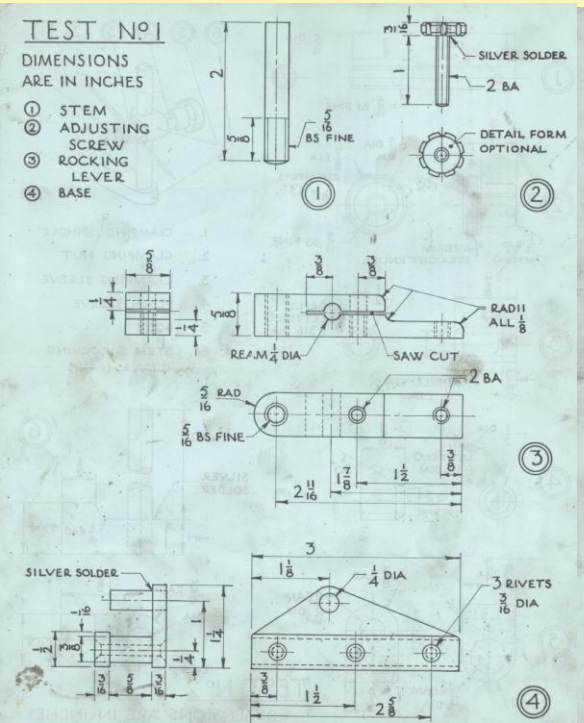
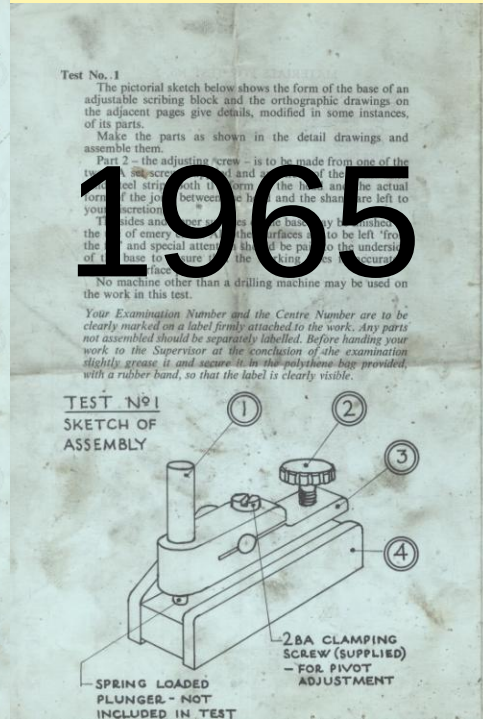
d&t .. how did we get here?
.. where are we headed?

assessment

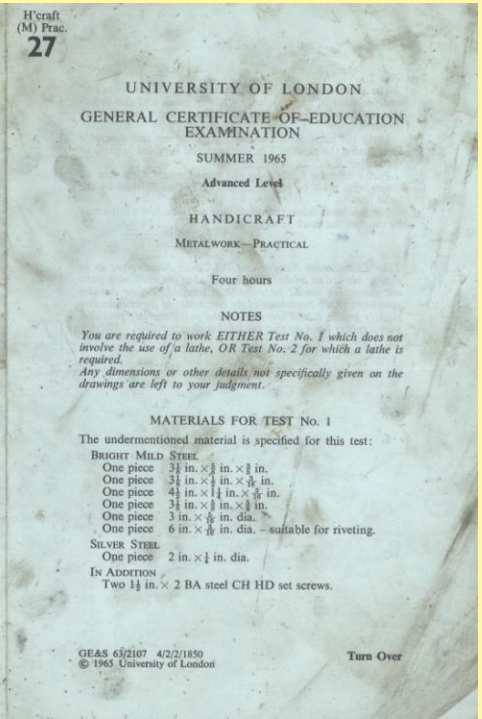
Prof Richard Kimbell

TERU Goldsmiths University of London





1965



20th C
divided education

grammar schools	= high status
entry	= by IQ selection (top 25%)
learning	= scholarly
assessment	= written exams

sec modern schools	= low status
entry	= by IQ ‘failure’ (75%)
learning	= practical
assessment	= performance tests

Govt reports begin to articulate doubts about this schism

Crowther (1959) "15-18"
(ie ***Grammar*** school 6th forms)

CHAPTER 35 The Alternative Road
568. An observer of English education can hardly fail to be disturbed by the large number of able boys and girls who *lose their intellectual curiosity before they have exhausted their capacity to learn*.

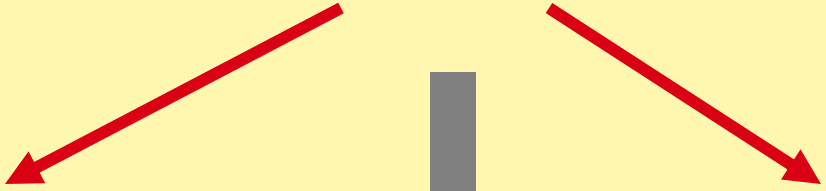
… rehabilitate 'practical' (active) learning …

1960s educational revolution (Harold Wilson)

'66 Comprehensive schools
'67 Open university
'68 CSE examinations for 14-16
for 'the rest' - the 80%
including coursework assessment
'70 Raising of the school leaving age (ROSLA)
secondary education for all
100 years after *elementary* education for all
including *assessment* for all …

1970s

comprehensive schools …. but …. segregated assessment



academic GCE ‘O’ and ‘A’
Oxf/Camb/London exam boards

20-30%

applied CSE
Regional exam boards

70-80%

what kind of **assessment** do we need ?

what kind of **person** do we need ?

