RaY

Research at the University of York St John

From Good to Outstanding

Katy Bloom
Science Lead Tutor
Associate Principal Lecturer, Leeds Trinity University

STEM Learning Limited

Intended Learning Outcomes

By the end of the session you will:

- decide on your own definition of outstanding and what it means for your teaching team;
- engage with the evidence-base of 'what works' to learn what the 'literature' says is outstanding;
- reflect on the implications this will have for their own classroom practice, and make targets for future action.

Perspectives

Ofsted
e.g., School Inspection Handbook: "School leaders and teachers should decide for themselves how best to teach, and be given the opportunity, through questioning by inspectors, to explain why they have made the decisions they have and provide evidence of the effectiveness of their choices."

Research
e.g., http://educationendowmentfoundation.org.uk/toolkit

Teachers
What is the individual's notion of outstanding?

Students
"when you were learning well, what was I doing?"

Definitions

Let's be clear…

Are we talking about:
- outstanding teaching?
- outstanding pupil achievement?
- both?

Does your team know what you are all talking about?
Do you share a vision of what outstanding looks like?

Science
LEARNING NETWORK

♦9

Activity in small groups:

On the 16 cards are different aspects of what could be described as characteristics of outstanding.

Decide which 9 of the 16 resonate with you most, then further prioritise these into a Diamond Nine.

Be prepared to discuss your choices!

Science
LEARNING NETWORK

Think-Pair-Share
What key features do great lessons have?

1. Pupils must see the value of learning for themselves
2. Pupils should have self-belief and self-esteem
3. Pupils should reach for challenging goals
4. Pupils need feedback and dialogue
5. Pupils need their learning to be structured
6. Pupils need time to practise
7. Pupils need to learn skills as well as content

from Geoff Petty, ch14 Evidence Based Teaching 2nd ed.

Science
LEARNING NETWORK

Evidence Based Practice

Evidence based teaching should become the norm ~ an analysis of 300,000 studies of interventions involving tens of millions of students globally tells us what works

A meta-analysis compares the factors that affect achievement in a very objective way. We'll look a little at how it's done without going into deep research methods!

Visible Learning – A synthesis of over 800 meta-analyses relating to achievement John Hattie 2009

Science
LEARNING NETWORK

Effect Sizes

The effects of each study are converted to a common measure called an effect-size so that overall effects can be quantified, interpreted, compared and followed up

effect size

Average mark for control group

Average mark for experimental group

Number of students with that mark

Achievement of students (s.d.)

Science
LEARNING NETWORK
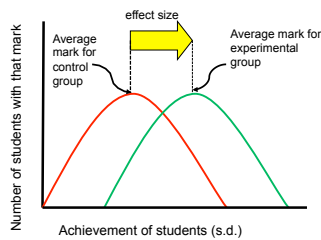
Distribution of effects

In general:

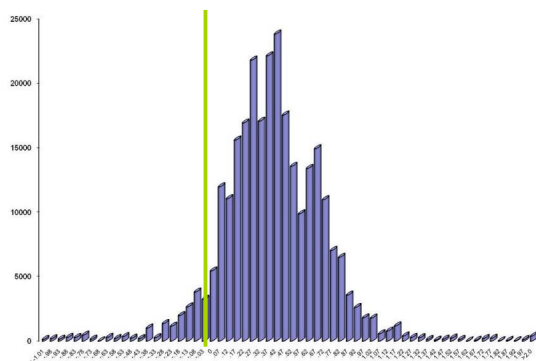|	
0.1	normal annual maturation, no teaching
0.25	average effect of a teacher, regardless of quality
0.42	**average effect of all interventions**
0.5	minimum standard for a new intervention
0.8	significant effects
1.0	improving the rate of learning by 50%, advancing the learners' achievement by 1 year, a two-grade leap

Science
LEARNING NETWORK

What does it tell us?

- From this we can conclude that an effect size of 0.5 is equivalent to the difference between two adjacent grades at GCSE.

- There are thousands of pieces of research within these studies, making them extremely authoritative.

- It also shows that methods that work the best do so in every educational phase and across the ability range.

Science
LEARNING NETWORK

Hattie's "Barometer of Influence"

d=0.15 and d=0.40
Influences in this zone are similar to what teachers can accomplish in a typical year of schooling.

d=0.0 and d=0.15
What students could probably achieve if there was no schooling.

