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# Inquiry Based Learning

## Mentone Girls Secondary Feb 2011

*Dr Adrian Bertolini*

## Intention of Today

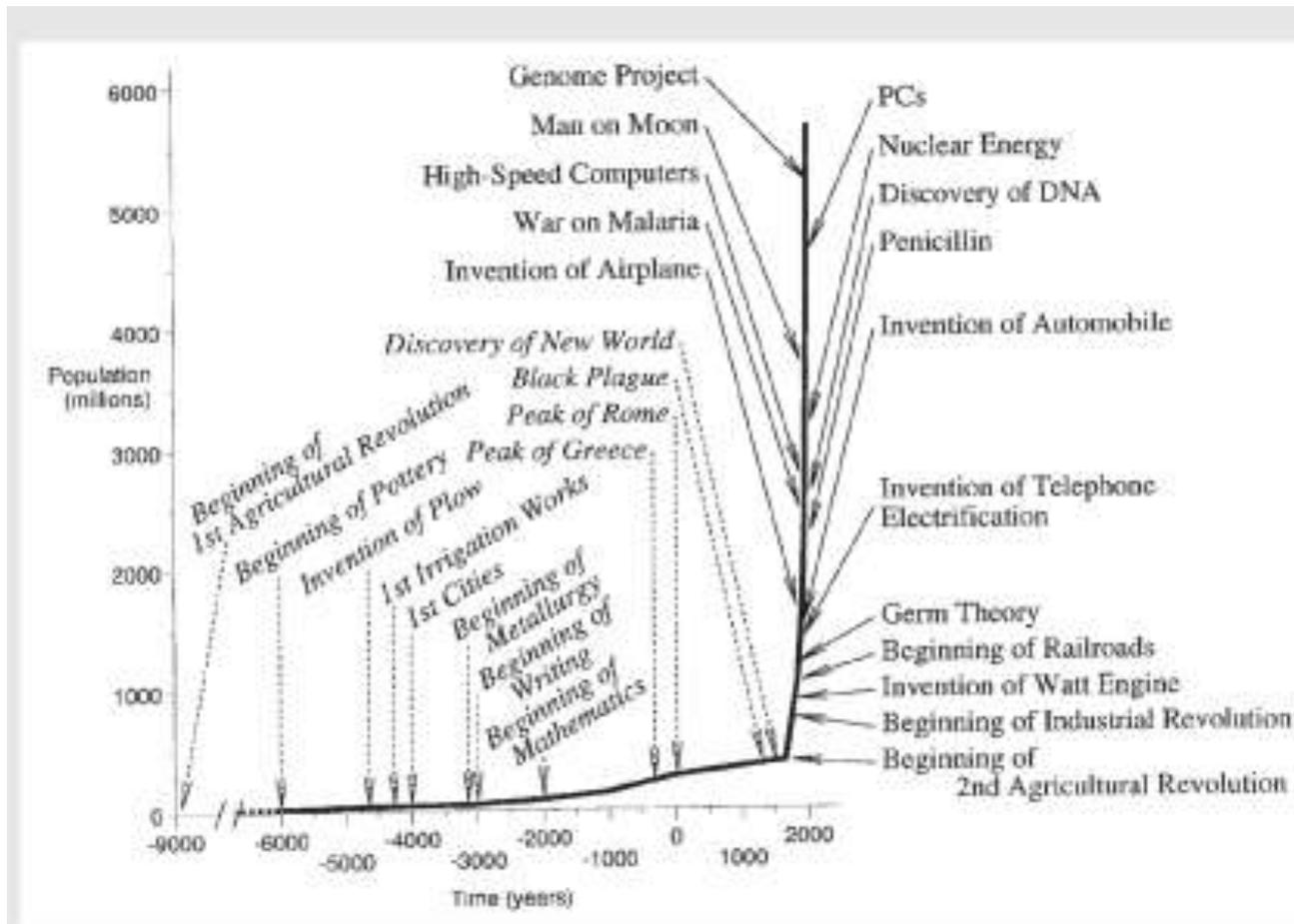
- To have teachers **begin to plan** units for term one that will **allow for differentiation** and deliver the skills and content that needs to be covered.
- To have the **teachers inspired and clearer** about how first term will look with the units they are developing

**Remember – Be the Shamwow!**

**Suck it all in ... don't judge and assess ...  
just have a go!**



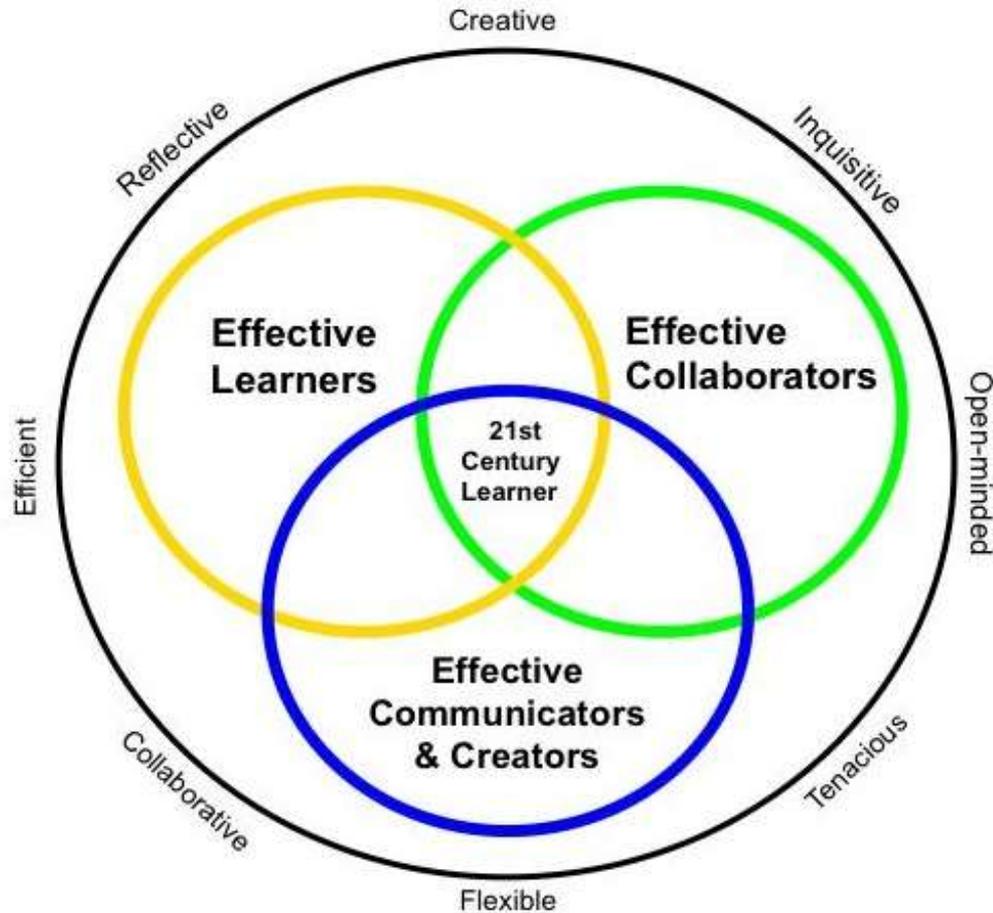
# We are living in *exponential* times



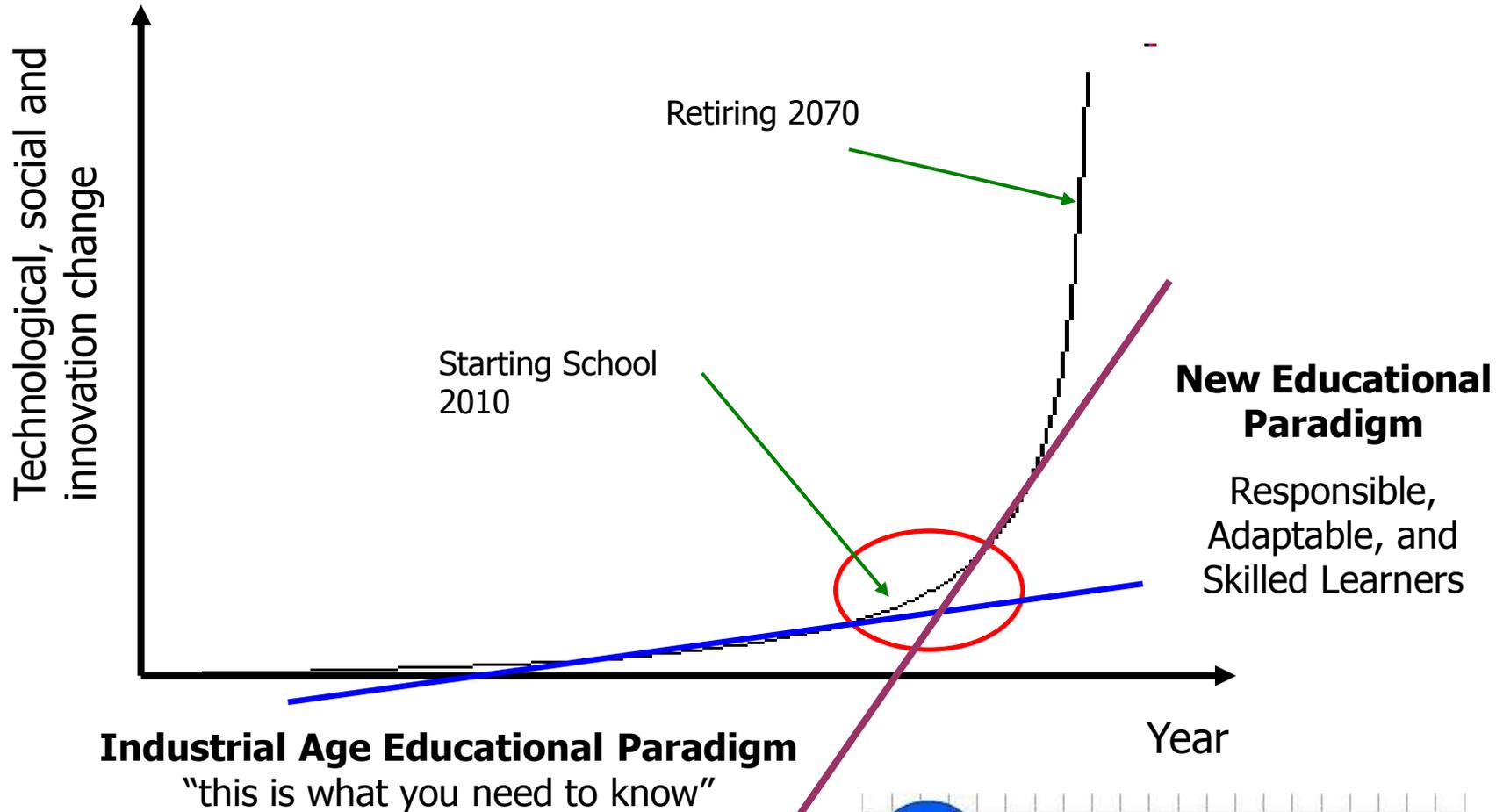
**Figure 5.1** The growth of world population and the speed of technological change

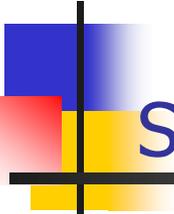
Source: Fogel, Robert, "Catching Up with the Economy", *American Economic Review*, Vol. 89(1), pp. 1-21 (p. 2).