QuickTime™ and a
decompressor
are needed to see this picture.

"Our aim is that risk-takers are rewarded. Let us believe in ourselves again. Britain's future depends on those with confidence, who take risks, like the creative talents we celebrate here today. They are the people that Britain needs in the next century... those who have ambition for our country"

(Blair: Millennium Products Awards - Millennium Dome Dec 1999)

QuickTime™ and a
decompressor
are needed to see this picture.

"If you've got an idea, if you want to create jobs, and if you have the ambition to build a world beating company here in the U.K., we want you,"

"Britain wants to become the home of ***enterprise*** and the land of opportunity."

(Cameron in Bloomberg Nov 2010)

Alan Sugar

Henry Ford

Thomas Edison

Mary Quant

Bill Gates

Richard Rogers

Steve Jobs

Richard Branson

Ralph Lauren

dropped-out

turned off by

abstract academic learning

QuickTime™ and a
decompressor
are needed to see this picture.

QuickTime™ and a
decompressor
are needed to see this picture.

QuickTime™ and a
decompressor
are needed to see this picture.

QuickTime™ and a
decompressor
are needed to see this picture.

because ... or ... despite

Crowther:intellectual curiosity

1985 merger { academic GCE ‘O’ and ‘A’ level
practical CSE

GCSE

General Certificate of Secondary Education

exams + coursework

i) the challenge of differentiation

ii) the challenge of ‘process’

(*being* scientific … not just *knowing* science)

- real challenging tasks …
- head & hand & heart …
- coursework assessment …
- portfolio-based evidence ... see what I can ***do***
- differentiate by the ***outcome***

1990s employment skills

- teamwork & collaboration
- creativity and innovation
- problem solving
- entrepreneurship

- the self-bailing dinghy
  by (and for) a fanatical Cornish sailor

- the intelligent lobster pot
  for a shell fishery - to prevent lobster theft

- the adjustable climbing wall
  for schools gyms by a trainee rock climber

- the one-handed can opener
  for a disabled grandmother

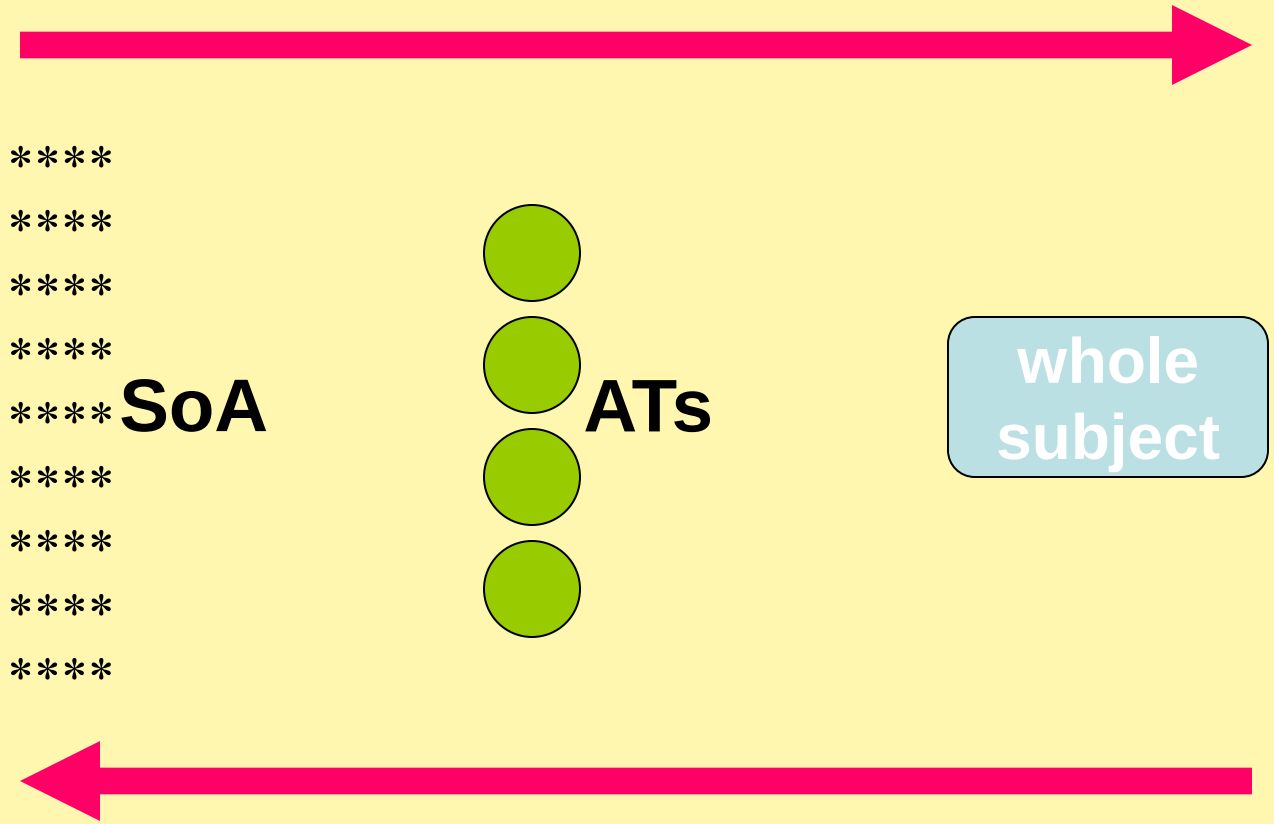
- the safe learning environment
  for a blind 3 yr old

