

# Transforming the ‘Traditional Grammars of Schooling’



LEARNINGS  
TEACHINGSPACE

August 26th, 2010

Jim Davies,

former Principal

Australian Science & Mathematics School



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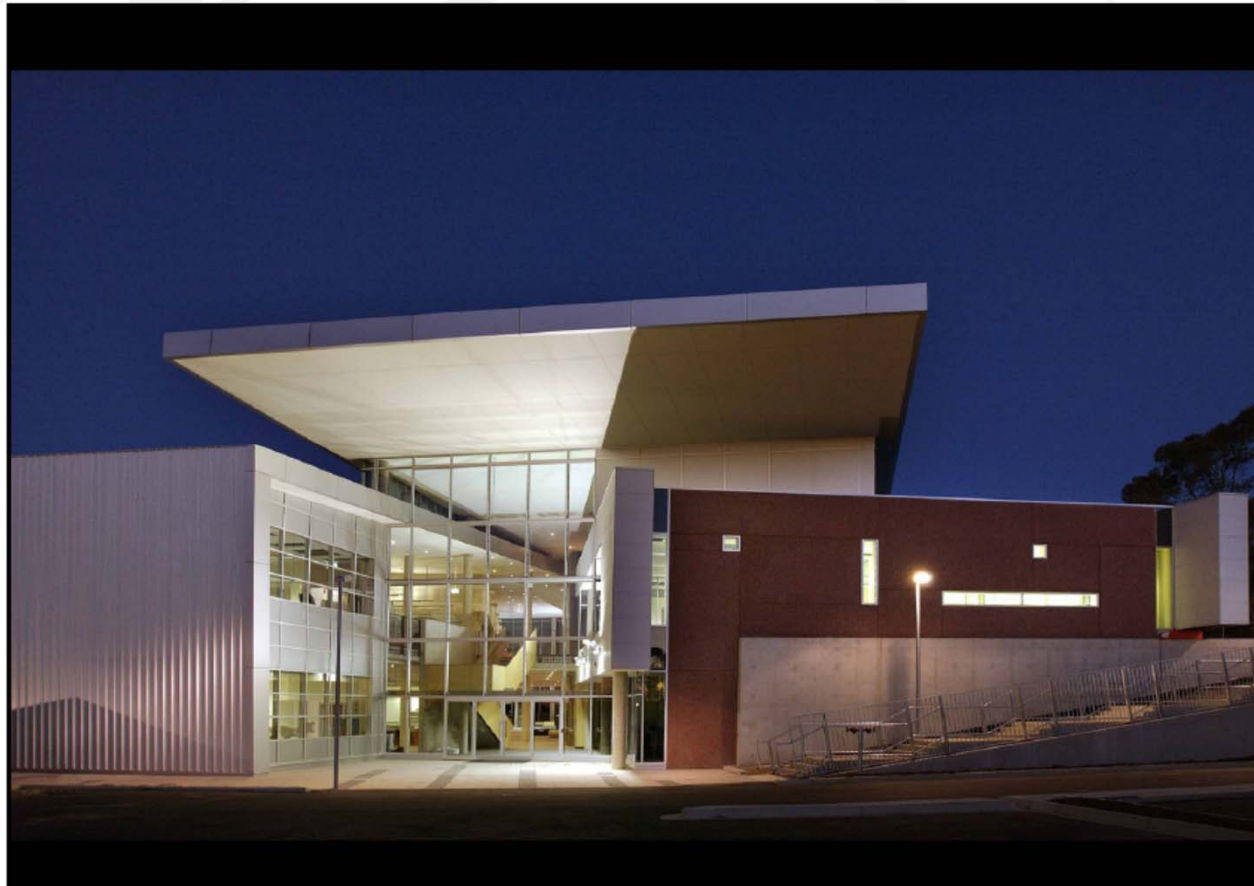
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# Personalised Learning

Personalised learning is described as “fulfilling the potential” of all students...

By enhancing learner’s *‘voice’* and *‘choice’* in deciding what, when and how they learn and how they know the quality and extent of their learning.

# Transforming the Traditional Grammars of Schooling



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# Transforming the Traditional Grammars of Schooling

- Learning programs  
(new sciences, interdisciplinary curriculum, inquiry based)
- Learning styles  
(collaborative, meta-cognition, personal learning pathways, constructivist)
- Learning environment  
(open, interactive, collaborative, ICT rich)
- Professional learning  
(community of learners, action research)



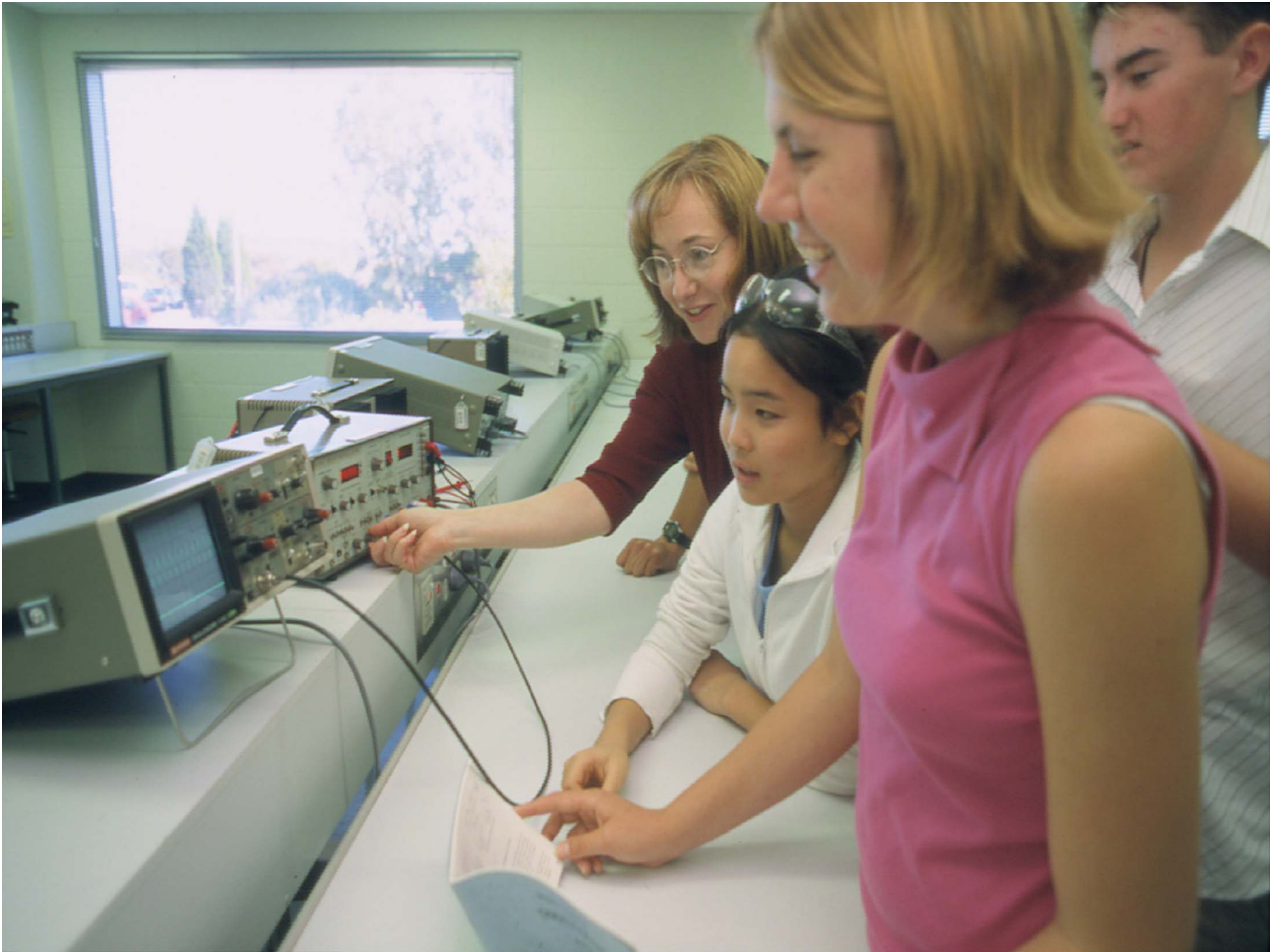
# Learning Environment

Architectural response to desired pedagogy.

- Flexible and ubiquitous ICT.....learning in physical space merging with learning in electronic space













# Learning Environment

Architectural response to desired pedagogy.

