



Leading education  
and social research  
Institute of Education  
University of London

# Designing teacher learning that benefits students: the role of school and college leaders

Annual Conference of the Association of  
School and College Leaders

Birmingham: March 2009

**Dylan Wiliam**

[www.dylanwiliam.net](http://www.dylanwiliam.net)



[www.ioe.ac.uk](http://www.ioe.ac.uk)

# Overview: science and design

We need to improve student achievement  
This requires improving teacher quality  
Improving the quality of entrants takes too long  
So we have to make the teachers we have better

Science

We can change teachers in a range of ways  
Some will benefit students, and some will not.  
Those that do involve changes in teacher *practice*

Changing practice requires new kinds of teacher learning  
And new models of professional development.

Design

# Raising achievement matters

## **For individuals**

- ζ Increased lifetime salary
- ζ Improved health
- ζ Longer life

## **For society**

- ζ Lower criminal justice costs
- ζ Lower health-care costs
- ζ Increased economic growth

# Where's the solution?

## Structure

- ζ Small secondary schools
- ζ 'All-through' schools

## Alignment

- ζ Curriculum reform
- ζ National strategies

## Governance

- ζ Specialist schools
- ζ Academies

## Technology

- ζ Computers
- ζ Interactive white-boards

# School effectiveness

## Three generations of school effectiveness research

### ζ Raw results approaches

- ψ Different schools get different results
- ψ Conclusion: Schools make a difference

### ζ Demographic-based approaches

- ψ Demographic factors account for most of the variation
- ψ Conclusion: Schools don't make a difference

### ζ Value-added approaches

- ψ School-level differences in value-added are relatively small
- ψ Classroom-level differences in value-added are large
- ψ Conclusion: An effective school is a school full of effective classrooms

# And it's teachers that make the difference

**The commodification of teachers has received widespread support:**

- ζ From teacher unions (who understandably resist performance-related pay)
- ζ From politicians (who are happy that the focus is on teacher supply, rather than teacher quality)

**But has resulted in the pursuit of policies with poor benefit to cost**

**To see how big the difference is, take a group of 50 teachers**

- ζ Students taught by the best teacher learn twice as fast as average
- ζ Students taught by the worst teacher learn half as fast average

**And in the classrooms of the best teachers**

- ζ Students with behavioural difficulties learn as much as those without
- ζ Students from disadvantaged backgrounds do as well as those from advantaged backgrounds

# How to make teachers better...

## **Replace existing teachers with better ones**

- ζ Important, but very slow, and of limited impact
  - ψ Raising the bar for entry to teaching (5 percentage points in 30 years)
  - ψ Teach First (at most 1% of teaching force)

## **Improve the effectiveness of existing teachers**

- ζ Not because they are not good enough, but because they can be better
  - ψ (so 'good enough' is not good enough)
- ζ The “love the one you’re with” strategy
- ζ It *can* be done
  - ψ Provided we focus rigorously on the things that matter to students
  - ψ Even when they’re hard to do

# The ‘dark matter’ of teacher quality

**Teachers make a difference**

**But what makes the difference in teachers?**

<b>Advanced content matter knowledge</b>	<b>&lt;5%</b>
<b>Pedagogical content knowledge</b>	<b>10-15%</b>
<b>Further professional qualifications (MA, NBPTS)</b>	<b>&lt;5%</b>
<hr/> <b>Total “explained” difference</b> <hr/>	<hr/> <b>20-25%</b> <hr/>

# Cost/effect comparisons

Intervention	Extra months of learning per year	Cost/classroom/yr
Class-size reduction (by 30%)	4	£20k
Increase teacher content knowledge from weak to strong	2	?
Formative assessment/ Assessment for learning	8	£2k

# The formative assessment hi-jack...

## **Long-cycle**

- ζ Span: across units, terms
- ζ Length: four weeks to one year
- ζ Impact: Student monitoring; curriculum alignment

## **Medium-cycle**

- ζ Span: within and between teaching units
- ζ Length: one to four weeks
- ζ Impact: Improved, student-involved, assessment; teacher cognition about learning

## **Short-cycle**

- ζ Span: within and between lessons
- ζ Length:
  - ψ day-by-day: 24 to 48 hours
  - ψ minute-by-minute: 5 seconds to 2 hours
- ζ Impact: classroom practice; student engagement

# Pareto analysis

## **Vilfredo Pareto (1848-1923)**

- ζ Economist, philosopher, etc., associated with the 80:20 rule

## **Pareto improvement**

- ζ A change that can make at least one person (e.g., a student) better off without making anyone else (e.g., a teacher) worse off.

