

15th Annual
Hawker Brownlow
**Thinking &
Learning**
Conference

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PROFESSOR DYLAN WILIAM

SATURDAY 19 MAY

One-Day Institute

Leadership for Teacher Learning Institute

MELBOURNE

PROFESSOR DYLAN WILIAM

Professor Dylan Wiliam is emeritus professor of educational assessment at University College London. In a varied career, he has taught in urban public schools, directed a large-scale testing program, served a number of roles in university administration, authored numerous books, and pursued a research program focused on supporting teachers to develop their use of assessment in support of learning.



As one of the United Kingdom's leading experts on assessment, Dylan has an extensive history of research and consultation in this area. His recent work has focused on the use of assessment to support learning, which is sometimes called formative assessment. He was the coauthor, with Paul Black, of a major review of the research evidence on formative assessment, and he has worked with many groups of teachers across the globe on developing formative assessment practices.

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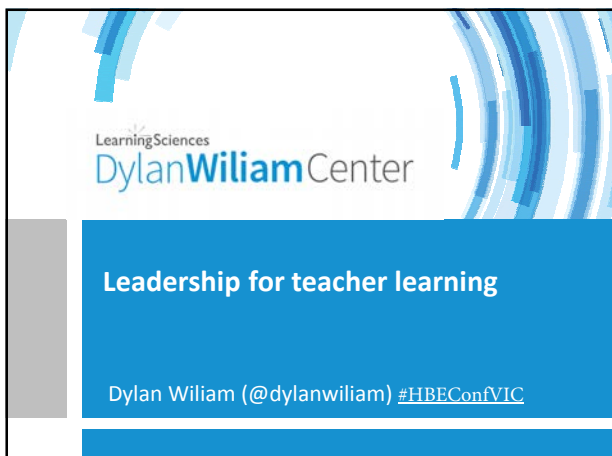


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Leadership for teacher learning

Dylan Wiliam (@dylanwiliam) #HBEConfVIC

Outline: six questions

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- Where should our efforts be focused?
- Where does formative assessment fit in?
- What makes effective teacher learning?
- How should teacher meetings be organized?
- What doesn't get done?
- How will we know it's working?

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Where should our efforts be focused?

3

Which of these is most strongly associated with high student achievement?

- A. Student speaks the language of instruction at home
- B. Student behaviour in the school is good
- C. The amount of inquiry-based instruction
- D. The amount of teacher-directed instruction
- E. The school's socio-economic profile

OECD (2016, Fig II.7.2)

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Why we need to raise achievement

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- In advanced economies, over the next 20 to 30 years
 - Between a quarter and a third of jobs could be offshored (Blinder, 2011)
 - About half of all jobs could be done by machines (Frey & Osborne, 2013)

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What kinds of schools do we need?

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| School model | Ethos | Key process |
|-------------------|--|--|
| Talent refineries | School must provide opportunities for students to show what they can do | Ensuring good teaching and syllabus coverage |
| Talent incubators | All students students can learn, but not all students can achieve at high levels | Drawing out what is within the student |
| Talent factories | All students can achieve at high levels | "Whatever it takes" |

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The control-impact matrix

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| | | Control | |
|--------|------|--------------------|------------------|
| | | Inside | Outside |
| Impact | Low | Ability grouping | School buildings |
| | High | Classroom practice | Poverty |

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What determines how quickly children learn?

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- Student characteristics
- School organization
- Instructional quality
 - The quality of the curriculum
 - The time teachers have to plan teaching
 - The size of classes
 - The resources available
 - The skills of the teacher
- All of these are important, but the quality of the teacher is especially important

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Teaching quality and teacher quality

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- Teaching quality depends on a number of factors:
 - The time teachers have to plan teaching
 - The size of classes
 - The resources available
 - The skills of the teacher
- All of these are important, but the quality of the teacher seems to be especially important
- Teacher quality can be improved by:
 - Replacing existing teachers with better ones, or
 - Investing in the teachers we already have

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Teacher quality and student achievement

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| Study | Location | Correlation with progress in | |
|-------------------------------------|----------------|------------------------------|------|
| | | Reading | Math |
| Rockoff (2004) | New Jersey | 0.10 | 0.11 |
| Nye, Konstantopoulos, Hedges (2004) | Tennessee | 0.26 | 0.36 |
| Rivkin, Hanushek, and Kain (2005) | Texas | 0.15 | 0.11 |
| Aaronson, Barrow, and Sander (2007) | Chicago | | 0.13 |
| Kane, Rockoff, and Staiger (2008) | New York City | 0.08 | 0.11 |
| Jacob and Lefgren (2008) | | 0.12 | 0.26 |
| Kane and Staiger (2008) | | 0.18 | 0.22 |
| Koedel and Betts (2009) | San Diego | | 0.23 |
| Rothstein (2010) | North Carolina | 0.11 | 0.15 |
| Hanushek and Rivkin (2010) | | | 0.11 |
| Chetty et al. (2014) | | 0.12 | 0.16 |

Hanushek and Rivkin (2010)

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What does this mean for student progress?

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- Take a group of 50 teachers:
 - Students taught by the most effective teacher in that group of 50 teachers learn in six months what those taught by the average teacher learn in a year
 - Students taught by the least effective teacher in that group of 50 teachers will take two years to achieve the same learning
- And furthermore:
 - In the classrooms of the most effective teachers, students from disadvantaged backgrounds learn at the same rate as those from advantaged backgrounds (Hamre & Pianta, 2005)

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Can we identify good teachers?

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Can we identify good teachers from their qualifications?

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Teacher preparation, student progress

| | Mathematics | | | Reading | | |
|-------------------------------------|-------------|--------|------|---------|--------|------|
| | Primary | Middle | High | Primary | Middle | High |
| General theory of education courses | | | | | — | |
| Teaching practice courses | | | | — | + | |
| Pedagogical content courses | + | + | | | | |
| Advanced university courses | | | — | | | + |
| Aptitude test scores | | | — | | | |

Harris and Sass (2007)

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Can we identify good teachers by observation?

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Do we know a good teacher when we see one?

- Experiment 1
 - Seven teachers (3 high-performing, 4 not)
 - Group 1: at least 0.5 sd above mean value-added for 3 years
 - Group 2: never 0.5 sd above average value-added in 3 years
 - 7 video clips shown to 100 raters
 - Average number of correct ratings: 2.8

| Distribution of total correct ratings | | | | | | | | |
|---------------------------------------|-----|-----|-----|-----|----|----|----|--|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 1% | 11% | 29% | 36% | 13% | 9% | 1% | 0% | |

Strong, Gargani, and Hacifazlıoğlu (2011)

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Ratings by rater type

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| Rater | Number | Accuracy (%) |
|-----------------------|--------|--------------|
| Teachers | 10 | 37 |
| Parents | 7 | 37 |
| Mentors | 10 | 47 |
| University professors | 9 | 41 |
| Administrators | 10 | 31 |
| Teacher educators | 10 | 31 |
| College students | 11 | 36 |
| Math educators | 10 | 34 |
| Other adults | 11 | 43 |
| Elementary students | 12 | 50 |



What if the difference is larger?

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- Experiment 2
 - Two groups of teachers (4 teachers in each group)
 - Group 1: at least 0.5 sd above average value-added
 - Group 2: at least 0.5 sd below average value-added
 - 8 video clips shown to 165 experienced administrators
 - Average number of correct ratings: 3.85

Distribution of total correct ratings

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----|----|-----|-----|-----|-----|----|----|----|
| 1% | 3% | 11% | 25% | 25% | 24% | 9% | 1% | 0% |



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Can we identify good teachers after training?