- the moorland (9 hole) golf-course
  for a country hotel

"Design & Technology" Statutory Order 1990

	Attainment Target 1 IDENTIFYING NEEDS AND OPPORTUNITIES	Attainment Target 2 GENERATING A DESIGN PROPOSAL
	Pupils should be able to identify and state clearly needs and opportunities for design and technological activities through investigation of the contexts of home, school, recreation, community, business and industry. Pupils should be able to:	Pupils should be able to generate a design specification and explore ideas to produce a design proposal and develop it into a realistic, appropriate and achievable design. Pupils should be able to:
level 1	describe to others what they have seen in familiar surroundings or visualised about imaginary situations: suggest what might be done:	Express their ideas about what they might do:
level 2	ask questions which help them to identify the needs and opportunities for design and technological activity: describe what they have observed or visualised and found out in their exploration: suggest practical changes that could be made in response to a need and describe to others why they made the changes:	use talk, pictures, drawings, models, to develop their design proposals, giving simple reasons why they have chosen to make something:
level 3	starting with something familiar, use their knowledge and the results of investigations to identify needs and opportunities for a design and technological activity: develop and clarify their ideas about possible needs and opportunities through discussion with those involved:	record how they have explored different ideas about design and technological proposals to see how realistic they are: use information about materials, people, markets and processes, and from other times and cultures, to help in developing their ideas: make a design proposal by selecting from their ideas and giving reasons for their choices: apply knowledge and skills to select ways of realising the different parts of their design: use drawings and modelling including annotated drawings and working models to develop their design proposals:
level 4	recognise the points of view of others and consider what it is like to be in another person's situation: devise ways of gathering information in addition to using printed and other sources: starting with something unfamiliar, identify needs and opportunities for design and technological activities: know that in the past and in other cultures people have used design and technology to solve familiar problems in different ways: work with others in planning, apportioning tasks, and optimising use of resources: provide oral and written justification for the conclusions they reach as a result of investigation: understand that a range of criteria, which are sometimes conflicting, must be used to make judgements about what is worth doing:	record how their ideas have developed: use information obtained from their own investigations, and from other sources, to review their design proposals to identify where decisions still need to be made: suggest possible courses of action which will improve their original design proposals: estimate the resource requirements and check on availability: use storyboards to describe and edit design proposals:
level 5	show judgement in the choice of sources of information, both qualitative and quantitative, in the systematic search for a need or opportunity for a design and technological activity: recognise that economic, social, environmental and technological considerations and the preferences of users are important:	record the progress of their ideas showing how they have clarified and developed them: seek out and organise information to help them develop their ideas and refine their design proposal: extend their first ideas by combining aspects of them to formulate a design proposal and explain why some ideas were not used: establish and check the availability of the resources required, adapting their design as appropriate: specify what they intend to do and what they will need by using simple plans and flow diagrams:
level 6	understand why design and technology, in industry and in other cultures, developed in the ways it did: explain how they have identified needs and opportunities for design and technological activities and give a justification of the conclusions they have reached: understand how the introduction of new technologies can offer new opportunities for design and technological activity:	produce a design specification and use it to develop their design proposal: make judgements about realistic ways forward by exploring alternative solutions and use these to refine their design proposal: use specialist modelling techniques to develop design proposals:
level 7	vary methods of investigation to obtain all the information required: identify and draw upon sources of expert advice relevant to the identification of needs and opportunities for design and technological activities: analyse information of several kinds and draw conclusions about the needs and opportunities for a design and technological activity, recognising and resolving conflicting considerations: consider both the user and the producer when defining the need for a technological activity:	seek out, systematically appraise, organise and use information from different sources to develop and combine ideas and judge how realistic they might be: review the detail of their design, using their own experience and that of others, and suggest alternative ways of achieving what is intended: apply criteria including user requirements, cost, time, skill demands, scale of production and aesthetic considerations, to take decisions about the details of the design proposal: produce a design proposal recording their decisions and the ways of reaching their chosen outcome:
level 8	investigate how needs and opportunities have led to design and technological activities in other cultures: provide an evaluation in the light of a range of considerations of the needs and opportunities for design and technological activities:	record and present, using a range of methods and media the progress of their ideas: detail and refine their design proposal and incorporate modifications; use computer aided design, image generation and desk top publishing techniques to explore, detail and refine their ideas: plan their activities to take into account multiple constraints which may at times be conflicting: show a willingness to experiment and take risks recognising the implications of decisions taken in designing:
level 9	devise a strategy which will lead to the development of a design proposal containing details of cost-effective solutions, optimum means of production and potential product sales in international markets: review their knowledge base and draw up a strategy to exploit expert sources:	develop ideas by drawing on information and understanding from a broad knowledge of sources, and showing judgement about the detail required: refine their design to achieve an optimum practicable outcome demonstrating originality and understanding of constraints in the justification of their design:
level 10	find out and interpret the perceptions, motivations and needs of people in a range of contrasting situations: convey, using presentation techniques matched to their audience, that their identification of needs and opportunities is justified and worth developing: make reasoned judgements about what is a subject for design and technological activities and what is better dealt with in other ways:	provide a substantiated account of the full range of ideas they have explored and the strategies used showing: (i) how they explored ideas used in existing artefacts, systems or environments and how they used them to develop their own ideas: (ii) evidence that they have : • identified ways of improving and refining their proposals: • predicted with accuracy the outcomes of possible improvements and refinements: • resolved conflicting demands: • included their decisions in a coherent specification: and using an appropriate range of media and methods:

assessment procedures



“Coursework assessment to end in GCSE shake-up’

The Independent
By Richard Garner, Education Editor
Monday, 22 November 2010

A major shake-up of GCSEs to be unveiled this week means the end of coursew
and a **return to the traditional end-of-year exam**. Education Secretary Micha
is planning to ditch the … system, under which coursework done during the two
study period counts towards the overall grade.

