Keynote: Creativity Research in Australian Schools – Systematic Approaches to Understanding Creativity in the Classroom

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UPCE, March 2017

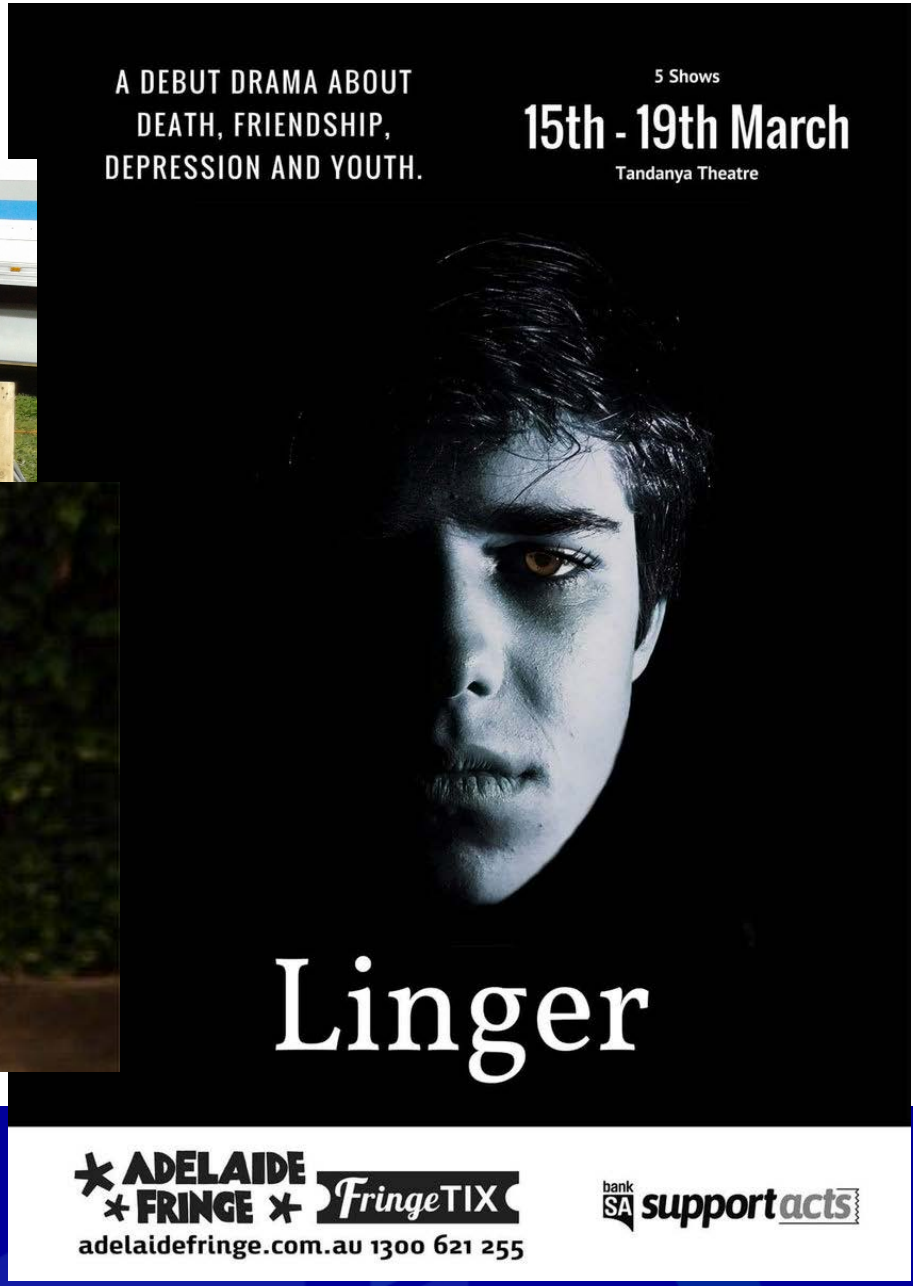
University of South Australia

@dhcropley

Outline

- Life at 9
- ACARA
- DECD
- GGS
- IPAI

Creativity & “The Arts”



