

Keynote Address

Engagement and contingency: the essential ingredients for engineering effective learning environments for *all* students

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Successful education

The test of successful education is not the amount of knowledge that a pupil takes away from school, but his [*sic*] appetite to know and his capacity to learn. If the school sends out children with the desire for knowledge and some idea how to acquire it, it will have done its work. Too many leave school with the appetite killed and the mind loaded with undigested lumps of information. The good schoolmaster [*sic*] is known by the number of valuable subjects which he declines to teach.

(Sir Richard Livingstone, President of Corpus Christi College, Oxford, 1941)



MOTIVATION

IF A PRETTY POSTER AND A CUTE SAYING ARE ALL IT TAKES TO MOTIVATE YOU,
YOU PROBABLY HAVE A VERY EASY JOB. THE KIND ROBOTS WILL BE DOING SOON.

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Raising achievement matters

For individuals

- ⌘ Increased lifetime salary
- ⌘ Improved health

For society

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

What do we need students to learn?

...the model that says ‘learn while you are at school the skills that you will apply during your lifetime’ is no longer tenable. These skills will be obsolete by the time you get into the workplace and need them, except for one skill – the skill of being able to learn. It is the skill of being able, not to give the right answer to questions about what you were taught in school, but to make the right response to situations that are outside the scope of what you were taught in school. We need to produce people who know how to act when they are faced with situations for which they were not specifically prepared. (Papert, 1998)

Preparation for future learning (PFL)

Cannot be taught in isolation from other learning

Students still need the basic skills of literacy, numeracy, concepts and facts

Learning power is developed primarily through pedagogy, *not curriculum*

We have to change the way teachers teach, *not what they teach*

Where's the solution?

Structure

- ⌘ Creating/getting rid of middle schools
- ⌘ Selection, streaming, setting
- ⌘ Federated schools

Alignment

- ⌘ Curriculum reform
- ⌘ Textbook replacement

Governance

- ⌘ Specialist schools
- ⌘ Academies

Technology

- ⌘ Computers
- ⌘ Interactive white-boards

School effectiveness?

Three generations of school effectiveness research

⌘ Raw results approaches

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

⌘ Demographic-based approaches

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

⌘ Value-added approaches

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

It's the classroom

Variability at the classroom level is up to 4 times greater than at school level

It's not class size

It's not the between-class grouping strategy

It's not the within-class grouping strategy

It's the teacher

Teacher quality:

A labor force issue with 2 solutions

Replace existing teachers with better ones?

- ⌘ No evidence that more pay brings in better teachers
- ⌘ No evidence that there are better teachers out there deterred by certification requirements

Improve the effectiveness of existing teachers

- ⌘ The “love the one you’re with” strategy
- ⌘ It can be done
- ⌘ We know how to do it, but at scale? Quickly? Sustainably?

Learning power environments

Key concept:

- ⌘ Teachers do not create learning
- ⌘ Learners create learning

Teaching as engineering learning environments

Key features:

- ⌘ Create student engagement (pedagogies of engagement)
- ⌘ Well-regulated (pedagogies of contingency)

Why pedagogies of engagement?

Intelligence is partly inherited

⌘ So what?