“traditional end-of-year exa

Where is creativity and innovation?
Where is collaboration & team-working?
Where is the integration of head/hand/heart?
Where is problem solving?
Where is entrepreneurship?

who are the winners …. who are the losers ?

Winners
Classical scholarship
literature
history

PPE at Baliol
become a politician

Losers
Creatives & innovators
engineering
business

Entrepreneurs who
make Britain wealthy

QuickTime™ and a
decompressor
are needed to see this picture.

QuickTime™ and a
decompressor
are needed to see this picture.

QuickTime™ and a
decompressor
are needed to see this picture.

QuickTime™ and a
decompressor
are needed to see this picture.

so … some analysis

assessment is political

… inseparable from policy

politicians

fast change
before next election

reliability
so I'll win if challenged

certainty about standards

one rule for all

visible (surface) change
behaviour / pass rates

teachers

consistency year-by-year

validity
performance must mean something

fair-play for my students this year

meaningful to individual learners

deep change
understanding / attitude / beliefs

politicians

fast change
before the next election

reliability
so I'll win if challenged

certainty about standards

one rule for all

surface (visible) change
behaviour / pass rates

teachers

consistency year-by-year

validity
performance must mean something

fair-play for my students this year

meaningful to individual learners

deep change
understanding / attitude / beliefs

US style multiple choice testing — **machine scored**

individualised coursework — **teacher judgement**

coursework assessment banned

formative

to support learning in the classroom

aggregation

aggregation

proliferation & atomisation

aggregation

summative

for certification and awards to students

aggregation

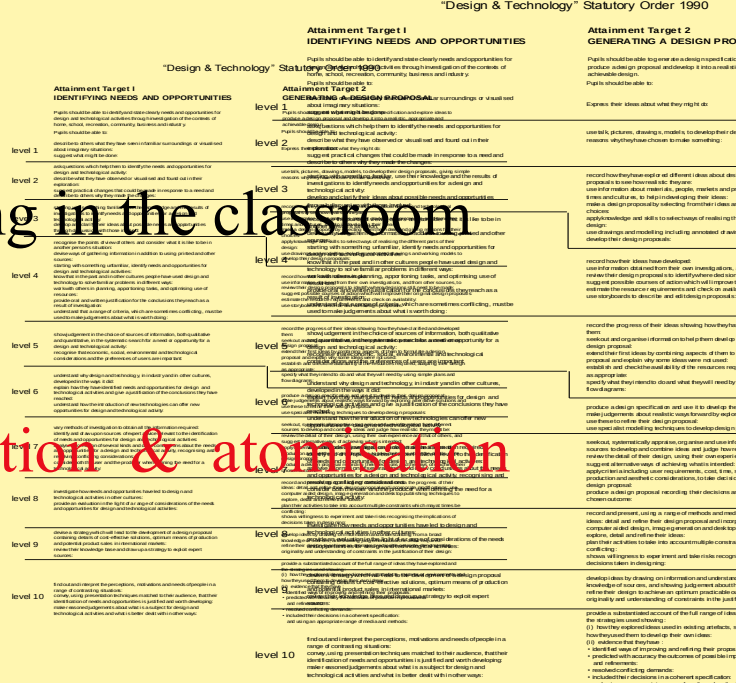
aggregation

payment
by results
(1860-90)

aggregation

evaluative

to audit the performance of the system


"Design & Technology" Statutory Order 1990

Attainment Target 1
IDENTIFYING NEEDS AND OPPORTUNITIES

Pupils should be able to identify and state clearly needs and opportunities for design and technological activities through investigation of the contexts of home, school, recreation, community, business and industry.

Pupils should be able to:

level 1
level 2
level 3
level 4
level 5
level 6
level 7
level 8
level 9
level 10

Attainment Target 2
GENERATING A DESIGN PROPOSAL

Pupils should be able to generate a design proposal and develop it into a realistic, appropriate and achievable design.

Pupils should be able to:

level 1
level 2
level 3
level 4
level 5
level 6
level 7
level 8
level 9
level 10

formative

to support learning in the classroom

AfL

summative

for certification and awards to students

performance

portfolios

evaluative

to audit the performance of the system

APU

inspection

light sampling

Ofqual CEO: Isabel Nesbit

"End paper exams for digital generation"