Low

High

Teacher Effects

Developmental Effects

Desired Effects

d=0.4+ Influences that have greatest impact on student achievement outcomes

Negative

Reverse Effects

d=below 0.00
Can be considered potentially harmful and probably should not be implemented

0.4
0.15
0.7
0.0
1.0
-0.2
1.2

© John Hattie
Visible Learning

Rank these 10 effects:

- Concept mapping
- Acceleration of gifted students
- Teacher subject matter knowledge
- Phonics instruction
- Homework
- Teacher credibility
- Class size
- Metacognitive Strategies
- Small group learning
- Feedback

(from 1 = lowest effect to 10 = highest effect)

Science
LEARNING NETWORK

Sounds too good to be true...

Cons:
- Comparing/combining apples and pears?
- Meta-analysis seeks 'big facts' and does not seek to explain complexities (classrooms are places where complexities abound)
- Based on past studies
- May involve the use of low quality studies (generally though, the effects are not compromised by the quality of the study)
- The Hawthorne effect comes into play
- It assumes that all learners are the same and have the same needs
- It ignores context – what works well in one place might not work well in another
- They do not tell us <u>why</u> these methods work

Science
LEARNING NETWORK

Good teachers...

The greatest sources of variance within our system relate to teachers (Hattie, 2003).

Some teach in a deliberate and visible manner. When they see learning occurring (or not):

- they intervene in meaningful ways
- they alter the direction of learning
- they make sure the goal is shared, specific and challenging
- they provide students with multiple opportunities and alternatives for developing learning strategies.

Science
LEARNING NETWORK

What do expert teachers do?

Research identified 5 major dimensions of 'expert' teachers, comprising 16 attributes:

• Identify essential representations of their subject
• Guide learning through classroom interactions
• Monitor learning and provide feedback
• Attend to affective attributes
• Influence student outcomes

Within these, Challenge, Deep Representation and Monitoring & Feedback accounted for 80%, and most critically in the depth of processing that the students of expert teachers attain.

from Hattie, J (2003) Teachers Make a Difference: What is the research evidence?

Science LEARNING NETWORK

Learning Quality: SOLO Taxonomy...
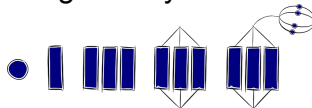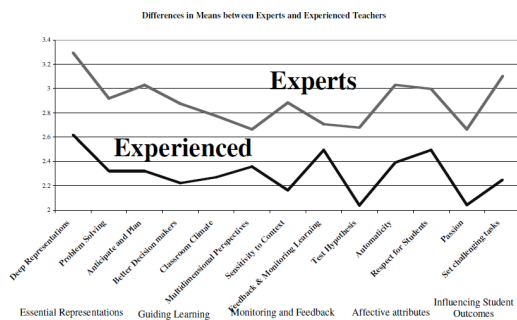
1. Pre-structural

    2. Uni-structural

        3. Multi-structural

            4. Relational

                5. Extended abstract

A reliable measure of how WELL students have learned (not what they can recall!)

Science LEARNING NETWORK

Experience versus expertise?

Differences in Means between Experts and Experienced Teachers

'Hattifying' lessons

Hattie distilled 3 principles from his vast research:

1. Achievement depends on the amount of challenge set
2. Achievement is enhanced by feedback
3. Increases in student learning involve reconceptualisation of learning

In other words, set a challenging goal, get students to work towards the goal and then give them feedback.

Science
LEARNING NETWORK

Demystifying Differentiation

In the UK, we often talk about differentiation in terms of:
• Task
• Support
• Outcome

In the USA, authors such as C.A. Tomlinson use the terms:
• **Content** – input, what the students learn
• **Process** – how the students go about making sense of ideas and information
• **Product** – output, how the students demonstrate what they have learned.

Science
LEARNING NETWORK

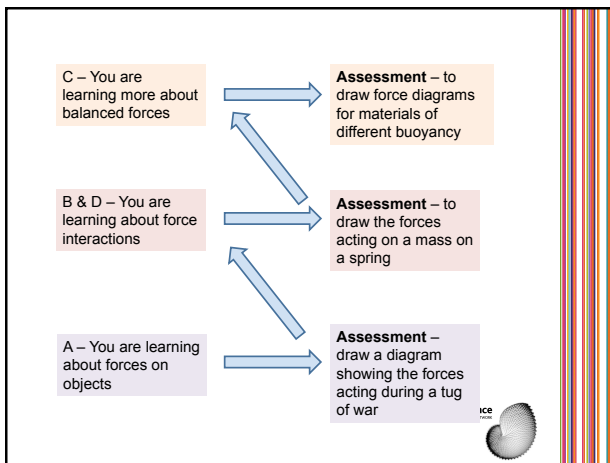## Putting it into practice…

The bottle is not moving. There are no forces on it

A

The only force on the bottle is the force of gravity pulling it downwards

B

There are two forces on the bottle – the force of gravity and the push of the shelf upwards, which balances it.

C

A shelf cannot push. It is just in the way of the bottle and stops it falling.

