Assessment and learning
Pulje 6
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Gordon Stobart
Emeritus Professor of Education
Institute of Education, University of London

g.stobart@ioe.ac.uk
The Big Picture

Thinking about learning

– What kind of learners do we want?

Assessment that supports good learning

– Finding out where learner are – good diagnostics as feedback for teachers
– Making learning goals and standards clear – feed forward
– Giving feedback that works
– Encouraging self-regulated learners
How we learn

• What am I good at?
• *How and why did I get good?*
• How do I know I’m good?

• What am I *not* good at?
• How and why did I not get good?
• How do I know I’m not good?
The 21st century learner agenda

Are students prepared for future challenges? Can they analyse, reason and communicate effectively? Do they have the capacity to continue learning throughout life?

PISA homepage [www.pisa.oecd.org](http://www.pisa.oecd.org)

As never before, the next generation will need to be innovative, creative, and skilled at managing knowledge as a resource.

(Alberta Province, Canada, *Inspiring Education*, 2010, p.3)
The 21st century learner agenda

• Ways of Thinking
  • 1. Creativity and innovation
  • 2. Critical thinking, problem solving, decision making
  • 3. Learning to learn, metacognition
• Ways of Working
  • 4. Communication
  • 5. Collaboration (teamwork)
• Tools for Working
  • 6. Information literacy
  • 7. ICT literacy
• Living in the World
  • 8. Citizenship – local and global
  • 9. Life and career
  • 10. Personal and social responsibility – including cultural awareness and competence

P. Griffin et al. (eds.), Assessment and Teaching of 21st Century Skills,
Is this the message of the "Standards" movement?
Defining learning

‘A significant change in capability or understanding’

This excludes: the acquisition of further information when it does not contribute to such changes.

(Michael Eraut)

‘Any process that...leads to permanent capacity change’

this involves content, incentive and interaction

(Knut Illeris)

‘It’s like learning to ride a bike’
Developing expertise

Nobody is born an expert: ‘Child prodigies do not have unusual genes; they have unusual upbringings’ (Matthew Syed)

Expertise is the result of:

1. **Knowing where we want to go**

2. **Deliberate practice** (10K hours)
   - Designed to improve
   - Repeated until automatic
   - Continuous feedback
   - Demanding mentally
   - Involves risks and is hard work

3. **Deepening knowledge**
   - Development of a mental model/framework
   - Recognising what’s relevant and irrelevant
   - Remembering more – ‘chunking’
Deliberate practice

Comfort zone

Learning zone

Panic zone

Source: Colvin, 2009
Mental models

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Working memory

Write 18725 as code
Mental models
Recognising patterns

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Everyday expertise at ‘chunking’

- wmroanshtehtyrl
- norwayisthehomeoftrolls
- 938473652830
- 191420121939
What are the messages for schools?
John Hattie’s priorities for effective teaching and learning

<table>
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<tr>
<th>Transparent goals</th>
<th>• the more transparent the teacher makes the learning goals, then the more likely the student is to engage in the work needed to meet the goal.</th>
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<td>Success criteria</td>
<td>• the more the student is aware of the criteria of success, then the more the student can see the specific actions that are needed to attain these criteria</td>
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<td>Rapid formative feedback</td>
<td>• the more there is feedback about progress from prior to desired outcomes the more positive attributes to learning are developed</td>
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https://tmsydney.wikispaces.com/
Aligning assessment and learning

What forms of classroom assessment will help effective classroom learning?

i. **Builds on what we know** – assessment that finds out where learners are in their learning

ii. **Makes meaning** - ‘makes sense’- makes clear the learning intentions, recognises success

iii. **Is active and social** – learners take part in their own assessment; importance of classroom interaction (feedback); development of self-regulating learners.
Assessment for Learning

Assessment for Learning is the process of seeking and interpreting evidence for use by learners and their teachers to decide where the learners are in their learning, where they need to go and how best to get there.

