Integrating and Assessing Essential Learning Skills

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Australian Council *for* Educational Research

What's the problem?
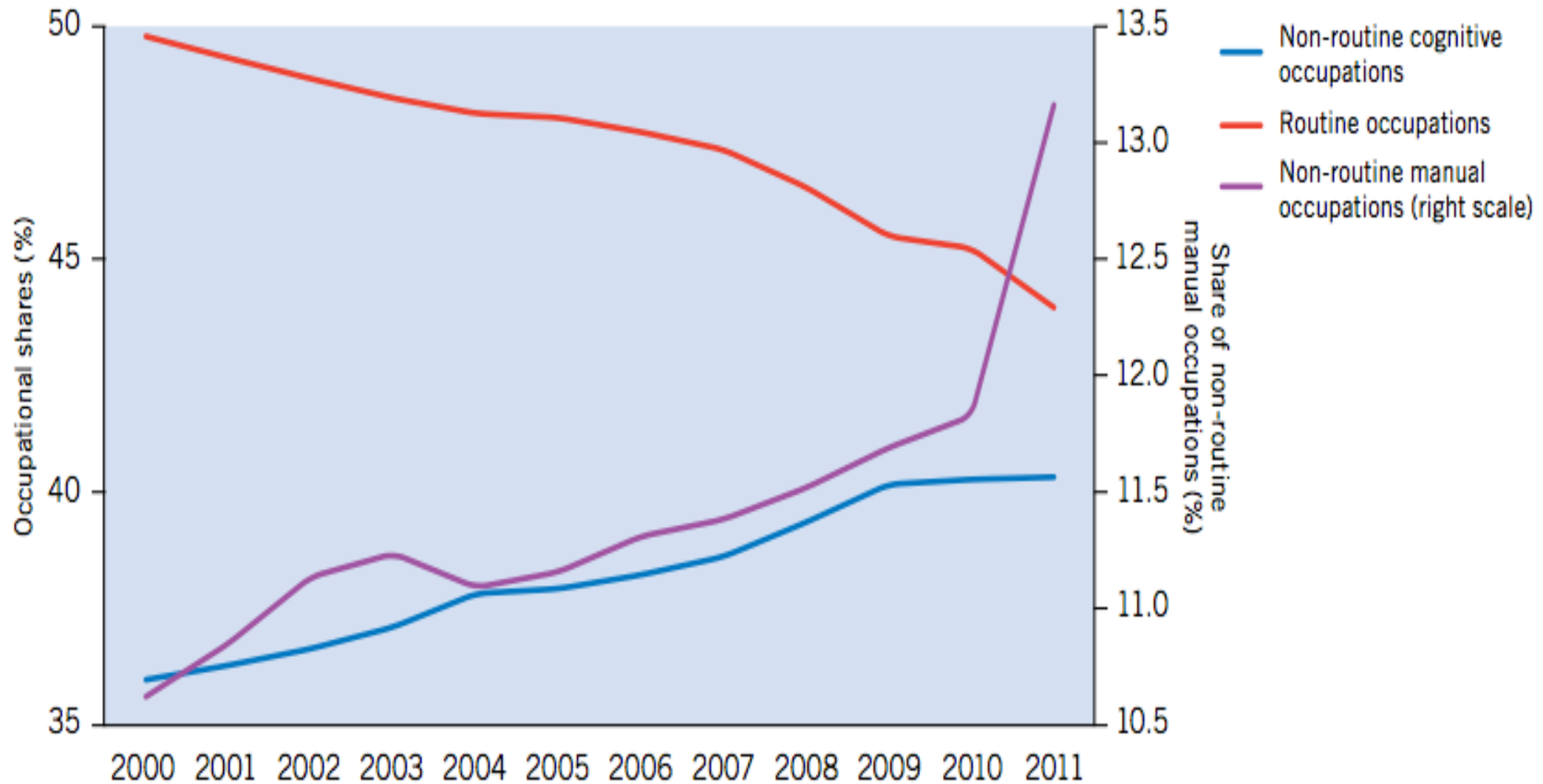
Global measures routine and non-routine task input 2000-2011, Global Employment Trends (2013)
Data derived from Key Indicators of the Labour Market, 7th ed., International Labour Organization
Jaimovich & Siu (2012); Autor, Levy & Murnane (2003)