Framework for teaching (Danielson 1996)

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- Four domains of professional practice
 - Planning and preparation
 - Classroom environment
 - Instruction
 - Professional responsibilities
- Links with student achievement (Sartain, et al. 2011)
 - Domains 1 and 4: no impact on student achievement
 - Domains 2 and 3: some impact on student achievement

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Framework for teaching (Danielson, 1996)

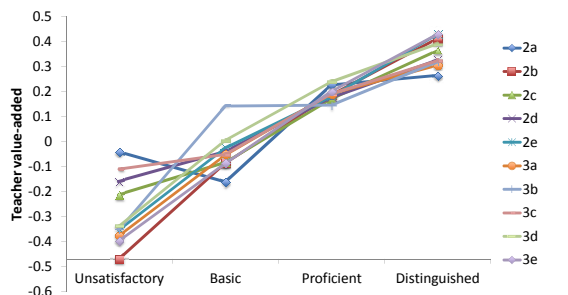
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- Domain 2: The classroom environment
 - 2a: Creating an environment of respect and rapport
 - 2b: Establishing a culture for learning
 - 2c: Managing classroom procedures
 - 2d: Managing student behavior
 - 2e: Organizing physical space
- Domain 3: Instruction
 - 3a: Communicating with students
 - 3b: Using questioning and discussion techniques
 - 3c: Engaging students in learning
 - 3d: Using assessment in instruction
 - 3e: Demonstrating flexibility and responsiveness

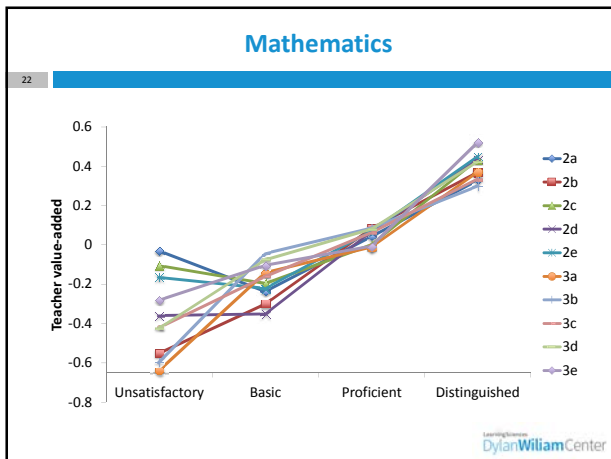
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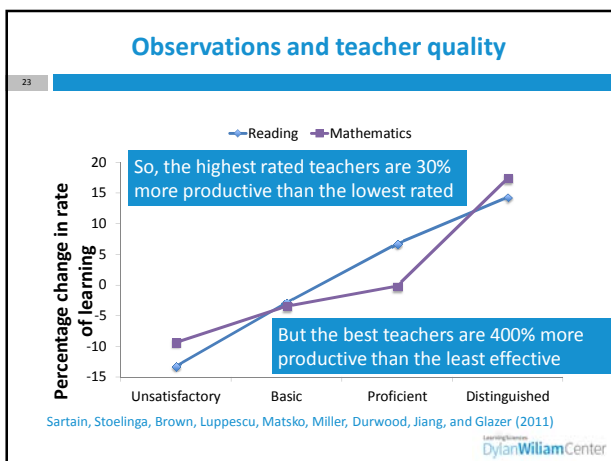
Reading

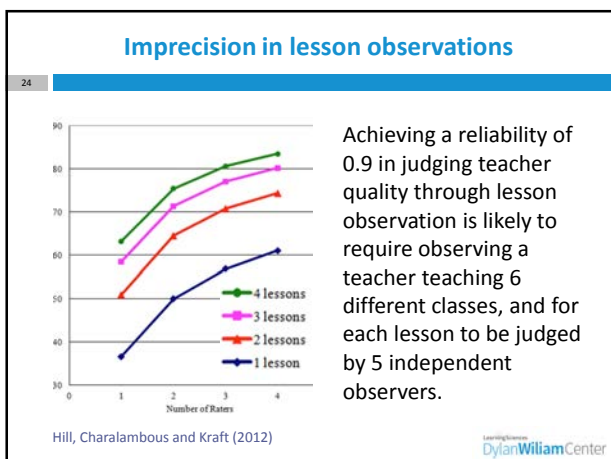
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Bias in lesson observations

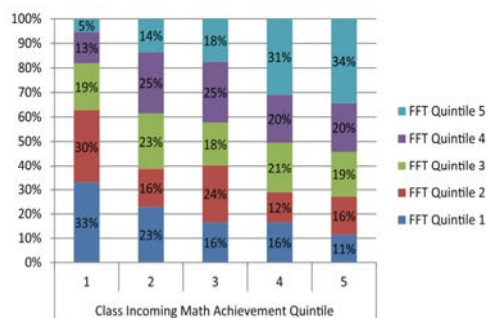
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- A study of 834 teachers from six large US school districts found that teachers were more likely to be given a higher observation rating if they were teaching students with higher achievement.
- Compared with teachers teaching the lowest achieving students (bottom 20%), those teaching the highest achieving students (top 20%) were:
 - 2.5 times as likely to be top-rated in English
 - 6 times as likely to be top-rated in mathematics

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Bias in lesson observations

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Steinberg and Garrett (2016)

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Can we identify good teachers from test scores?

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VAM: Different models, different answers

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- Analysis of teacher value-added estimates from ACT scores

| Subject | Number of teachers |
|-----------------------------|--------------------|
| Algebra I teachers | 22 |
| Algebra II teachers | 36 |
| Biology teachers | 31 |
| Chemistry teachers | 26 |
| 10th-grade English teachers | 25 |
| 11th-grade English teachers | 34 |
| Geometry teachers | 38 |
| Total | 212 |

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Teachers allocated to quintiles of quality

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Cross-classification of the percentage of teachers classified in quintiles of teacher quality using two different value-added models

| | | Student fixed-effects model | | | | |
|-------------------|---|-----------------------------|----|----|----|----|
| Traditional model | | 1 | 2 | 3 | 4 | 5 |
| | 1 | 38 | 22 | 24 | 16 | 0 |
| | 2 | 26 | 28 | 15 | 20 | 11 |
| | 3 | 20 | 20 | 20 | 24 | 16 |
| | 4 | 13 | 24 | 26 | 13 | 24 |
| | 5 | 9 | 5 | 12 | 28 | 47 |

Goldhaber, Goldschmidt, and Tseng (2013)

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Can we identify good teachers by combining evidence from different sources?

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Measures of Effective Teaching project

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- Three sources of evidence on teacher effectiveness
 - Value-added estimates
 - Classroom observation
 - Student perception surveys
- Four models
 1. Maximize prediction of future student achievement
 2. Value-added at 50%, the other two sources at 25%
 3. Observation at 50%, the other two sources at 25%
 4. Equal weight for each source

Bill and Melinda Gates Foundation (2012)



Four models

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| Model | Weight given to: | | |
|-------|----------------------|--------------|-----------------|
| | value-added measures | observations | student surveys |
| 1 | 81% | 17% | 2% |
| 2 | 50% | 25% | 25% |
| 3 | 25% | 50% | 25% |
| 4 | 33% | 33% | 33% |



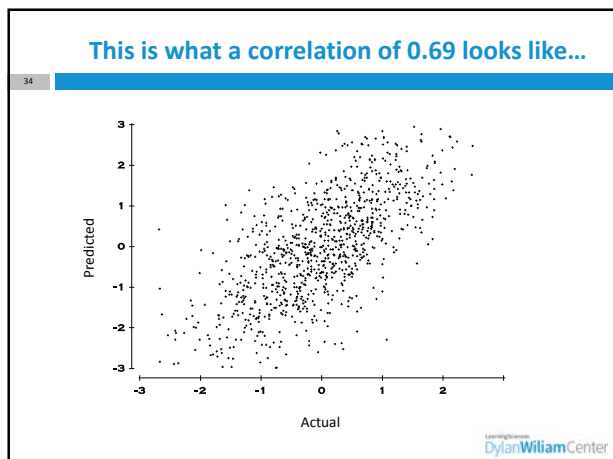
For middle school language arts teachers

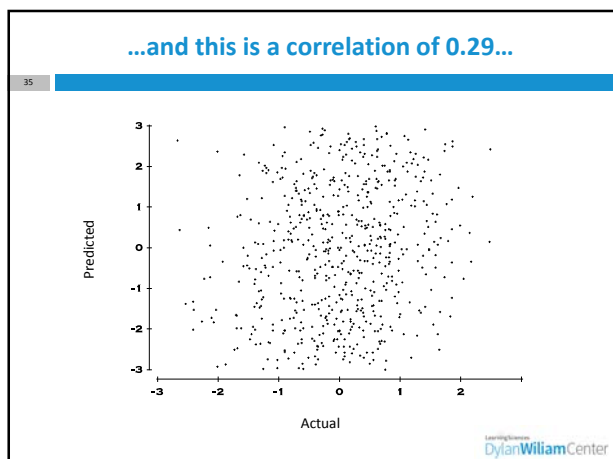
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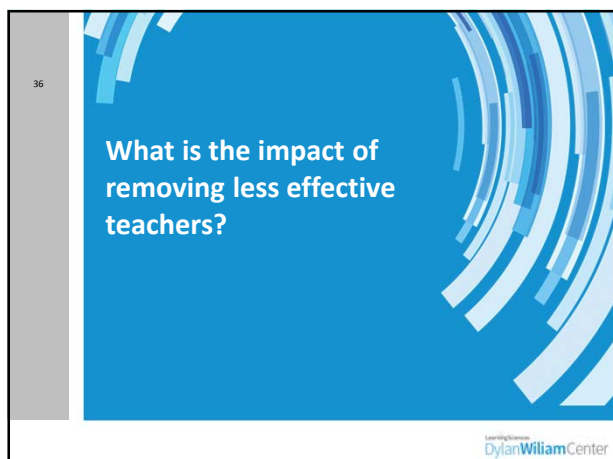
| | Model | | | |
|-------------------------------------|-------|------|------|------|
| | 1 | 2 | 3 | 4 |
| Correlation with state test gains | 0.69 | 0.63 | 0.43 | 0.53 |
| Correlation with higher-order tests | 0.29 | 0.34 | 0.32 | 0.33 |
| Reliability | 0.51 | 0.66 | 0.75 | 0.76 |