- Fosters interaction through integrating the physical, cultural and organisational environment
- Transfers the power of adolescent social interaction into the learning environment









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# Beliefs about learning

- Learning is enhanced when students possess **deep understanding** of their preferred approaches to learning and are able to **self-direct** and **individually plan** their learning
- Learning is most effective when the **needs and interests** of students shapes their curriculum and learning experiences and supports their development as **independent, life-long learners**





# Beliefs about learning

- An **experiential** and **inquiry-based**, **interdisciplinary** learning environment deepens understanding
- The development of learners is enhanced through **rigorous intellectual challenge** and the opportunity to explore issues **in depth**



# Beliefs about learning

- Learning is enhanced through the development of a thorough understanding of the ***applications of science and mathematics*** within the wider community.
- Access to ***information and communication technologies*** empowers learning



# Beliefs about learning

- Effective and inclusive learning communities value **collaboration, flexibility, respect and interconnectedness** with others
- Perspectives gained through **inter-cultural and international** communications strengthens understanding of ourselves and others and ability to operate within a **global context.**



# Developing a Deep Learning Environment

## CONTROLLING SCHOOLING



## ENRICHING SCHOOLING

Teacher centred  
Content oriented  
Subjects and classes  
Directive  
Exam assessment  
Lock-step progression  
Sorting and ranking  
Individual

Student centred  
Self-directed  
Experiential  
Authentic  
Social  
Flexible  
Continuous assessment  
Skills upgrading

Memory  
Replication  
Directed  
Competitive

Critical thinking  
Problem solving  
Communication  
Collaborative  
Creative

Competency



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*(adapted from Clicks, Bricks & Spondulicks Summary Report)*



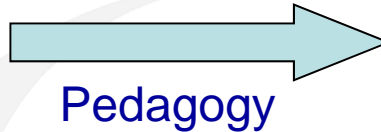
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# Developing a Deep Learning Environment

## ENRICHING SCHOOLING

- Student centred
- Self-directed
- Experiential
- Authentic
- Social
- Flexible
- Continuous assessment
- Skills upgrading

- Critical thinking
- Problem solving
- Communication
- Collaborative
- Creative



## DISCERNING SCHOOLING

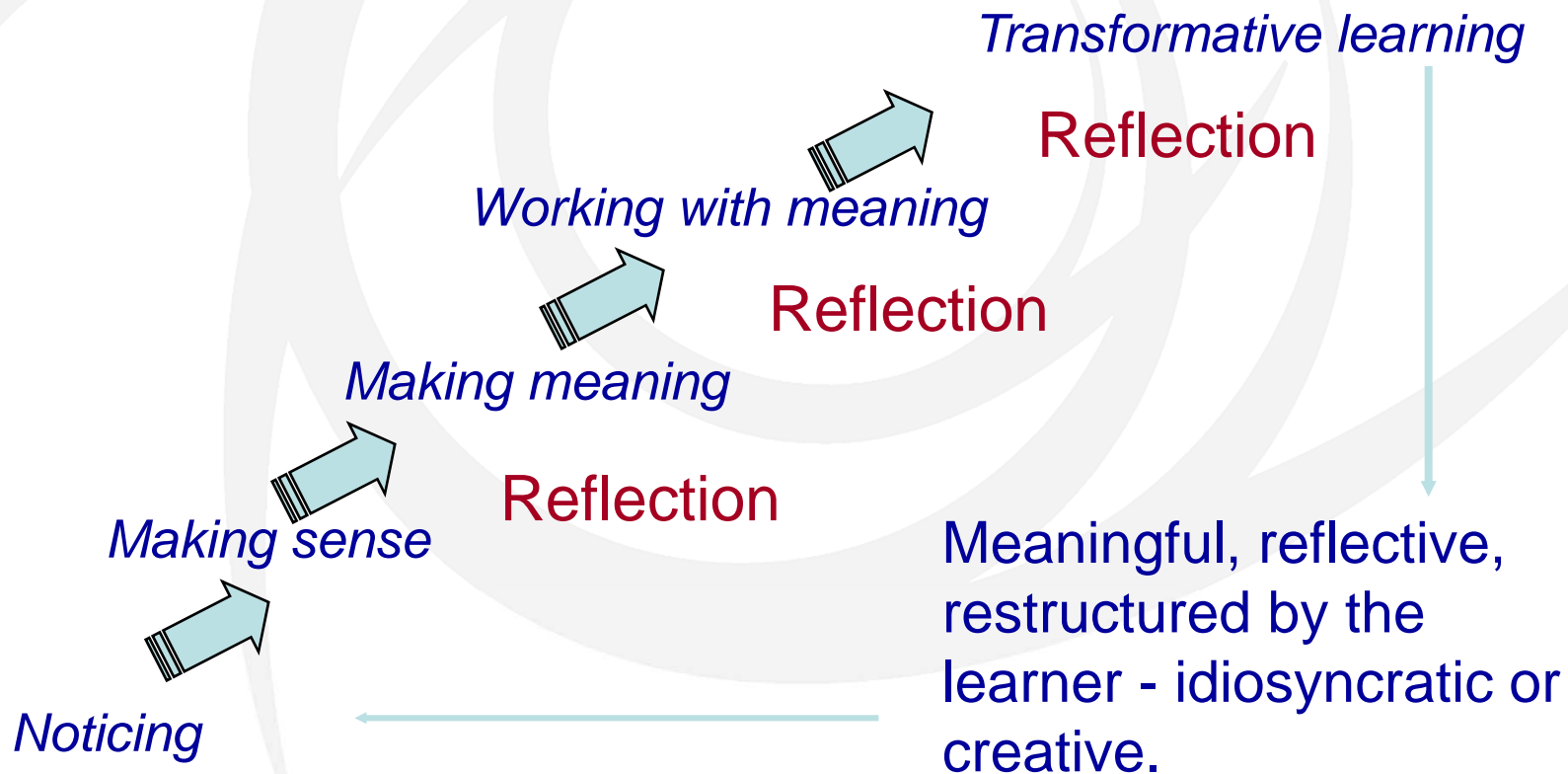
- Experience centred
- Team directed
- Problem oriented
- Virtual authenticity
- Multi connected
- Multi processing
- Authentic assessment
- Multi literacies

- Inventive thinking
- Risk taking
- Ethical
- Results oriented
- Interactive

Capacity

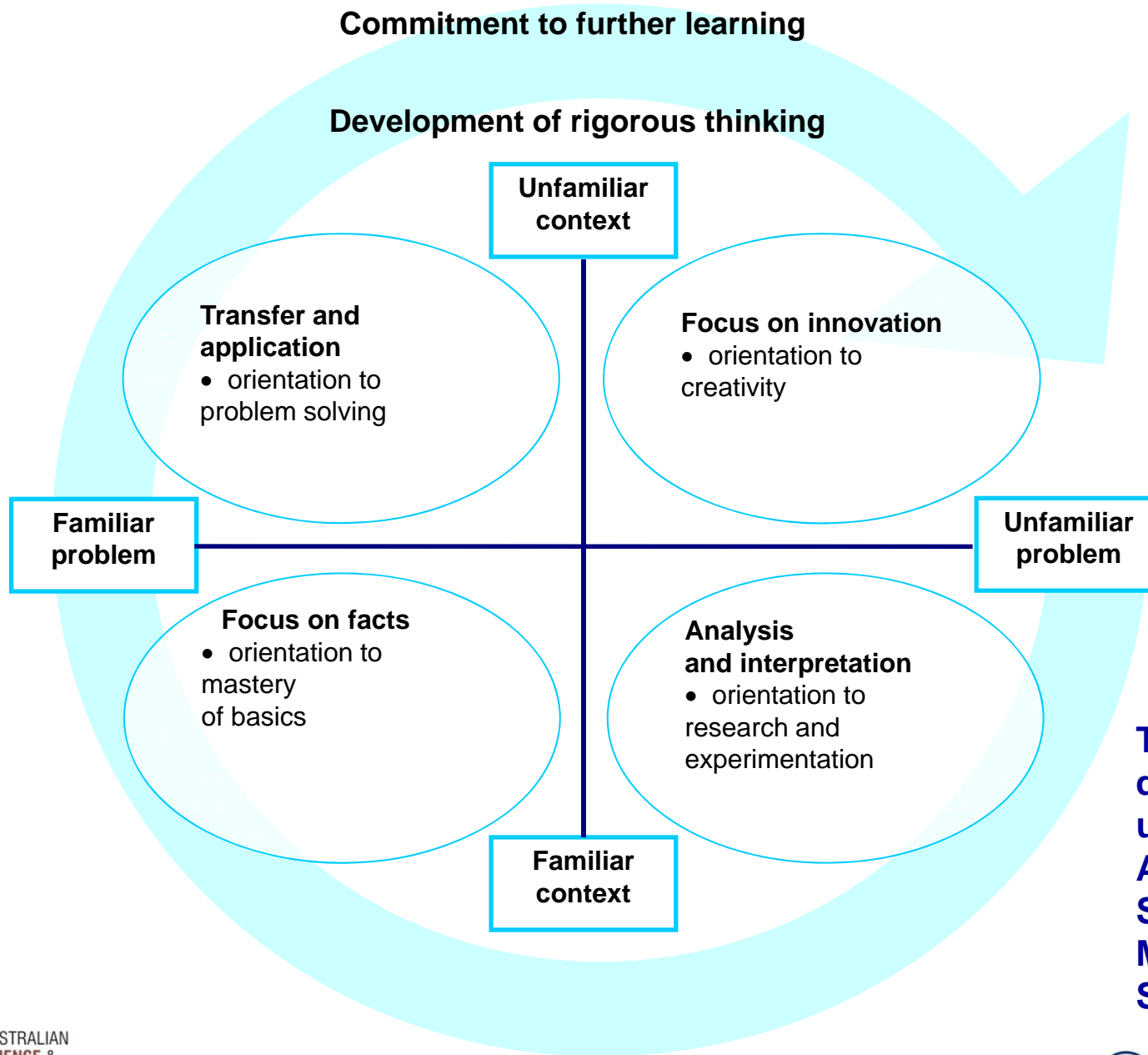
# Guiding Framework

- Moon's (1999) 'map of learning' used as a tool for reflecting on and mapping learning.