Intelligence is partly environmental

⌘ Environment creates intelligence

⌘ Intelligence creates environment

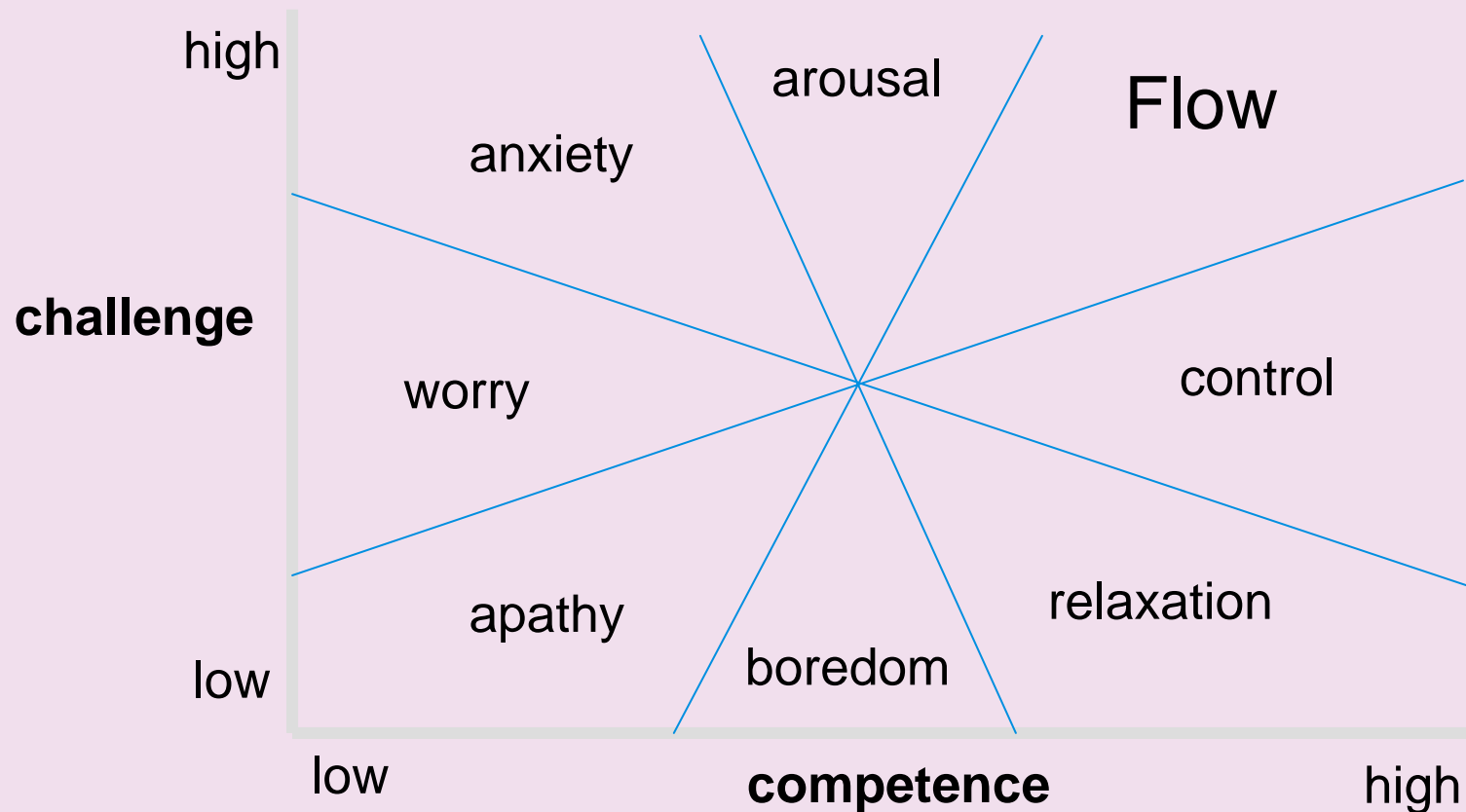
Learning environments

⌘ High cognitive demand

⌘ Inclusive

⌘ Obligatory

Motivation: cause or effect?



(Csikszentmihalyi, 1990)

Why pedagogies of contingency?

For evaluating institutions

For describing individuals

For supporting learning

⌘ Monitoring learning

☒ Whether learning is taking place

⌘ Diagnosing (informing) learning

☒ What is not being learnt

⌘ Forming learning

☒ What to do about it

Cost/effect comparisons

Intervention	Extra months of learning per year	Cost/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 research evidence

Several major reviews of the research

- ⌘ Natriello (1987)
- ⌘ Crooks (1988)
- ⌘ Kluger & DeNisi (1996)
- ⌘ Black & William (1998)
- ⌘ Nyquist (2003)

All find consistent, substantial effects

Types of formative assessment

Long-cycle

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

Medium-cycle

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

Short-cycle

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

Unpacking formative assessment

Key processes

- ⌘ Establishing where the learners are in their learning
- ⌘ Establishing where they are going
- ⌘ Working out how to get there

Participants

- ⌘ Teachers
- ⌘ Peers
- ⌘ Learners

Aspects of formative assessment

	Where the learner is going	Where the learner is	How to get there
Teacher	Clarify and share learning intentions Understand and share learning intentions Understand learning intentions	Engineering effective discussions, tasks and activities that elicit evidence of learning	Providing feedback that moves learners forward
Peer		Activating students as learning resources for one another	
Learner		Activating students as owners of their own learning	

Practical techniques: eliciting evidence

Key idea: questioning should

- ⌘ cause thinking
- ⌘ provide data that informs teaching

Getting away from I-R-E

- ⌘ basketball rather than serial table-tennis
- ⌘ 'No hands up' (except to ask a question)
- ⌘ class polls to review current attitudes towards an issue
- ⌘ 'Hot Seat' questioning