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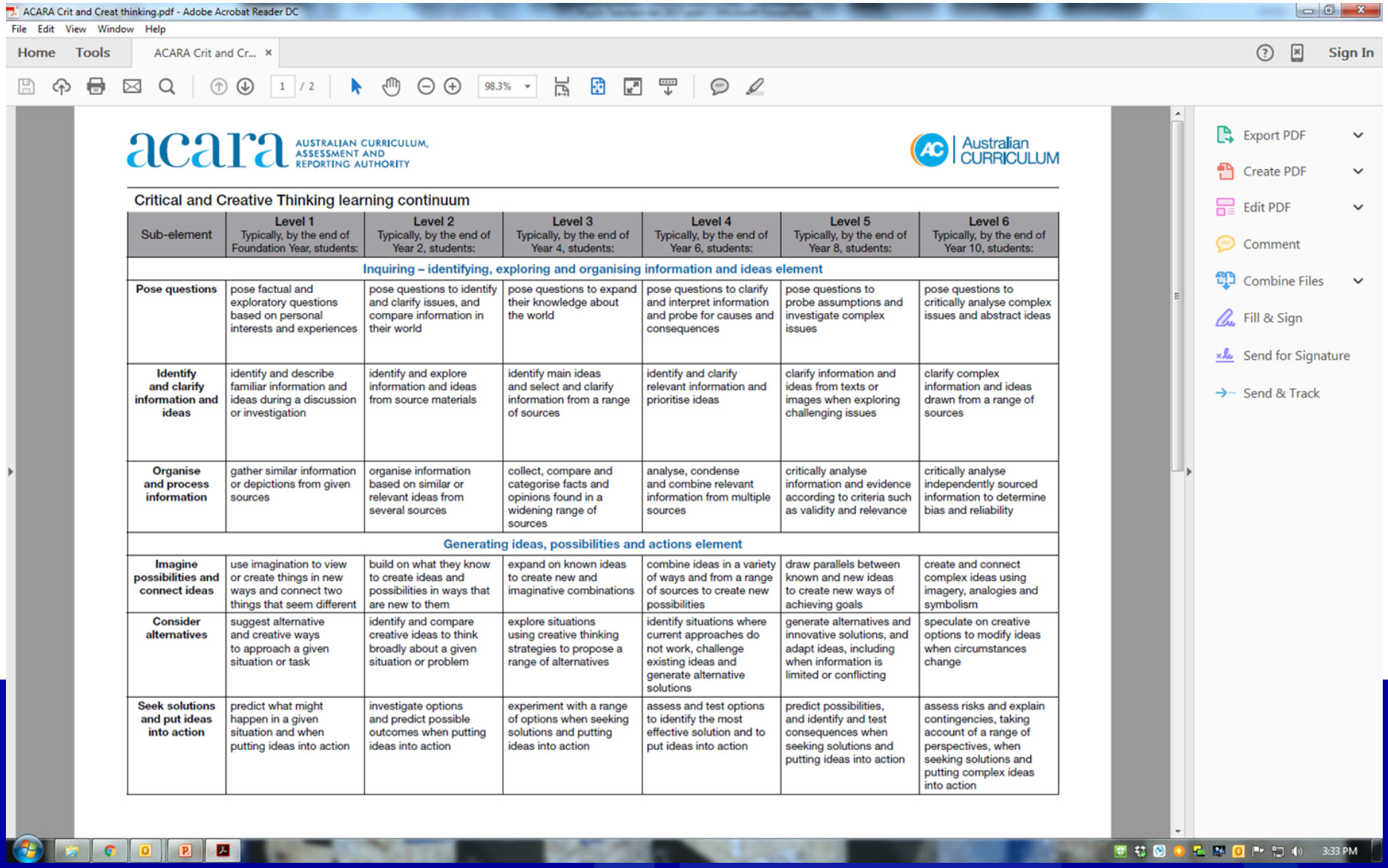
“Life at 9” (ABC Television, 2014)

ACARA

- **The Australian Curriculum Assessment and Reporting Authority (ACARA) began developing a national curriculum approx. 9 years ago.**
- **Among range of *general capabilities* defined in 2010/11 was *Critical & Creative Thinking* (C&CT).**
- **Over last two years, growing interest in private schools, public schools and State Departments of Education.**