To make this as reliable as the SAT, you would need to collect data over 11 years









Effects of removing low-performing teachers

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- Data: reading scores for 4th and 5th grade students in Florida's public schools from 2004-05 to 2008-09
- A total of 227,014 students (96%) are matched to 15,152 teachers responsible for teaching reading
- A value-added score is estimated for each teacher each year
- Two policy options explored for teacher removal:
 - Value-added score below threshold for two consecutive years
 - Two-year average value-added score below threshold

Winters and Cowen (2013)



Impact on student achievement

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| Policy | Years later | Teachers removed below | | |
|-------------------|-------------|----------------------------|-----------------------------|-----------------------------|
| | | 5 th percentile | 10 th percentile | 25 th percentile |
| Consecutive years | One | -0.19 | -0.15 | -0.11 |
| | Two | -0.10 | -0.10 | -0.09 |
| Two-year average | One | -0.11 | -0.09 | -0.06 |
| | Two | -0.08 | -0.07 | -0.04 |



Number of teachers and students affected

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| Consecutive years policy | Number of teachers removed | | |
|--------------------------|----------------------------|-----------------------------|-----------------------------|
| | 5 th percentile | 10 th percentile | 25 th percentile |
| Below 2006 | 754 | 1509 | 3774 |
| Dismissed 2007 | 50 | 155 | 844 |
| Dismissed/observed 2008 | 31 | 88 | 523 |
| Students | 555 | 1595 | 9403 |

One teacher for each two counties in the state

Winters and Cowen (2013)



Number of teachers and students affected

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| Two-year average policy | Number of teachers removed | | |
|-------------------------|----------------------------|-----------------------------|-----------------------------|
| | 5 th percentile | 10 th percentile | 25 th percentile |
| Dismissed 2007 | 493 | 987 | 2468 |
| Dismissed/observed 2008 | 292 | 593 | 1639 |
| Students | 5131 | 10,557 | 27,867 |

Four teachers in each county in the state

Winters and Cowen (2013)



System-wide impact

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| Policy | Severity (percentile) | Increase in teacher valued-added | Extra weeks of learning per student per year |
|------------------|-----------------------|----------------------------------|--|
| Consecutive | 5 th | .003 | 0.0 |
| | 10 th | .006 | 0.1 |
| | 25 th | .020 | 0.3 |
| Two-year average | 5 th | .020 | 0.3 |
| | 10 th | .031 | 0.4 |
| | 25 th | .050 | 0.7 |



Why every school should do pareto analysis

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- Vilfredo Pareto (1848-1923)
 - Economist, philosopher, and sociologist, associated with the 80:20 rule
- Pareto improvement
 - 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
 - An allocation (e.g., of resources) is Pareto efficient or Pareto optimal when there are no more Pareto improvements





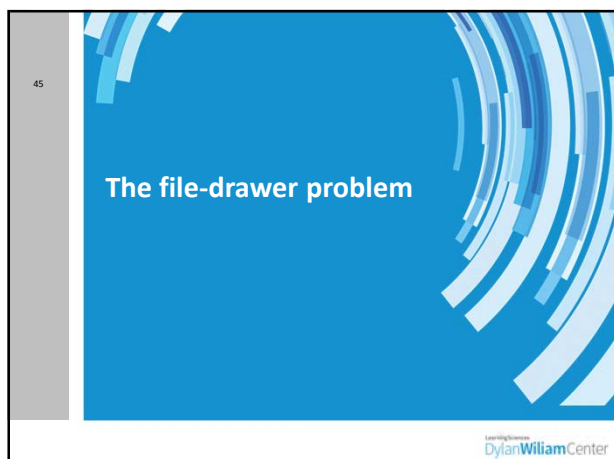

Understanding meta-analysis

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- A technique for aggregating results from different studies by converting empirical results to a common measure (usually effect size)
- Standardized effect size is defined as:

$$\frac{\text{experimental mean} - \text{control group mean}}{\text{population standard deviation}}$$
- Problems with meta-analysis
 - The “file drawer” problem
 - Variations in intervention quality
 - Variation in population variability
 - Selection of studies
 - Sensitivity of outcome measures

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The importance of statistical power

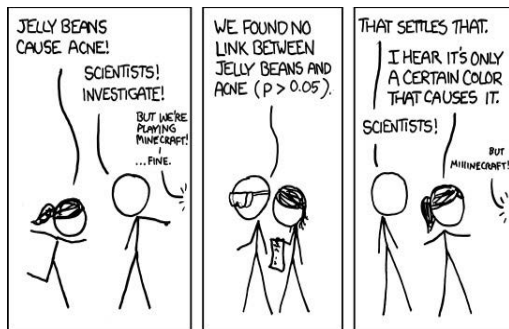
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- The statistical power of an experiment is the probability that the experiment will yield an effect that is large enough to be statistically significant.
- In single-level designs, power depends on
 - significance level set
 - magnitude of effect
 - size of experiment
- The power of most social studies experiments is low
 - Psychology: 0.4 (Sedlmeier & Gigerenzer, 1989)
 - Neuroscience: 0.2 (Burton et al., 2013)
 - Education: 0.4
- Only lucky experiments get published...

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Significant (XKCD 2011)

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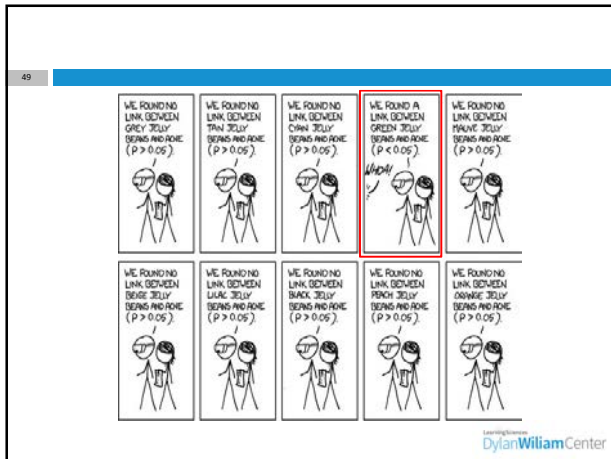


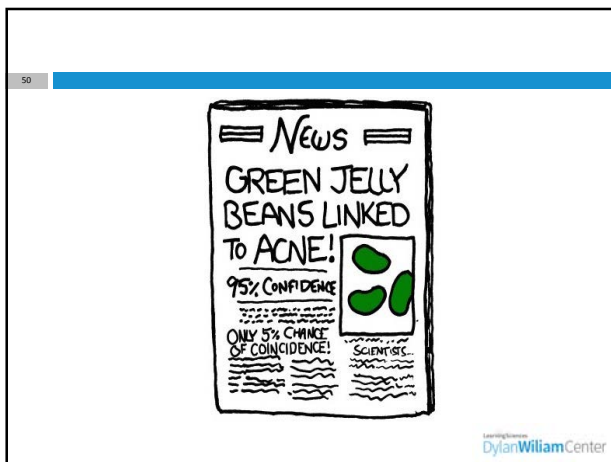
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Consequences of low statistical power

- fMRI scan of an Atlantic salmon shown 15 photos of humans in social situations for 10 seconds and asked to determine the emotion being displayed
- Voxelwise statistics on the salmon data were calculated through an ordinary least-squares estimation of the general linear model (GLM)
- Areas of significant blood oxygen level changes ($p < 0.001$) shown
- The salmon was not alive at the time of the scanning