# What are the skills needed to be successful in the 21<sup>st</sup> Century?



# Tension that exists

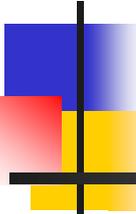




## So how do we do this?

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- How do we create a school environment to prepare for this new paradigm?
- What makes a powerful learning environment?
- How do we structure our classes?
- How do we prepare our teachers? The parents?
- What do we need to develop our students in to be ready for the 21<sup>st</sup> Century?
- How do we, as a school and staff, be adaptable?



# Mentone Girls SC Challenge No. 2 - Review

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## **Mentone Girls SC – School Review July 27 2010**

### **Staff Culture and Professional Practice**

While many staff enjoy work, work collegially and collaboratively with others, inspire students, and want change and improvement

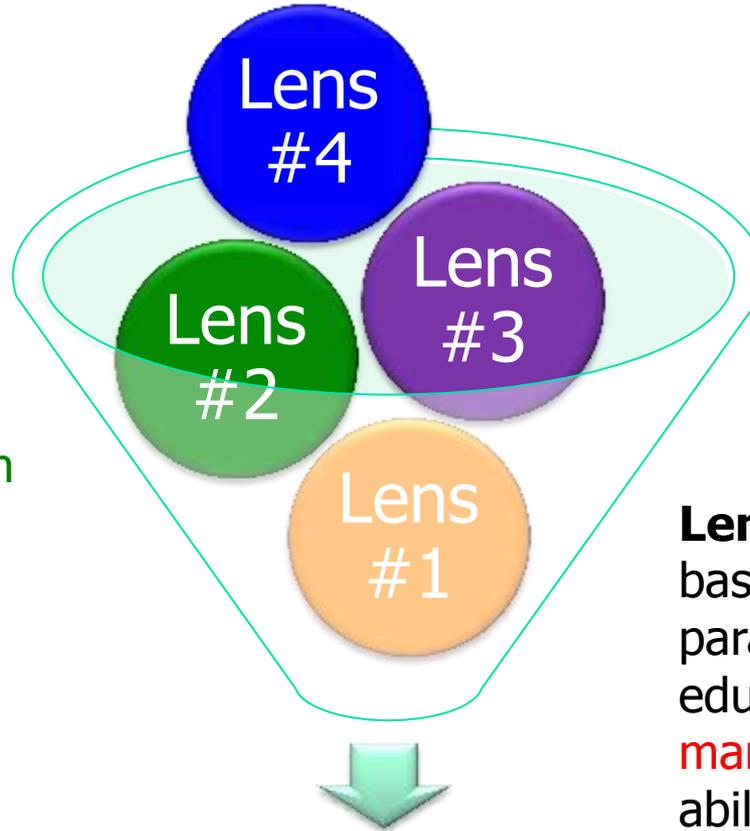
#### Significant aspects that inhibit school

- Lack of esprit de corps among teaching staff
- Lack of school-wide genuine collaboration
- A number of teachers appear insular, out-of-touch with current professional standards, lack trust and confidence in each other, etc
- Some evidence of  
negative stereotyping  
gender-based generalisations

# Lens Covered on Tuesday

**Lens #4** –Building trust brings velocity to improving performance

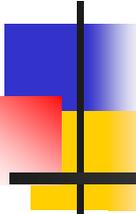
**Lens #2:** We exist in hidden social networks and tribal cultures – understanding these allows for elevation in performance



**Lens #3:** 3 laws of Performance – perception gives actions

**Lens #1:** Education still based on Industrial Age paradigm – students are educated based on **date of manufacture (age)** not ability.

Shift in Actions



# Mentone Girls SC Challenge No. 2 - Review

## Mentone Girls SC – School Review July 27 2010

### Student Learning

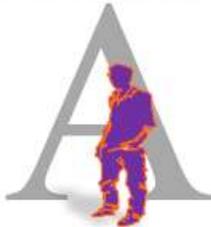
- Evidence of strong and improved student learning in some areas but not to the extent desired by the college or expected
- VCE – average performance is stable in top 10% of Gov. Schools
- NAPLAN – top 10% in years 7 and 9 (and slightly lower in Year 9 Numeracy)
- VCE - School great at lifting performance of lower-midrange achievement students BUT NOT to same extent for upper range students
- Evidence that student learning growth from years 7 – 9 less than achieved in similar Victorian Colleges

# I.D.E.A – one proposed context to look from

*“Why not..?”*



*“Let’s Rock!”*



*“We can  
make that  
work”*

*“Prove it!”*



*Minds at Work*

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**Intuyu Consulting**

EMPOWERING LEARNING FOR THE 21ST CENTURY

# I.D.E.A – one proposed context to look from



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## **I: Imagination People**

- Ideas, Creative, Driven by Imagination, Inspiration People
- Ask questions such as – Why not? What if? How about? Let's try something different! What is something no one has thought of? What's the 500 year plan?
- Pure I People they have lots of ideas but don't know the details to have it happen, will not consider obstacles, and will take some action but get bored quickly and think of something else. Sometimes considered as rebels, fluffy, and space cadets (dreamers).

# I.D.E.A – one proposed context to look from



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## **D: Designers**

- Unstoppable “let’s find a way” people
- Ask questions such as – What would that look like? How could we do that? Suppose it did work, how would it work? What are the limitations?
- Pure D people will spend lots of time figuring out how to do something but not necessarily put anything into action, very deep thought types, all about detail and HOW. They can sometimes be empire builders and bureaucrats. They work well with I people and E people.

# I.D.E.A – one proposed context to look from

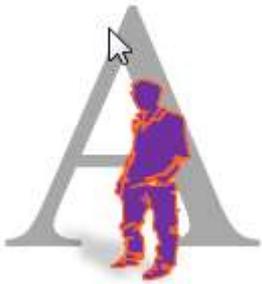


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## **E: Evaluators**

- “Yeah But” or “Prove It” people
- Ask questions such – Cost? Benefit? Risk? What are the numbers? What are the options? How do you know that? What’s the best bang for buck?
- Pure E people do NOT work well with I people and are quite often considered the cynic, devil advocates’, and perfectionists. They can be control freaks with a passion for dotting the i’s and crossing the t’s. They are critical to the process because if a Designer can overcome the obstacles they find – then the project will happen.

# I.D.E.A – one proposed context to look from

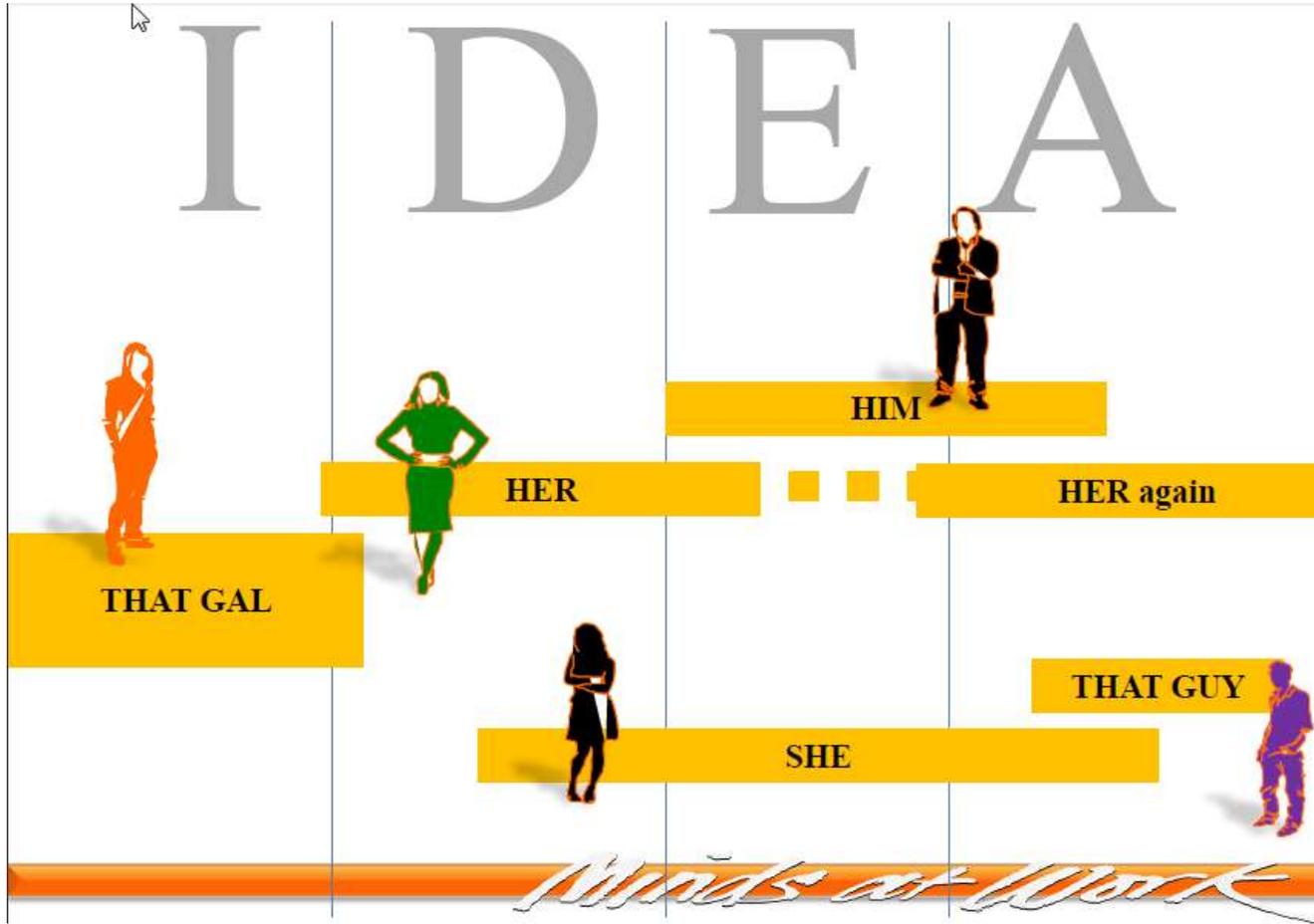


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## **A: Action People**

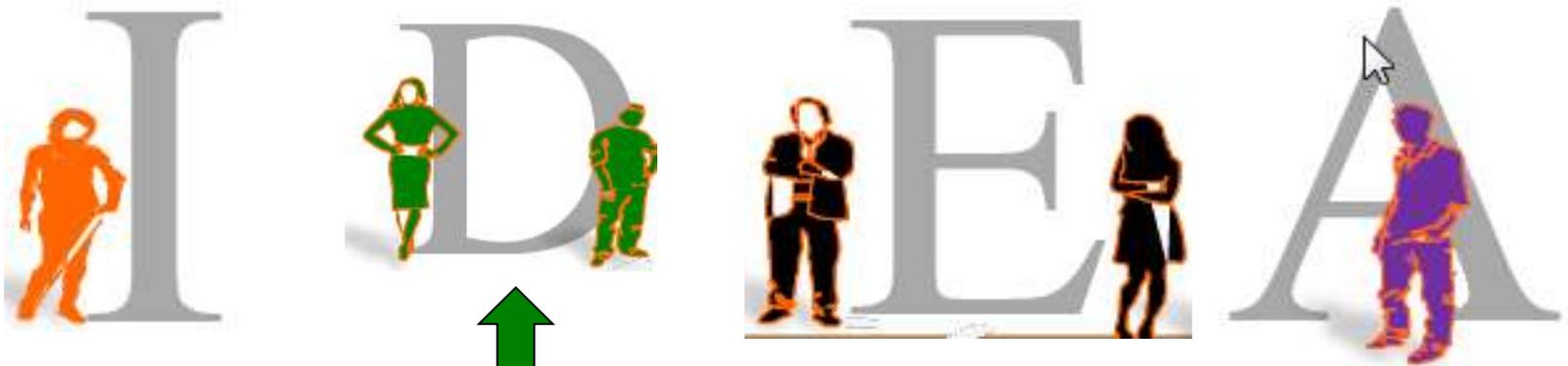
- “Just Do It” people
- Ask questions such as – Are we there yet?
- Love to be in action and need a direction otherwise will do a lot of work to get nowhere.
- They are sometimes the drones, the passive, non-thinking worker. However if you want something done ... they will do it as you have told them.