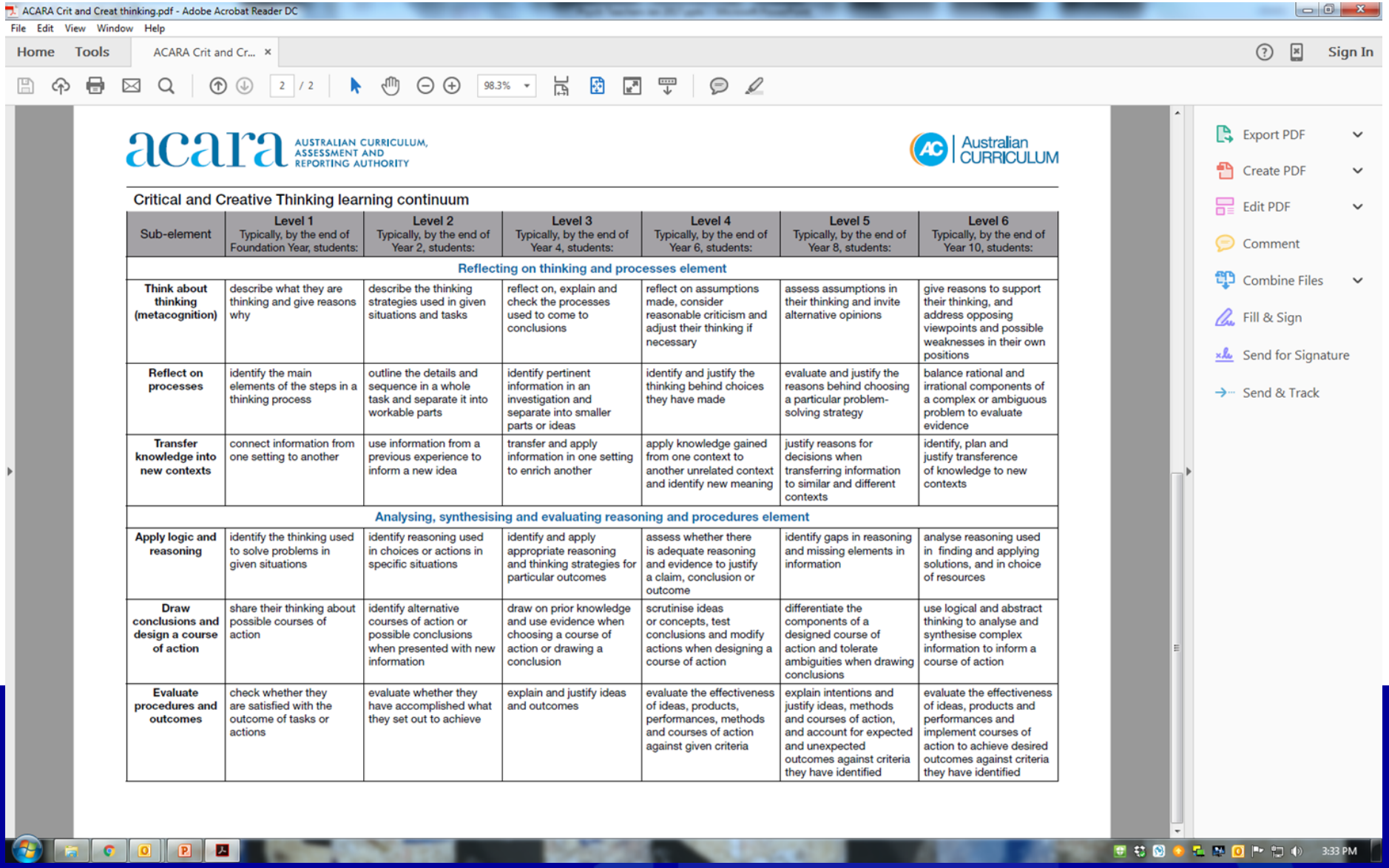
ACARA C&CT *Learning Continuum*



Critical and Creative Thinking learning continuum

Sub-element	Level 1 Typically, by the end of Foundation Year, students:	Level 2 Typically, by the end of Year 2, students:	Level 3 Typically, by the end of Year 4, students:	Level 4 Typically, by the end of Year 6, students:	Level 5 Typically, by the end of Year 8, students:	Level 6 Typically, by the end of Year 10, students:
Inquiring – identifying, exploring and organising information and ideas element						
Pose questions	pose factual and exploratory questions based on personal interests and experiences	pose questions to identify and clarify issues, and compare information in their world	pose questions to expand their knowledge about the world	pose questions to clarify and interpret information and probe for causes and consequences	pose questions to probe assumptions and investigate complex issues	pose questions to critically analyse complex issues and abstract ideas
Identify and clarify information and ideas	identify and describe familiar information and ideas during a discussion or investigation	identify and explore information and ideas from source materials	identify main ideas and select and clarify information from a range of sources	identify and clarify relevant information and prioritise ideas	clarify information and ideas from texts or images when exploring challenging issues	clarify complex information and ideas drawn from a range of sources
Organise and process information	gather similar information or depictions from given sources	organise information based on similar or relevant ideas from several sources	collect, compare and categorise facts and opinions found in a widening range of sources	analyse, condense and combine relevant information from multiple sources	critically analyse information and evidence according to criteria such as validity and relevance	critically analyse independently sourced information to determine bias and reliability
Generating ideas, possibilities and actions element						
Imagine possibilities and connect ideas	use imagination to view or create things in new ways and connect two things that seem different	build on what they know to create ideas and possibilities in ways that are new to them	expand on known ideas to create new and imaginative combinations	combine ideas in a variety of ways and from a range of sources to create new possibilities	draw parallels between known and new ideas to create new ways of achieving goals	create and connect complex ideas using imagery, analogies and symbolism
Consider alternatives	suggest alternative and creative ways to approach a given situation or task	identify and compare creative ideas to think broadly about a given situation or problem	explore situations using creative thinking strategies to propose a range of alternatives	identify situations where current approaches do not work, challenge existing ideas and generate alternative solutions	generate alternatives and innovative solutions, and adapt ideas, including when information is limited or conflicting	speculate on creative options to modify ideas when circumstances change
Seek solutions and put ideas into action	predict what might happen in a given situation and when putting ideas into action	investigate options and predict possible outcomes when putting ideas into action	experiment with a range of options when seeking solutions and putting ideas into action	assess and test options to identify the most effective solution and to put ideas into action	predict possibilities, and identify and test consequences when seeking solutions and putting ideas into action	assess risks and explain contingencies, taking account of a range of perspectives, when seeking solutions and putting complex ideas into action