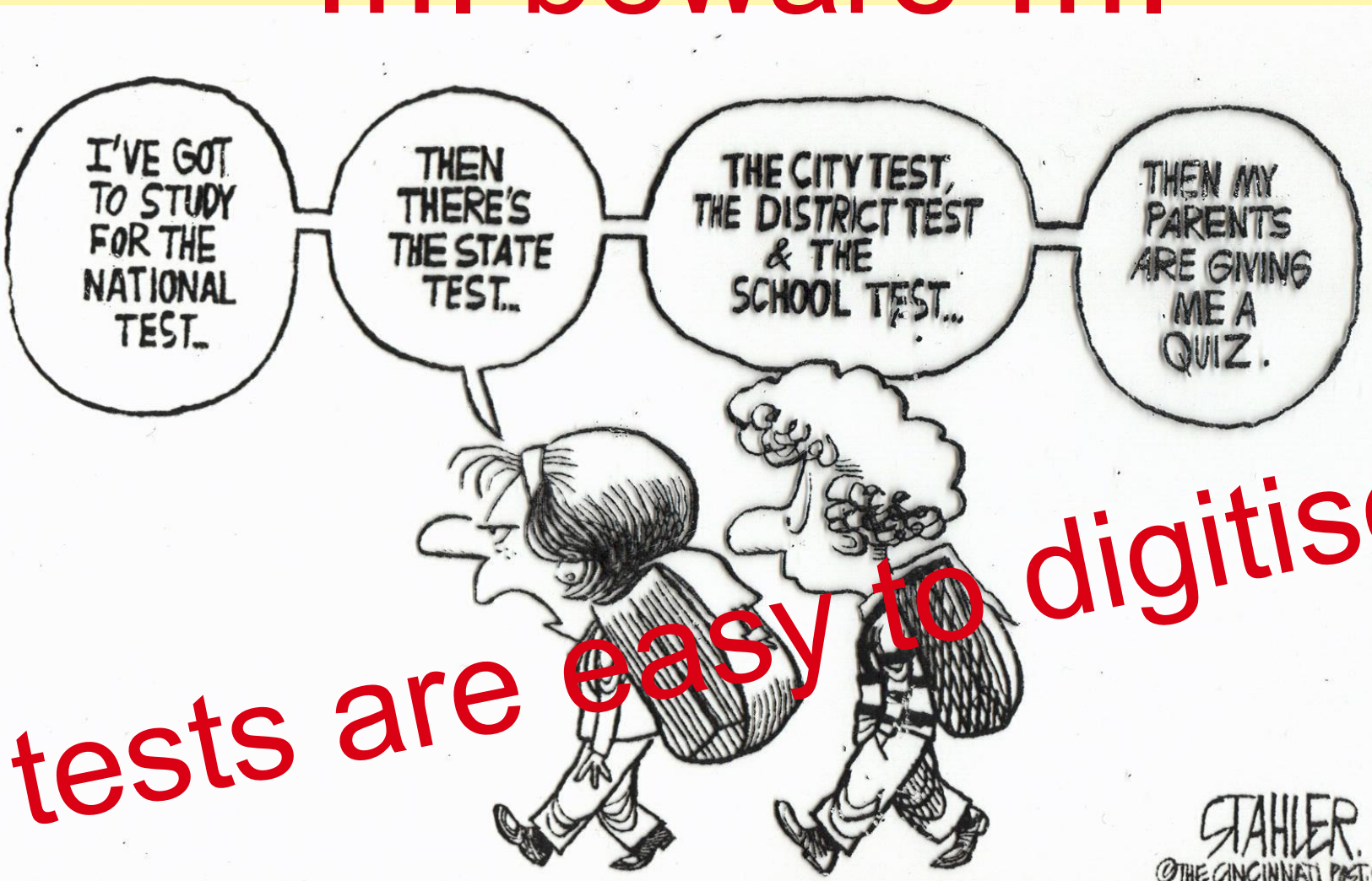
"..students are increasingly learning on computers, so should be tested on them …'

"Computerised exams should replace pen and paper tests for a generation used to digital learning, the head of England's exams watchdog has said."

BBC. Feb 2011

The current reliance on handwritten papers 'cannot go on'.

…. beware ….

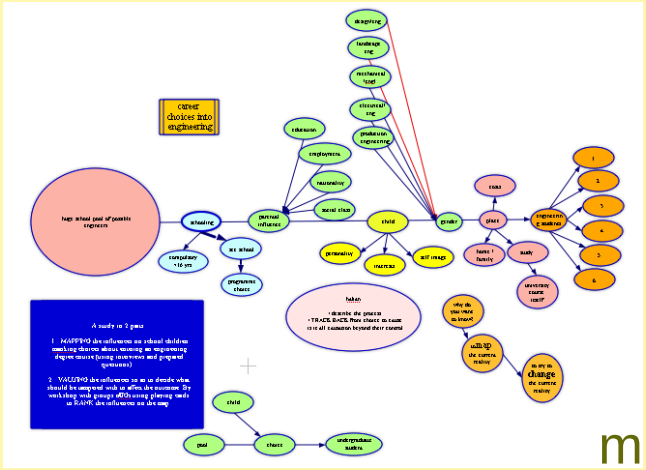


By Jeff Stahler, The Cincinnati Post, Newspaper Enterprise Association

tests are easy to digitise

digital capture of real-time performance

audio reflections



mind-maps

data and notes

sketching
(and collaborating)