# I.D.E.A – people can have several strengths

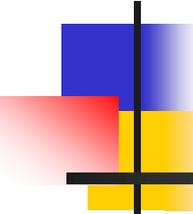


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# I.D.E.A – what are children natural at?



**21<sup>st</sup> Century Learner**  
adaptable, responsible,  
always learning

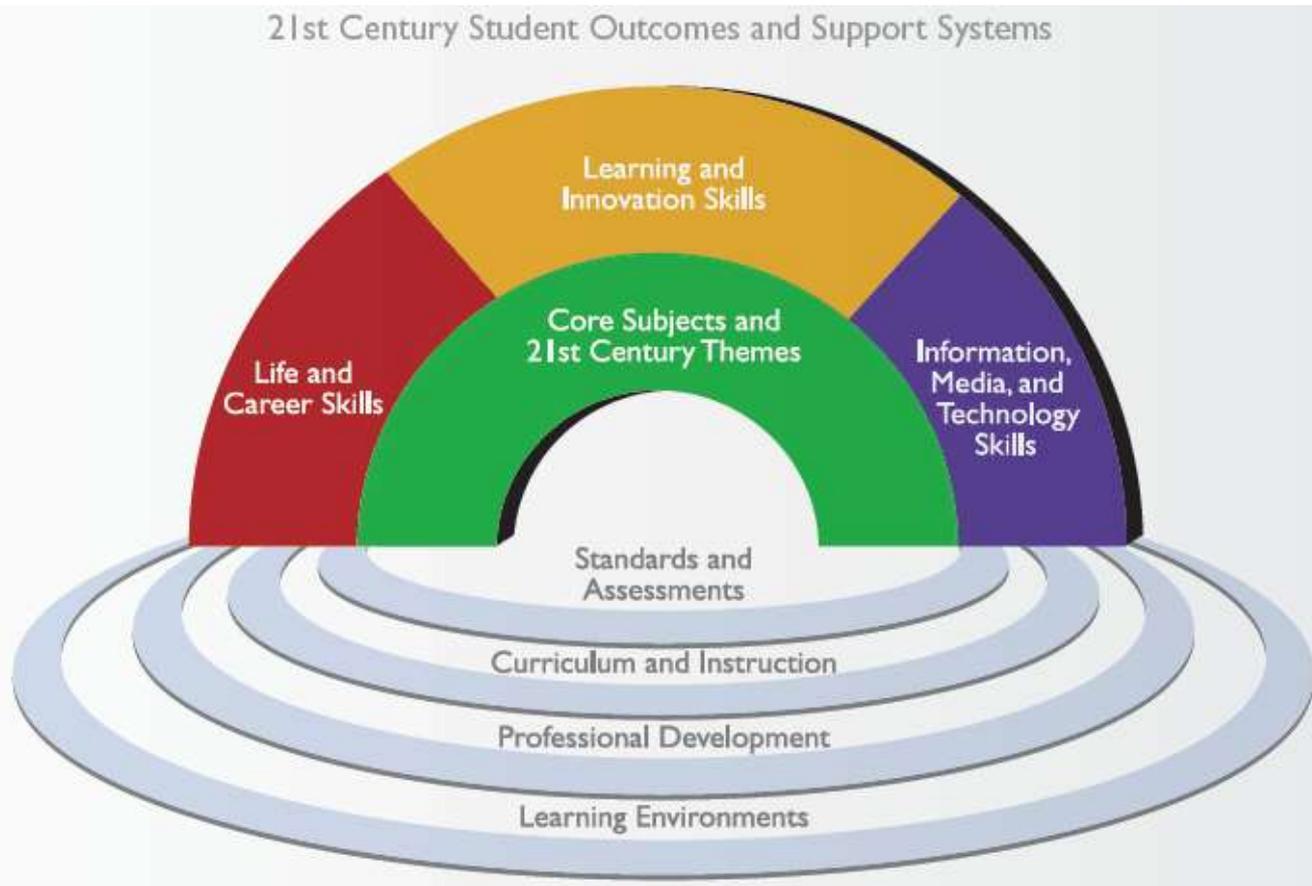


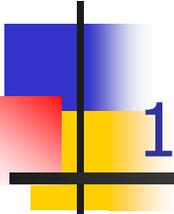
# So how do we develop 21<sup>st</sup> Century Learning?

## Four **key** factors

1. Develop leading edge **curriculum** that focuses on developing knowledge, understandings, skills and capacities for the 21st century
2. Develop an **approach** that naturally allows for skill and capacity development as well as differentiation
3. Develop **assessment** and **systems** that support the skill and capacity development
4. Develop **a professional development culture** in the staff and the students

# So how do we develop 21<sup>st</sup> Century Learning?





# 1. National Curriculum

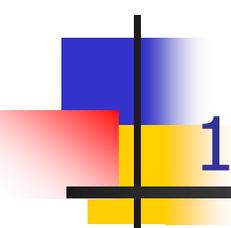
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**Develop leading edge curriculum that focuses on developing knowledge, understandings, skills and capacities for the 21st century**

The Australian National Curriculum (ANC) is being designed to address

- An increasingly mobile student and teacher population
- Allow for collaboration across the nation
- Greater attention to preparing students for the 21<sup>st</sup> Century

***There is a large synergy between the VELS and the National Curriculum***



# 1. National Curriculum

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- The curriculum will describe the **knowledge, understandings, skills and dispositions** that students will be expected to develop, in sequence, for each learning area across the years of schooling.
- Each curriculum sequence will represent what is known about the **progression of learning** in that area, recognising that there will need to be some variability.
- Students' attitudes to the knowledge, understanding and skills they develop will be **influenced more by teaching** than by curriculum BUT curriculum assists if the
  - Content and design is sufficiently coherent over time.
  - Students understand their progress in learning
  - Curriculum is relevant to their lives and futures.



## 2. Adaptable and Flexible Approach

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2. Develop an **approach** (**learning environment**) that allows for skill and capacity development as well as differentiation.

**Any** approach that we develop must address the following common factors for why people do not perform as expected on tasks and in their learning:

- They do not know **WHAT** they are supposed to do
- They do not know **HOW** to do it
- They do not know **WHY** they do it
- There are **obstacles** beyond their control
- **variance** in student interests and academic ability

# What has Differentiation got to do with Inquiry?

## Differentiated learning

- Arises to deal with the student variation and various student interests in a classroom
- In any class there can be up to **seven years of variance** in student skills and knowledge in certain areas
- Being focussed on content knowledge and content understanding in a class with large academic variance and range of student interest makes **differentiation VERY difficult**
- Part of the difficulty is that of **teacher-centredness** – how do you prepare for 7 years of variance of interest, skill and understanding?

# What has Differentiation got to do with Inquiry?

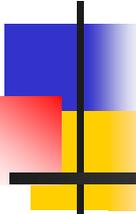
## Differentiated learning

- Dignifies students with learning that is “whole, important and meaning making”
- Allows for **stability in the core of what** they learn but allows **variance in the degree of difficulty**, working arrangements, modes of expression, and sorts of scaffolding
- Plans for what students should know, understand and be able to do at the end of a sequence (**begins with the end in mind**)
- Allows for **relevance and student interest** and is student focussed
- Requires teachers to **know where each student is** in knowledge, skill and understanding and **where they need to move to**.

# What has Differentiation got to do with Inquiry?

Inquiry Learning is an **approach** that

- allows for **natural skill and capacity** development
- allows for **safety to make mistakes** (no right or wrong)
- allows for students to **tackle obstacles** normally beyond their control and develop the skills to overcome / get around those obstacles. Skills include creativity, resilience, reflection, reasoning, research, and independence.
- creates a **strong context for learning** allowing for connecting through with what they already know and what their interests are
- allows for **easier differentiation** to account for academic variance, student interests, choice and responsibility



## What is Inquiry?

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“Inquiry is a systematic investigation or study into a worthy question, issue, problem or idea.”

[www.galileo.org/inquiry-what.html](http://www.galileo.org/inquiry-what.html)

Authentic Learning is ...

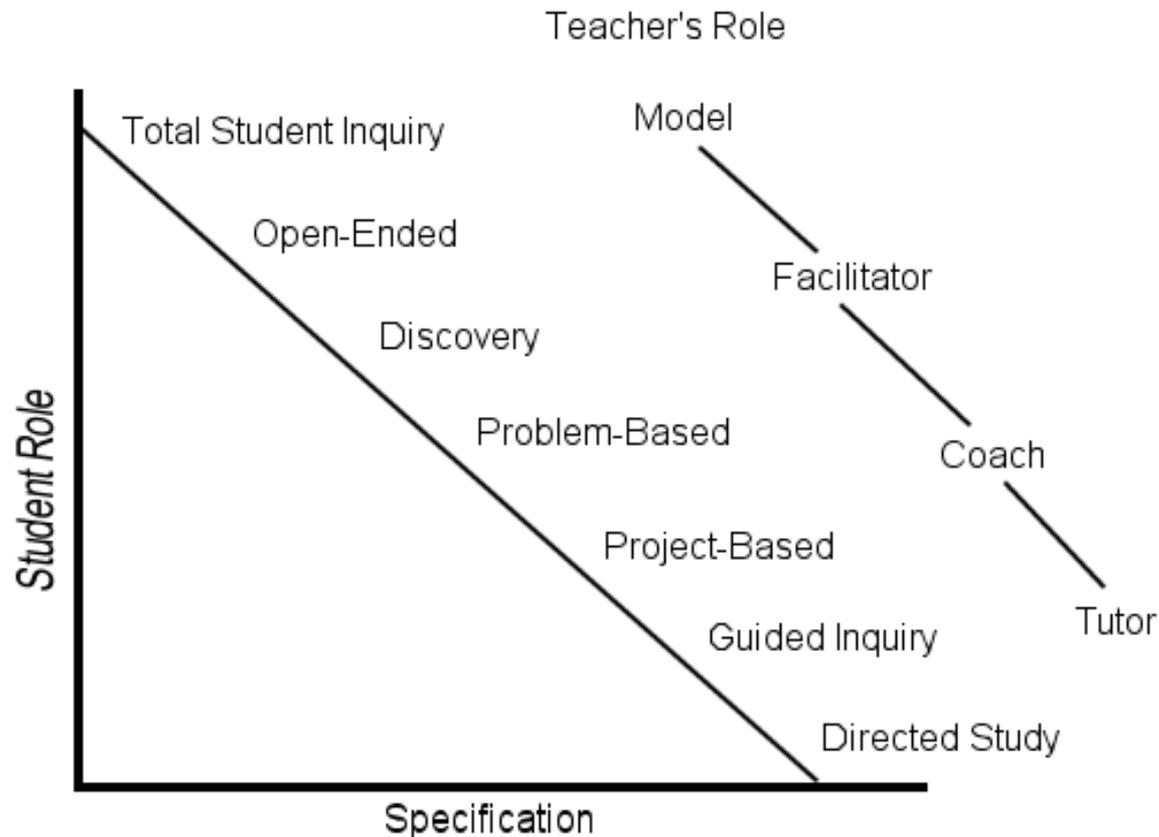
“Construction of knowledge, through disciplined inquiry, to produce discourse, products and performances and that have meaning beyond success in school.”