ACARA C&CT *Learning Continuum*



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Reflecting on thinking and processes element						
Think about thinking (metacognition)	describe what they are thinking and give reasons why	describe the thinking strategies used in given situations and tasks	reflect on, explain and check the processes used to come to conclusions	reflect on assumptions made, consider reasonable criticism and adjust their thinking if necessary	assess assumptions in their thinking and invite alternative opinions	give reasons to support their thinking, and address opposing viewpoints and possible weaknesses in their own positions
Reflect on processes	identify the main elements of the steps in a thinking process	outline the details and sequence in a whole task and separate it into workable parts	identify pertinent information in an investigation and separate into smaller parts or ideas	identify and justify the thinking behind choices they have made	evaluate and justify the reasons behind choosing a particular problem-solving strategy	balance rational and irrational components of a complex or ambiguous problem to evaluate evidence
Transfer knowledge into new contexts	connect information from one setting to another	use information from a previous experience to inform a new idea	transfer and apply information in one setting to enrich another	apply knowledge gained from one context to another unrelated context and identify new meaning	justify reasons for decisions when transferring information to similar and different contexts	identify, plan and justify transference of knowledge to new contexts
Analysing, synthesising and evaluating reasoning and procedures element						
Apply logic and reasoning	identify the thinking used to solve problems in given situations	identify reasoning used in choices or actions in specific situations	identify and apply appropriate reasoning and thinking strategies for particular outcomes	assess whether there is adequate reasoning and evidence to justify a claim, conclusion or outcome	identify gaps in reasoning and missing elements in information	analyse reasoning used in finding and applying solutions, and in choice of resources
Draw conclusions and design a course of action	share their thinking about possible courses of action	identify alternative courses of action or possible conclusions when presented with new information	draw on prior knowledge and use evidence when choosing a course of action or drawing a conclusion	scrutinise ideas or concepts, test conclusions and modify actions when designing a course of action	differentiate the components of a designed course of action and tolerate ambiguities when drawing conclusions	use logical and abstract thinking to analyse and synthesise complex information to inform a course of action
Evaluate procedures and outcomes	check whether they are satisfied with the outcome of tasks or actions	evaluate whether they have accomplished what they set out to achieve	explain and justify ideas and outcomes	evaluate the effectiveness of ideas, products, performances, methods and courses of action against given criteria	explain intentions and justify ideas, methods and courses of action, and account for expected and unexpected outcomes against criteria they have identified	evaluate the effectiveness of ideas, products and performances and implement courses of action to achieve desired outcomes against criteria they have identified

ACARA

- **Cons – I think the terminology is unhelpful:**
  - I see a risk that teachers/schools will misunderstand the relationship between critical thinking and creativity.
  - It seems to fail to address key issues, e.g. how to assess creativity in the classroom.
- **Pros – quite simply, schools and administrators are becoming *very interested* in creativity!**

DECD

- **In South Australia, the Department of Educational & Child Development (DECD) is responsible for primary and secondary education.**
- **Over the last 2-3 years, I've had several approaches from public schools for workshops on creativity.**
- **Late 2016, this coalesced into a DECD project with 25 schools in 4 clusters – *Explore Learning Sites: Critical and Creative Thinking Collaborative Inquiry Project.***
- **I'm now assisting them as an *Academic Partner*.**

Key readings on critical thinking and creativity in the classroom

Prepared by Associate Professor David H Cropley

University of South Australia

Introduction

The overviews of selected key readings which follow are not simply abbreviated regurgitations of the entire contents of the articles and chapters in question. Rather, they focus on selected key points in each article, and for this reason are labelled "digests"; the key points are those that are relevant for the core topic of interest here – promoting critical thinking and creativity in the classroom. The references focus on four topics:

1. critical thinking and its relationship to creativity,
2. an education-related concept of creativity (i.e., understanding what you are trying to promote),
3. recognizing classroom creativity when you see it (i.e., the personal and product-related components of creativity – personality, processes, products),
4. creativity-oriented pedagogy (i.e., how to teach in ways which will promote creativity as it is defined in 2).

GGS

- **Roughly simultaneous to DECD, I was approached by a member of staff at Geelong Grammar School (GGS), near Melbourne.**
- **GGS appointed a *Coordinator of Creativity & Innovation*.**
- **Background – GGS is regarded as Australia's richest school. Annual day-pupil fees approx. €22,000 (boarding approx. €45,000).**