## **Pareto efficiency/Pareto optimality**

- ζ An allocation (e.g., of resources) is Pareto efficient or Pareto optimal when there are no more Pareto improvements

QuickTime™ and a  
TIFF (Uncompressed) decompressor  
are needed to see this picture.

# Schools are rarely Pareto optimal

## Examples of Pareto improvements

- ζ Less time on marking to spend more time on planning questions to use in lessons
- ζ Increased use of peer assessment
- ζ Larger classes with reduced teacher contact time
- ζ Larger classes with increased teacher salaries

## Obstacles to Pareto improvements

- ζ The political economy of reform
- ζ In professional settings, it is incredibly hard to stop people doing valuable things in order to give them time to do even more valuable things
  - ψ e.g., “Are you saying what I am doing is no good?”
  - ψ e.g., “I care about my kids”.

# Why is improving classroom practice so hard?



# Looking at the wrong knowledge...

## **The most powerful teacher knowledge is not explicit**

- ζ That's why telling teachers what to do doesn't work
- ζ What we know is more than we can say
- ζ And that is why most professional development has been relatively ineffective

## **Improving practice involves changing habits, not adding knowledge**

- ζ That's why it's hard
  - ψ And the hardest bit is not getting new ideas into people's heads
  - ψ It's getting the old one's out
- ζ That's why it takes time

## **But it doesn't happen naturally**

- ζ If it did, the most experienced teachers would be the best, and we know that's not so (Hanushek, 2005)

# Example: CPR (Klein & Klein, 1981)

**Six video extracts of a person delivering cardio-pulmonary resuscitation (CPR)**

- ζ 5 of the video extracts are students
- ζ 1 of the video extracts is an expert

**Videos shown to three groups: students, experts, instructors**

**Success rate in identifying the expert:**

- ζ Experts: 90%
- ζ Students: 50%
- ζ Instructors: 30%

## Sensory capacity (Nørretranders, 1998)

Sensory system	Total bandwidth (in bits/second)	Conscious bandwidth (in bits/second)
Eyes	10,000,000	40
Ears	100,000	30
Skin	1,000,000	5
Taste	1,000	1
Smell	100,000	1



Leading education  
and social research  
Institute of Education  
University of London

So how do we improve  
teaching at scale?



[www.ioe.ac.uk](http://www.ioe.ac.uk)

# Teacher learning

**Teacher learning is just like any other learning in a highly complex area**

- ζ In the same way that teachers cannot do the learning for their learners
- ζ Leaders cannot do the learning for their teachers

**Two extreme responses**

- ζ “It’s hopeless”
- ζ Let a thousand flowers bloom..

**Neither will work**

- ζ What leaders can do is engineer effective learning environments for teachers
- ζ ‘Servant’ leadership

# Two competing drivers in design

## **Some reforms are too loose**

- ζ e.g., the 'Effective schools' movement
- ζ Allows customization to the local context
- ζ But can suffer from 'lethal mutations'

## **Some reforms are too tight**

- ζ e.g., Montessori Schools
- ζ Undoubtedly effective
- ζ Not possible to implement everywhere
- ζ Fails to capitalize on affordances in the local context

# Designing for scale: tight *but* loose

## “In-principle” scalability requires

- ζ A single model for the whole school
  - ψ But which honours the specificities of each subject and age-range
- ζ Understanding what it means to scale (Coburn, 2003)
  - ψ Depth
  - ψ Sustainability
  - ψ Spread
  - ψ Shift in reform ownership
- ζ Consideration of the diversity of contexts of application
- ζ Clarity about components, and the theory of action