Wehlage, Newman & Secada

Care of [www.inquiringmind.co.nz](http://www.inquiringmind.co.nz)

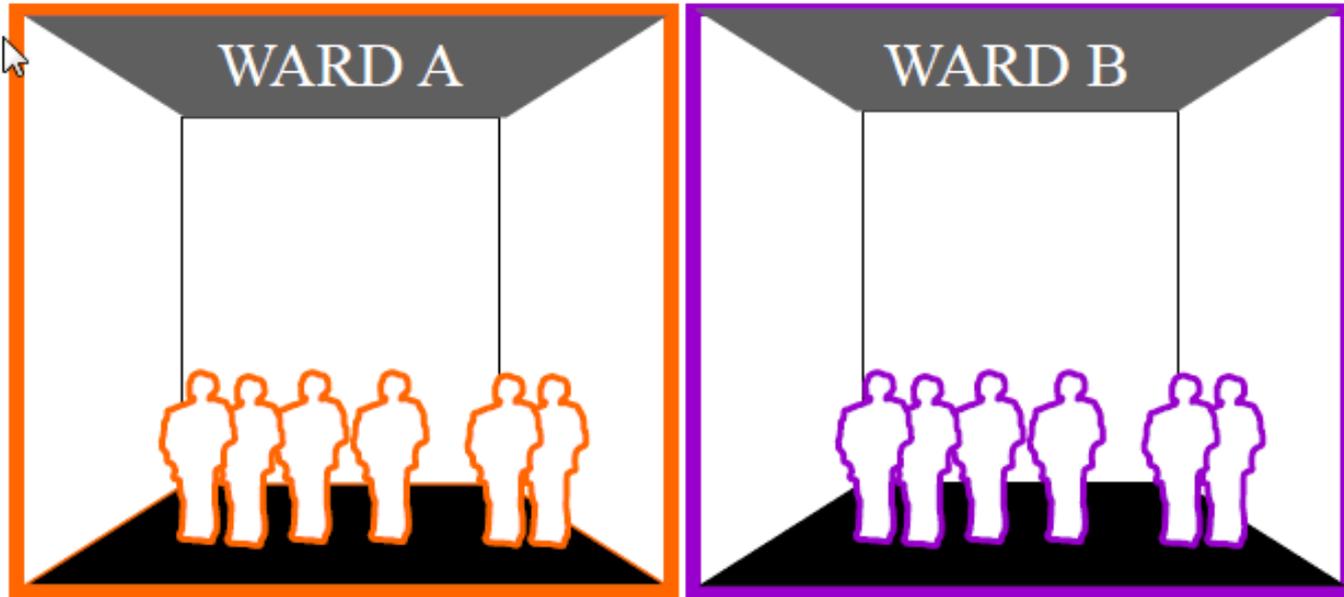
# Spectrum of Inquiry-Based Learning

## The Path Towards Student Inquiry



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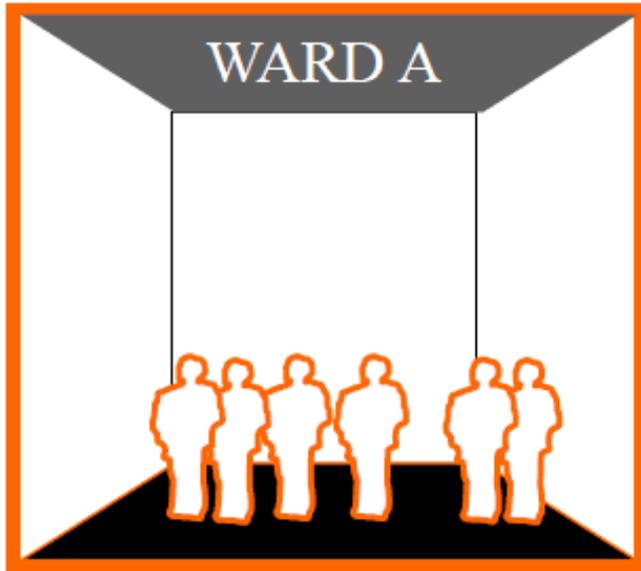
# Importance of Choice and Responsibility



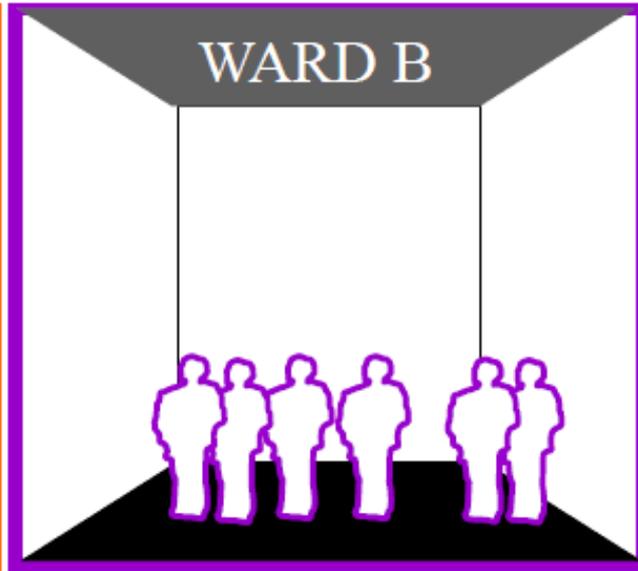
*NO CHOICE  
NO RESPONSIBILITY*

*CHOICE &  
RESPONSIBILITY*

# Importance of Choice and Responsibility

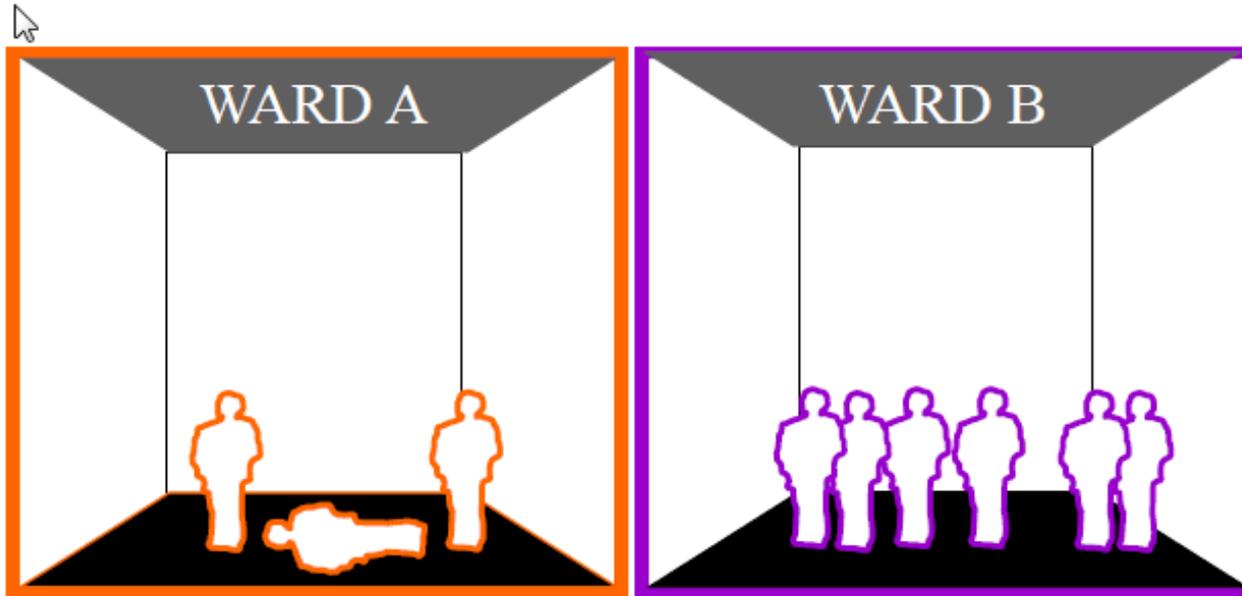


*FIXED EGG DIET PLAN*  
*FIXED MOVIE TITLE & DATE*  
*FIXED PLANT TYPE & POSITION*  
*SYSTEM DECIDES & PROVIDES*



*CHOOSE EGG DIET PLAN*  
*CHOOSE MOVIE TITLE & DATE*  
*CHOOSE PLANT TYPE & POSITION*  
*PATIENT DECIDES AND MANAGES*

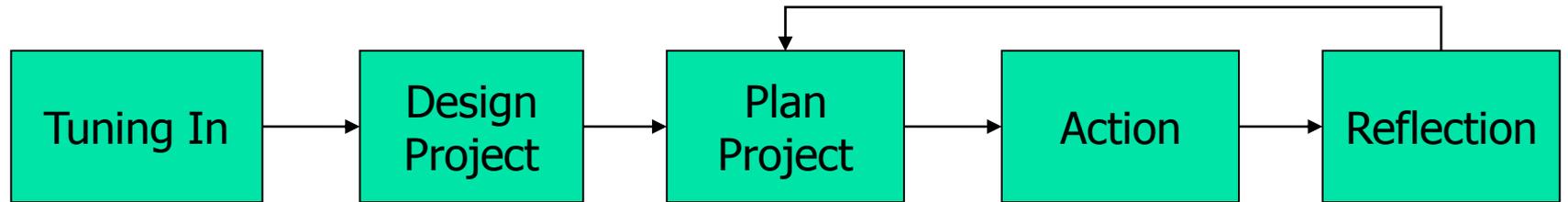
# Importance of Choice and Responsibility