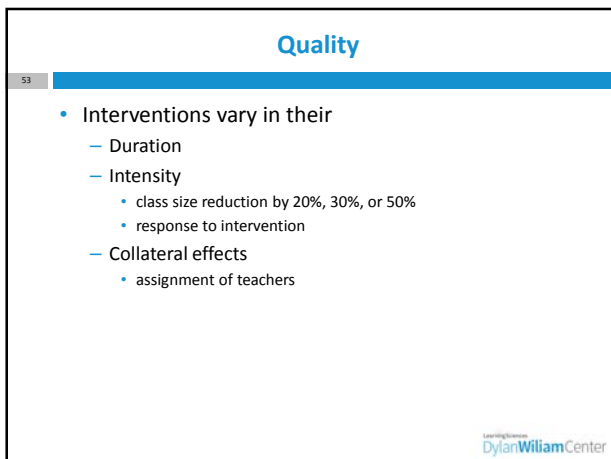
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4.0
3.5
3.0
2.5

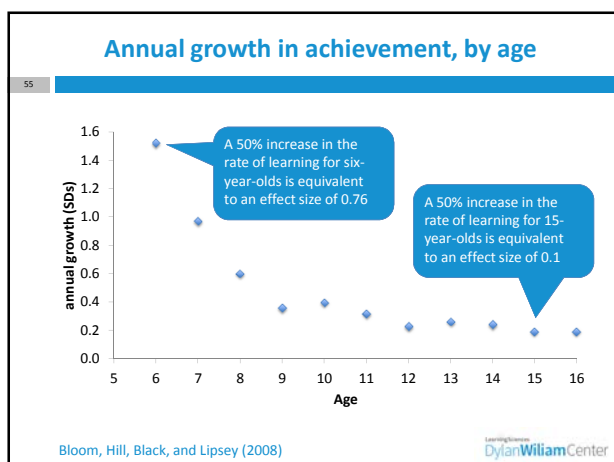
Bennett, Baird, Miller, and Wolford (2013)

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Variation in variability

- Studies with younger children will produce larger effect size estimates
- Studies with restricted populations (e.g., children with special needs, gifted students) will produce larger effect size estimates

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Selection of studies

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Feedback in STEM subjects

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- Review of 9000 papers on feedback in mathematics, science and technology
- Only 238 papers retained
 - Background papers 24
 - Descriptive papers 79
 - Qualitative papers 24
 - Quantitative papers 111
 - Mathematics 60
 - Science 35
 - Technology 16

Ruiz-Primo and Li (2013)



Classification of feedback studies

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1. Who provided the feedback (teacher, peer, self, or technology-based)?
2. How was the feedback delivered (individual, small group, or whole class)?
3. What was the role of the student in the feedback (provider or receiver)?
4. What was the focus of the feedback (e.g., product, process, self-regulation for cognitive feedback; or goal orientation, self-efficacy for affective feedback)?
5. On what was the feedback based (student product or process)?
6. What type of feedback was provided (evaluative, descriptive, or holistic)?
7. How was feedback provided or presented (written, video, oral, or video)?
8. What was the referent of feedback (self, others, or mastery criteria)?
9. How, and how often was feedback given in the study (one time or multiple times; with or without pedagogical use)?



Main findings

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| Characteristic of studies included | Math | Science |
|--|------|---------|
| Feedback treatment is a single event lasting minutes | 85% | 72% |
| Reliability of outcome measures | 39% | 63% |
| Validity of outcome measures | 24% | 3% |
| Dealing only or mainly with declarative knowledge | 12% | 36% |
| Schematic knowledge (e.g., knowing why) | 9% | 0% |
| Multiple feedback events in a week | 14% | 17% |



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Sensitivity to instruction

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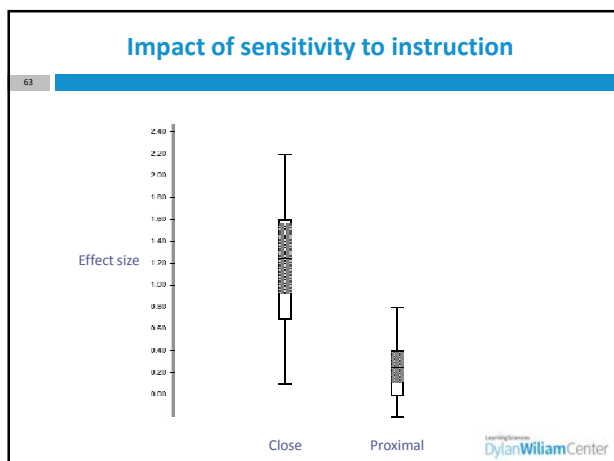
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Sensitivity of outcome measures

- Distance of assessment from the curriculum
 - Immediate
 - e.g., science journals, notebooks, and classroom tests
 - Close
 - e.g., where an immediate assessment asked about number of pendulum swings in 15 seconds, a close assessment asks about the time taken for 10 swings
 - Proximal
 - e.g., if an immediate assessment asked students to construct boats out of paper cups, the proximal assessment would ask for an explanation of what makes bottles float
 - Distal
 - e.g., where the assessment task is sampled from a different domain and where the problem, procedures, materials and measurement methods differed from those used in the original activities
 - Remote
 - standardized national achievement tests.

Ruiz-Primo, Shavelson, Hamilton, and Klein (2002)

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Meta-analysis in education

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- Some problems are unavoidable:
 - Sensitivity to instruction
 - Selection of studies
- Some problems are avoidable:
 - File-drawer problem
 - Quality
 - Variation in variability
- Unfortunately, most of the people doing meta-analysis in education:
 - don't discuss the unavoidable problems, and
 - don't avoid the avoidable ones

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Learning from research: Best-evidence synthesis

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Things that don't work

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- Getting smarter people into teaching
- Paying good teachers more
- Brain Gym®
- Learning styles
- Copying other countries

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Things that *might* work

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- Differentiated instruction
- Lesson study/Learning study
- Social and emotional aspects of learning
- Educational neuroscience
- Grit
- Growth mindset

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Things that do work—a bit

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- Firing bad teachers
- Charter schools/free schools
- Vouchers
- Class size reduction

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Things that do work—a lot

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- Curriculum improvement
- Formative assessment

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Relevant studies

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- Fuchs & Fuchs (1986)
- Natriello (1987)
- Crooks (1988)
- Bangert-Drowns, et al. (1991)
- Dempster (1991)
- Dempster (1992)
- Kluger & DeNisi (1996)
- Black & Wiliam (1998)
- Nyquist (2003)
- Elshout-Mohr (1994)
- Brookhart (2004)
- Allal & Lopez (2005)
- Köller (2005)
- Brookhart (2007)
- William (2007)
- Hattie & Timperley (2007)
- Shute (2008)
- Kingston & Nash (2011)

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Unpacking Formative Assessment

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| | Where the learner is going | Where the learner is now | How to get the learner there |
|---------|--|---|--|
| Teacher | Clarifying, sharing, and understanding learning intentions | Eliciting evidence of learning | Providing feedback that moves learners forward |
| Peer | | Activating students as learning resources for one another | |
| Student | | Activating students as owners of their own learning | |

Unpacking Formative Assessment

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| | Where the learner is going | Where the learner is now | How to get the learner there |
|---------|---|--------------------------|------------------------------|
| Teacher | Using evidence of achievement to adapt what happens in classrooms to meet learner needs | | |
| Peer | | | |
| Student | | | |

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The relationship of formative assessment to other policy priorities

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Educational Endowment Foundation toolkit

| Intervention | Cost | Quality of evidence | Extra months of learning |
|-----------------------------------|------------|---------------------|--------------------------|
| Feedback | \$\$ | 000 | +8 |
| Metacognition and self-regulation | \$\$ | 0000 | +8 |
| Peer tutoring | \$\$ | 0000 | +6 |
| Early years intervention | \$\$\$\$\$ | 0000 | +6 |
| One to one tuition | \$\$\$\$\$ | 0000 | +5 |
| Homework (secondary) | \$ | 000 | +5 |
| Collaborative learning | \$ | 0000 | +5 |
| Phonics | \$ | 0000 | +4 |
| Small group tuition | \$\$\$ | 0000 | +4 |
| Behaviour interventions | \$\$\$ | 00 | +4 |
| Digital technology | \$\$\$\$\$ | 0000 | +4 |
| Social and emotional learning | \$ | 0000 | +4 |