D

Science
LEARNING NETWORK

C – You are learning more about balanced forces

Assessment – to draw force diagrams for materials of different buoyancy

B & D – You are learning about force interactions

Assessment – to draw the forces acting on a mass on a spring

A – You are learning about forces on objects

Assessment – draw a diagram showing the forces acting during a tug of war

Over to you…

For these lessons on 'rocks' or 'bonding', the students are being asked to manage their differentiation to quite a high degree.

There is a 'menu' from which to choose a starting point . This gives more control of the pace and the direction of their learning.

Some teachers fear that showing a minimum option will mean that their students will take it. Often however, and peer pressure aside, they are keen to go for the maximum.

Choose a starting point, and go through the range of activities.

Science
LEARNING NETWORK

The practice and learning zones

Potential Ability

Learning Zone

Current Ability

Performance

Practice Zone

Subconscious Ability

Time

Science
LEARNING NETWORK
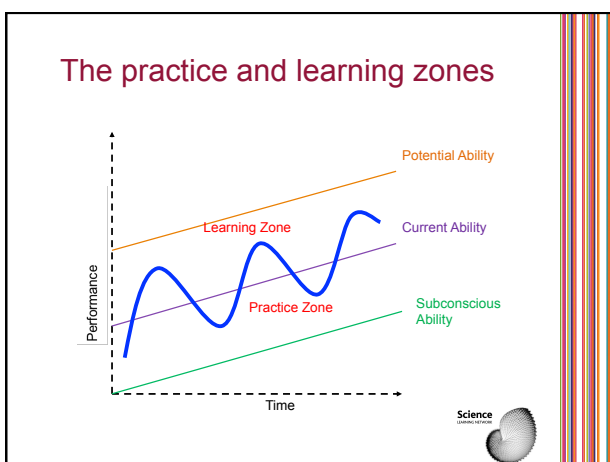
Range of 'readiness'

Foundational	⟷ Transformational
Concrete	⟷ Abstract
Simple	⟷ Complex
Single Facet	⟷ Multiple Facets
Small leap	⟷ Great leap
More structured	⟷ More open
Less independence	⟷ Greater Independence
Slow	⟷ Quick

Science
LEARNING NETWORK

Learning Through Four Stages of Mastery
"The way we learn changes as we get better at what we do."

Novice →	Competent →	Experienced →	Master/Expert
New to Job; Knows Little or Nothing	Can Perform to Basic Standards	Can Vary Performance Based on Unique Situations	Can Invent New, Better Ways to do Job; Can Teach Others

Increasing Fluency, Learning Agility and Shareable Knowledge

Push — **Pull**

Needs
Common Learning Needs/Performance Requirements ⟷ Unique Learning Needs/Performance Requirements

Formal-Informal
More Formal, Structured Training ⟷ More Informal, Social, Workplace-Centered Learning

Structure
Common Curricula (Program Driven) ⟷ Personalized Learning (Performer Driven)

Approaches
Training, E-Learning, Blended Learning, Simulation, Coaching, SoMe, Performance Support, Information Access, Collaboration

Primary Strategy: Education & Training (Classroom and Online) "Show Me How"	Primary Strategy: Practice, Coaching "Help Me Do It Better"	Primary Strategy: Access to Knowledge & Performance Resources "Help Me Find What I Need"	Primary Strategy: Collaboration & Problem-Solving "I Create My Own Learning"

A **GOOD ACTIVITY** is something students will make or do

- using an essential skill(s) and essential information
- in order to understand an essential idea/principle or answer an essential question.

A **GOOD** *DIFFERENTIATED* **ACTIVITY** is something students will make or do

- In a range of modes at varied degrees of sophistication in varying time spans
- With varied amounts of teacher or peer support (scaffolding)
- using an essential skill(s) and essential information
- in order to understand an essential idea/principle or answer an essential question.

CA Tomlinson, How to differentiate instruction in a mixed-ability classroom 2001.

Science
LEARNING NETWORK

Activity post-mortem

In terms of the differentiated Rocks or Bonding activities that you did, how could you reflect upon it, and modify it further, especially in terms of the continuum ranges of readiness?
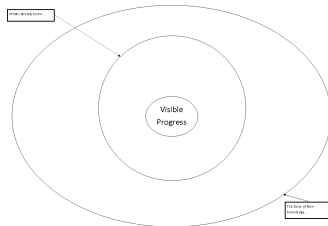
Use the accompanying hand-out for discussion points.

We'll collate ideas at the front…

Science
LEARNING NETWORK

Pens of Progress

What progress have you made on your circle map?

Visible Progress

List three things

Write down three things that you learned this session

What are your next steps going to be?

Science
LEARNING NETWORK