PASSIVE  
WEAK  
SICK  
UNHAPPY  
RESIGNED

ACTIVE  
STRONG  
HEALTHY  
HAPPY  
SELF MOTIVATED

# Practical Inquiry Structure

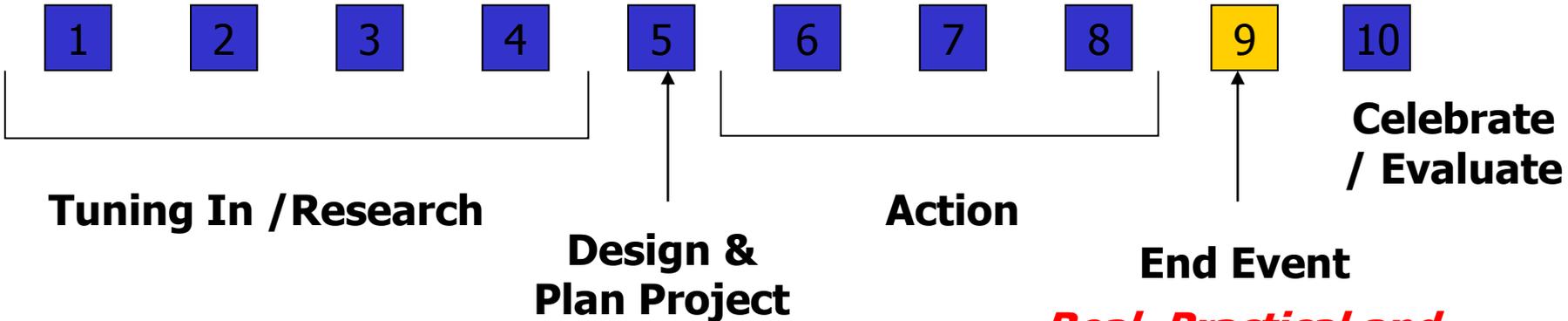


*J*

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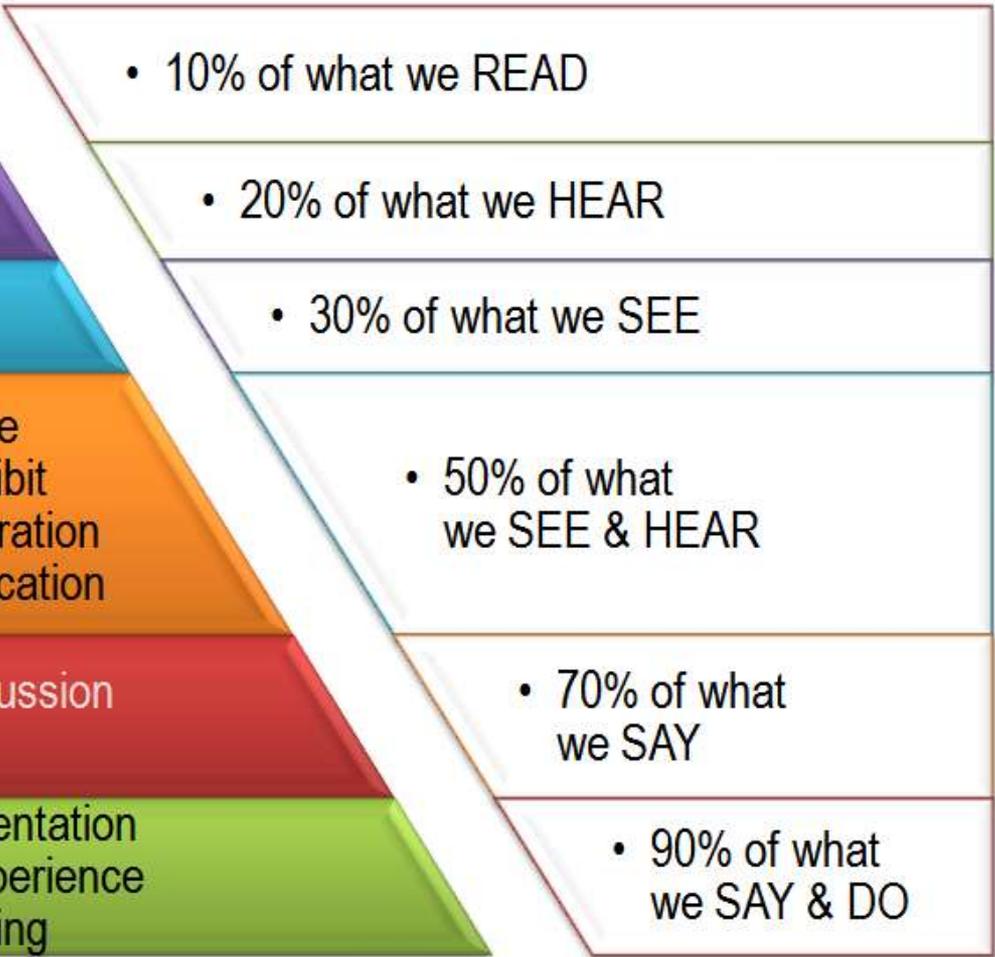
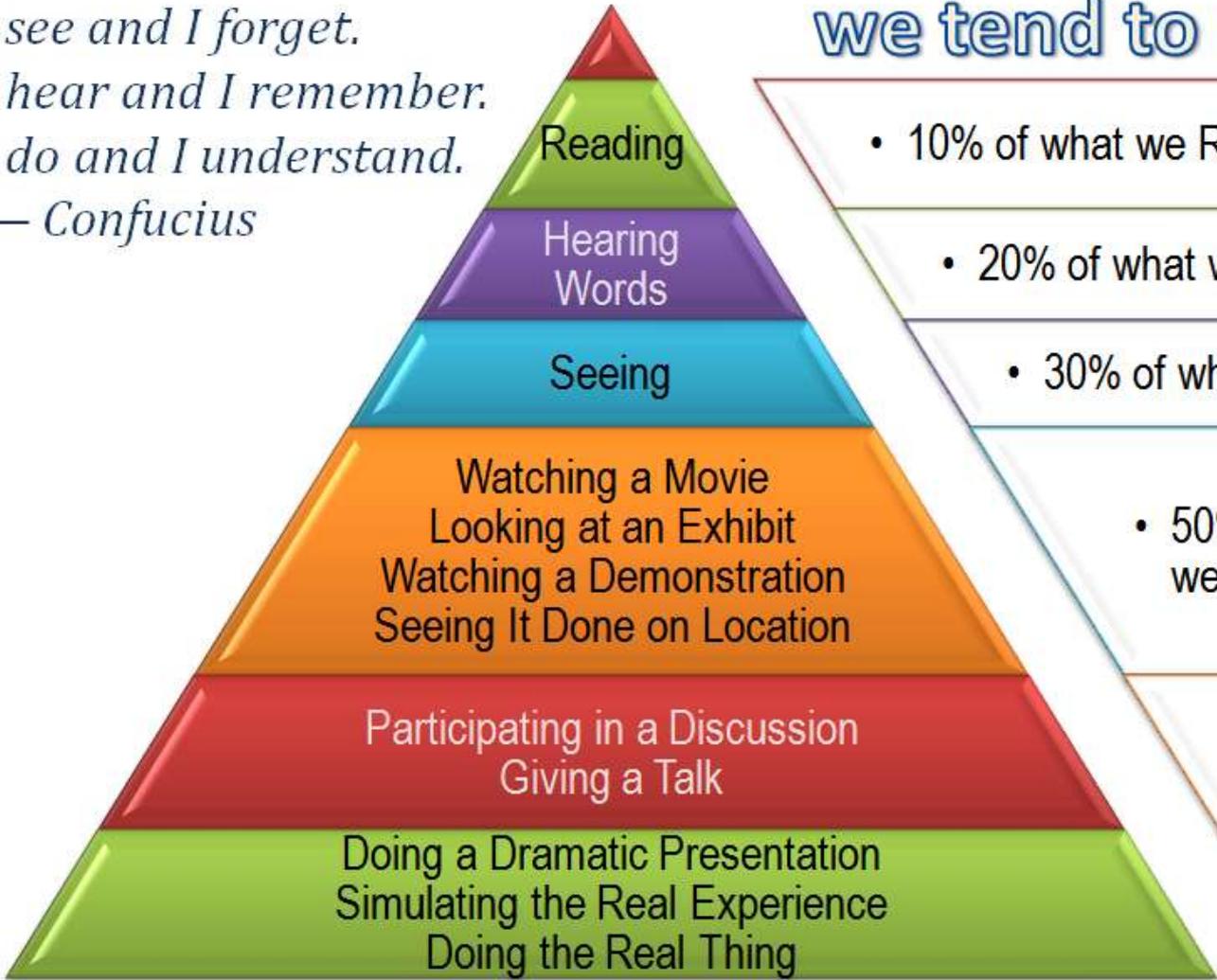


*Real, Practical and  
involve Community*

# The Cone of Learning

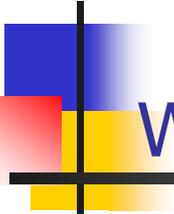
*I see and I forget.  
I hear and I remember.  
I do and I understand.*  
— Confucius

After 2 weeks,  
we tend to remember ...



P  
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Source: Edgar Dale (1969)



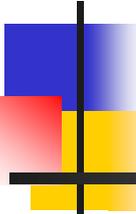
## Where to begin – the process

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- ✦ What is the content you want to cover in this unit?
- ✦ What are the content understandings you want to make sure the students have by the end of the unit?
- ✦ What are the overarching key understandings (the Big WHY of the unit)?
- ✦ What are the skills you want to develop the students in during this unit?

After you have done this foundational work ... only then

- ✦ Brainstorm possible end products / performances / events



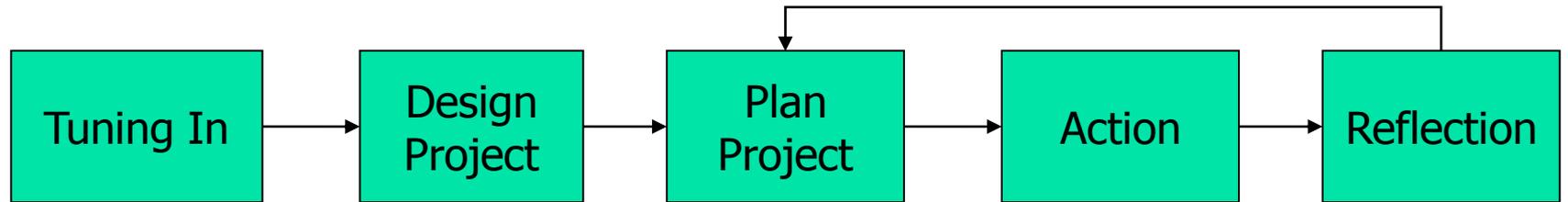
## Learning From Mistakes

# Diana Laufenberg

## How to learn? From Mistakes



# Practical Inquiry Structure

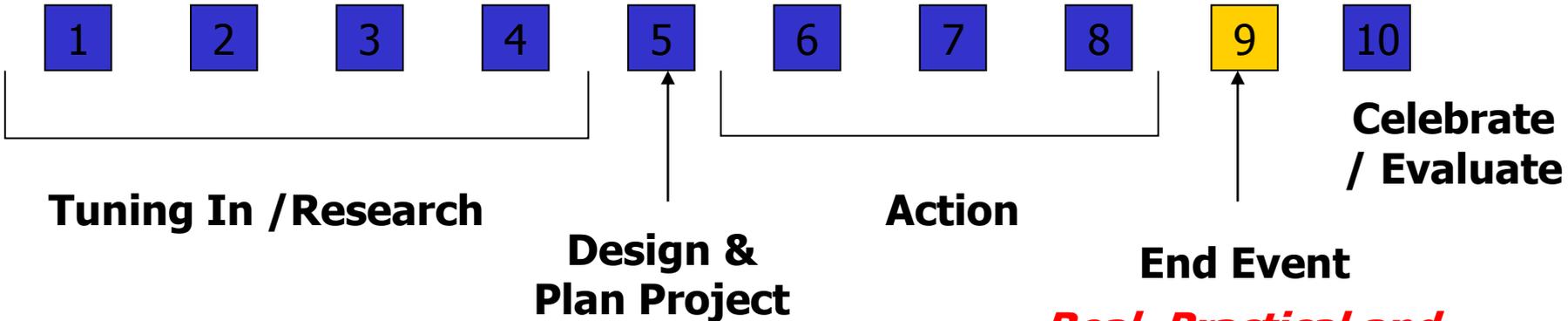


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*Real, Practical and  
involve Community*