# Transformational Learning ...towards personalising learning

“Informational learning – new skills and information – increases **what** a person knows, whereas transformational learning changes **how** a person knows...in other words, the person has enhanced his or her capacities (cognitive, interpersonal, and intrapersonal) to manage the complexities of their work.” Drago-Severson (2004:23)



**The model for deep learning used at the Australian Science and Mathematics School.**





# How?

## Pedagogical Shift = Relationship shift

### Towards Personalisation

#### Teacher

- Knows
- Tells
- Examines

#### Student

- Boundaries to learning defined for them
- Learning quantified by others

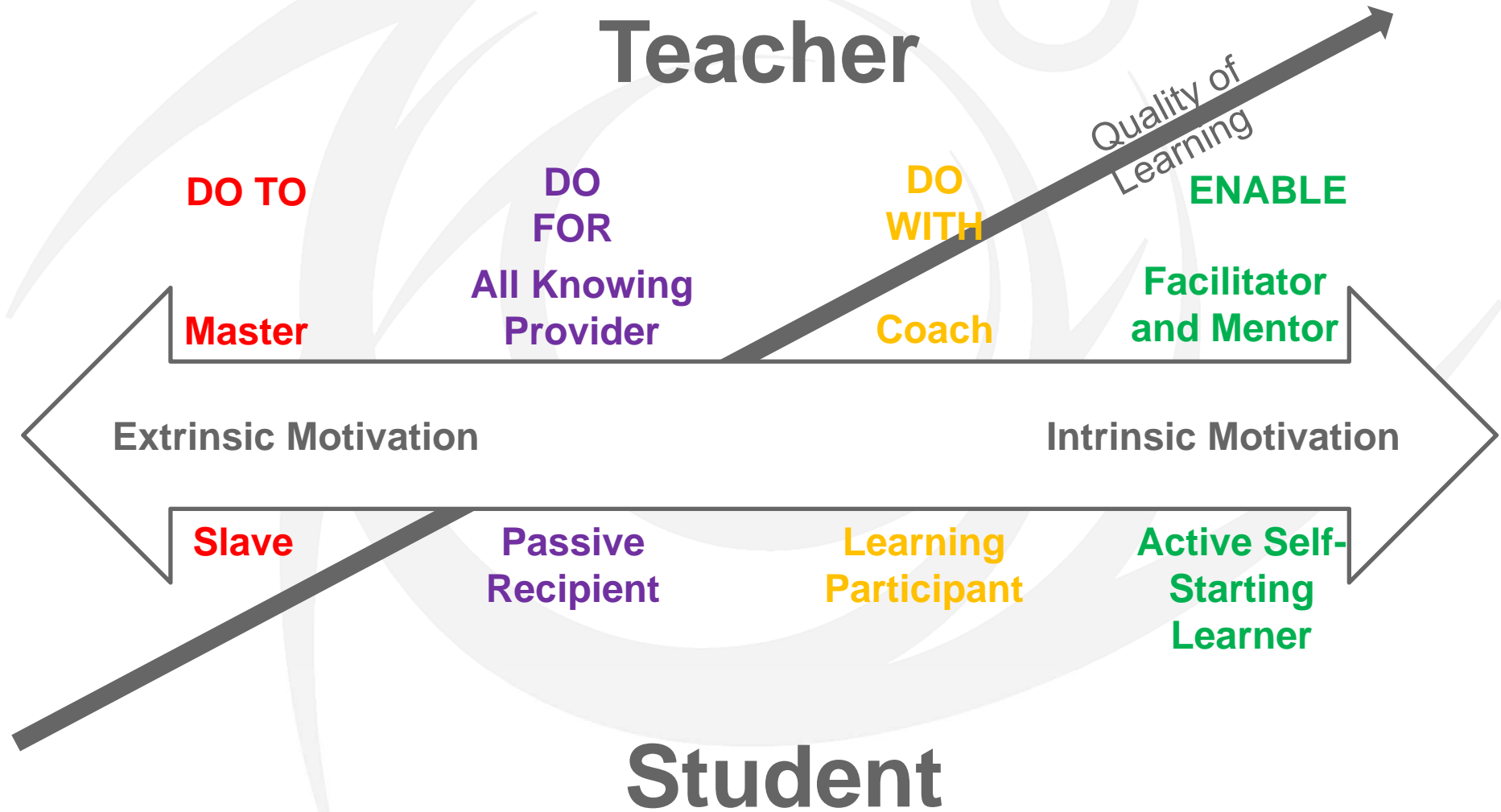
#### Teacher

- Facilitates Learning
- Coaches
- Challenges
- Verifies Learning

#### Student

- No boundaries to learning
- Demonstrates learning – verified by others

# Teacher:Student Relationship Continuum Teacher



A key aspect is the idea of aligning goals for learning with what is taught, how it is taught, and how it is assessed.

(Bransford, Brown & Cocking, 2002)

# What about what is taught and learned?

## Scenario 1:

- Community based learning opportunity
- Symphony orchestra pianist
- Retired, volunteer helper meals on wheels
- Senior student, 1 day per week, 1:1 instruction and mentoring

Approve or not approve???

# What about what is taught and learned?

## Scenario 2:

- Community based learning opportunity
- International expert, hydroponics
- Motorcycle riding, hobbyist tattoo artist
- Senior student, 1 day per week, 1:1 instruction and mentoring

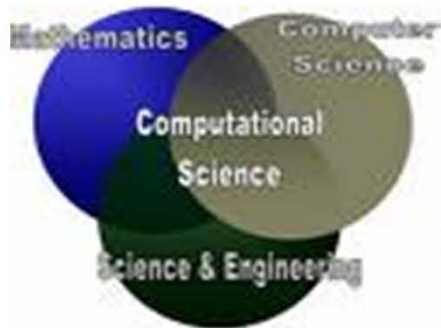
Approve or not approve???

# What about what Science is taught and learned?

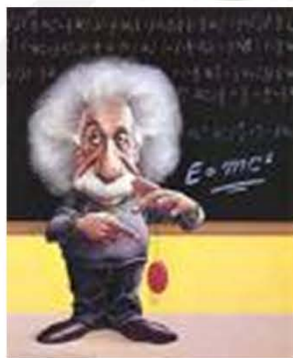
The big content question.....

- What foundational science is necessary in the school curriculum?

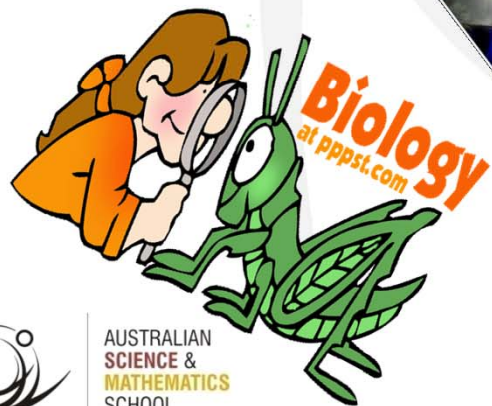




**NANOSCIENCE**  
the Science of  
Teeny Tiny Things  
at pppst.com



**PHYSICS**  
at pppst.com




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# Curriculum Conventions

- Areas of Study
  - Eg, Ma, Sc, Gg, His, PE etc etc
- Science... 15-16 years
  - Science  Pc, Chem, Biol, Geol
- **What about?????** LOTE, Music, road safety, HIV, Dance, Drama, Community service.....etc