Assessment Reform Group (2002)

Quality AfL keeps learning principles central – the spirit – ‘high organisation based on ideas’ in contrast to the letter when practices are used without understanding.

An alternative classification: routine vs adaptive expertise
Finding out where learners are

- *Classroom dialogue*: questions, discussions
  Teachers talk 70-80% of time;
  ask 200-300 questions a day, 60% recall facts, 20% procedural;
  <5% group discussion or meaningful ideas;
  70% of answers less than 5 secs (3 words) (Source J. Hattie 2012)

How long do teachers wait after asking a question before taking action?

*Questions* > ‘thinking time’ (wait time) > pair and share > no hands up.

*Traffic lights*
Quality questioning

• Using good question stems:
  ‘why does...?’; ‘what if...?'; ‘how would you...?'; ‘could you explain...?’

• Poker face - the teacher’s body language does not signal to the student what the teacher wants to hear (keeps the focus on the task)

• Basketball not ping-pong

• Statements instead of questions

• Avoids: asking too many questions at once; answering it yourself; only asking the best students; ignoring answers; failing to build on answers
Learners as questioners

Once you have learned to ask questions – relevant and appropriate and substantial – you have learned how to learn and no one can keep you from learning whatever it is you need to know. (Postman and Weingartner, Teaching as a Subversive Activity)

Why do our pupils ask so few thoughtful questions? Why do they ask fewer as they get older?

Using group work to encourage questioning:
  – developing questions to ask other groups
Ways of encouraging question asking

• Written questions
  Question box / ‘Hold on miss I’ve got a question’ board/ Exit questions
• Role play – interview the expert
• Don’t know the answer – please research
• Groups write test questions for others in class at end of a topic
Where learners need to go:

Learning intentions & success criteria

1. High expectations are the key to improving learning
2. The teacher is clear about what is being learned (progression in learning) – and makes it clear to the student.
3. What we will be *learning* rather than what we will be *doing*
4. The importance of ‘*tuning in’* (building on ‘where learners are in their learning’):
2. The importance of being clear about what and why we are learning – and making deep demands

The need to ‘make sense’ and ‘make meaning’

– It’s not that I haven’t learned much. It’s just that I don’t understand what I’m doing’ (15 yr old)

– Sir treats us like we’re babies, puts us down, makes us copy stuff off the board, puts up all the answers like we don’t know anything. And we’re not going to learn from that, ‘cause we’ve got to think for ourselves. (low achieving student)

– We knew how to do it. But we didn’t know why we were doing it and we didn’t know how we got around to doing it.....I can get the answer, I just don’t understand why . (maths student)

(source: Jo Boaler)
2. The teacher is clear about what is being learned and makes it clear to the student

In the CEM/Sutton Trust report *What makes great teaching* (2014) the two strongest factors are:

• **Pedagogical content knowledge**
  
  ‘The most effective teachers have deep knowledge of the subjects they teach, and when teachers’ knowledge falls below a certain level it is a significant impediment to student learning’

• **Quality of instruction**
  
  ‘Includes elements such as effective questioning, and the use of assessment by teachers. Specific practices, like reviewing previous learning, providing model responses for students, giving adequate time for practice to embed skills securely and progressively introducing new learning (scaffolding) are also elements of high quality instruction.’
Separating the learning from the task

Doing this makes it easier to differentiate instruction without creating a classroom in which different students are working towards different goals.

All students are working towards the same learning intention; the differentiation comes in the success criteria – how far are students able to transfer their learning?

All students should be able to transfer what they have learned to very similar contexts while others can be challenged by assessing how far they can transfer what they have learned.

(Dylan Wiliam)
Tuning in – teaching division in maths

Relevant recall questions (finding out where learners are)
Recall experiences of ‘cutting things up’ (cake etc. ) and relate to division – ‘so if you cut up the cake like this, how many pieces would you divide it into?’
Also use ‘sharing out’ to link to division – ‘If there were six sweets to divide between two children, how many would each child get?’
Practise both and learn to recognise a division problem.
If a gardener has 20 bulbs to put equally in 5 flower beds, how many would be in each bed?
Step 1: This a sharing out problem so I must divide

(Source: Geoff Petty, Evidenced-based teaching)
3. Find x.