## Some qualities that make a successful inquiry-based unit (via Kath Murdoch)

- ✚ The best topics are built around **big ideas** and engage students in learning about **significant, robust and transferable ideas**
- ✚ A good unit **feels like a journey** rather than a smorgasbord of related activities
- ✚ A great unit has a deft **mix of the planned and spontaneous**, or deliberate, guided tasks and the more organic, responsive teaching arising out of the interactions we have with students

## Some qualities that make a successful inquiry-based unit (via Kath Murdoch)

- ✚ Developing and articulating **shared visions** with teachers and students establishes a stronger sense of shared purpose
- ✚ Activities that involve **real people, real places** and the stories that surround them
- ✚ Units fall flat when we fail to **connect students with the emotional terrain** around a topic
- ✚ Ensure that students **gather information from direct experience and stories** (expert incursions and excursions)

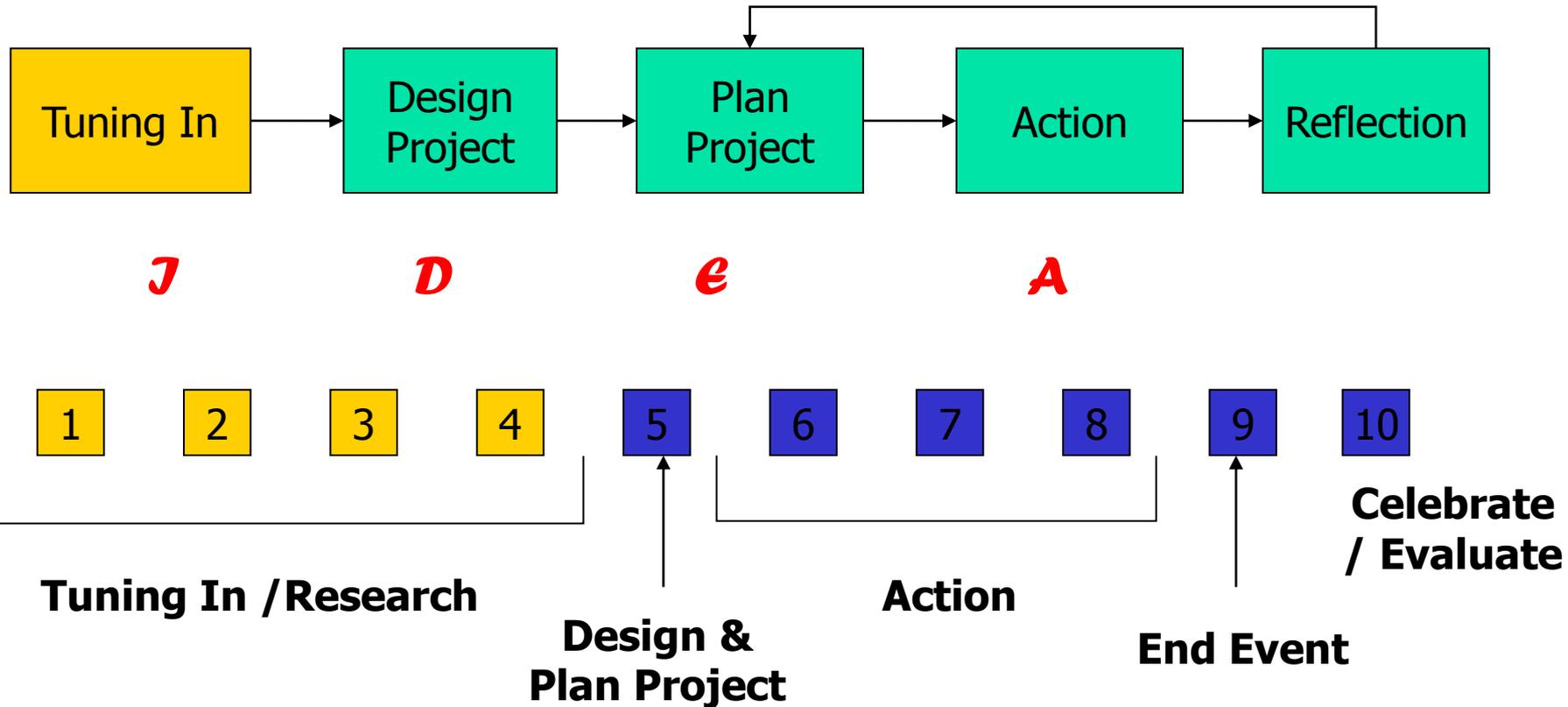
## Some qualities that make a successful inquiry-based unit (via Kath Murdoch)

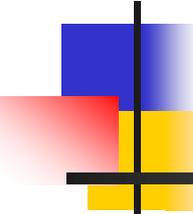
- ✦ Inquiry learning requires teachers to be **looking for opportunities** to make worthwhile curriculum connections
- ✦ Students being **given genuine choices** about what they will learn, how they will inquire and how they will show what they know
- ✦ A great unit is **both relevant and challenging** – students come away from it with new, deeper understandings and new questions
- ✦ Great units involve both students and teachers in **regular explicit reflection**

## Some qualities that make a successful inquiry-based unit (via Kath Murdoch)

- ✚ Great inquiry units **work towards a goal** – a problem or a project can really drive and help sequence a successful inquiry
- ✚ Whilst inquiry learning can happen effectively within the scope of one KLA the best units are those where **students connect learning across the curriculum**
- ✚ Useful tool is the **double-entry journal**:  
one side of the page is descriptive (recording what is being done as the inquiry unfolds) and the other documents reflections on and the questions arising from those experiences

# Tuning In / Immersion - Investigating



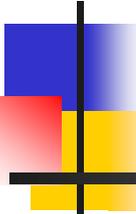


## Our Attention is Stimulated by:

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- Anything that is different – novelty electrifies
- Strong sensory stimulation especially smell, colour, touch & movement.
- Material that we can easily relate to though links to previous knowledge. It needs to provide both sense and meaning.
- Something that has a strong link to our personal lives such as a story, book or film.
- Strong emotional experiences.

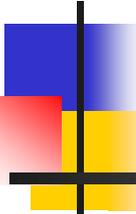
**Our brain soon **tunes out** to anything that it perceives as **boring, irrelevant or time wasting**. During our earlier years and especially at primary school, these will be **strongly tied to emotions**. By mid to late secondary and into adult life, logic plays a stronger role in making choices, however, **emotions reign supreme**.**



## Tuning In

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- **Novelty** electrifies the imagination and breaks the bonds of the past
- **Explicit teaching and research** is mostly in this section to allow students to gain the knowledge they need to form ideas, projects and opinions.
- Use **different media and communication** forms. Grade 5/6 students and younger require concrete experiences
- Can use **music and movement** (via games) so that we link mind-body learning
- Tie in new information & content to what they have done in the past or previous personal experiences. This is where you can have incursions and excursions to **create an emotional link** for them
- Have fun!



# Useful Teacher Practices to Develop Learning

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**The correct music makes an ideal state change or state change trigger.** Music can also be a strong motivator for learning.

## **Music can be used in three distinct ways:**

- For Arousal -** e.g. High energy tracks such as William Tell to create a feeling of urgency.
- As a Carrier -** In this case, the music is secondary to the activity. This would include background music while working or music to accompany a learning song where the lyrics are more important.
- As a Primer -** e.g. The theme from “Jaws” could be used to prime expectation, create tension or to prewire a compelling statement.

# Creating Engagement



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### 3. Develop Assessment and Systems

- While **Novelty** electrifies, **rituals** are needed to unify.
- **Rituals help establish safety.**
- Teachers need to go beyond their normal assessment practices which measure content knowledge.
- We need to develop **rubrics** (*a prescribed guide for conduct or action*) that have the students develop **responsibility** for their own learning and **guide the student** to develop the skills, capabilities and behaviours.
- How can we ritualise skill development?

# Formative Rubrics to develop skills – Year 6

## RUBRICS – AUSTRALIANS AT WAR – TERM 2 -2010

SKILLS	high school	grade 6	grade 5 or below	TEACHER PRACTICES / TEMPLATES
NOTETAKING	<ul style="list-style-type: none"> <li>Shows main facts</li> <li>Uses sub headings</li> <li>Writes down where information comes from</li> <li>May use drawings or diagrams</li> </ul>	<ul style="list-style-type: none"> <li>Write some notes in point form and sentences.</li> <li>Convert information into own words</li> </ul>	<ul style="list-style-type: none"> <li>Highlight key words in a passage</li> <li>Requires assistance to write information in own words</li> <li>Neat handwriting</li> </ul>	<ul style="list-style-type: none"> <li>Teacher role models approach</li> <li>WA Steps resource</li> <li>Mind map</li> <li>Graphic organisers</li> <li>Explicit workshop on note taking</li> </ul>
RESEARCH	<ul style="list-style-type: none"> <li>Uses a wide variety of resources (5+)</li> <li>Can locate resources independently</li> </ul>	<ul style="list-style-type: none"> <li>Uses different resources (2-4)</li> <li>Can locate some resources without assistance</li> </ul>	<ul style="list-style-type: none"> <li>Uses 1-2 resources</li> <li>Requires assistance to search for information</li> <li>Uses only teacher given resources</li> </ul>	<ul style="list-style-type: none"> <li>Library</li> <li>Atlas</li> <li>Wikipedia</li> <li>Web resources</li> <li>Google</li> <li>Encarta</li> </ul>
EXTRACT RELEVANT INFORMATION	<ul style="list-style-type: none"> <li>Extracts information that directly relates to chosen topic or direction</li> <li>Write or explain in own words and understands information.</li> </ul>	<ul style="list-style-type: none"> <li>Extracts basic information that is relevant to topic or direction.</li> <li>Repeats some information and demonstrates some understanding</li> </ul>	<ul style="list-style-type: none"> <li>Cuts and pastes information</li> </ul>	<ul style="list-style-type: none"> <li>Modelling</li> <li>Explicit teaching</li> <li>Links</li> <li>WA Steps resource</li> </ul>
FORM A POINT OF VIEW	<ul style="list-style-type: none"> <li>Provides relevant and lots of evidence to support a point of view</li> <li>Addresses others' points of view well</li> </ul>	<ul style="list-style-type: none"> <li>Provides a number of relevant facts to support point of view</li> <li>Addresses some of others point of view</li> </ul>	<ul style="list-style-type: none"> <li>Provides a few relevant facts to support point of view</li> <li>Does not address others point of view</li> </ul>	<ul style="list-style-type: none"> <li>Define 'point of view'</li> <li>PMI</li> <li>For / Against chart</li> <li>Thinking strategies</li> </ul>