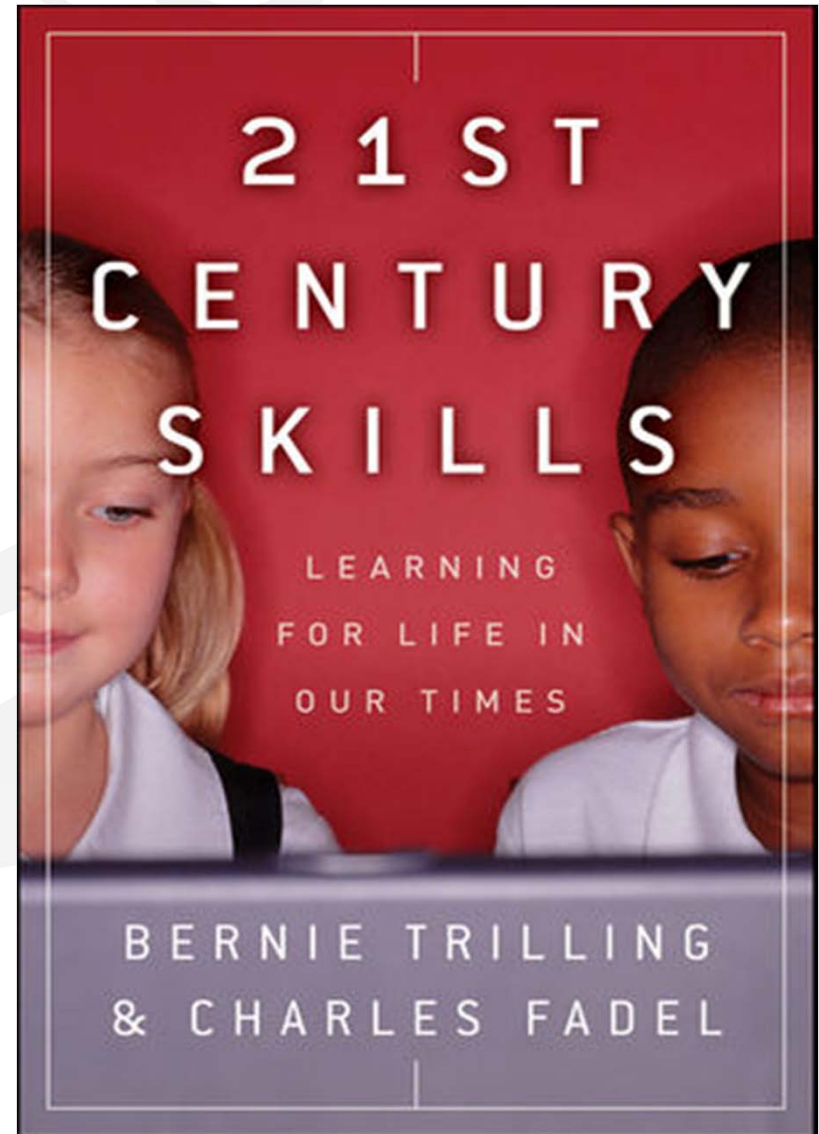




# Towards a more Discerning Curriculum

## 7 C's

- Critical thinking , problem solving
- Creativity , innovation
- Collaboration, team, leadership
- Cross-cultural understanding
- Communications, information, media literacy
- Computer, ICT literacy
- Career and learning self-reliance

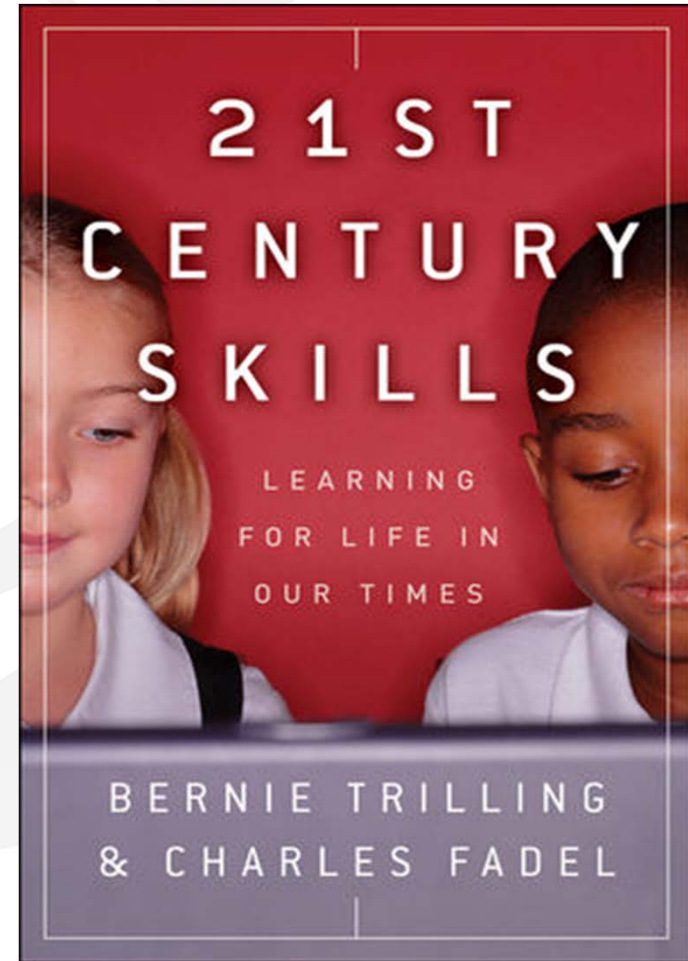


# Towards a more Discerning Curriculum

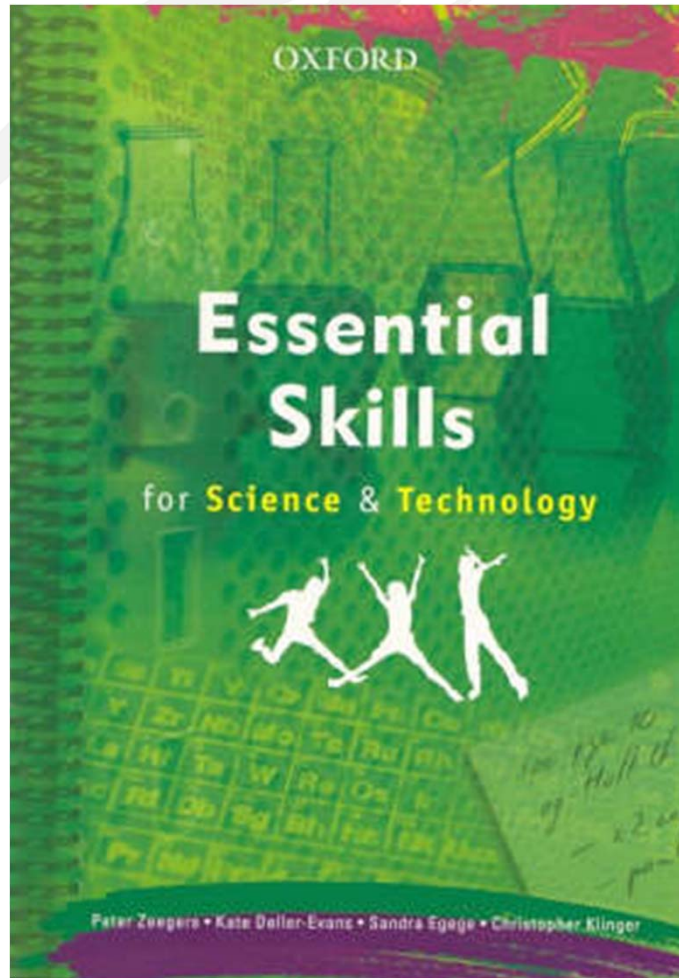
C21 Learning= 3R'sx 7C's

## R's

- Reading
- ‘Riting’
- ‘Rithmetic’”



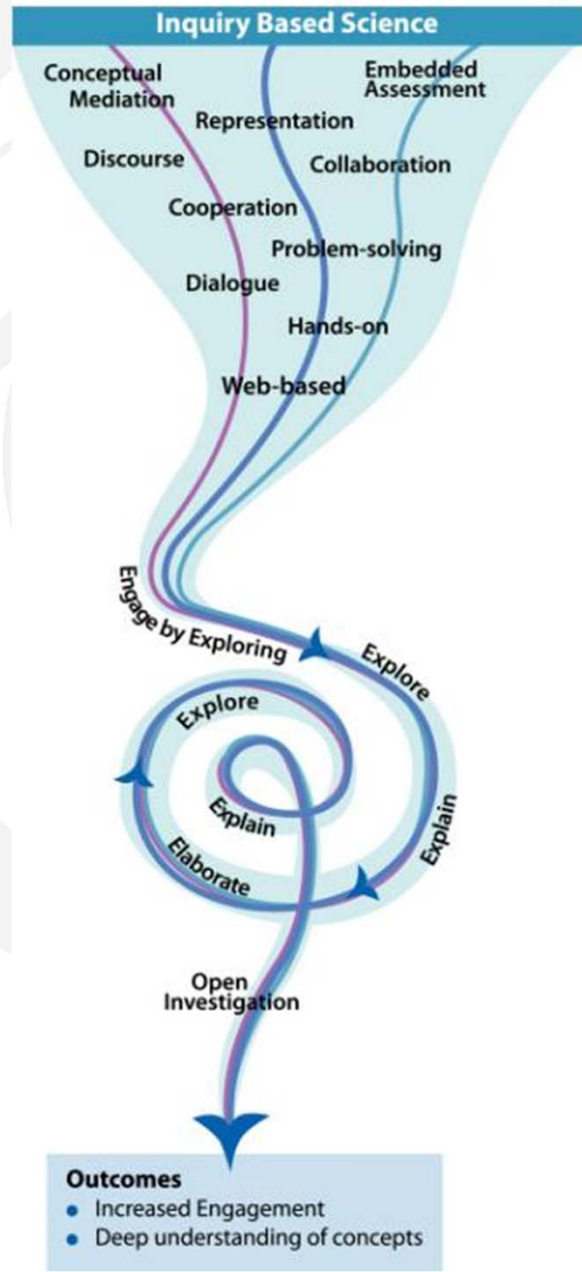
# Towards a more Discerning Curriculum



- Critical Thinking
- Reading scientific literature
- Writing for sciences
- E-learning and research
- Problem solving



# Science by Doing



# Towards a more Discerning Curriculum

**CURRICULUM**  
**21** Essential Education  
for a Changing World



Edited by  
**HEIDI HAYES JACOBS**

- Old Habits run deep
- Standards or ‘standardisation’
- C19 structures
  - Schedules
  - Groupings
  - Use of space



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# Towards a more Discerning Curriculum

**CURRICULUM**  
**21** Essential Education  
for a Changing World



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- Upgrade curriculum
  - Integration, real world practice
  - Global and personal
  - Creativity

- Upgrade assessment types



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# ***FIGHTING THE FLAT-LINED CURRICULUM***



your child's potential



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# Quality and extent of learning? Assessment Shift

## Towards Personalisation

### Limited Genre

- Written Examinations
- Teacher determined and designed assessment tasks
  - Tests
  - assignments