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Educational Endowment Foundation toolkit

| Intervention | Cost | Quality of evidence | Extra months of learning |
|----------------------------|------------|---------------------|--------------------------|
| Parental involvement | \$\$\$ | 000 | +3 |
| Reducing class size | \$\$\$\$\$ | 000 | +3 |
| Summer schools | \$\$\$ | 00 | +3 |
| Sports participation | \$\$\$ | 00 | +2 |
| Arts participation | \$\$ | 000 | +2 |
| Extended school time | \$\$\$ | 00 | +2 |
| Individualized instruction | \$ | 000 | +2 |
| After school programmes | \$\$\$\$\$ | 00 | +2 |
| Learning styles | \$ | 000 | +2 |
| Mentoring | \$\$\$ | 000 | +1 |
| Homework (primary) | \$ | 000 | +1 |

Educational Endowment Foundation toolkit

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| Intervention | Cost | Quality of evidence | Extra months of learning |
|--------------------------|----------|---------------------|--------------------------|
| Teaching assistants | \$\$\$\$ | □□ | 0 |
| Performance pay | \$\$ | □ | 0 |
| Aspiration interventions | \$\$\$ | □ | 0 |
| Block scheduling | \$ | □□ | 0 |
| School uniform | \$ | □ | 0 |
| Physical environment | \$\$ | □ | 0 |
| Ability grouping | \$ | □□□ | -1 |

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Unpacking Formative Assessment

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| | Where the learner is going | Where the learner is now | How to get the learner there |
|---------|--|---|--|
| Teacher | Clarifying, sharing, and understanding learning intentions | Eliciting evidence of learning | Providing feedback that moves learners forward |
| Peer | | Activating students as resources for one another | |
| Student | | Activating students as owners of their own learning | |



Formative assessment and other priorities

79

- Formative assessment is an integral part of many current policy priorities:
 - Framework for teaching (Danielson)
 - Teacher evaluation model (Marzano)
 - Differentiated instruction (Tomlinson)
 - Response to (instruction and) intervention

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Framework for teaching (Danielson 1996)

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- Four domains of professional practice
 1. Planning and preparation
 2. Classroom environment
 3. Instruction
 4. Professional responsibilities
- Links with student achievement (Sartain, et al. 2011)
 - Domains 1 and 4: no impact on student achievement
 - Domains 2 and 3: some impact on student achievement

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The framework in detail

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- Domain 2: The classroom environment
 - 2a: Creating an environment of respect and rapport
 - 2b: Establishing a culture for learning
 - 2c: Managing classroom procedures
 - 2d: Managing student behavior
 - 2e: Organizing physical space
- Domain 3: Instruction
 - 3a: Communicating with students
 - 3b: Using questioning and discussion techniques
 - 3c: Engaging students in learning
 - 3d: Using assessment in instruction
 - 3e: Demonstrating flexibility and responsiveness

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Formative assessment and domain 3

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Framework for teaching

- Communicating with students
- Using questioning and discussion techniques
- Engaging students in learning
- Using assessment in instruction
- Demonstrating flexibility and responsiveness

Classroom formative assessment

- Sharing learning intentions with students
- Eliciting evidence
- Feedback
- Students as learning resources
- Students as owners of their learning

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Marzano Teacher Evaluation Model

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• Three lesson segments

- Routine events
 - DQ1: Communicating learning goals and feedback
 - DQ6: Establishing rules and procedures
- Addressing content
 - DQ2: Helping students interact with new knowledge
 - DQ3: Helping students practice and deepen new knowledge
 - DQ4: Helping students generate and test hypotheses
- Enacted on the spot
 - DQ5: Engaging students
 - DQ7: Recognizing attendance to rules and procedures
 - DQ8: Establishing and maintaining effective relationships
 - DQ9: Communicating high expectations for all students

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Marzano Teacher Evaluation Model crosswalk

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SFA Strategy 1: Clarifying, sharing and understanding learning intentions

| # | DQ | Marzano Teacher Evaluation Model element |
|---|----|--|
| 1 | 1 | Providing Rigorous Learning Goals and Performance Scales |
| 6 | 2 | Identifying Critical Content |

SFA Strategy 2: Eliciting evidence

| # | DQ | Marzano Teacher Evaluation Model element |
|----|----|--|
| 18 | 3 | Examining Errors in Reasoning |
| 30 | 5 | Using Friendly Controversy |
| 35 | 7 | Understanding Students' Interests and Backgrounds |
| 40 | 9 | Asking Questions of Low Expectancy Students |
| 41 | 9 | Probing Incorrect Answers with Low Expectancy Students |
| 26 | 5 | Managing Response Rates |

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Marzano Teacher Evaluation Model crosswalk

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SFA Strategy 3: Providing feedback that moves learning forward

| # | DQ | Marzano Teacher Evaluation Model element |
|---|----|--|
| 2 | 1 | Tracking student progress |
| 3 | 1 | Celebrating Success |

SFA Strategy 4: Activating students as learning resources for one another

| # | DQ | Marzano Teacher Evaluation Model element |
|----|----|--|
| 15 | 3 | Organizing Students to Practice and Deepen Knowledge |

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Marzano Teacher Evaluation Model crosswalk

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SFA Strategy 5: Activating students as owners of their own learning

| # | DQ | Marzano Teacher Evaluation Model element |
|----|----|--|
| 12 | 2 | Helping Students Record and Represent knowledge |
| 13 | 2 | Helping Students Reflect on Learning |
| 31 | 5 | Providing Opportunities for Students to Talk about Themselves |
| 20 | 3 | Revising Knowledge |
| 22 | 4 | Engaging Students in Cognitively Complex Tasks |
| 23 | 4 | Providing Resources and Guidance for Cognitively Complex Tasks |

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Evaluation vs. improvement

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- Evaluation frameworks:
 - of necessity, have to be comprehensive
 - include all aspects of teachers work
 - at best, incentivize improvement on all aspects of practice
 - at worst, incentivize improvement on aspects of practice that are easy to improve
- Improvement frameworks:
 - are selective
 - focus on those aspects of practice with the biggest payoff for students
- To maximize improvement, evaluation frameworks have to be used *selectively*

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Differentiated instruction: not a new idea

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- Differentiation in action (Stradling & Saunders, 1993)
- Differences in
 - educational goals
 - curriculum structure
 - course content
 - learning tasks
 - teaching approach
 - pace of learning
 - assessment
 - review

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Most definitions of DI are vague

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“While the concept of ‘differentiated instruction’ can be defined in many ways, as good a definition as any is ensuring that what a student learns, how he/she learns it, and how the student demonstrates what he/she has learned is a match for that student’s readiness level, interests, and preferred mode of learning.” (Tomlinson, 2004 p. 188)

“To differentiate instruction is to recognize students’ varying background knowledge, readiness, language, preferences in learning and interests; and to react responsively. Differentiated instruction is a process to teaching and learning for students of differing abilities in the same class.” (Hall, Strangman, & Meyer, 2011)

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Differentiated instruction and formative assessment

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| | Aspects of differentiated instruction (Hall, Strangman & Meyer, 2008) | FA? |
|---------------|---|-----|
| Content | Several elements and materials are used | |
| | Align tasks and objectives to learning goals | |
| | Instruction is concept-focused and principle-driven | |
| Process | Flexible grouping is consistently used | |
| | Classroom management benefits students and teachers | |
| Products | Initial and on-going assessment of student readiness and growth | |
| | Students are active and responsible explorers | |
| | Vary expectations and requirements for student responses | |
| Miscellaneous | Clarify key concepts and generalizations | |
| | Use assessment as a teaching tool | |
| | Emphasize critical and creative thinking as a goal in lesson design | |
| | Engaging all learners is essential | |
| | Balance between teacher-assigned and student-selected tasks | |

Response to (instruction and) intervention

91

"Response to intervention integrates assessment and intervention within a multi-level prevention system to maximize student achievement and reduce behavior problems. With RTI, schools identify students at risk for poor learning outcomes, monitor student progress, provide evidence-based interventions and adjust the intensity and nature of those interventions depending on a student's responsiveness, and identify students with learning disabilities." (National Center on Response to Intervention, 2010)

- Two "creation myths" for RT(I)
 - An alternative to IQ testing in the identification of learning disabilities
 - A protocol for preventing academic failure (progress monitoring, early—research-based—intervention)

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Evaluating "Response to Intervention" (RtI)

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- Sample: 146 elementary schools across 13 states
- Study of those just above and just below cut-off for placement in a different RtI tier ("regression-discontinuity" design)
- Measures
 - Early Childhood Longitudinal Study, Kindergarten Cohort of 2011 (ECLS-K: 2011)
 - Test of Sight Word Reading Efficiency (2nd edition) (TOWRE2)