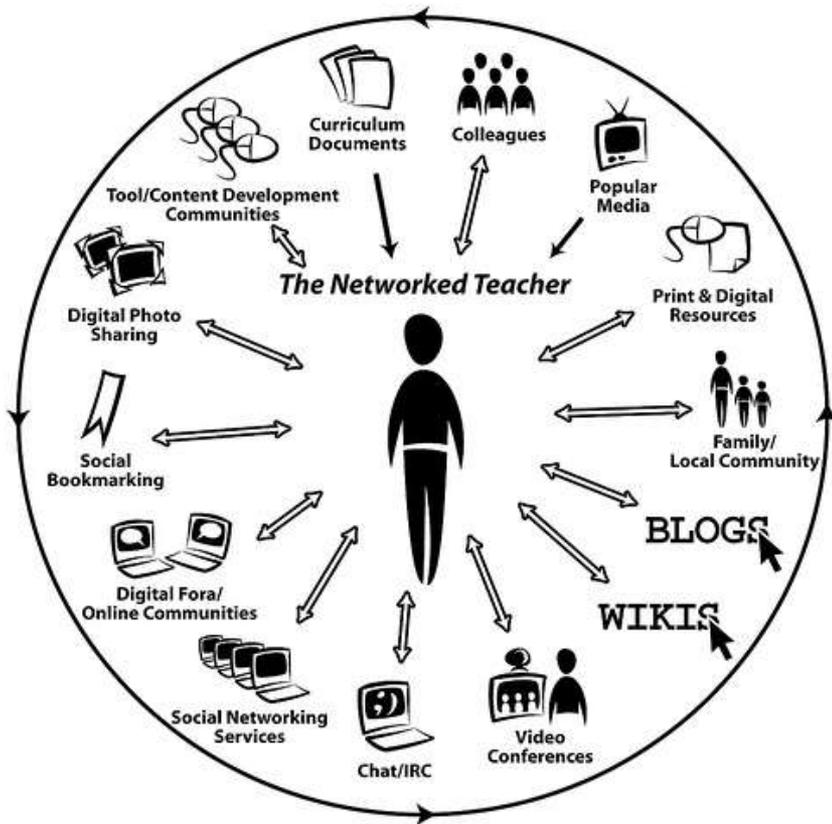
# Formative Rubrics to develop skills - Personal

Skill	Very High 5.5	Medium 5.25	Low <5.0	Teacher practices/ workshop/ Templates
<b>Personal attributes</b>				
- shows Initiative	Student suggests new ideas and alternatives (6+) to the group	Student suggests (3-5) new ideas and alternatives to the group  Some teacher guidance is used	Student suggests some new ideas and/or builds on others suggestions  Student requires a lot of teacher assistance to develop ideas	Brain storm ways; i.e. working at home when you have an idea to bring back; discussing with your group outside of set time
- Independent	Student is able to complete each individual task without requiring prompting  Student recognized when to seek assistance with the task	Student is able to complete most of the task without prompting  Student requires prompting when difficulties were experienced	Student needs much prompting to complete a task  Student requires assistance to complete tasks	Research in own time; complete tasks using a wide range of resources (including people)

# Formative Rubrics to develop skills - Research

Skill	Very High 5.5	Medium 5.25	Low <5.0	Teacher practices/ workshop/ Templates
<b>Research</b> - sources	Use a wide variety of sources (7+)  Independently selects reliable and appropriate sources to the task	Uses some different sources (3-6)  Requires some assistance to select appropriate sources	Uses limited sources (1-2)  Sources are not reliable  Requires mainly teacher assistance to select appropriate sources	Give rubrics to student focus group to review  KWHL chart – i.e. your tool kit  Graphics organisers - venn diagrams - mind maps - fishbones - spider map - Y charts - PMI
- analyse	Student(s) critically review the information and draw appropriate and inventive conclusions with supporting evidence	Student(s) show analysis of the evidence collected	Student(s) conclusions require stronger supporting evidence  Analysis is basic	
- questioning	Student(s) recognise and pose focus questions, which involve them in challenging research  Student(s) recognise when and who to seek advice from, after exploring a range of options	Student(s) construct questions with readily available answers  Student(s) recognize when and who to seek advice from, prior to exploring a range of options	Students rely on teachers to create questions, or develop a question requiring little creative thought  Students require teacher direction often	Using: “delicious”, NING  Double Entry Journal (maths classes)  Use different search engines; i.e. google scholar, ENDNOTE( an automatic bibliography)

## 4. Professional Development Culture



Teachers need to develop their capacity to be adaptable and flexible and also be “walking the talk” of 21<sup>st</sup> century skills.

This doesn't mean you have to be an expert in “knowledge” or ICT. You must expand your ability to **coach, facilitate, tutor, lead, role model.**

# Culture Level in School – what are you building?

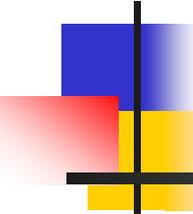
Tribal Stage	Communication	Collaboration	%	Trust (Covey)
1	"Life Sucks"	Alienated	2	Self
2	"My Life Sucks"	Separate	23	Relationship
3	"I'm great and you're not"	Personal	48	Organisational
4	"We're great and they're not"	Partnership	22	Market
5	"Life is Great"	Team	2	Societal

# Stages of Leadership

DEVELOPMENT LEVEL	APPROPRIATE LEADERSHIP STYLE
<p><b>D1</b> Low Competence • High Commitment</p>	<p><b>S1</b> <b>DIRECTING</b> Structure, organize, teach, and supervise</p>
<p><b>D2</b> Some to Low Competence Low Commitment</p>	<p><b>S2</b> <b>COACHING</b> Direct and support</p>
<p><b>D3</b> Moderate to High Competence Variable Commitment</p>	<p><b>S3</b> <b>SUPPORTING</b> Praise, listen, and facilitate</p>
<p><b>D4</b> High Competence • High Commitment</p>	<p><b>S4</b> <b>DELEGATING</b> Turn over responsibility for day-to-day decision-making</p>

At different year levels, and with different students, you must choose a different approach in how you support the students.

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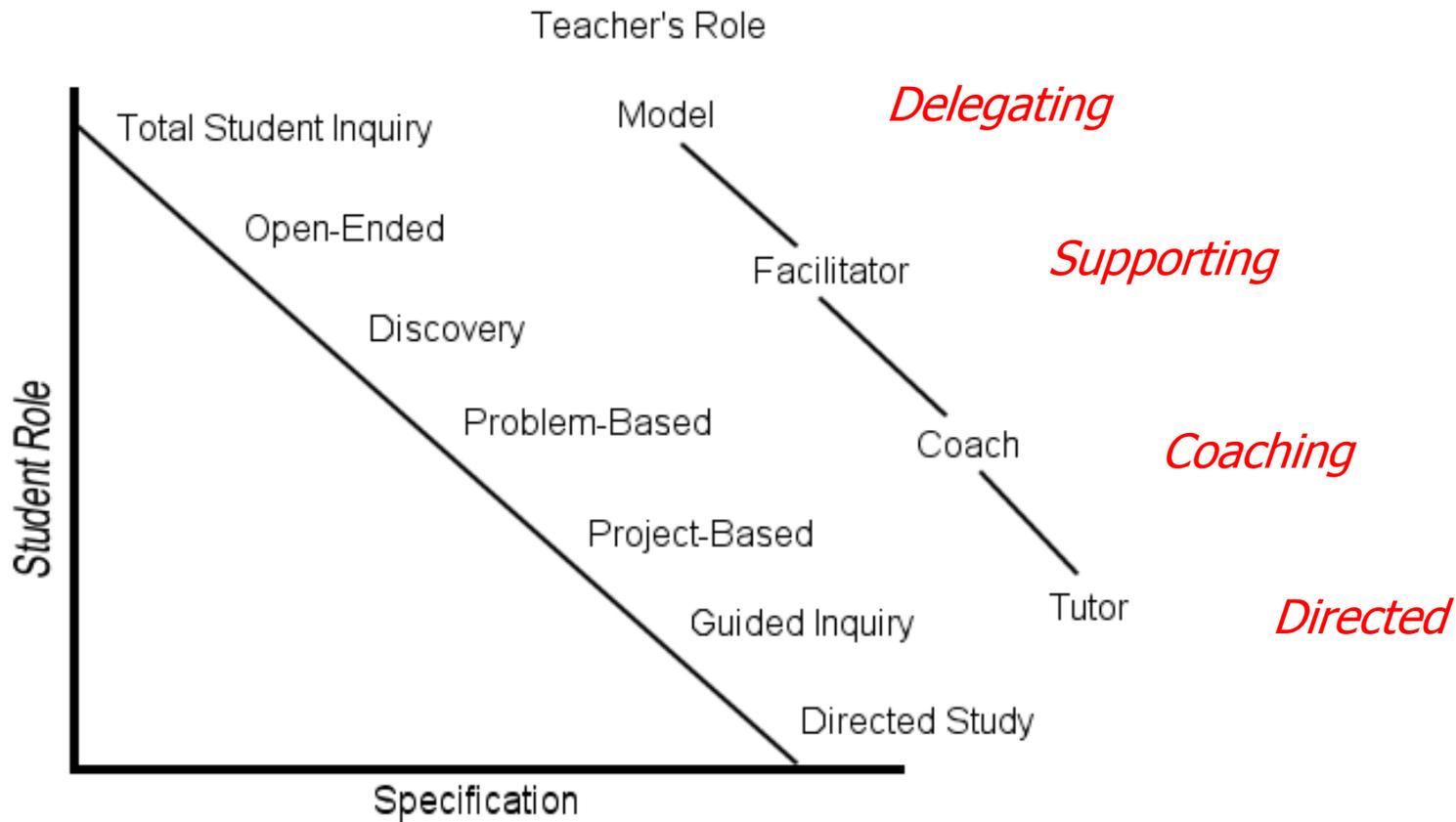


## Stages of Leadership (One Minute Manager)

- **Directing** – for people who lack competence but are enthusiastic and committed. They need direction and frequent feedback to get them started.
- **Coaching** – for people who have some competence but lack commitment. They need direction and feedback because they are relatively inexperienced. They also need support and praise to build their self-esteem, and involvement in decision making to restore their commitment.
- **Supporting** – for people who have competence but lack confidence or motivation. They don't need much direction because of their skills, but support is necessary to bolster their confidence and motivation.
- **Delegating** – for people who have both competence and commitment. They are able and willing to work on a project by themselves with little supervision or support.