### Limitless Genre

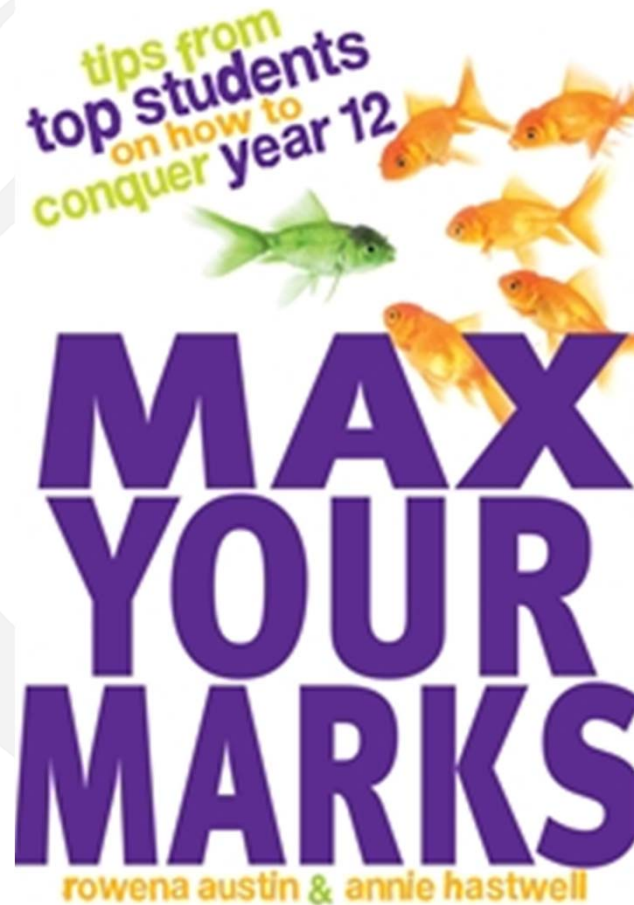
- Performance
- Multi-media
- Web based
- On-line
- Just-in-time
- Symposium
- Expert audience
- Community based
- Industry based
- International

### Future Certification

- Verified learning e-portfolio



# Contemplate the messages



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# Teacher:Student Relationship

Personalisation of Learning

Teacher Directedness

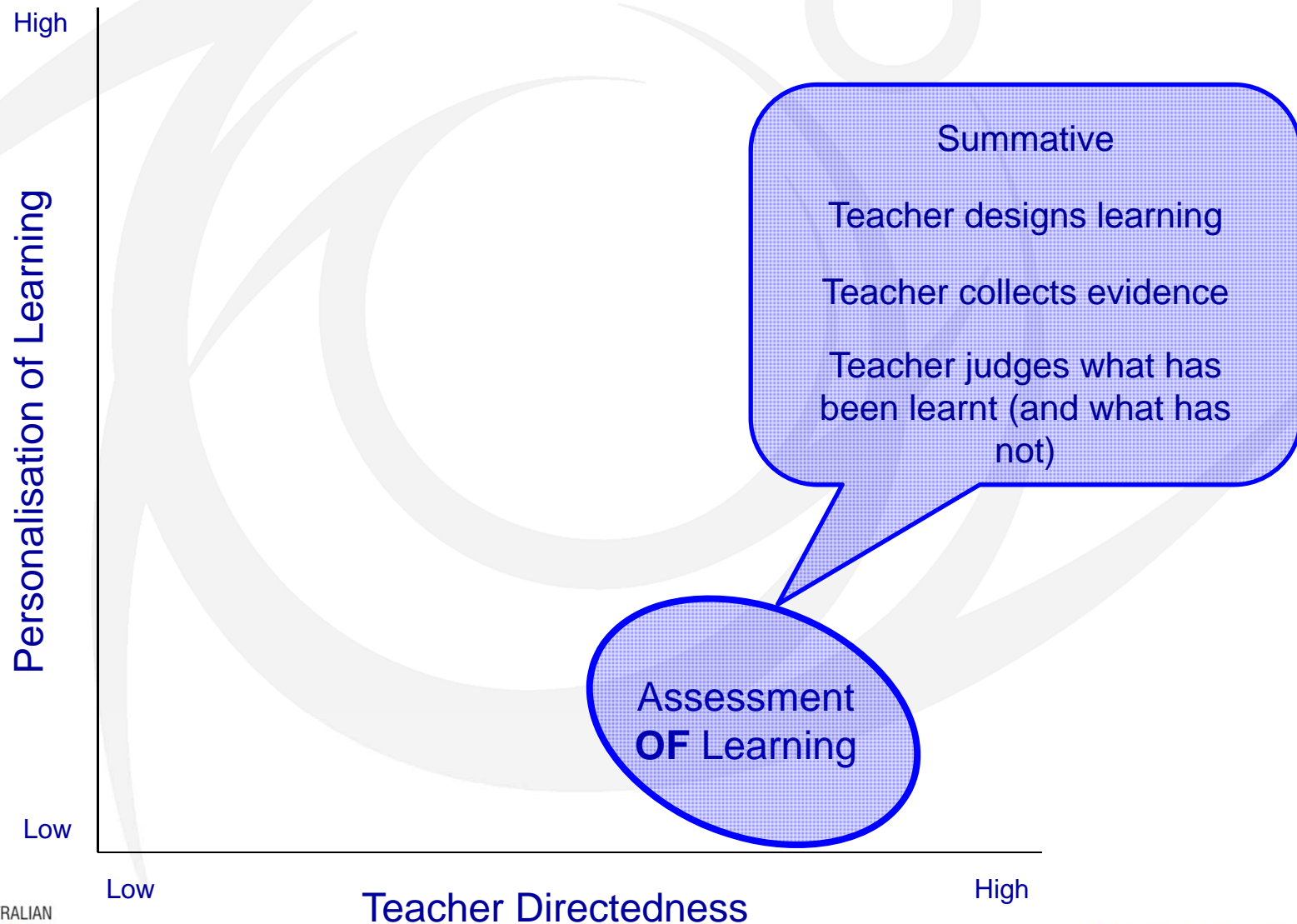


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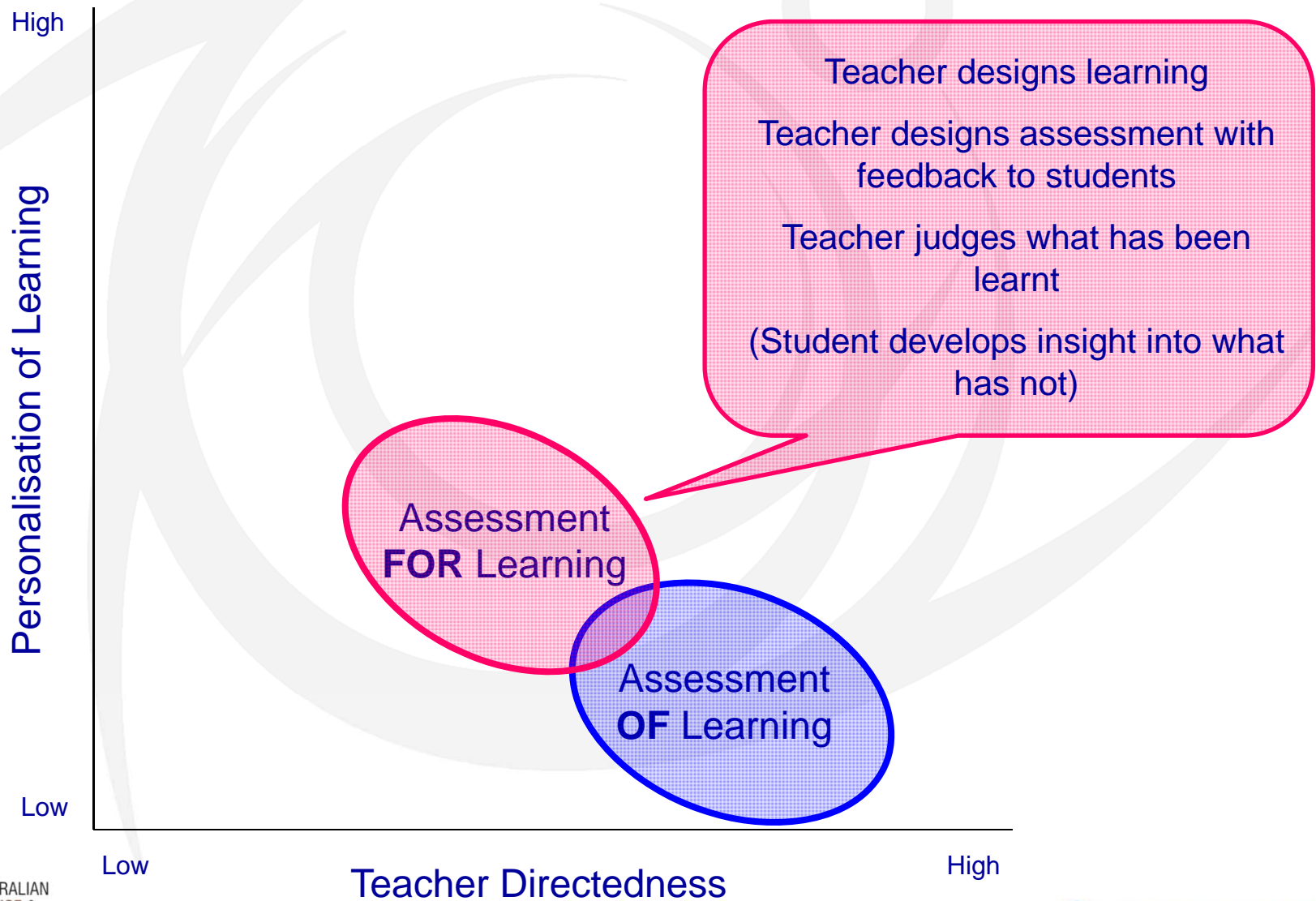