empathy

creativity

flexibility

citizenship

initiative
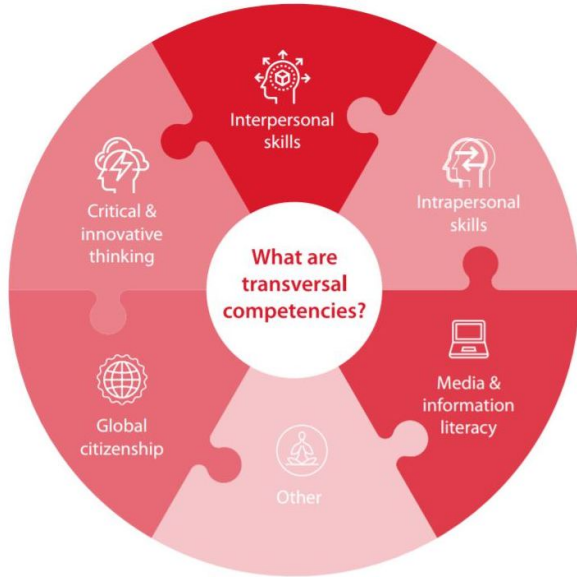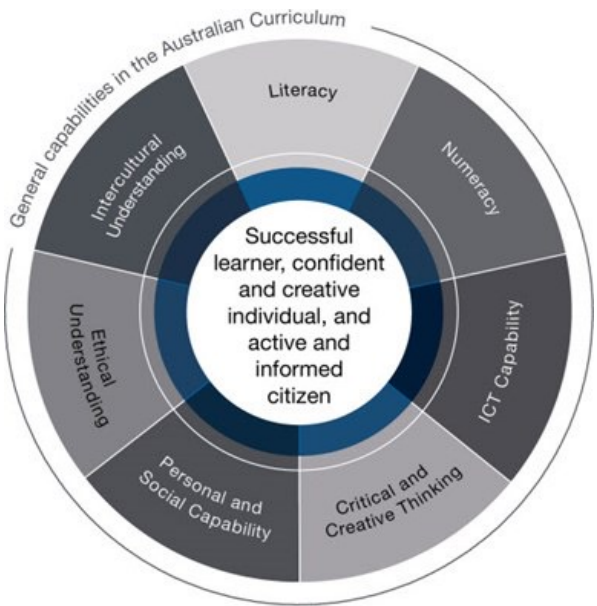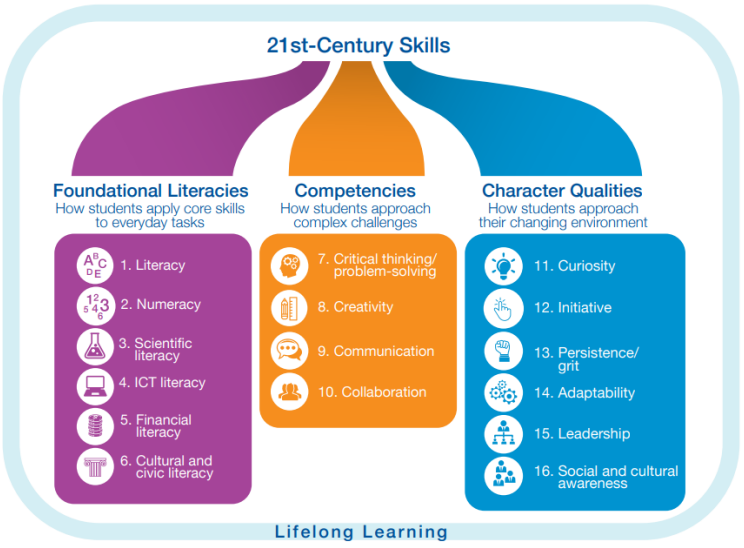