GGS

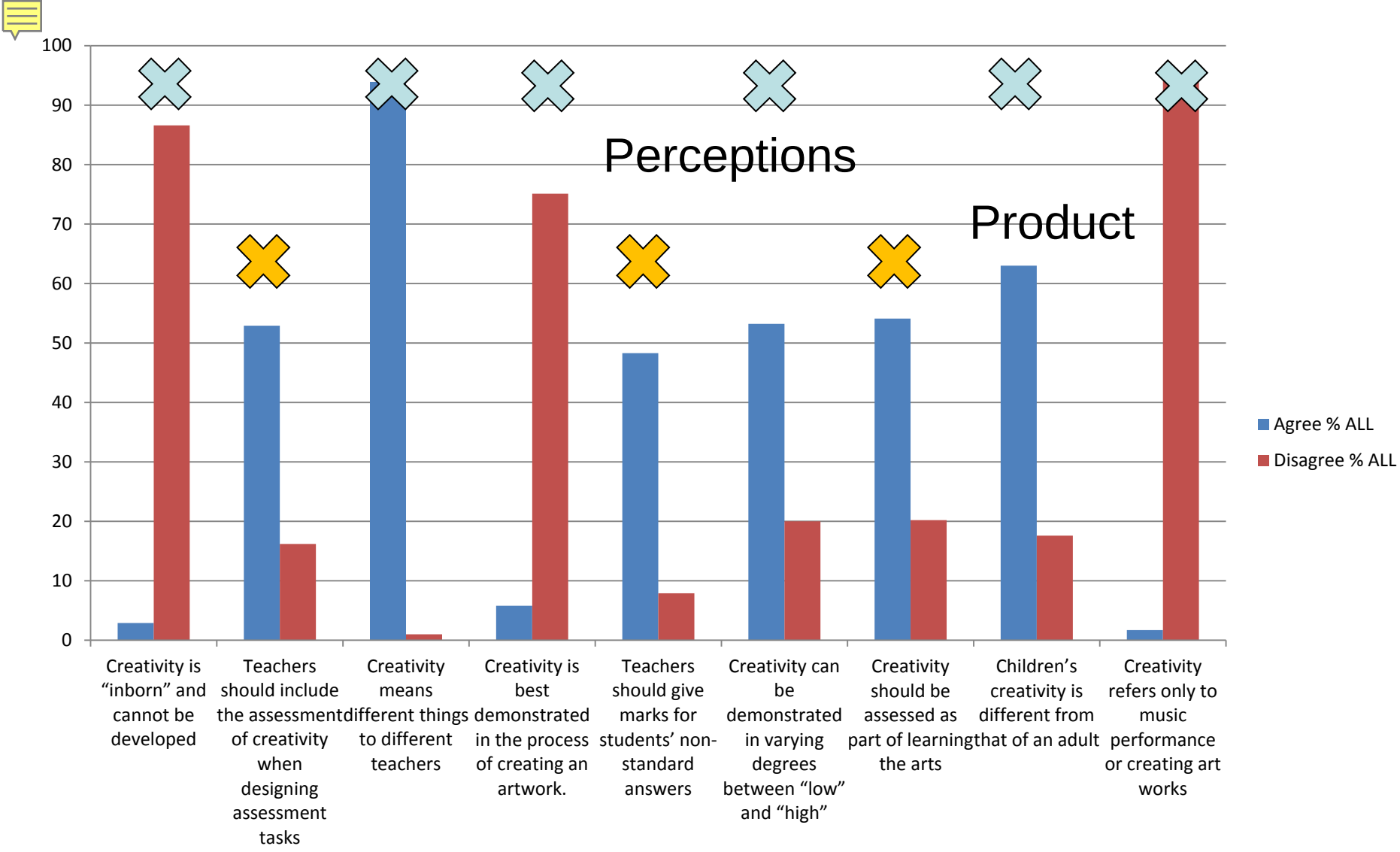
- **The point is, this is a school that has the resources to address issues it sees as important – and that now includes *creativity*.**
- **The good news is also that they want to get value from their investment, and they are willing to be an active partner in research studies.**
- **They are also co-funding a doctoral student of mine.**
- **This has resulted in a three-way partnership: Geelong – David Cropley – James Kaufman (Uni Connecticut).**

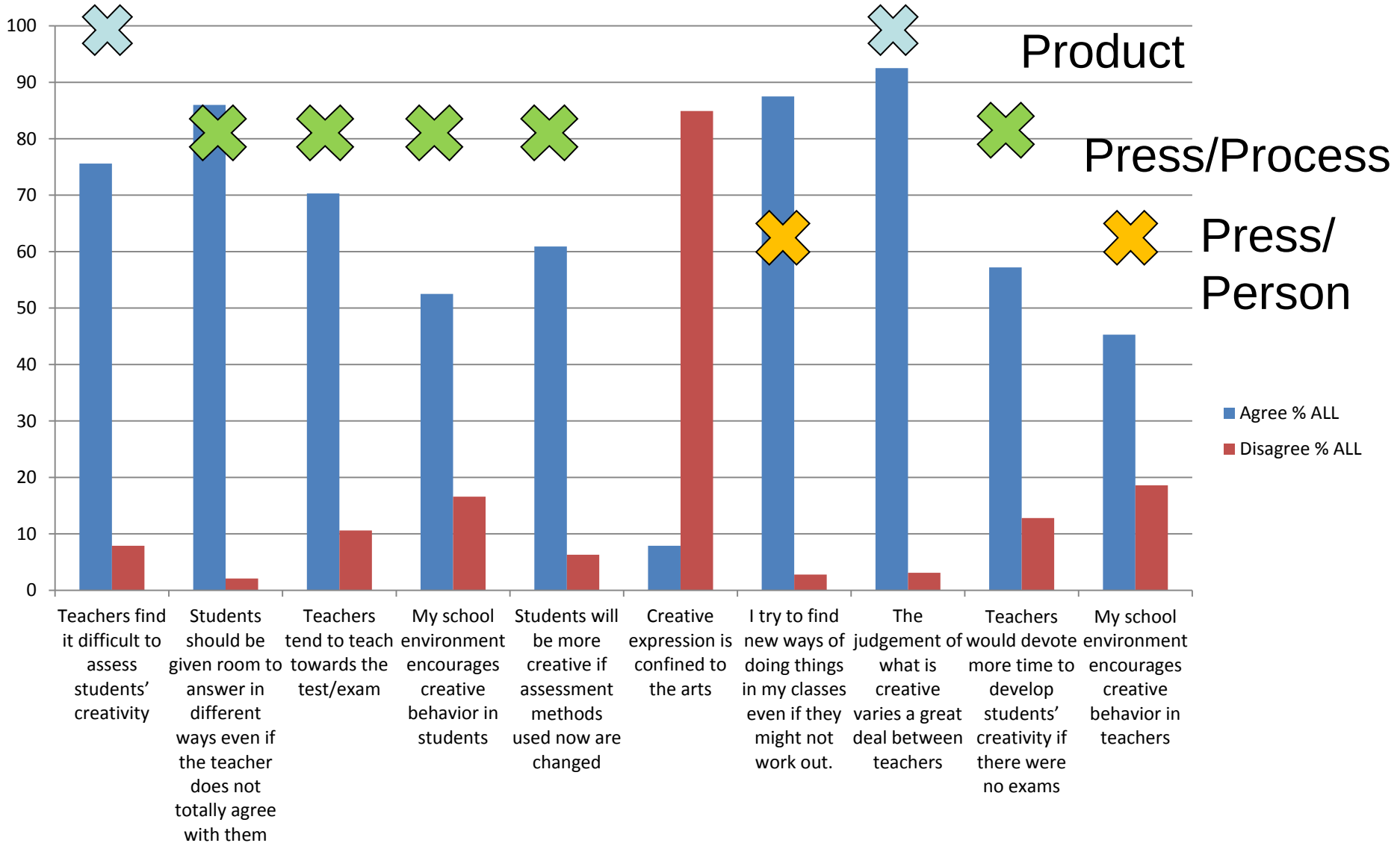
GGS Projects (Creativity)