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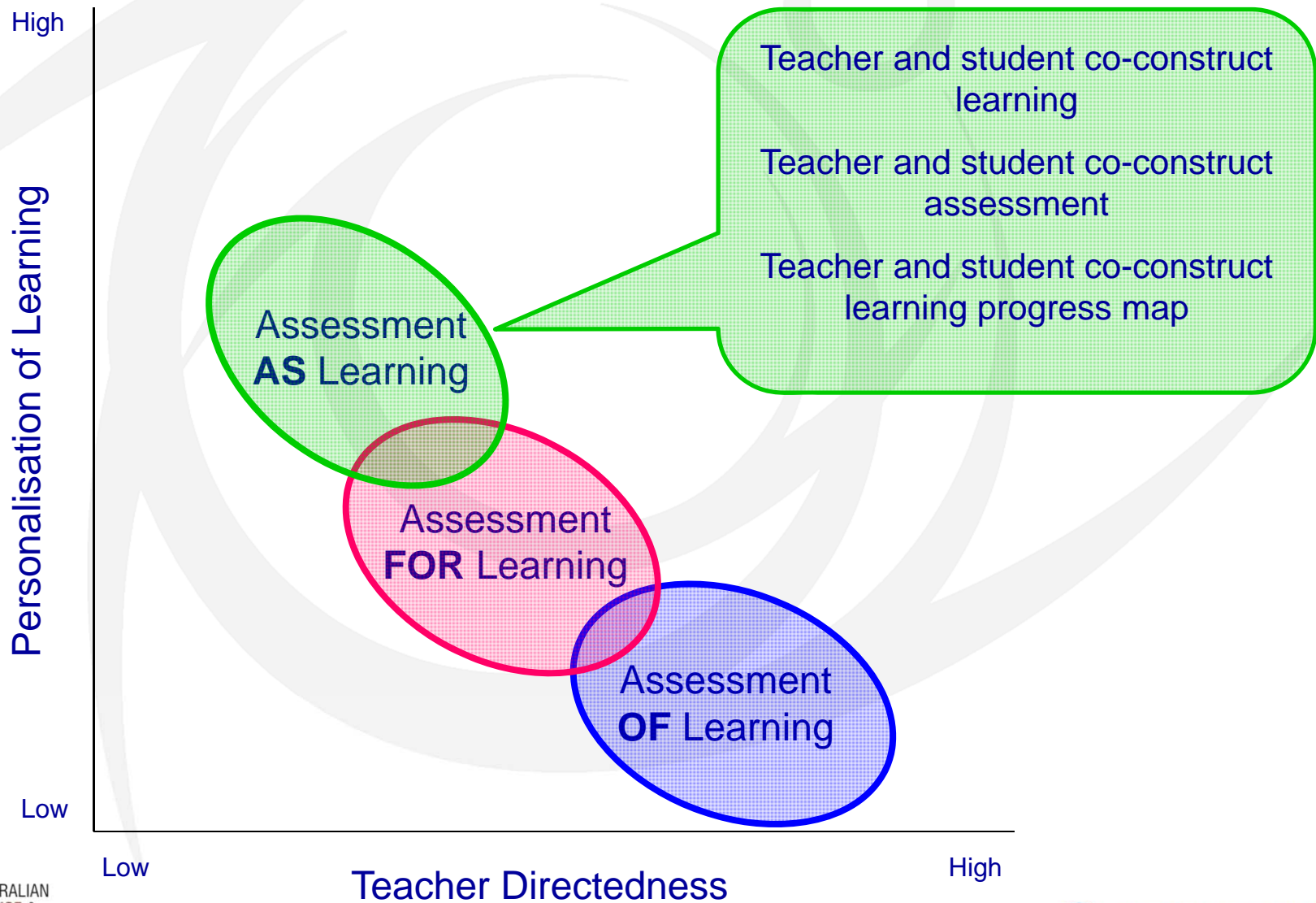
# Assessment Paradigms



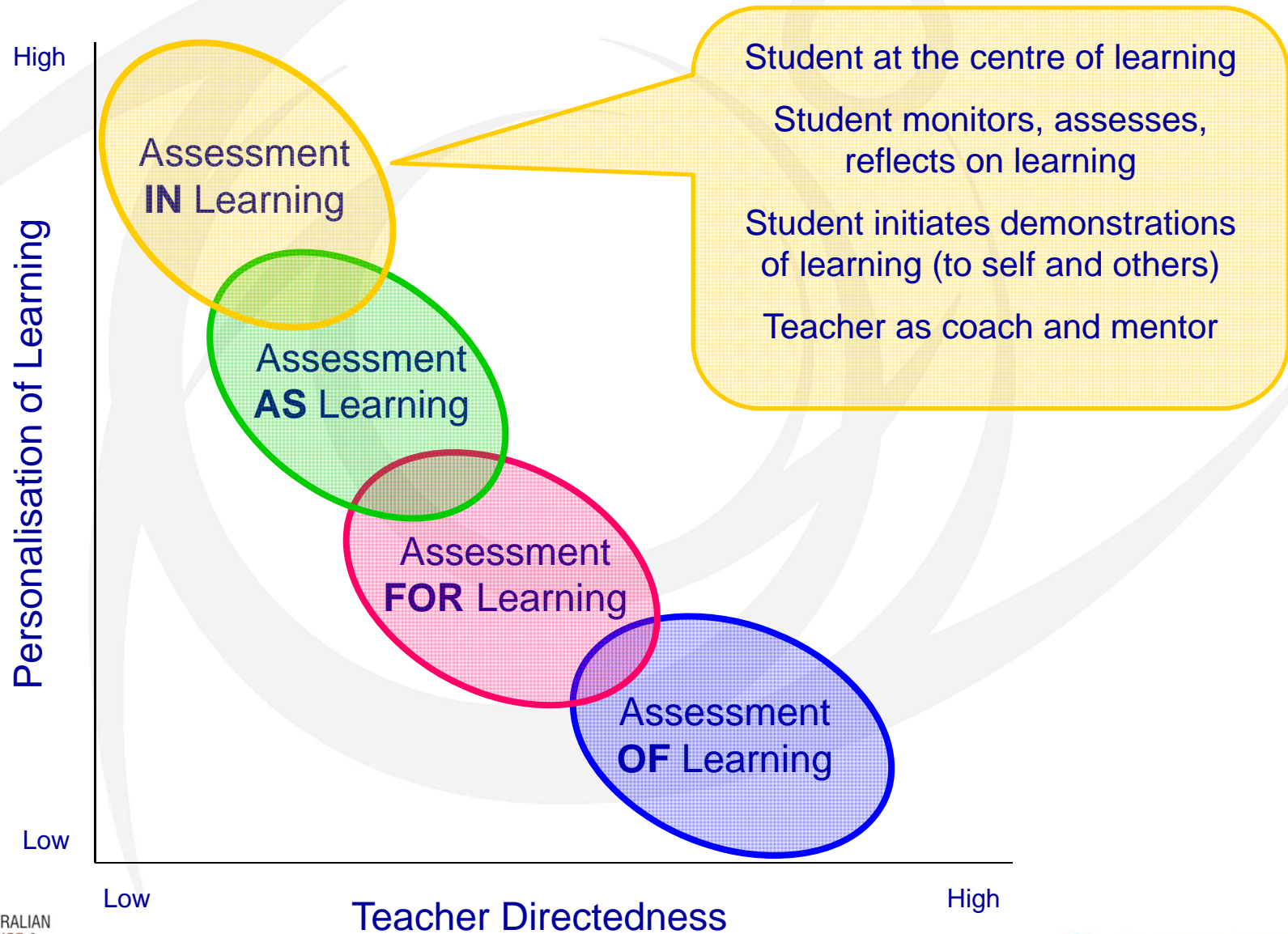
# Assessment Paradigms



# Assessment Paradigms



# Assessment Paradigms



# A Landscape of Assessment Practices

Assessment Focus	Teacher / System Directed Assessment	Teacher Directed Assessment	Cooperatively Managed Assessment	Student Directed Assessment
<b>Key indicator 1</b> <i>Learning Program</i>	<ul style="list-style-type: none"> <li>Teacher / system initiates and designs the learning</li> </ul>	<ul style="list-style-type: none"> <li>The teacher allows student negotiation of the learning program</li> </ul>	<ul style="list-style-type: none"> <li>Teacher and student co-construct the learning program</li> </ul>	<ul style="list-style-type: none"> <li>Student initiates and designs the learning program</li> </ul>
<b>Key indicator 2</b> <i>Evidence of learning</i>	<ul style="list-style-type: none"> <li>Teacher / system determines the evidence of learning</li> </ul>	<ul style="list-style-type: none"> <li>The teacher allows student negotiation of the demonstrations of learning</li> </ul>	<ul style="list-style-type: none"> <li>Teacher and student co-construct the demonstration of learning</li> </ul>	<ul style="list-style-type: none"> <li>Student determines the demonstrations of learning</li> </ul>
<b>Key indicator 3</b> <i>Judgment of learning</i>	<ul style="list-style-type: none"> <li>Teacher / system judges what has been learnt and not learnt</li> </ul>	<ul style="list-style-type: none"> <li>The teacher allows some student self assessment of the evidence of learning</li> </ul>	<ul style="list-style-type: none"> <li>Teacher and student co-construct the learning progress map</li> </ul>	<ul style="list-style-type: none"> <li>Student monitors, assesses and reflects on learning</li> </ul>
<b>Key indicator 4</b> <i>Purpose of Learning</i>	<ul style="list-style-type: none"> <li>The assessment is used for summative and accreditation purposes</li> </ul>	<ul style="list-style-type: none"> <li>The assessment is used for summative and developmental purposes</li> </ul>	<ul style="list-style-type: none"> <li>The assessment is used for summative and developmental purposes</li> </ul>	<ul style="list-style-type: none"> <li>The assessment is used for self-development purposes</li> </ul>

**Summative**

**Formative**

**Informative**

# How can this be achieved?

‘Educational change depends on what teachers do and think. It’s as simple and complex as that.’