# Spectrum of Inquiry-Based Learning

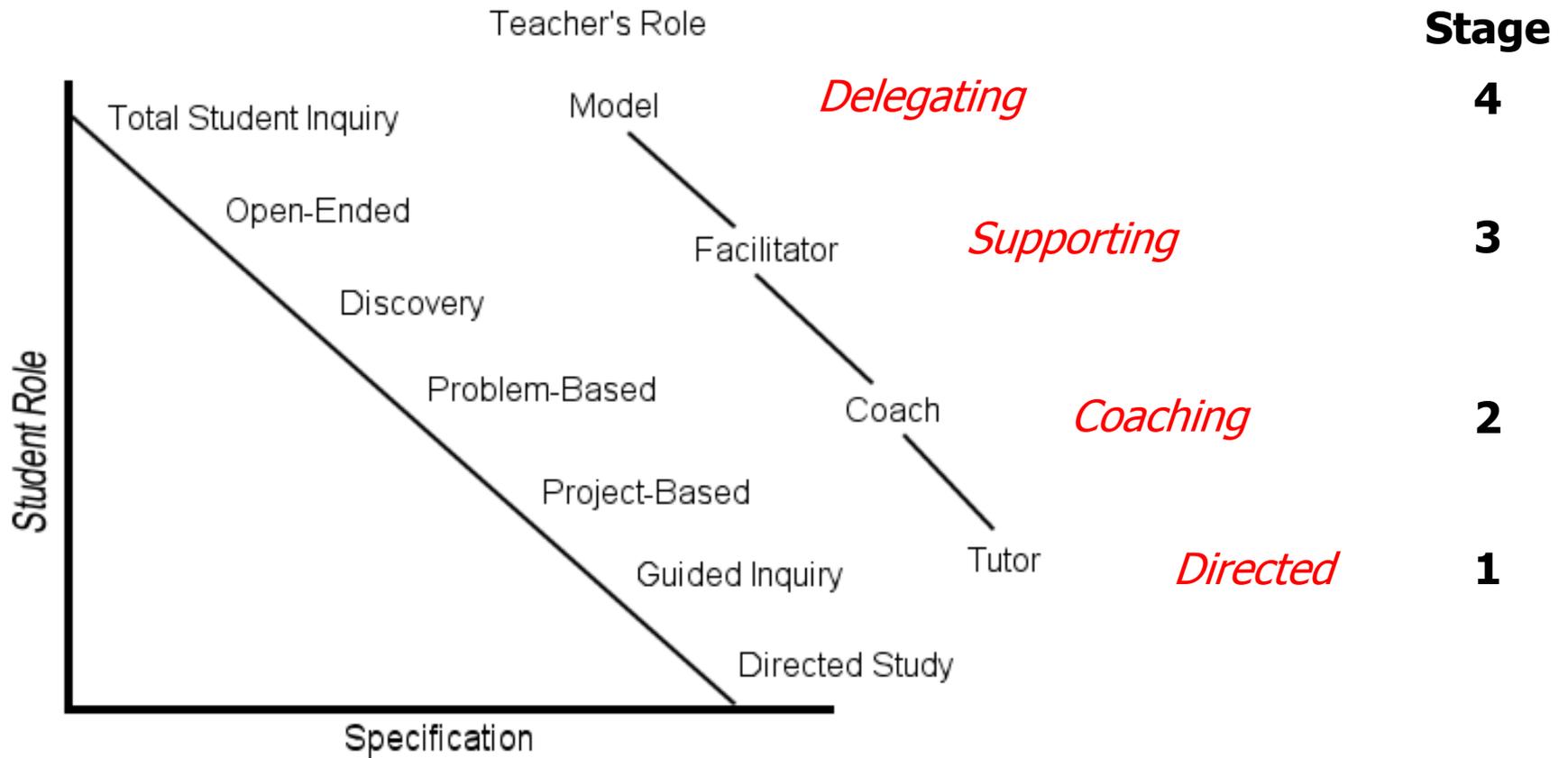
## The Path Towards Student Inquiry



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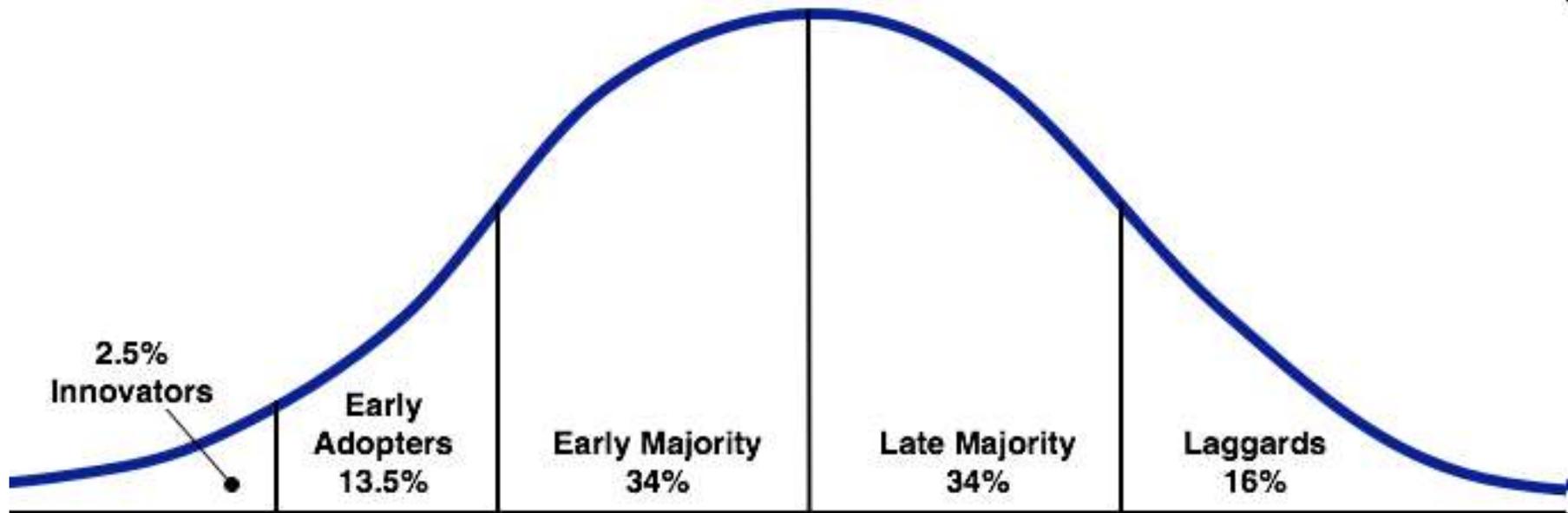
# Spectrum of Inquiry-Based Learning

## The Path Towards Student Inquiry



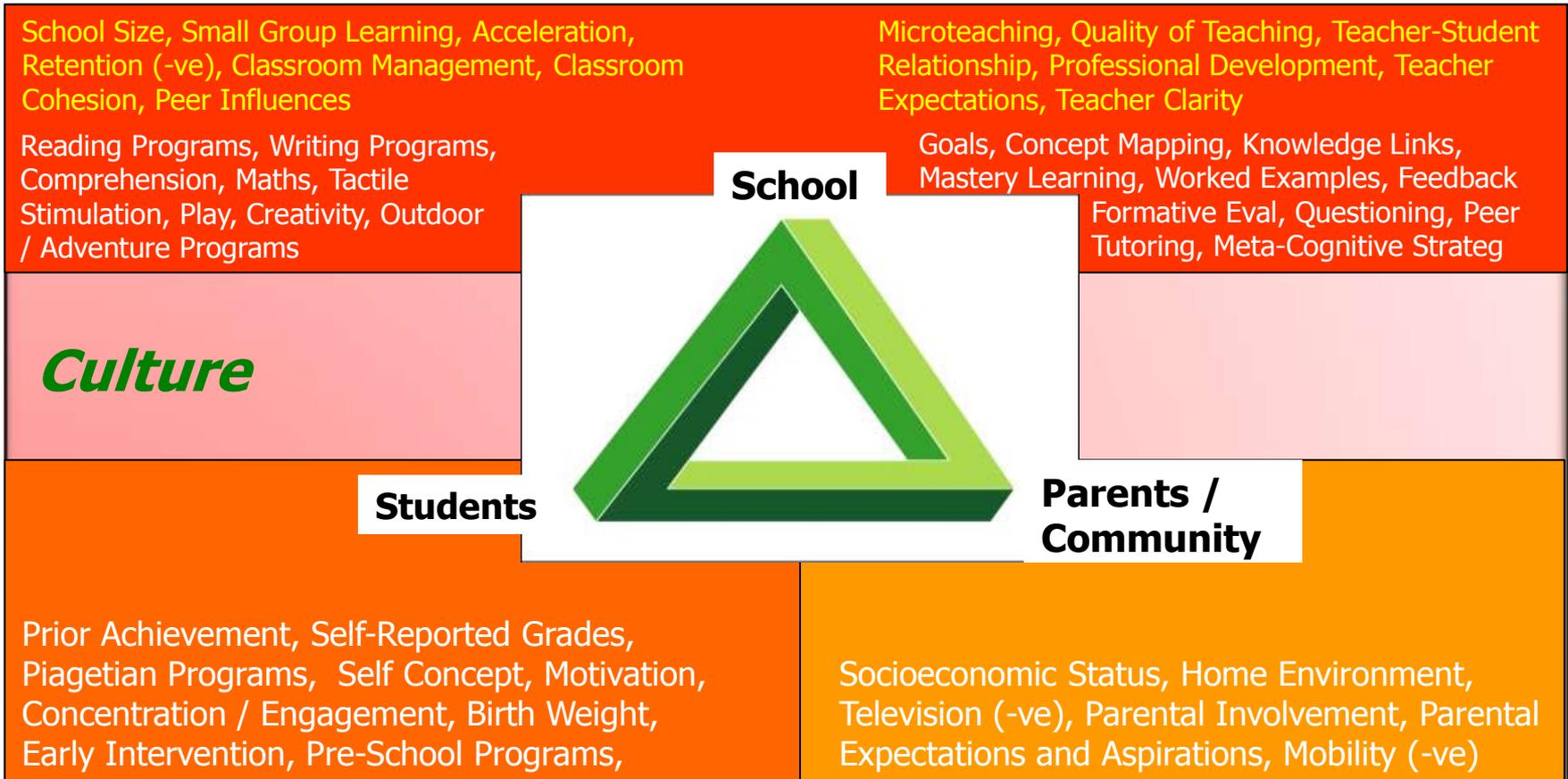
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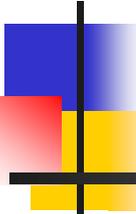
# Culture Change Takes Time



Source: Everett Rogers, *Diffusion of Innovations* model

# Developing a Powerful Learning Culture





# Change and Human Beings

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“Mankind is divided into two sorts when faced with an unknown future – those who find it threatening and those who find it thrilling.

If change threatens you, you become conservative in self-defense.

If change thrills you, you become liberal in self-liberation.

**Threateneds** are frequently more successful in the short run because they always fight dirty.

But in the long run they always lose, because **Thrilled** people learn and accomplish more.”

*Robert Heinlen and Spider Robinson*