# The “tight but loose” formulation

... combines an obsessive adherence to central design principles (the “tight” part) with accommodations to the needs, resources, constraints, and particularities that occur in any school or district (the “loose” part), *but only where these do not conflict with the theory of action of the intervention.*

# A model for teacher learning

**Content, *then* process**

**Content (what we want teachers to change)**

- ζ Evidence
- ζ Ideas (strategies and techniques)

**Process (how to go about change)**

- ζ Choice
- ζ Flexibility
- ζ Small steps
- ζ Accountability
- ζ Support

# Strategies and techniques

## Distinction between strategies and techniques

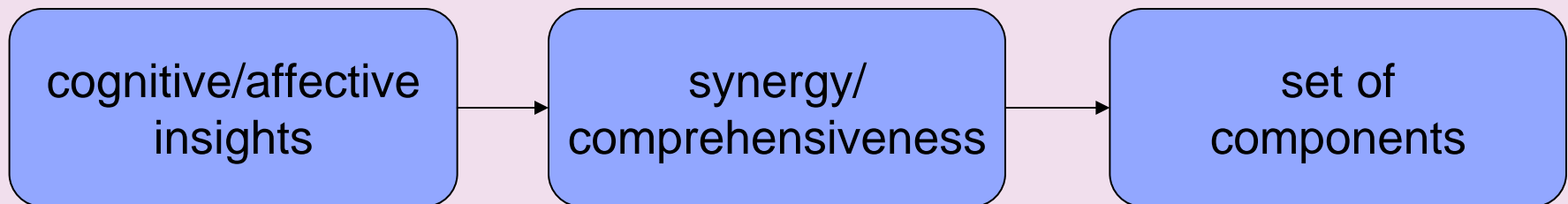
- ζ Strategies define the territory of formative assessment (tight)
- ζ Teachers are responsible for choice of techniques (loose)
  - ψ Allows for customization/ caters for local context
  - ψ Creates ownership
  - ψ Shares responsibility

## Key requirements of techniques

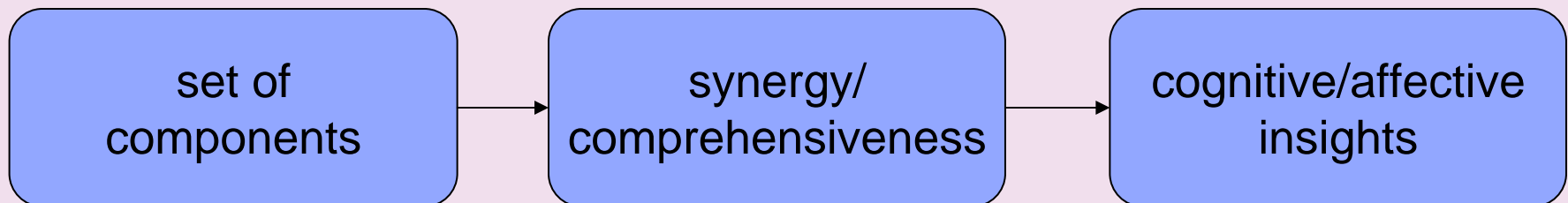
- ζ embodiment of deep cognitive/affective principles
- ζ relevance
- ζ feasibility
- ζ acceptability

# Design and intervention

## Our design process



## Teachers' implementation process



# So what do we need?

## What is needed from teachers

- ζ A commitment to:
  - ψ the continuous improvement of practice
  - ψ focus on those things that make a difference to student outcomes