Here it is.
4b) Expand

\[(a+b)^n = (a+b)^n\]

\[= (a+b)^n\]

\[= (a+b)^n\]
A woman is on a diet. She buys 3 turkey slices which weigh 1/3 of a pound (0.45 of a kilo) but her diet only lets her eat 1/4 of a pound. How much of the 3 slices she bought can she eat if she stays on her diet?
Some solutions

1. 3 slices = $\frac{1}{3}$; $x$ slices = $\frac{1}{4}$
   cross-multiply so that $\frac{1}{3} \times x = \frac{3}{4}$, so $x = \frac{9}{4}$

2. If 3 slices is a third of a pound then 9 slices is a pound. I can eat $\frac{1}{4}$ of a pound so $\frac{1}{4}$ of 9 slices is $\frac{9}{4}$ slices (Grade 5)

3. (Source: Jo Boaler)
Success criteria – understanding what is needed

Royce Sadler’s paradox: why does thoughtful feedback often not work?

Success criteria need:

1. **Negotiation**: ‘what would you expect to see in a successful piece of work?’

2. **Exemplars**: ‘which of these two (or more) pieces of work best meets the criteria?’

3. **Modelling**: ‘Here’s what I mean...’

4. **Guided practice**: activity > independent practice (6x)

The greatest enemy of understanding is coverage. As long as you are determined to cover everything, you actually ensure that most kids are not going to understand. You've got to take enough time to get kids deeply involved in something so they can think about it in lots of different ways and apply it—not just at school but at home and on the street and so on.  

(Howard Gardner)
When Learning Intentions become a problem

When they:

• become routine/mechanical
• are introduced unimaginatively – eg timing
• are used managerially (to check on what teacher is covering)
• become administrative/paperwork
AfL in practice: teaching Sudoku

Sudoku

Fill the grid so that each row, column and 3x3 box contains the numbers 1-9
Our experience of feedback

Can you think of an example of feedback that has, for you, ‘closed the gap’ in learning?

Can you thing of an example of feedback you have given that has helped a learner close the gap?
Teachers getting feedback from their pupils about their teaching

*You haven’t taught until they’ve learned* – John Wooden

- decide what pupils find difficult (from previous years) and adjust teaching (‘Pre-emptive feedback’);
- analyse classroom and summative assessments to see what has been done badly and re-teach;
- Pick up from classroom dialogue what is known and what has been misunderstood – then address this.

*Can you give examples of lessons you have changed as a result of pupil feedback*
Feedback

‘Provides information which allows the learner to close the gap between current and desired performance’

*It is most effective when:*

- It is effectively timed;
- It is specific and clear;
- It is clearly linked to the learning intention;
- The learner understands the success criteria/standard;
- It focuses on the task rather than the learner (self/ego);
- It gives cues at the right levels on how to bridge the gap;
- It offers strategies rather than solutions;
- It challenges, requires action, and is achievable.
Effective timing

The most effectively timed feedback is everyday classroom feedback which is informal (oral best), comes during the work, and feeds forward.
Classroom feedback can be delayed if students are motivated out of personal interest (intrinsic) – the teacher should not ‘rescue’ too soon.
End of assignment feedback should be as soon as possible and allow time to deal with the feedback.
The thermo-chromatic ink in this changes colour from the temperature from your forehead. It tells you if you are too hot.

Continue to improve handwriting and spelling.