Fullan, 1991:117



The learning environment of students is derived from and a reflection of the learning environment of teachers

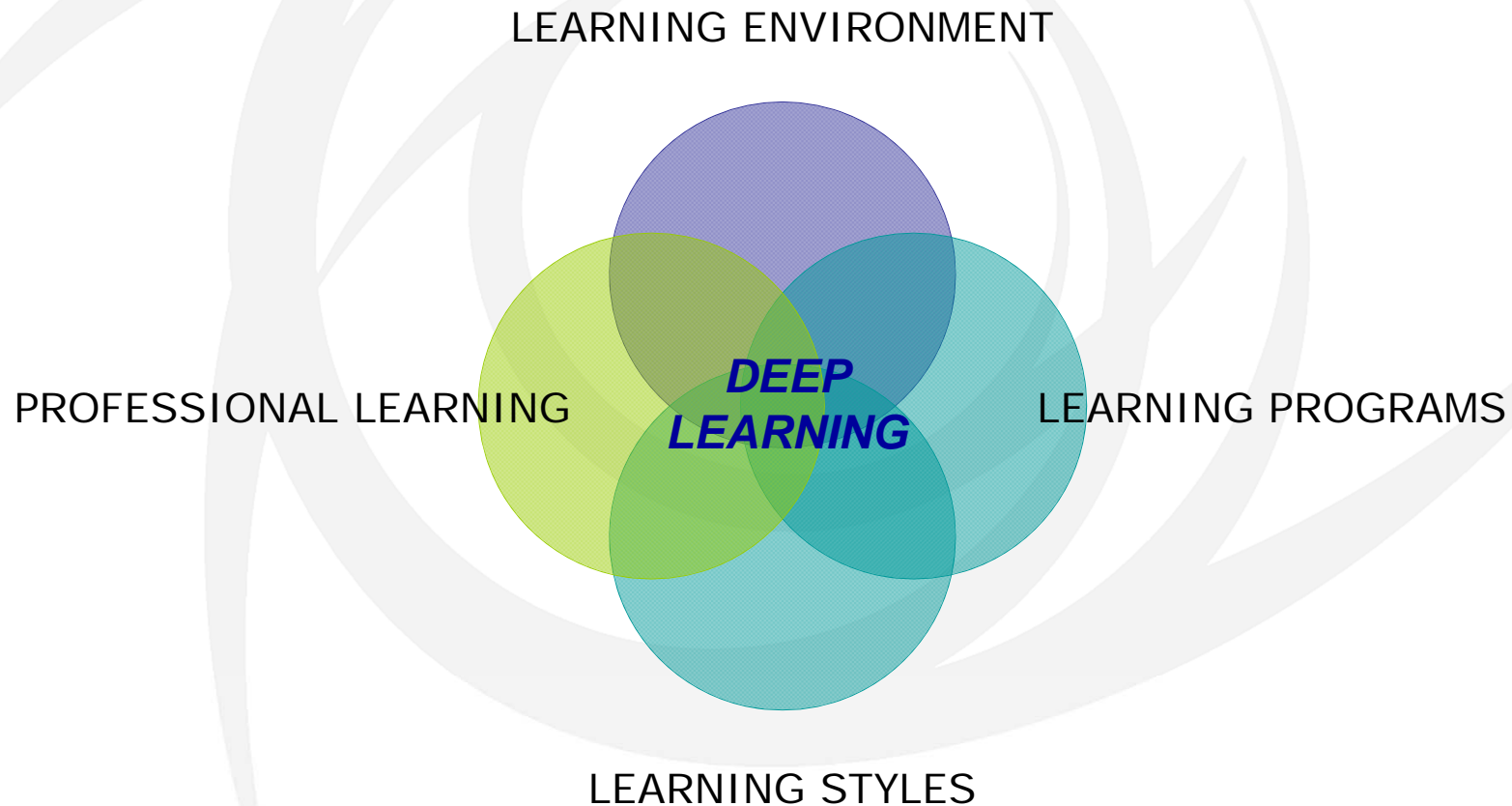


# The 21<sup>st</sup> Century Learning Teacher

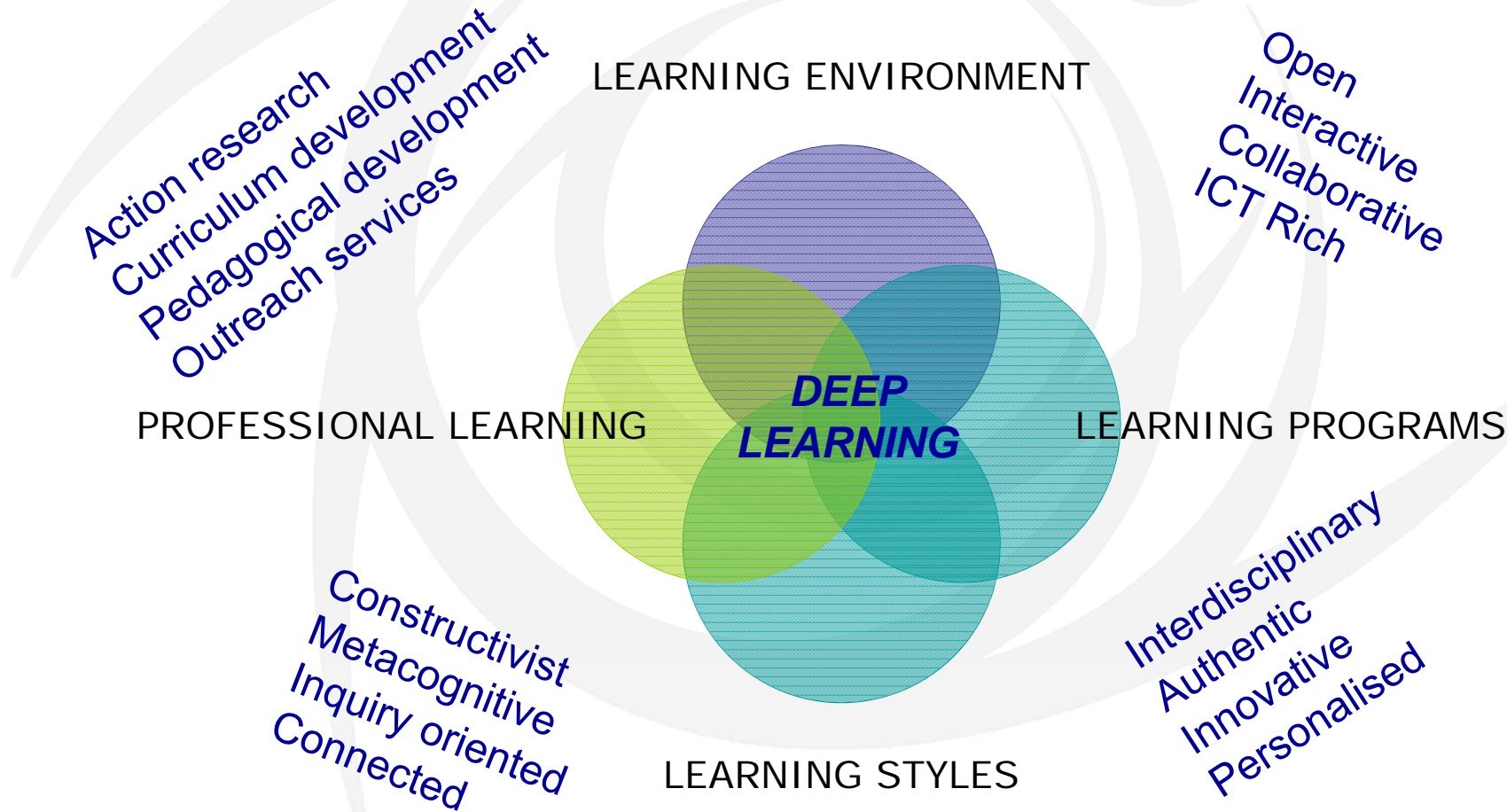
- **Learning is their most important work priority**
- **De-privatisation of teaching**
- **Every teacher a pedagogical leader**