Balu, Zhu, Doolittle, Schiller, Jenkins, and Gersten (2015)

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Evaluating "Response to Intervention" (RtI)

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| Fall 2011 | Movement | Winter 2012 |
|-------------------------------|--|-------------------------------|
| Tier 3: 16% 1,034 students | → 65% stayed in Tier 3 → ↓ 20% moved to Tier 2 ↓ ↓↓ 15% moved to Tier 1 ↓↓ | Tier 3: 16% 1,065 students |
| Tier 2: 25% 1,632 students | ↗ 17% moved to Tier 3 ↗ → 50% stayed in Tier 2 → ↓ 33% moved to Tier 1 ↓ | Tier 2: 22% 1,454 students |
| Tier 1: 59% 3,869 students | ↗↗ 3% moved to Tier 3 ↗↗ ↗ 11% moved to Tier 2 ↗ → 86% stayed in Tier 1 → | Tier 1: 62% 4,016 students |

Balu, Zhu, Doolittle, Schiller, Jenkins, and Gersten (2015)

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Evaluating "Response to Intervention" (RtI)

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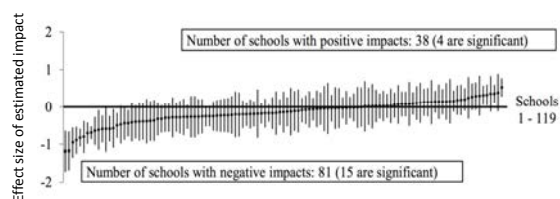
- Impact on:
 - ECLS-K reading assessment: -0.17
 - TOWR2 (first grade): -0.11
 - TOWR2 (second grade): 0.10
 - State reading test (third grade): -0.01

Balu, Zhu, Doolittle, Schiller, Jenkins, and Gersten (2015)



Impact on student achievement

95



Balu, Zhu, Doolittle, Schiller, Jenkins, and Gersten (2015)



Response to (instruction and) intervention

96

- Key points
 - Tier 1 must be high-quality, evidence-based instruction
 - Student progress must be monitored
 - Failure to progress triggers additional support
- Formative assessment
 - Makes tier 1 instruction as effective as it can be
 - Allows assessment of progress



Recent meta-analytic findings

97

| Content area | N | 95% confidence interval for effect size | | |
|-----------------------|----|---|------|-------|
| | | Lower | Mean | Upper |
| Mathematics | 19 | 0.14 | 0.17 | 0.20 |
| English Language Arts | 4 | 0.30 | 0.32 | 0.34 |
| Science | 17 | 0.06 | 0.19 | 0.31 |
| Total | 40 | | | |

Mean effect size = 0.20

A big effect size

Equivalent to a 50% to 70% increase in the rate of learning

Kingston and Nash (2011, 2015)

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Formative Assessment: A contested term

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| | Long-cycle | Medium-cycle | Short-cycle |
|--------|----------------------------------|-----------------------------------|---------------------------------|
| Span | Across terms, teaching units | Within and between teaching units | Within and between lessons |
| Length | Four weeks to one year | One to four weeks | Minute-by-minute and day-by-day |
| Impact | Monitoring, curriculum alignment | Student-involved assessment | Engagement, responsiveness |

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Main Approaches to Formative Assessment

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- **Professional Learning Communities**
 "...an inclusive group of people, motivated by a shared learning vision, who support and work with each other, finding ways, inside and outside their immediate community, to enquire on their practice and together learn new and better approaches that will enhance all pupils' learning." (Stoll et al., 2006)
- **Two main approaches**
 - Focus on outcomes for students
 - Focus on increased teacher capacity

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Complementary Processes

| Instructional Data Teams | Teacher Learning Communities |
|---|---|
| <ul style="list-style-type: none"> • Quality control • Common assessments • Improvement through better team work and systems • Focus on individual outcomes for students • Regular meetings focused on data • 16 points on PISA (in two to three years) | <ul style="list-style-type: none"> • Quality assurance • Highly structured meetings • Improvement through increased teacher capacity • Focus on teachers' individual accountability for change • Regular meetings focused on teacher change • 30 points on PISA (in two to three years) |

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101

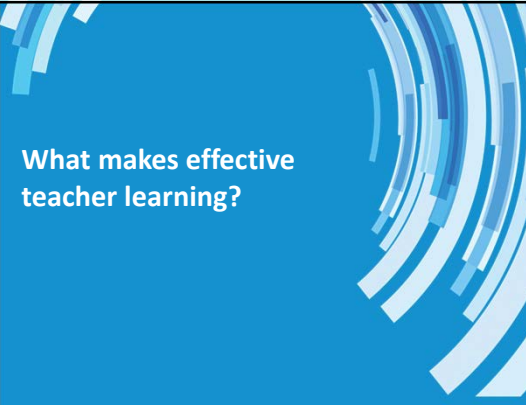
Force-field analysis (Lewin, 1954)

| What are the forces that will support or drive the adoption of classroom formative assessment practices in your district/school? + | What are the forces that will constrain or prevent the adoption of classroom formative assessment practices in your district/school? — |
|---|---|
| | |

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What makes effective teacher learning?



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The knowing-doing gap (Pfeffer 2000)

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| Statement | We know we should do this | We are doing this |
|--|---------------------------|-------------------|
| Getting ideas from other units in the chain | 4.9 | 4.0 |
| Instituting an active suggestions program | 4.8 | 3.9 |
| Detailed assessment processes for new hires | 5.0 | 4.2 |
| Posting all jobs internally | 4.2 | 3.5 |
| Talking openly about learning from mistakes | 4.9 | 4.3 |
| Providing employees with frequent feedback | 5.7 | 5.2 |
| Sharing information on financial performance | 4.3 | 3.8 |

Strategies for change (Heath & Heath, 2010)

104

- Direct the rider
 - Follow the bright spots (malnutrition in Vietnam)
 - Script the critical moves (1% milk, 25 points)
 - Point to the destination (no dry holes)
- Motivate the elephant
 - Find the feeling (gloves on the table)
 - Shrink the change (five-minute room makeover)
 - Grow your people (mindset)
- Shape the path
 - Tweak the environment (popcorn study, one-click)
 - Build habits (don't tax the rider, action triggers)
 - Rally the herd (free spaces in hospitals)

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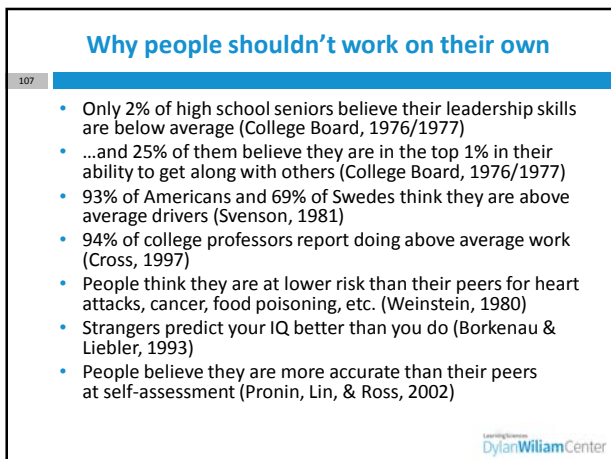
Strategies for teacher change

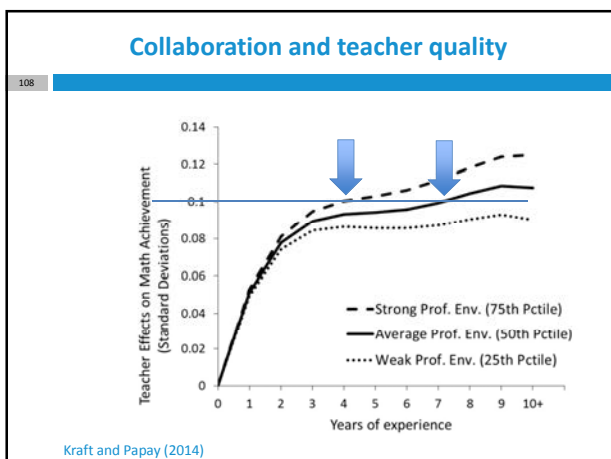
105

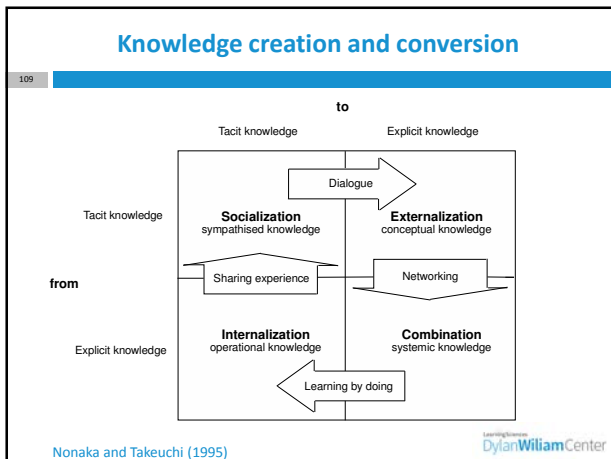
- Direct the rider
 - Follow the bright spots (volunteers vs. conscripts)
 - Script the critical moves (structured meetings)
 - Point to the destination (NCLB)
- Motivate the elephant
 - Find the feeling (the moral imperative)
 - Shrink the change (small steps)
 - Grow your people (all teachers can improve)
- Shape the path
 - Tweak the environment (time for teacher learning)
 - Build habits (create routines and structures)
 - Rally the herd (make new mistakes)

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What are professional learning communities?