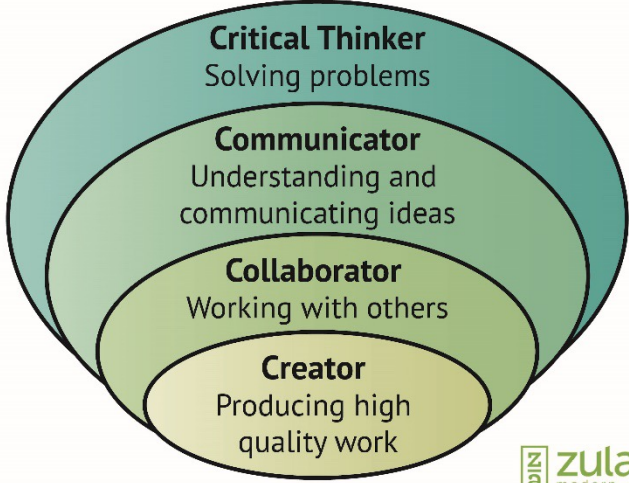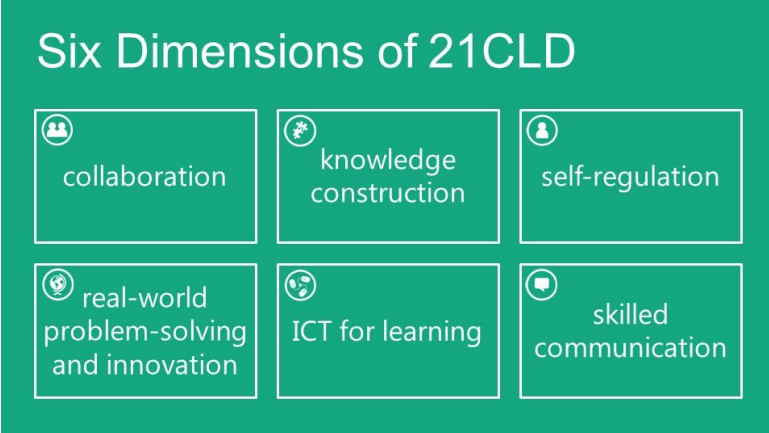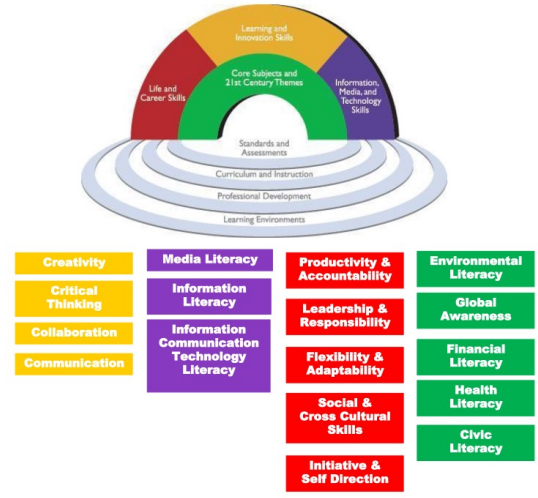
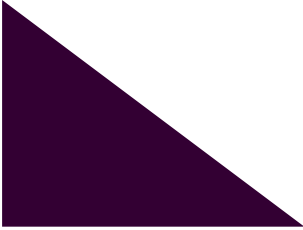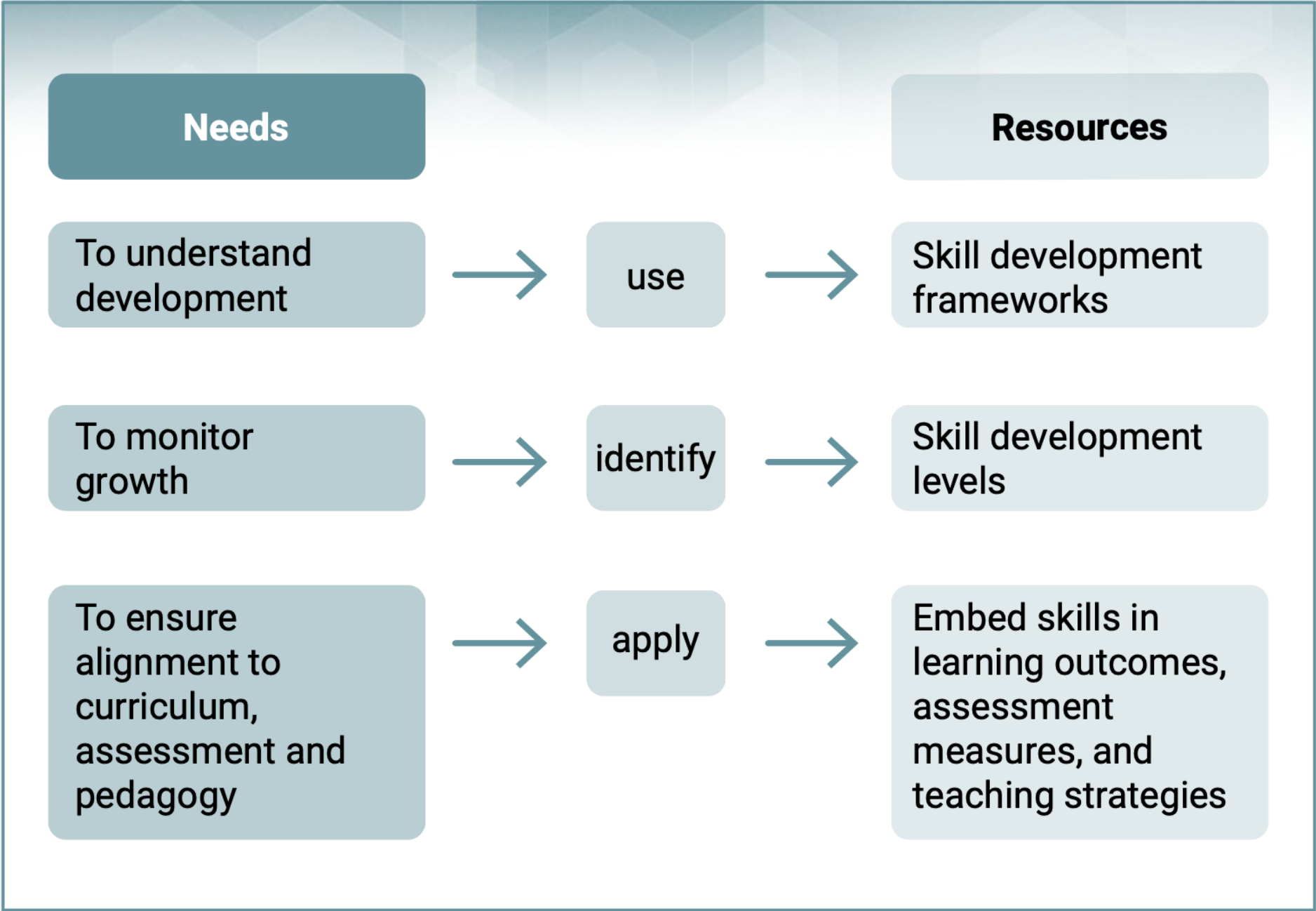emotionality