All-student response systems

- ⌘ ABCD cards, Mini white-boards, Exit passes

Practical techniques: feedback

Key idea: feedback should

- ⌘ cause thinking
- ⌘ provide guidance on how to improve

Comment-only grading

Focused grading

Explicit reference to rubrics

Suggestions on how to improve

- ⌘ 'Strategy cards' ideas for improvement
- ⌘ Not giving complete solutions

Re-timing assessment

- ⌘ (eg two-thirds-of-the-way-through-a-unit test)

Practical techniques: sharing learning intentions

Explaining learning intentions at start of lesson/unit

⌘ Learning intentions

⌘ Success criteria

Intentions/criteria in students' language

Posters of key words to talk about learning

⌘ eg describe, explain, evaluate

Planning/writing frames

Annotated examples of different standards to 'flesh out' assessment rubrics (e.g. lab reports)

Opportunities for students to design their own tests

Practical techniques: activating students

Students assessing their own/peers' work

- ⌘ with rubrics
- ⌘ with exemplars
- ⌘ “two stars and a wish”

Training students to pose questions/identifying group weaknesses

Self-assessment of understanding

- ⌘ Traffic lights
- ⌘ Red/green discs

End-of-lesson students' review



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...and one big idea

Use evidence about learning to adapt teaching and learning to meet student needs

Keeping Learning on Track (KLT)

A pilot guides a plane or boat toward its destination by taking constant readings and making careful adjustments in response to wind, currents, weather, etc.

A KLT teacher does the same:

- ⌘ Plans a carefully chosen route ahead of time (in essence building the track)
- ⌘ Takes readings along the way
- ⌘ Changes course as conditions dictate



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Putting it into practice



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Implementing FA/AfL requires changing teacher habits

Teachers “know” most of this already

So the problem is not a lack of knowledge

It’s a lack of understanding what it means to do FA/AfL

That’s why telling teachers what to do doesn’t work

Experience alone is not enough—if it were, then the most experienced teachers would be the best teachers—we know that’s not true

(Hanushek, 2005; Day, 2006)

People need to reflect on their experiences in systematic ways that build their accessible knowledge base, learn from mistakes, etc. (Bransford, Brown & Cocking, 1999)

Teacher learning takes time

To put new knowledge to work, to make it meaningful and accessible when you need it, requires practice.

A teacher doesn't come at this as a blank slate.

- ⌘ Not only do teachers have their current habits and ways of teaching—they've lived inside the old culture of classrooms all their lives: every teacher started out as a student!
- ⌘ New knowledge doesn't just have to get learned and practiced, it has to go up against long-established, familiar, comfortable ways of doing things that may not be as effective, but fit within everyone's expectations of how a classroom should work.

It takes time and practice to undo old habits and become graceful at new ones. Thus...

- ⌘ Professional development must be sustained over time

A model for teacher learning

Content, *then* process

Content (what we want teachers to change)

- ⌘ Evidence
- ⌘ Ideas (strategies and techniques)

Process (how to go about change)

- ⌘ Choice
- ⌘ Flexibility
- ⌘ Small steps
- ⌘ Accountability
- ⌘ Support



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**NACE 9th annual conference for Local
Authorities, London: 7 Feb 08**



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How to set up a teacher learning community (TLC)

Plan that the TLC will run for two years

Identify 8 to 10 interested colleagues

⌘ Should have similar assignments (e.g. early years, math/sci)

Secure institutional support for:

⌘ Monthly meetings (2 hrs each, inside or outside school time)

⌘ Time between meetings (2 hrs per month in school time)

☒ Collaborative planning

☒ Peer observation

⌘ Any necessary waivers from school policies

The TLC leader's role

To ensure the TLC meets regularly

To ensure all needed materials are at meetings

To ensure that each meeting is focused on AfL

To create and maintain a productive and non-judgmental tone during meetings

To ensure that every participant shares with regard to their implementation of AfL

To encourage teachers to provide their colleagues with constructive and thoughtful feedback

To encourage teachers to think about and discuss the implementation of new AfL learning and skills

To ensure that every teacher has an action plan to guide their next steps

But not to be the AfL “expert”

A 'signature pedagogy' for teacher learning?

Every monthly TLC meeting should follow the same structure and sequence of activities

Activity 1: Introduction & Housekeeping (5 minutes)

Activity 2: How's It Going (50 minutes)

Activity 3: New Learning about AfL (50 minutes)

Activity 4: Personal Action Planning (10 minutes)

Activity 5: Summary of Learning (5 minutes)



National Association for Able Children in Education

Thank you

Dr Dylan Wiliam