## What is needed from leaders

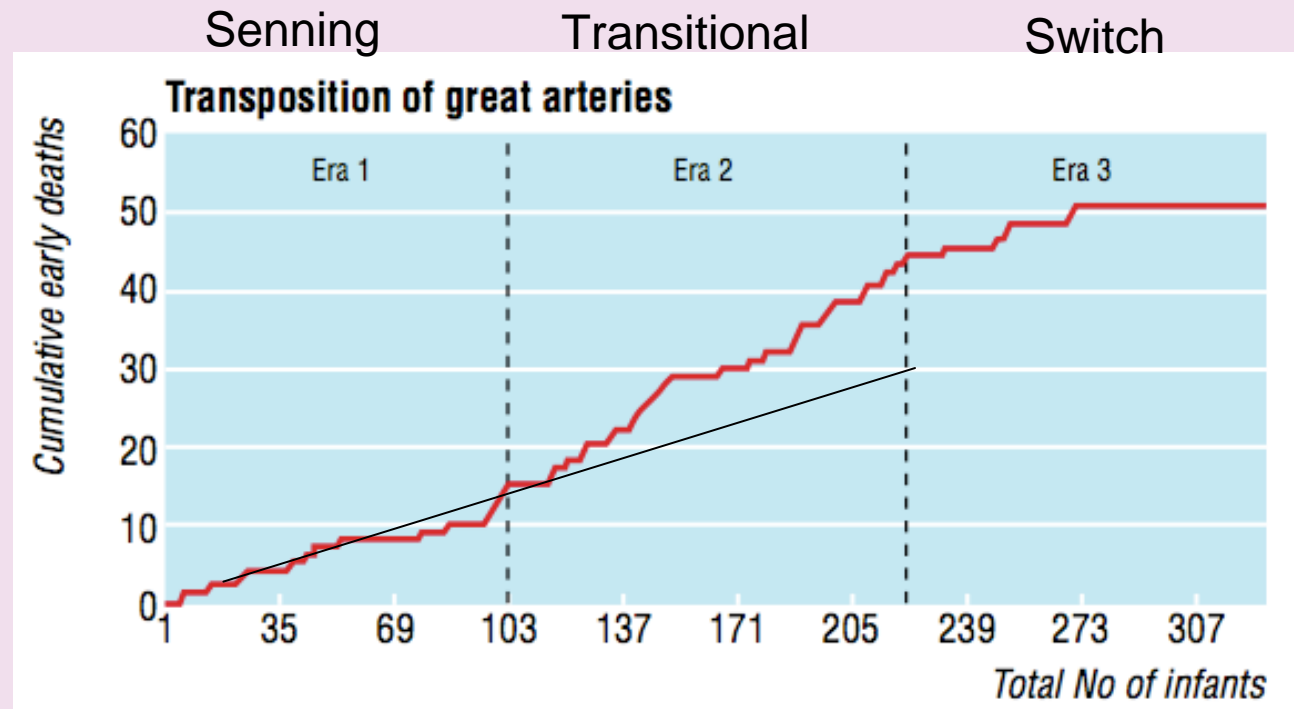
- ζ A commitment to:
  - ψ creating expectations for the continuous improvement of practice
  - ψ ensuring that the the focus stays on those things that make a difference to student outcomes
  - ψ providing the time, space, dispensation and support for innovation
  - ψ supporting risk-taking

# A case study in risk

## Transposition of the great arteries (TGA)

- ζ A rare, but extremely serious, congenital condition in newborn babies (~25 per 100,000 live births) in which
  - ψ the aorta emerges from the right ventricle and so receives oxygen-poor blood, which is carried back to the body without receiving more oxygen
  - ψ the pulmonary artery emerges from the left ventricle and so receives the oxygen-rich blood, which is carried back to the lungs
- ζ Traditional treatment: the ‘Senning’ procedure which involves:
  - ψ the creation of a ‘tunnel’ between the ventricles, and
  - ψ the insertion of a ‘baffle’ to divert oxygen-rich blood from the left ventricle (where it shouldn’t be) to the right ventricle (where it should)
- ζ Prognosis
  - ψ Early death rate (first 30 days): 12%
  - ψ Life expectancy: 46.6 years