leadership

collaboration

health

information-literacy

What's in a name?

General capabilities in the Australian Curriculum

Successful learner, confident and creative individual, and active and informed citizen

- Literacy
- Numeracy
- ICT Capability
- Critical and Creative Thinking
- Personal and Social Capability
- Ethical Understanding
- Intercultural Understanding

What are transversal competencies?
- Interpersonal skills
- Intrapersonal skills
- Media & information literacy
- Other
- Global citizenship
- Critical & innovative thinking

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The Four Cs of 21st Century Skills

Critical Thinker
Solving problems

Communicator
Understanding and communicating ideas

Collaborator
Working with others

Creator
Producing high quality work

zulama modern learning

21st-Century Skills

Foundational Literacies
How students apply core skills to everyday tasks
1. Literacy
2. Numeracy
3. Scientific literacy
4. ICT literacy
5. Financial literacy
6. Cultural and civic literacy

Competencies
How students approach complex challenges
7. Critical thinking/problem-solving
8. Creativity
9. Communication
10. Collaboration

Character Qualities
How students approach their changing environment
11. Curiosity
12. Initiative
13. Persistence/grit
14. Adaptability
15. Leadership
16. Social and cultural awareness

Lifelong Learning

Learning and Innovation Skills
Core Subjects and 21st Century Themes
Life and Career Skills
Information, Media, and Technology Skills
Standards and Assessments
Curriculum and Instruction
Professional Development
Learning Environments

- Creativity
- Critical Thinking
- Collaboration
- Communication
- Media Literacy
- Information Literacy
- Information Communication Technology Literacy
- Productivity & Accountability
- Leadership & Responsibility
- Flexibility & Adaptability
- Social & Cross Cultural Skills
- Initiative & Self Direction
- Environmental Literacy
- Global Awareness
- Financial Literacy
- Health Literacy
- Civic Literacy

Six Dimensions of 21CLD

- collaboration
- knowledge construction
- self-regulation
- real-world problem-solving and innovation
- ICT for learning
- skilled communication

Needs				Resources
To understand development	→	use	→	Skill development frameworks
To monitor growth	→	identify	→	Skill development levels
To ensure alignment to curriculum, assessment and pedagogy	→	apply	→	Embed skills in learning outcomes, assessment measures, and teaching strategies

Our approach to capabilities

1. Emphasis on growth
   – Capabilities can be defined with a growth aspect
   – Capabilities can be improved through teaching/ intervention
   – Capabilities can be measured