- **Initial Teacher Attitudes**
- **Teacher Implicit Theories**
- **GGS Student Self Reports**
- **GGS Student Performance Measures**

Initial Teacher Attitudes

- ***Self-Assessment of Creativity*** **(SAC), (Kaufman et al., 2013) (14 Items)**
- ***Creativity and Arts Assessment Scale*** **(CAAS), (Leung & Qiu, 2013) (43 Items)**
- **N ≈ 2,500**
- **Iceland, Australia, Italy, USA, UK**
- **Primary, secondary and pre-service teachers**
- **Variety of secondary subject areas**


Perceptions
Product
100
90
80
70
60
50
40
30
20
10
0
Creativity is "inborn" and cannot be developed
Teachers should include the assessment of creativity when designing assessment tasks
Creativity means different things to different teachers
Creativity is best demonstrated in the process of creating an artwork.
Teachers should give marks for students' non-standard answers
Creativity can be demonstrated in varying degrees between "low" and "high"
Creativity should be assessed as part of learning the arts
Children's creativity is different from that of an adult
Creativity refers only to music performance or creating art works
Agree % ALL
Disagree % ALL


Product
Press/Process
Press/ Person
Agree % ALL
Disagree % ALL
100
90
80
70
60
50
40
30
20
10
0
Teachers find it difficult to assess students' creativity
Students should be given room to answer in different ways even if the teacher does not totally agree with them
Teachers tend to teach towards the test/exam
My school environment encourages creative behavior in students
Students will be more creative if assessment methods used now are changed
Creative expression is confined to the arts
I try to find new ways of doing things in my classes even if they might not work out.
The judgement of what is creative varies a great deal between teachers
Teachers would devote more time to develop students' creativity if there were no exams
My school environment encourages creative behavior in teachers

Findings

- **<u>Perceptions</u>:**
- **Myths – *not* inborn, Good (Q1)**
- **Domains – not exactly same in each disciplines. Good (Q3)**
- **Misconceptions - Creativity not just Art (Q4, 9, 15) – Good**
- **Creativity “All or Nothing” – varying degree, differentiated – Good (Q6, 8)**

Findings

- **<u>Product</u> (Assessment) (Q2, 5, 7, 10, 17) – Teachers recognise the importance of assessing creativity, but are held back by an unfavourable Press, and lack of understanding of "what" to assess.**
- **Fixable.**

Findings

- **<u>Press/Process</u> – Tendency to CT (Q11, 12, 13, 14, 18)**
    - Problem awareness, but unfavourable Press – systemic factors that need to be addressed.
- **<u>Press/Person</u> - Teacher creativity (Q16, 19)**
    - Teachers themselves want to be creative (Good), but Press not uniformly favourable. Importance of interaction of person/press – systemic issues.
- **Fixable**

Teacher Implicit Theories

- ***Creative Student Characteristics Questionnaire*** **(CSCQ), (Gralewski & Karwowski, 2016), (42 Items)**
- **N ≈ 500**
- **Australia, UK**
- **Primary, Secondary**
- **Music, other**

GGS Student Self Reports (Baseline)

- **Multiple measures: Big 5 (50 item), K-DOCS (20 items), Intellectual Risk-Taking (6 items), Creative Mindsets (10 items), Creative Trait Motivation (20 items)**
- **N ≈ 700**
- **Years 3, 5, 7, 9**
- **National Maths/Literacy test data (NAPLAN)**
- **Geelong Students only**

GGS Student Performance Measures (Terms 1, 2, 3, 4)

- **Creative Self-Efficacy (3 items); Creative Personal Identity (3 items)**
- **Verbal Creative Production (Photo Caption):**
  - Metacognition – Pretask (4 items);
  - Caption;
  - Metacognition – Posttask (4 items).
- **Numerical Creative Production (Maths Task):**
  - Metacognition – Pretask (4 items);
  - Task;
  - Metacognition – Posttask (4 items).
- **Creative Self-Efficacy (3 items); Creative Personal Identity (3 items)**
- **DT Task; RAT**

