/2515/15341)

Helen Timperley is one of the world's foremost educational researchers and reviewers, her study on feedback co-authored by John Hattie is the most requested research review from the thousands available from the prestigious 'The Review of Educational Research'.

John Hattie's 'Visible Learning' (2008) gives an average effect size of 0.62 for Professional Development and he cites Timperley's report favourably.

0.62 is 'large', and one of the top 20 of 138 factors affecting student achievement. However this average effect size was produced by very carefully designed CPD programmes. Most CPD will be less effective, unless it follows the advice in her review.

An effect size of 0.5 is equivalent to raising student achievement by one grade at GCSE or A level. So Timperley's research studies improved student attainment by more than this on average. Her review uncovers the characteristics of the studies with above average effect size. Does your practice match up?!

### Timperley's approach in her study

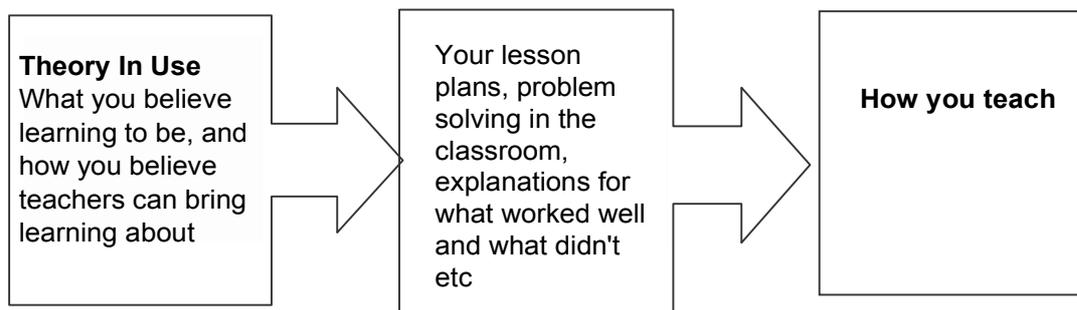
She guessed with help from many experts teachers etc, 84 characteristics that might affect the effectiveness of Professional Development and set about testing the 84 with the best designed studies she could find. She found some studies that had very large impacts on student achievement, one on low achieving students had an effect size of 2.1! The average effectiveness of her studies was 0.66.

#### What is a Community of Practice?

Timperley uses the term '**community of practice**' an important idea in understanding how teachers work. A community of practice is a group of teachers who converse, and who are all teaching similar courses/subjects or students. For example, a teaching team on a science diploma would be a 'community of practice'. This community transfers its ideas to new members, not always deliberately, via peer pressure, expectations etc and so tends to create a common way of thinking. They will agree more than they differ.

#### What is a teacher's "Theory In Use"?

See chapter 46, 'Teaching Today' Geoff Petty



Timperley looked for evidence for which of her 84 characteristics helped CPD to be effective. For example which of them were present or absent in the most effective CPD? She found six characteristics all of which seemed to be necessary, but not sufficient for CPD to work exceptionally well. These are:

- 1. An outside expert delivers the training. (Interestingly another influential research review (Joyce and Showers) does not agree experts are necessary as long as the materials and activities are expertly devised.)**
- 2. All teachers in the school or college should take part, not just volunteers**
- 3. The content of the training should be from policies, or authorities on what is best practice, rather than based on the whims of the trainer.**
- 4. The leaders in the institution should actively lead the learning opportunities, monitoring the implementation of the training by their teachers, and monitoring any improvement in student outcomes. They should develop a learning culture among teachers.**
- 5. Teachers' 'prevailing theories of practice' should be challenged, especially if they suggest that some students can't or won't learn as well as others. Timperley calls this 'problematical discourse'.**
- 6. There should be opportunities for the teachers being trained to talk about the implementation of the training over time. She calls this 'to engage with a community of practice' and 'professional dialogue'. This should last for at least six months to two years, or even more.**

The aim of the training should be 'sustainability', that is, it should aim to improve, long-term, teachers' planning, problem solving etc. **This requires that the training should engage with teachers own theories about what works best, what is possible or desirable etc.**

Other observations in the report (which is book length) include:

- **The aim of the training should be to help teachers self-regulate their own learning. This requires that teachers self-monitor, that is they must identify and diagnose problems with student learning. They must look at student work and other outcomes to see if teaching methods or learning strategies are working, whether these strategies are old or new.**
- **Like their learners the teachers being trained need informative feedback:**
  - **A 'medal' for what they are doing well**
  - **A 'mission' for how to improve**
  - **The 'medals' and 'missions' need to be in relation to a clear understanding of where they are going. They must have clear 'goals' for their teaching.**
- While dialogue in 'communities of practice' is necessary, this can work against the training. For example it might confirm and defend the status quo against the training. Timperley thinks expertise from outside the group is needed to challenge the 'communities' assumptions and provide the necessary new perspectives.

- It helps if existing practice is explicitly challenged. One way of doing this is to provide evidence that produces a 'cognitive conflict'. That is, evidence that directly contradicts teachers' current ideas and ways of working.
- Teachers learn like students so it is helpful in training to ask them to make use of their existing knowledge.
- Beware of the *'I already do this'* response. Often teachers only adopt the 'surface' features of best practice, they 'tick the boxes' or 'go through the motions' without using the methods and strategies in a 'deep' and effective way. They need to understand why and how methods work if they are to use them satisfactorily.
- The process of learning to teach differently is a trial and error or 'iterative' process where new approaches are used repeatedly with reviews. There is a deliberate attempt to learn from these trials, and to improve the use of the unfamiliar teaching method. Higher expectations will develop slowly as teaching methods are mastered and learning is seen to improve.
- Theory and practice need to be integrated, theory needs to be translated into practice.

"Leadership: The art of getting someone else to do something you want done, because he wants to do it." (And she!)

**--Dwight D. Eisenhower, 34th US president**

Timperley suggests a process for designing CPD:

**Teacher inquiry and knowledge-building cycle  
to promote valued student outcomes.**