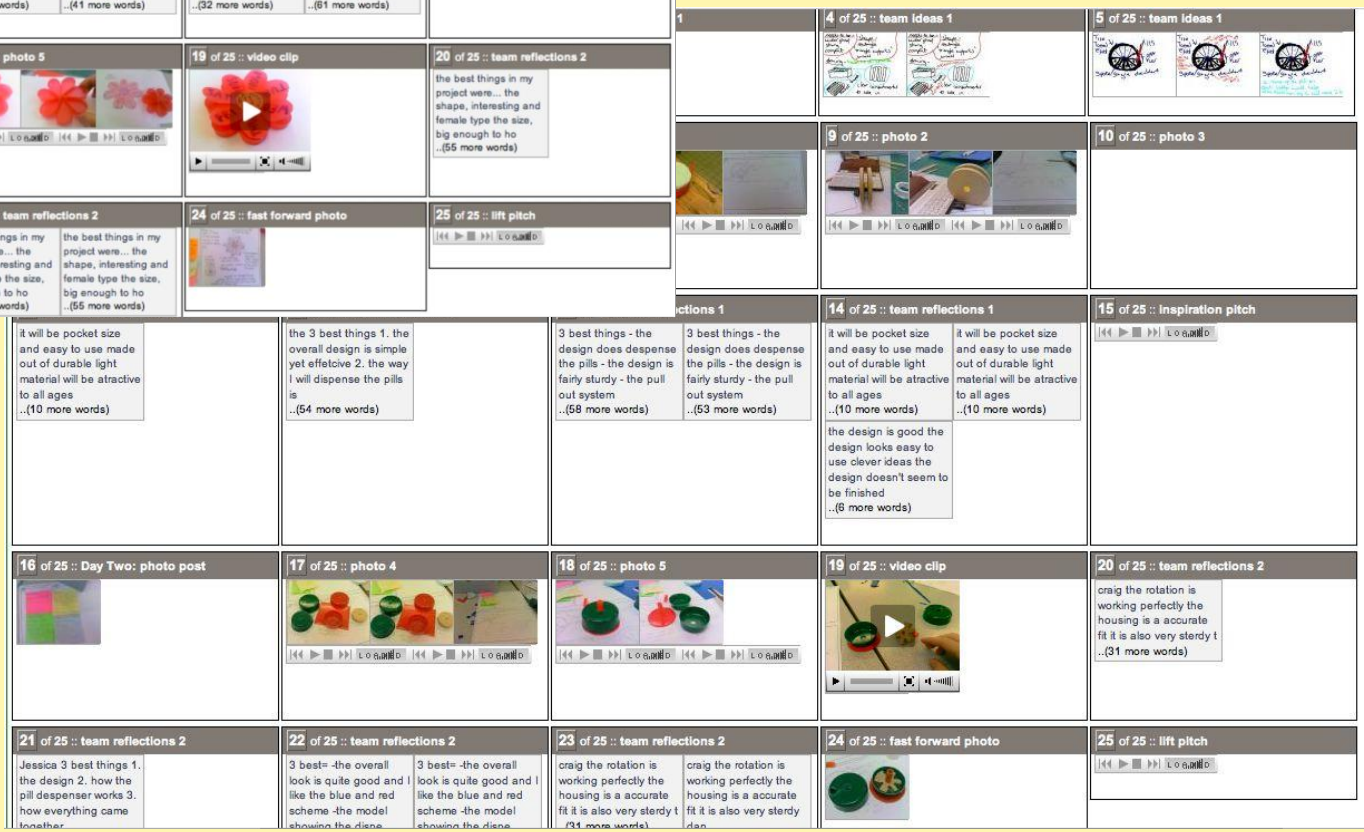
video presentation

photos of the
state of play

building authentic portfolios of students' performance

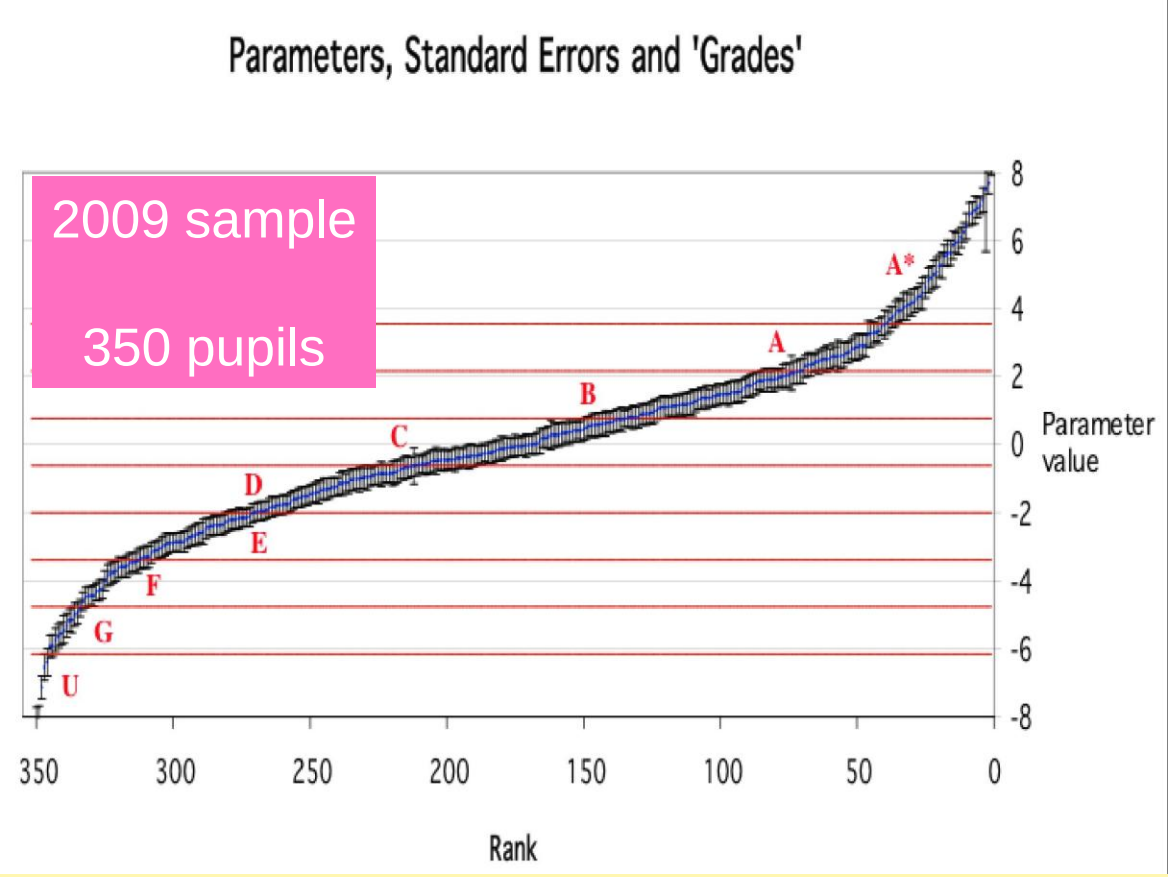
portfolio A

the ‘pairs engine’ manages the assessment process



portfolio B

and using the technology to support reliable judgements



multiple judges (28)