IPAI

- **The Innovation Phase Assessment Instrument* (IPAI) was developed to assess the alignment of organisations to the range of conditions that help or hinder innovation.**
- **It provides a diagnosis of strengths and weaknesses across six "dimensions" (Person, Process, etc), and 7 "phases".**
- **What about schools as places where innovation – the generation and exploitation of effective, novel ideas – takes place?**

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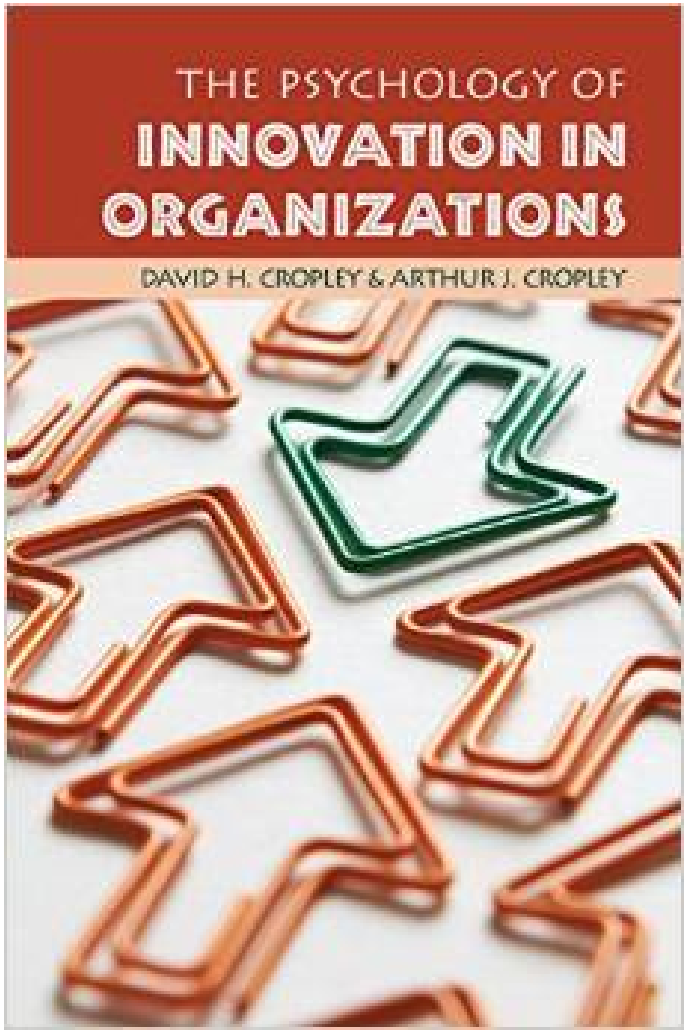
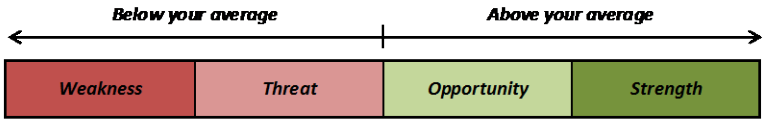
*Cropley, D. H., & Cropley, A. J. (2015). *The psychology of innovation in organizations*. New York, NY: Cambridge University Press.


THE PSYCHOLOGY OF
INNOVATION IN
ORGANIZATIONS
DAVID H. CROPLEY & ARTHUR J. CROPLEY

		Invention					Exploitation	
	Phase	Preparation Knowledge, problem recognition	Activation Problem definition, refinement	Generation Many candidate solutions	Illumination A few promising solutions	Verification A single optimal solution	Communication A working prototype	Validation A successful 'product'
Dimension	Poles							
Process Thinking Style	Convergent vs Divergent	**Convergent**	**Divergent**	**Divergent**	**Convergent**	**Convergent**	**Mixed**	**Convergent**
Motivation	Reactive vs Proactive	**Mixed**	**Proactive**	**Proactive**	**Proactive**	**Mixed**	**Reactive**	**Reactive**
Personal Properties	Adaptive vs Innovative	**Adaptive**	**Innovative**	**Innovative**	**Innovative**	**Adaptive**	**Adaptive**	**Adaptive**
Feelings	Conserving vs Generative	**Conserving**	**Generative**	**Generative**	**Generative**	**Conserving**	**Conserving**	**Conserving**
Product Phase output	Routine vs Creative	**Routine**	**Creative**	**Creative**	**Creative**	**Routine**	**Routine**	**Routine**
Press Organisational climate	High Demand vs Low Demand	**High**	**Low**	**Low**	**Low**	**High**	**High**	**High**

Teachers – Capacity for Innovation

	Problem Definition		Solution Generation			Solution Implementation		
	Preparation	Activation	Generation	Illumination	Verification	Communication	Validation	Dimension Ave.
Press	68	57	55	52	70	68	58	61
P/Properties	65	47	58	58	64	83	60	62
P/Motivation	69	70	69	85	74	84	48	71
P/Feelings	63	67	65	63	65	74	69	66
Process	61	72	50	69	71	64	65	65
Product	76	60	64	60	77	74	64	68
Phase Ave.	67	62	60	64	70	74	60	65

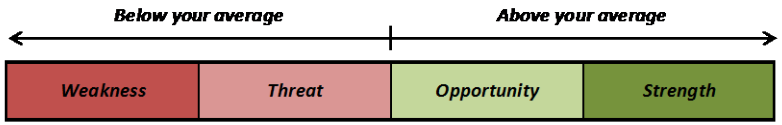


Overall Alignment

Note: Scores represent percentage alignment with ideal conditions for innovation.