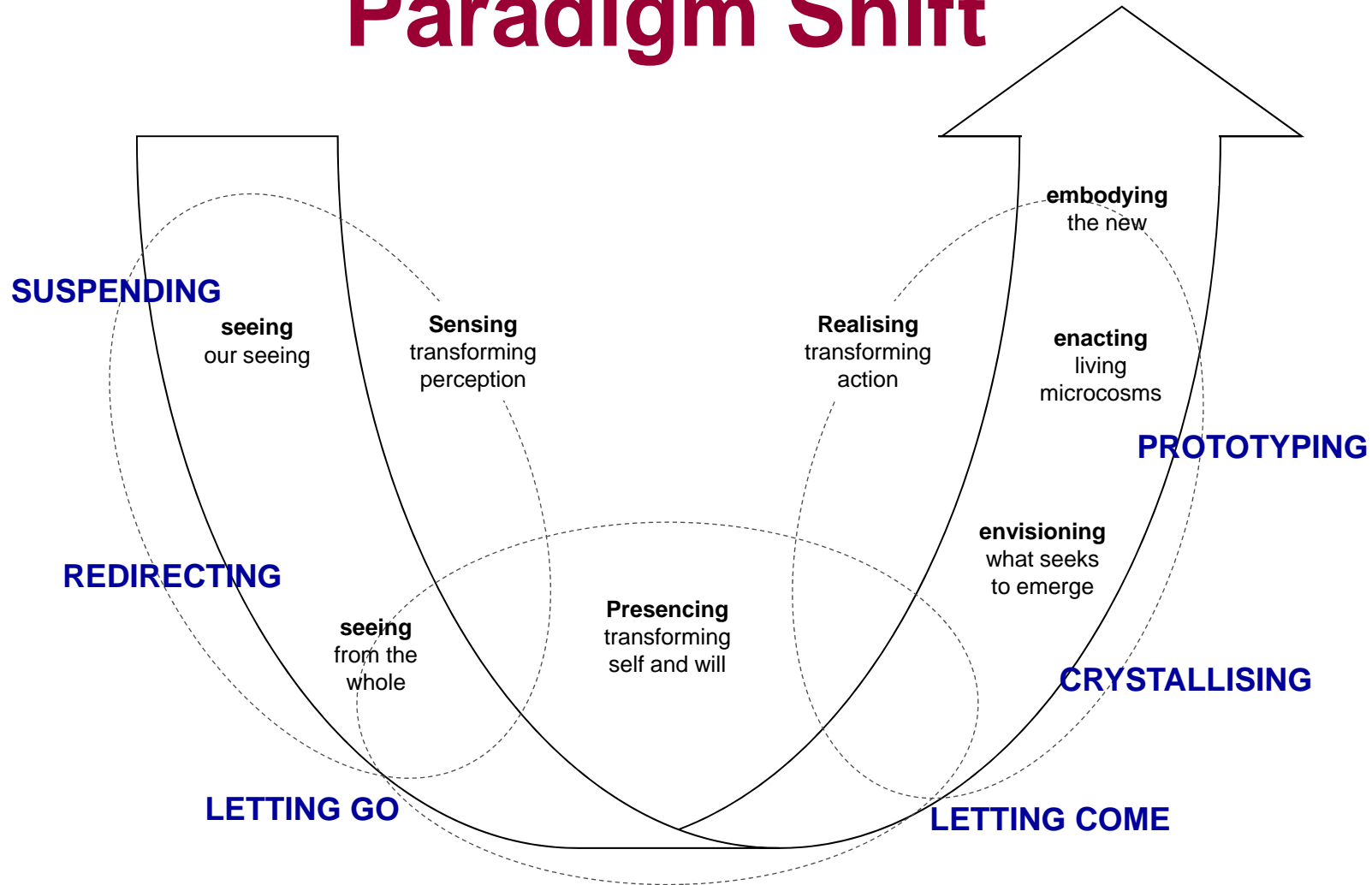
# Developing Deep Learning at the ASMS



# Developing Deep Learning at the ASMS



# Paradigm Shift



Seven Capacities of the U Movement

Senge, 2005

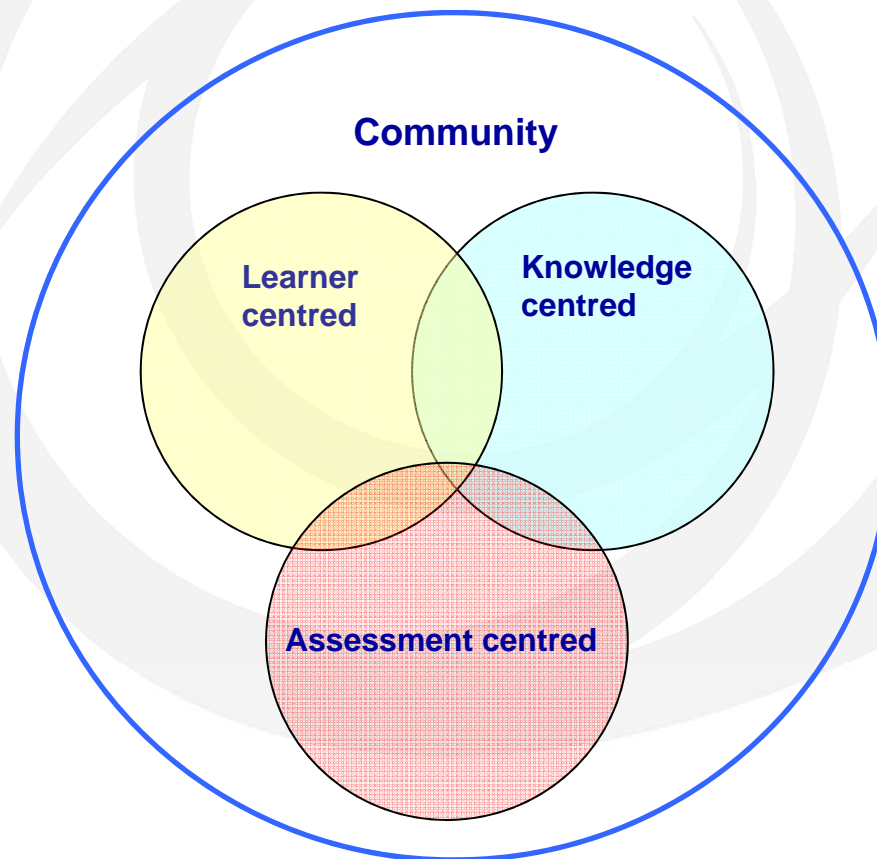


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# The 21<sup>st</sup> Century Learning Environment



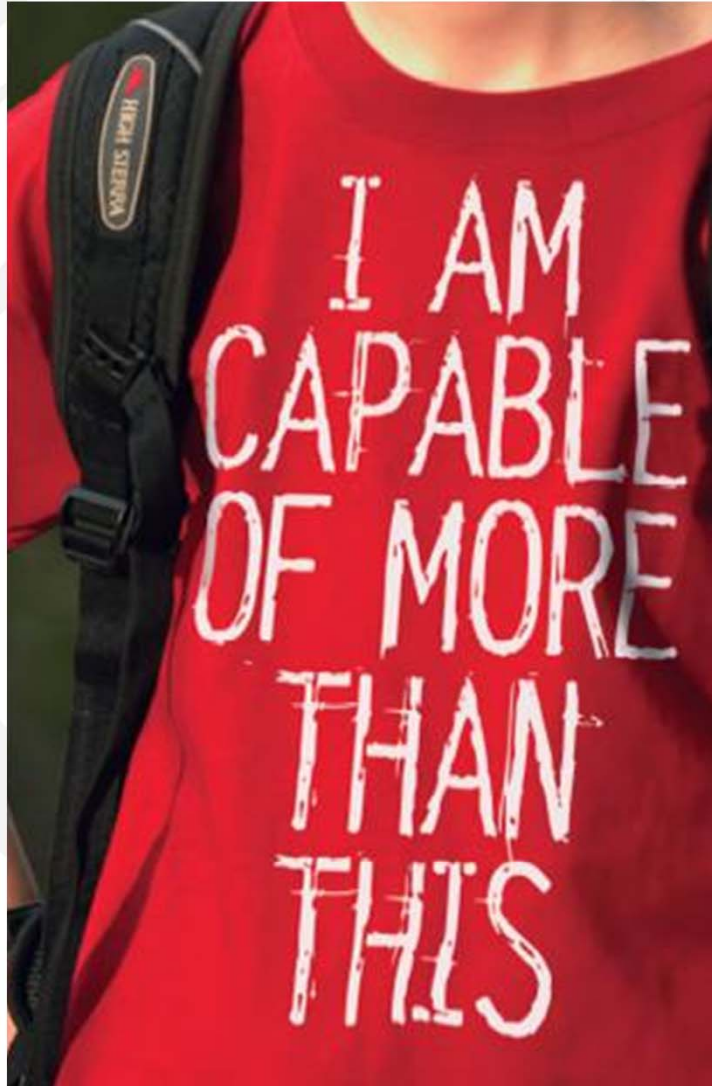
Source:

Perspectives on  
learning environments

Bransford et al (1998)

# Dignify the Learner

**Learning  
Leaders**



**Leading  
Learning**



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