# The introduction of the 'switch' procedure



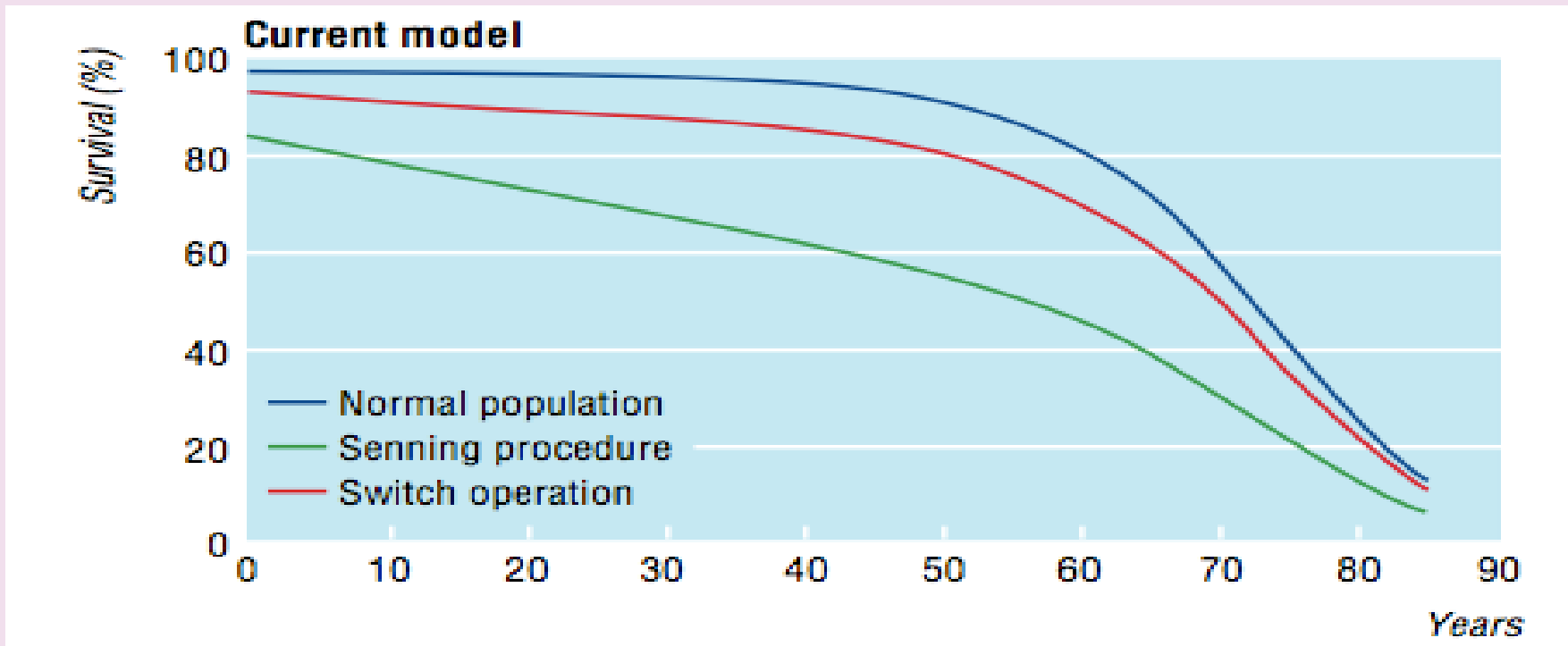
Early death rate

Senning 12%

Transitional 25%

Bull, et al (2000). *BMJ*, **320**, 1168-1173.

# Impact on life expectancy



Life expectancy:

Senning: 46.6 years

Switch: 62.6 years



Leading education  
and social research  
Institute of Education  
University of London

# Sustaining teacher learning with teacher learning communities



[www.ioe.ac.uk](http://www.ioe.ac.uk)



Leading education  
and social research  
Institute of Education  
University of London

# Signature pedagogies



Leading education  
and social research  
Institute of Education  
University of London

# In Law



# In Medicine



# A design for teacher learning in AfL

**Identify 8 to 10 interested colleagues, ideally in the same building**

**Provide institutional support for:**

- ζ Monthly meetings (75 - 120 minutes each, inside or outside school time)
- ζ Time between meetings for collaborative planning and peer observation
- ζ Any necessary waivers from school policies

**Stick to a standard agenda for each meeting**

1. Introduction and housekeeping (5-10 minutes)
2. Aims of the meeting (5 minutes)
3. How's It Going (30-45 minutes)
4. New Learning about formative assessment (20-45 minutes)
5. Personal Action Planning (10 minutes)
6. Summary of Learning (5 minutes)