Students (Years 8-12)

	Problem Definition		Solution Generation			Solution Implementation		
	Preparation	Activation	Generation	Illumination	Verification	Communication	Validation	Dimension Ave.
Press	53	54	50	50	58	56	57	54
P/Properties	52	48	49	48	53	52	57	51
P/Motivation	52	60	58	58	55	58	51	56
P/Feelings	57	55	59	51	55	50	52	54
Process	55	63	56	53	59	52	50	55
Product	54	50	58	51	55	62	51	54
Phase Ave.	54	55	55	52	56	55	53	54

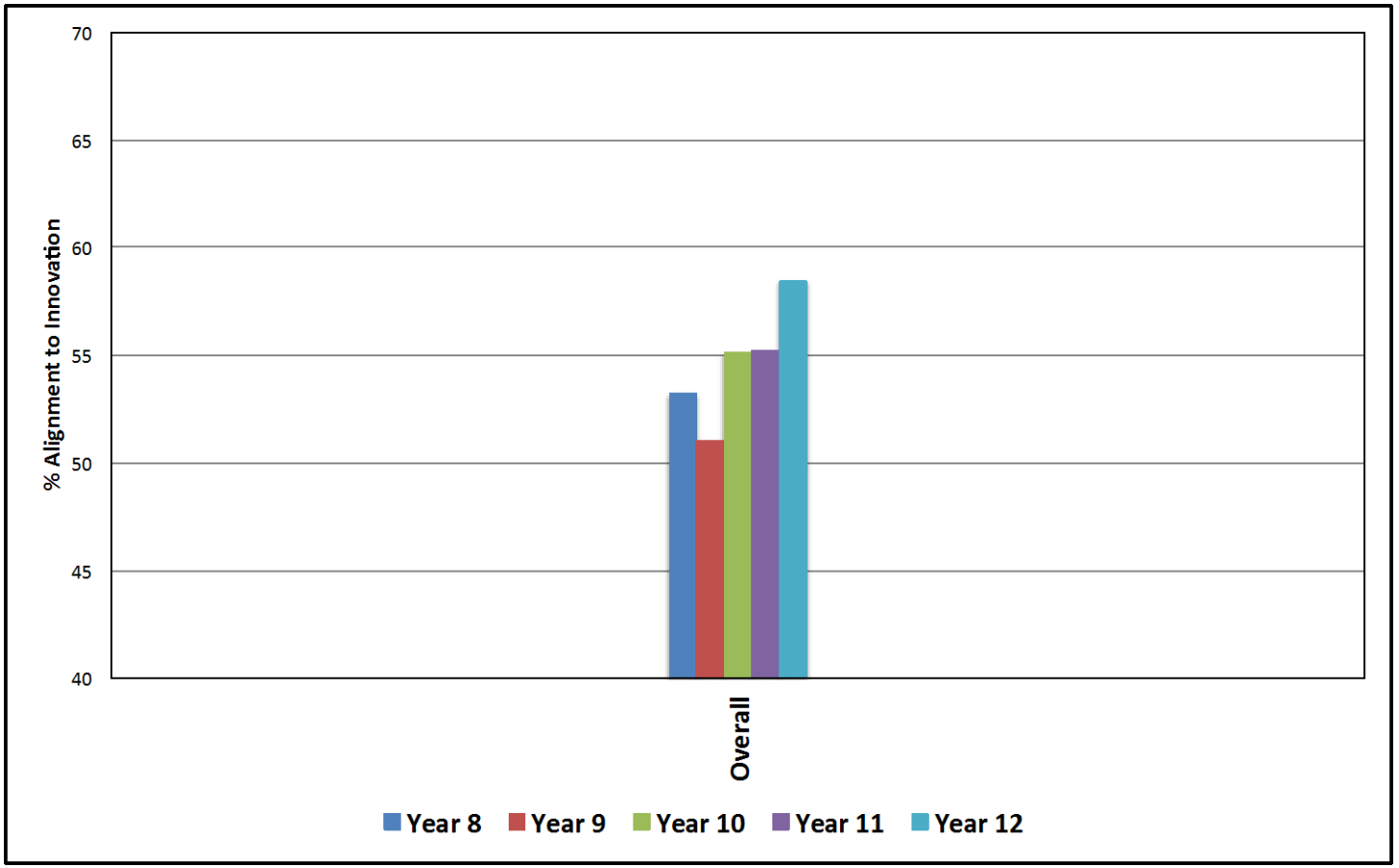


Overall Alignment

Note: Scores represent percentage alignment with ideal conditions for innovation.

Teachers – Alignment of the 4Ps

Students – Overall Score by Year



Students – 4Ps, Years 9 & 12

ngs

Process

Product

ngs

Process

Product

Conclusions

- **Teachers/Schools are interested in HOW?**
- **Need to dispel myths and give them a common language for understanding creativity.**
- **Then need to focus on helping teachers understand how to translate research into practical tools, approaches to improve creativity in schools.**

Questions?

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