Explain the science.
Feedback – written comments

These were the total comments over 6 months in one subject for a 12 year old:

Read carefully / Finish, colour / Good / Back of book
/Read / Quite good / Why? Explain / Study diagram /
Very poor / Keep trying harder / Please try harder to improve spelling and neatness / If you need help, ask/
Concentrate 100% - check words / Please listen to instructions. You should have copied out sentences /
Mixed. Some understandings, decent spelling but the book asked you to explain

How informative is feedback if we can’t even tell what subject it is?
It is clearly linked to the learning intention; the learner understands the success criteria/standard;

Year 7 home Learning Task 1

The answer is 20!
(What is the question?!?)

• Make up some maths questions that give an answer of 20.
• You can start simple, for example $13 + 7 = 20$
• Then you can be more imaginative: 25% of 80 = 20
• Be as creative as you can.
• You should come up with at least 20 questions but there is no upper limit.
• Credits and prizes will be awarded to the best, most creative questions!!

GOOD LUCK AND ENJOY!
20 ways to make 20 – be creative
(first maths homework in secondary school)

1. 100 - 80 = 20
2. 5 + 3 = 8
3. 0 x 2 = 0
4. 7 x 2 = 14
5. 2 x 10 = 20
6. $0.20 x 10 = 2.00$
7. $0.50 x 5 = 2.50$
8. $2.00 x 5 = 10.00$
9. $1.00 + 4 = 5$
10. $1 + 2 + 1 + 4 = 8$
11. $1 + 2 + 3 + 4 = 10$
12. $1 + 2 + 3 + 4 = 10$
13. $7 + 3 + 2 = 12$
14. $7 + 3 + 2 = 12$
15. $7 - 3 = 4$
16. $7 - 3 = 4$
17. $10 - 8 = 2$
18. $10 - 8 = 2$
19. $1000 - 800 = 20$
20. $52 - 50 = 2$

Very good use of all 4 operations.
What about using decimals, fractions or negative numbers?
(challenge)
Effective feedback: Task & effort-related

- It focuses on the TASK rather than the learner (self/ego);
- It gives cues at appropriate levels on how to bridge the gap: the task/process/self-regulation loop

**Task level:** get more/correct information (‘check the facts about...’) – ‘corrective feedback’ - best on simple tasks

**Process level:** improving processing of information or learning processes – checking for error, evaluating information (‘how could this argument be strengthened?’; ‘Can you think of a more dramatic ending?’)

**Self-regulation level:** creating internal feedback & self-assessment

(‘have you used what you know about writing up an experiment? What would your own judgement be?’)
Feedback often does not improve learning because:

It does not close the gap:
  • grades/marks;
  • praise/rewards;
  • unclear;
  • too general (‘more detail’).

It is directed at self/ego level rather than the task.

The learner can choose to:
  modify the standard;
  abandon the standard (‘retire hurt’);
  reject the feedback/messenger.
The problem with praise

Praise is the most common form of feedback – yet has little impact on learning.

Why? Because:

• It is directed at the person not the task & does not provide information about how to improve.
• It can ‘create a growing dependence on securing someone else’s approval’ (Kohn).
• It may move the focus from the task to the learner – so any praise should encourage self-regulation directed at task.

Expert teachers praise less than novice teachers (expectations)
My Trainer

Credit

© This is a sensitive, well planned drawing, your lines are light and you have observed very carefully. To develop draw a little larger which will also assist with achieving a more accurate shape.
Lovely drawing
- Big and bold.
- Keep pencil really sharp so edges are hard and crisp.
Learning to give feedback: Snowballing peer assessment to a best answer

• Students arranged in groups of 3 or 4
• Students given questions or calculations to do – work alone at first (5 mins)
• Students compare answers, reasoning, working etc. noting differences. They discuss and try to agree
  – Which are correct or best methods, workings, reasonings and answers and *why*
  – The group’s idea of the ‘best answer’
  – What errors were made and *why*
• Students then given model answers and compare with group answers
• Class discussion of issues.  
  (Source: G.Petty)
The Big Picture

Thinking about learning
– What kind of learners do we want?

Assessment that supports good learning
– Finding out where learner are – good diagnostics as feedback for teachers
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