multiple comparisons (17+)

reliability coefficient = 0.95

e-scape references and citations

by authors outside the e-scape team

Benson C 2008 ***International Handbook of Research and Development in Technology Education***. sensepublishers.com
https://www.sensepublishers.com/files/9789087908799PR.pdf#page=42
http://scholar.google.co.uk/scholar?q=related:I99KZ4RoaxEJ:scholar.google.com/&hl=en&as_sdt=2000
http://74.125.155.132/scholar?q=cache:I99KZ4RoaxEJ:scholar.google.com/+TERU+e-scape&hl=en&as_sdt=2000

Bramley, T Black,B 2008 Third International Rasch Conference. Cambridgeassessment.org.uk
http://www.cambridgeassessment.org.uk/ca/digitalAssets/171143_TB_BB_rank_order_Perth08.pdf

Clewes, P. 2009 Ò***The Great E-scape***Ó Design & Technology Association journal ÔDATA PracticeÕ(No01.2009 Jan 2009) Also on TERU web pages Š
http://www.gold.ac.uk/media/The Great E-SCAPE.pdf

Davies D 2009 Ò***Digital Portfolio Assessment of Secondary Students' Scientific Enquiry Skills: the e-scape project***Ó BERA 2009 Conference

Futurelab publications: e-scape projects are cited in all the following reports from Futurelab
Assessment and Social Justice Review: Jan 2009 Š Gardner J, Holmes B, Leitch R
http://www.futurelab.org.uk/resources/publications-reports-articles/literature-reviews/Literature-Review1186
Personalisation and digital technologies: Nov 2005 Š Green H, Facer K, Rudd T, Dillon P, Humphreys P
http://www.futurelab.org.uk/resources/publications-reports-articles/opening-education-reports/Opening-Education-Report201
Developing and accrediting personal skills and competencies: Mar 2007 Facer K, Pykett J
http://www.futurelab.org.uk/resources/publications-reports-articles/other-research-reports/Other-Research-Report1094
e-assessment: An Update on Research, Policy & Practise: Sept 2007 Š Ripley M
http://www.futurelab.org.uk/resources/publications-reports-articles/literature-reviews/Literature-Review204
Creativity Technology and Learning Update: Sept 2007 Š Loveless A
http://www.futurelab.org.uk/resources/publications-reports-articles/literature-reviews/Literature-Review382

Geographical Association:
e-scape in geography:
http://www.geography.org.uk/projects/e-scape/#top
e-scape geography school trials and reports
http://www.geography.org.uk/projects/e-scape/trialsandreport/#top
e-scape assessments in geography using comparative pairs
http://www.geography.org.uk/projects/e-scape/comparativepairs/#top
Thinking geographically
http://www.geography.org.uk/projects/e-scape/thinkinggeographically/#top
e-assessment and e-scape in geography
http://www.geography.org.uk/projects/e-scape/e-assessment/#top
e-scape: Controlled Assessment
http://www.geography.org.uk/projects/e-scape/controlledassessment/#top
digital fieldwork in geography
http://www.geography.org.uk/projects/e-scape/digitalfieldwork/#top

Times Education Supplement (TES online)
Feb 2007 - New reportsÕ green light for PDAÕs in classroom: - John M
http://213.232.94.135/merlinjohnonline/news.php?extend.118
Nov 2005 - Digital Challenge Š Ripley M
http://www.tes.co.uk/article.aspx?storycode=2153804
Oct 2009 Š Innovative design is the talk of the classroom Š Seith E
http://www.tes.co.uk/article.aspx?storycode=6026498
Nov 2005 Š The Great E-scape Š Kenny J
http://www.tes.co.uk/article.aspx?storycode=2153805
May 2005 Š The future of education is in hand Š Brown-Martin G
http://www.tes.co.uk/article.aspx?storycode=2097459

Malmborg L Peterson, B Pettersson M 2007 Ò***Augmenting pen and paper to support creative collaboration in design education***Ó Perth
http://scholar.google.co.uk/scholar?q=related:8bOBTs_v2VMJ:scholar.google.com/&hl=en&as_sdt=2000 or http://dspace.mah.se/handle/2043/5359