110

- Professional Learning Communities (PLCs) are
 - “...an inclusive group of people, motivated by a shared learning vision, who support and work with each other, finding ways, inside and outside their immediate community, to enquire on their practice and together learn new and better approaches that will enhance all pupils’ learning.” (Stoll et al., 2006)
- PLCs therefore represent essentially any team-based approach to educational improvement

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What is a professional learning community?

111

- Professional learning communities are:
 - Professional
 - Decision-making under uncertainty
 - Accountable to a community of peers
 - Learning
 - Focused on improvement in student outcomes
 - Communities
 - Joint enterprise
 - Mutual engagement
 - Shared repertoire

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Foci for professional learning communities

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- PLCs can be focused on almost anything, including
 - Curriculum design and planning
 - New initiatives
 - Instructional data teams
 - Improving teacher classroom formative assessment

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Uses of school-based PLCs

113

- PLCs are likely to be effective for
 - Situations in which team-work is likely to be more effective than individual activity
 - Data-driven decision-making
 - Lesson study
 - Changes that require changing habits
 - Classroom formative assessment
- PLCs are likely to be less effective for
 - Changes that require acquisition of knowledge
 - Changes that are relevant to a small number of people

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Complementary processes

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Instructional data teams

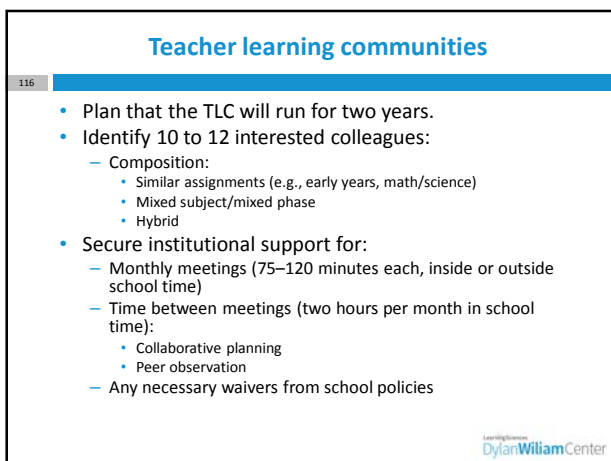
- Quality control
- Common assessments
- Improvement through better team work and systems
- Focus on individual outcomes for students
- Regular meetings focused on data
- 16 points on PISA (in two to three years)

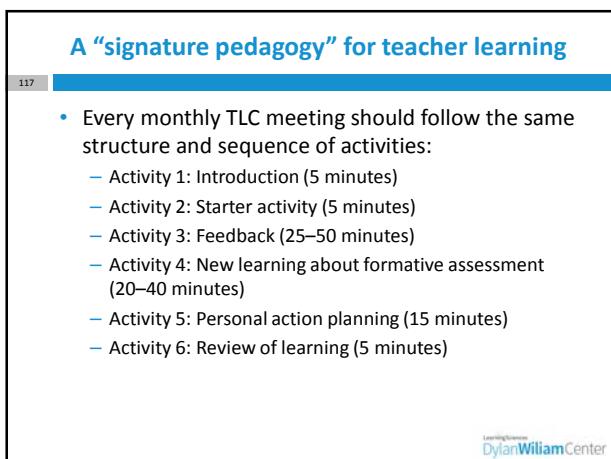
Classroom FA TLCs

- Quality assurance
- Highly structured meetings
- Improvement through increased teacher capacity
- Focus on teachers' individual accountability for change
- Regular meetings focused on teacher change
- 30 points on PISA (in two to three years)

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Activities 1, 2, 3, 5, 6: "Bookends"

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- For each of these five activities, the process is exactly the same at each TLC meeting
- This provides a familiar structure for teachers to get better together
 - As the structure fades into the background,
 - The learning comes into the foreground
- Teachers come to the meeting knowing what is expected of them

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Ground-rules for TLCs

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- Norms of collaboration (Garmston & Wellman, 1999)
- Seven powerful Ps
 - Pausing
 - Paraphrasing
 - Probing
 - Putting ideas on the table (and pulling them off!)
 - Paying attention to self and others
 - Presuming positive intentions
 - Pursuing a balance between advocacy and inquiry

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Activity 1: Introduction

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- Sharing learning intentions for the meeting

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Activity 2: Starter

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- A variety of warm-up activities to get participants' minds to the meeting:
 - Think of something you are looking forward to this year
 - 30-seconds to get "things off your chest" about what infuriates you about your job
 - 30 seconds to tell the group about something that happened within the last month and made you feel good
 - Think of something that happened in a lesson this year that made you smile
 - Think of something that one of your colleagues did last term that supported you
 - Go back to the TLC 'ground rules'

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Activity 3: Feedback

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- Routines need to be established, expectations shared, and structure maintained.
- Similar expectations regarding preparation and engagement.
 - Coming to the meeting knowing they will be sharing their own formative assessment experiences.
 - Being prepared to offer constructive, thoughtfully conceived feedback to colleagues.
 - Being prepared to challenge ideas that may be good classroom practice but are not necessarily tightly related to formative assessment.

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Activity 4: New learning

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- 'Drip-feed' of new ideas, to increase knowledge, and to produce variety
 - Watch videos of classroom practice
 - Book study (one chapter each month)
 - New formative assessment techniques

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Activity 5: Personal action planning

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- Each teacher updates his or her personal action plan
- Makes a specific commitment about what they will do over the coming month
- Arranges any support needed from colleagues
 - Specific date and time for peer observation



Activity 6: Wrap

125

- Did the meeting meet its intended objectives
 - If yes, great
 - If no, time to plan what to do about it



Every TLC needs a leader

126

- The job of the TLC leader(s):
 - To ensure that all necessary resources (including refreshments!) are available at meetings
 - To ensure that the agenda is followed
 - To maintain a collegial and supportive environment
- But most important of all:
 - It is not to be the formative assessment “expert.”



Peer observation

127

- Run to the agenda of the observed, not the observer:
 - Observed teacher specifies focus of observation:
 - E.g., teacher wants to increase wait time.
 - Observed teacher specifies what counts as evidence:
 - Provides observer with a stopwatch to log wait times.
 - Observed teacher owns any notes made during the observation.

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Senior leader responsibilities

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- Prioritizing and deprioritizing
- Top down v bottom up (tight but loose)
- Dealing with requests to vary content and agendas
- Allocating time for start-up and workshops (over an hour?)
- Encouraging risk taking and liaising with parents, school board members, etc
- Supporting TLC leaders (coaching and admin)
- Deciding what happens between workshops

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Supportive accountability

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- What is needed from teachers:
 - A commitment to:
 - The continual improvement of practice
 - Focus on those things that make a difference to students
- What is needed from leaders:
 - A commitment to engineer effective learning environments for teachers by:
 - Creating expectations for continually improving practice
 - Keeping the focus on the things that make a difference to students
 - Providing the time, space, dispensation, and support for innovation
 - Supporting risk-taking

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Excuses

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- Lack of time
- Lack of trust
- Unsexy
- Big problems require big solutions
- Lack of leadership
- Administrivia
- The knowing-doing gap
- The research evidence is unclear
- Culture of individual accountability
- Requires sophisticated systems of support
- Focus on knowing that, rather than knowing how

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A case study in risk

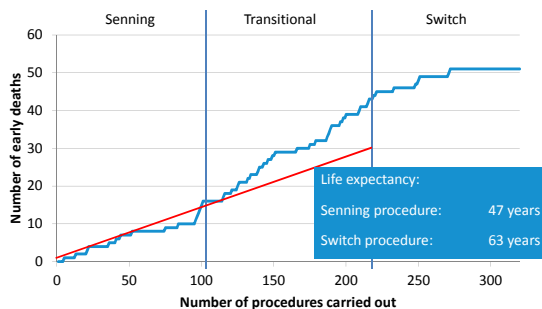
131

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

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The introduction of the ‘switch’ procedure

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Planning question

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- What are the most important things you can do to support teachers in taking risks to improve their teaching?