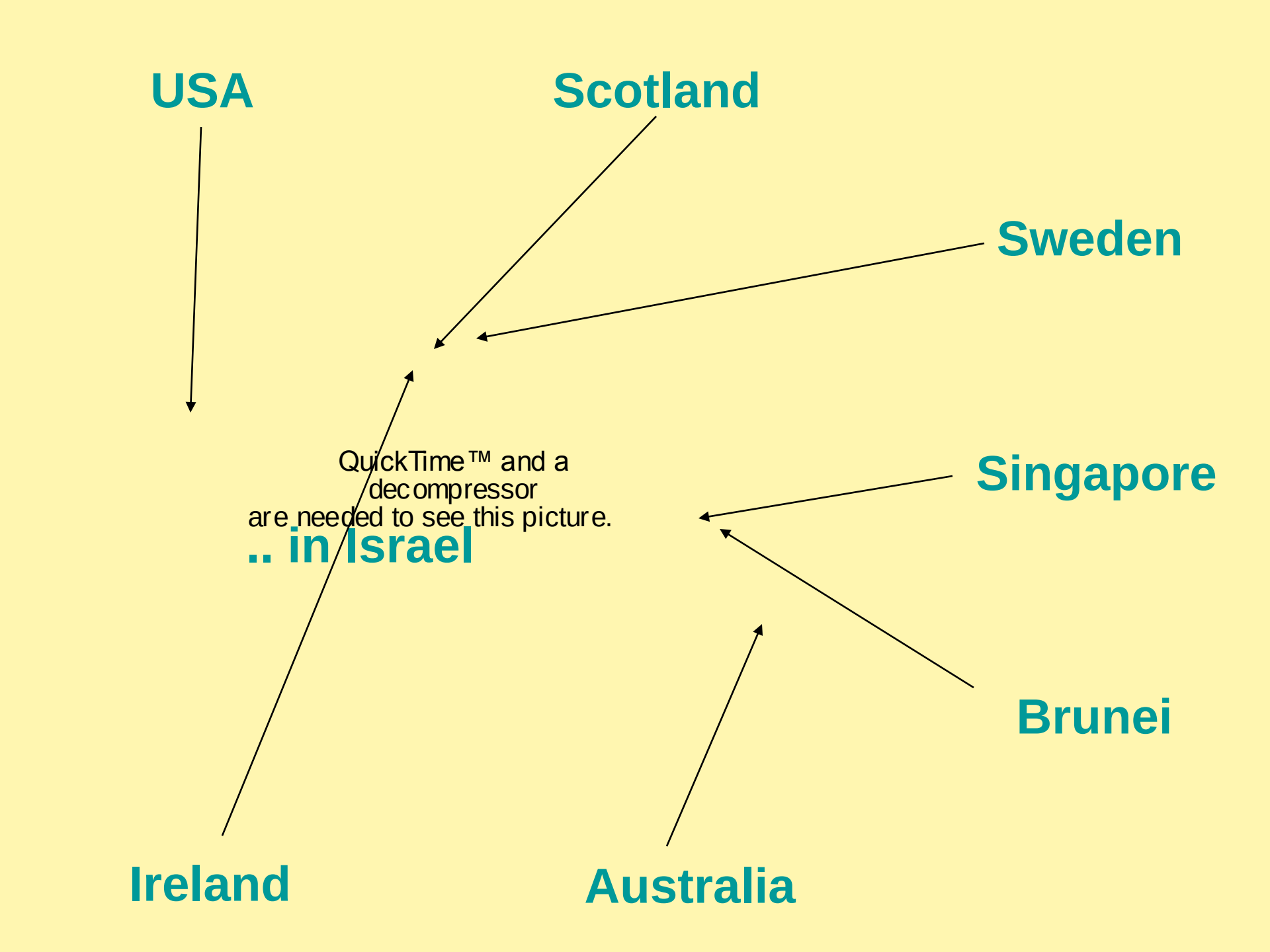
Martin, F & Beibrach, T 2009 Ò***The e-scape route to assessment***ÓTeaching Geography autumn 2009

Norman, E Mitchell, A Zanker, N Paterson, A 2009 ***Developing the research infrastructure for technology education in England (and beyond)*** PATT-15, the 20th Anniversary Conference
http://www.tnw.tudelft.nl/live/pagina.jsp?id=60763a45-a56b-4742-9ba1-5273b884a1b6&lang=en&binary=/doc/Final.pdf

Qualifications and Curriculum Authority (QCA) 2006 Ò***New ways of assessing creativity in design and technology***Ó *QCA/05/1513 Nov 2006*

Ripley, M 2008 ***Unlocking assessment: understanding for reflection and application***., Google scholar
http://scholar.google.co.uk/scholar?q=related:cRXA9xUqdVUJ:scholar.google.com/&hl=en&as_sdt=2000

Thomas, K 2008. Ò***Rewarding risk: how e-scape changes learning***ÓJuly 2008 Futurelab
http://www.futurelab.org.uk/resources/publications-reports-articles/web-articles/Web-Article1063


USA
Scotland
Sweden
QuickTime™ and a
decompressor
are needed to see this picture.
.. in Israel
Singapore
Brunei
Ireland
Australia

Organisation for Economic
Co-operation and Development

The Programme for International Student Assessment

(PISA)

a worldwide evaluation of 15-year-old performance

first performed in 2000
repeated every three years

“problem solving”

QuickTime™ and a
decompressor
are needed to see this picture.

assessment

schizophrenia

“end of year tests”

risk-takers
confident
creative

ideas
enterprise
opportunity

there is hope

… Dylan Wiliam
… Alastair Pollitt

QuickTime™ and a
decompressor
are needed to see this picture.

QuickTime™ and a
decompressor
are needed to see this picture.

QuickTime™ and a
decompressor
are needed to see this picture.

QuickTime™ and a
decompressor
are needed to see this picture.

QuickTime™ and a
decompressor
are needed to see this picture.

- the self-bailing dinghy
  by (and for) a fanatical Cornish sailor

- the intelligent lobster pot
  for a shell fishery - to prevent lobster theft

- the adjustable climbing wall
  for schools gyms by a trainee rock climber

- the one-handed can opener
  for a disabled grandmother

- the safe learning environment
  for a blind 3 yr old

- the moorland (9 hole) golf-course
  for a country hotel

r.kimbell@gold.ac.uk

TERU

TECHNOLOGY EDUCATION RESEARCH UNIT

Goldsmiths University of London

www.gold.ac.uk/teru