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A case study in one district

134

- Cannington
 - Urban school district serving ~20,000 students
 - Approximately 20% of the population non-white
 - No schools under threat of re-constitution, but all under pressure to improve test scores
- Funding for a project on “better learning through smarter teaching”
 - Focus on mathematics, science and modern foreign languages (MFL)
 - Commitment from Principals in November 2007
 - Initial workshops in July 2008

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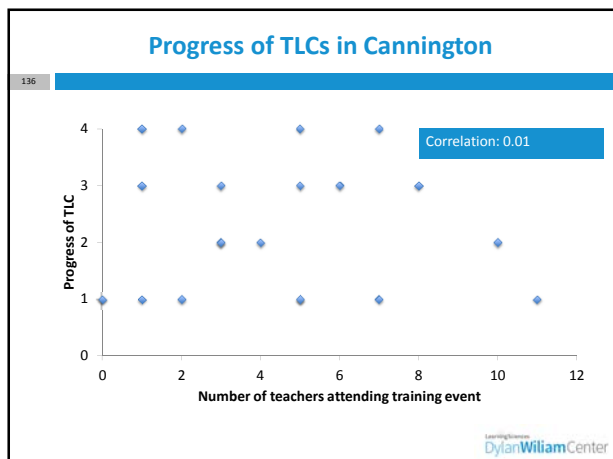
Progress of TLCs in Cannington

135

| | Math | Science | MFL |
|-----------|--------|---------|--------|
| Ash | 1 — | 1 — | 0 — |
| Cedar | 5 ■ | 1 ■ | 3 ■■ |
| Hawthorne | 4 ■■ | 10 ■■ | 5 ■■■■ |
| Hazel | 7 — | 12 — | 2 — |
| Larch | 1 ■■■■ | 0 ■ | 0 ■ |
| Mallow | 6 ■■ | 7 ■ | 3 ■■ |
| Poplar | 11 ■ | 3 ■■ | 1 ■■ |
| Spruce | 7 ■■■■ | 8 ■■ | 5 ■■■ |
| Willow | 2 ■ | 5 ■ | 2 ■■■ |
| Totals | 44 | 47 | 21 |

Black nos. show teachers attending launch event; blue bars show progress of TLC

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Planning question

137

- What activities within your control will you give up or do less of to make classroom formative assessment a priority?

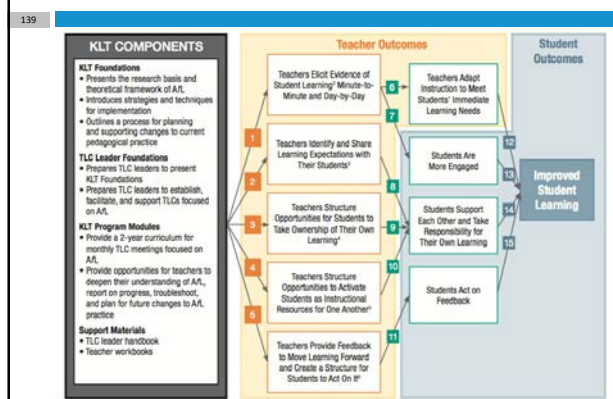
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How will we know if it's working?

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Using logic models to evaluate progress



We'll know when it's working when...

- 140
- Leading indicators of success
 - Teachers are given time to meet, and do so
 - Teachers increasingly act as “critical friends” to others
 - The prevalence of classroom formative assessment practices is increasing
 - Students are more engaged in classrooms
 - Teachers modify the techniques in appropriate ways, indicating an understanding of the underlying theory
 - There is a shift in the ownership of the reform
 - Lagging indicators of success
 - Increased student achievement
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Possible foci for “Learning walks”

- 141
- Clear, valuable learning intentions for lesson
 - Success criteria understood by students
 - Students chosen at random
 - Questions that make students think
 - Students, not teacher, dominate discussions
 - At least 80% students involved in answering questions
 - All-student response system used
 - Teacher waits three seconds after question
 - Students support each others' learning
 - Students take responsibility for own learning
 - Teacher gives oral formative feedback
 - Evidence of comments that advance learning
 - Teacher finds out what students learned
 - Teaching adjusted after evidence collection
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Planning question

142

- What will you do to assess how this is working?

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Development of teacher community

143

- Four aspects of progress in teacher community
 - Formation of group identity and norms of interaction
 - Understanding difference/Navigating fault lines
 - Negotiating the essential tension
 - Taking communal responsibility for individuals' growth

Grossman, Wineburg, and Woolworth (2000)

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Formation of group identity and norms of interaction

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| Stage | Features |
|-----------|---|
| Beginning | Identification with subgroup Individuals are interchangeable and expendable Undercurrent of incivility Sense of individualism overrides responsibility to group's functioning |
| Evolving | Pseudocommunity (false sense of unity; suppression of conflict) Recognition of unique contributions of individual members Open discussion of interactional norms Recognition of need for regulation of group behavior |
| Mature | Identification with the whole group Recognition that group is enriched by multiple perspectives (sense of loss when member leaves) Development of new interactional norms Communal responsibility for and regulation of group behavior |

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Understanding difference/Navigating fault lines

145

| Stage | Features |
|-----------|---|
| Beginning | Denial of difference Conflict goes backstage, hidden from view |
| Evolving | Appropriation of divergent views by dominant position Conflict erupts on main stage and is feared |
| Mature | Identification with the whole group Understanding and productive use of difference Conflict is an expected feature of group life and dealt with openly and honestly |

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Negotiating the essential tension

146

| Stage | Features |
|-----------|--|
| Beginning | Lack of agreement over purposes of professional community; different positions are viewed as inherently antagonistic |
| Evolving | Begrudging willingness to let different people pursue different activities |
| Mature | Recognition that teacher learning and student learning are fundamentally intertwined |

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Taking communal responsibility for individuals' growth

147

| Stage | Features |
|-----------|---|
| Beginning | Belief that teachers' responsibility is to students, not colleagues; intellectual growth is the responsibility of the individual Contributions to group are acts of individual volition |
| Evolving | Recognition that colleagues are resources for one's learning Recognition that participation is expected for all |
| Mature | Commitment to colleagues' growth Acceptance of rights and obligations of community membership (e.g. "intellectual midwifery", "press for clarification") |

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Key stakeholders' reactions

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- Departmental sub-cultures
- Unions
- Professional associations
- Teaching assistants
- Parents
- School Board members
- Community leaders

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Managing disappointments

149

- Failure: opportunity for learning or blame
- Falling down: failing or learning?
- High-reliability organizations embrace failure
- \$1m dollar club
- "A complaint is a gift"
- Group-work is hard for teachers, ... and for teachers of teachers...

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Final planning question

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- **Pulling all your conversations together, what critical action steps will engage staff in this work? Where do you want to start?**

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[illegible]

[illegible]

[illegible]

Available from Hawker Brownlow Education

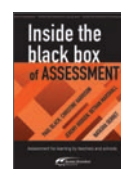
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GLA1291



GLA1314



GLA1369



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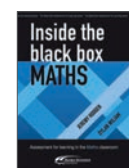
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GLA1307



GLA1338



GLA1321



GLA1284



GLA1383



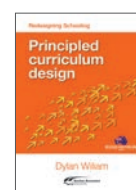
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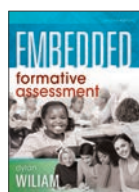
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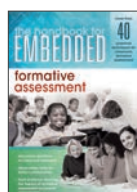
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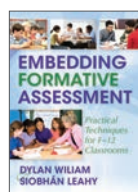
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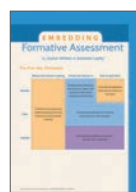
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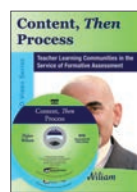
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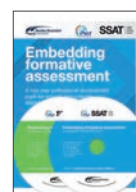
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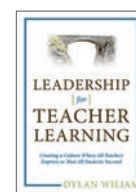
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SOT8281



LSM8306

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