2. Theory driven, Evidence based

3. Definition (consistency, criterion-referenced)

4. Definitions are:
   – Situated in an education context (assessment and teaching)
   – Goal orientated

5. Integrated in classroom (sustainability)

6. Contextualised in broad domains (relevance, general)

Holistic Development

- Critical Thinking
- Creative Thinking
- Collaboration/ Social
- Emotional Development
- Citizenship
- Self-regulation
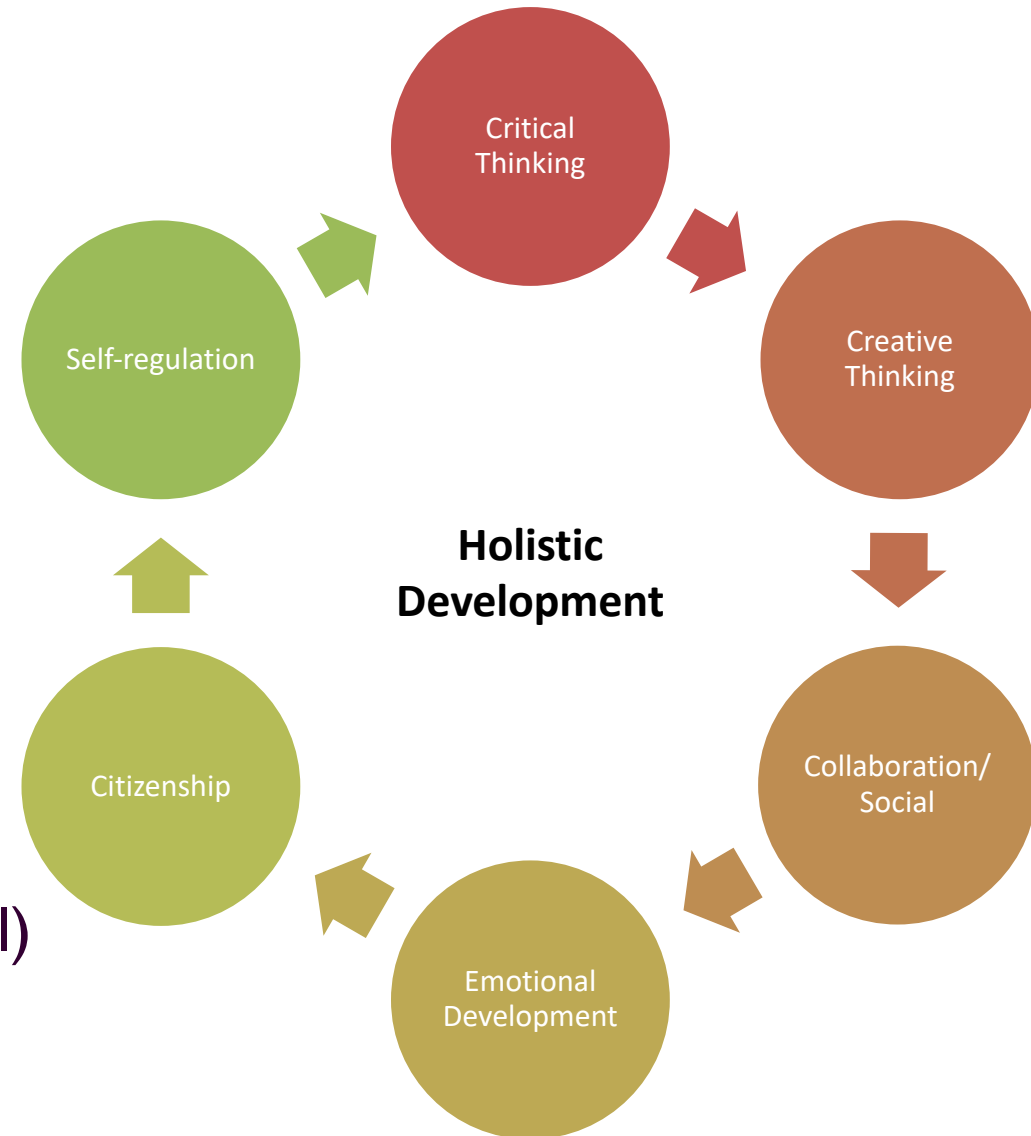
ACER's summary definition of critical thinking:

To think critically is to analyse and evaluate information, reasoning and situations, according to appropriate standards for the purpose of constructing sound and insightful new knowledge, understandings, hypotheses and beliefs. Critical thinking encompasses the subject's ability to process and synthesise information in such a way that it enables them to apply it judiciously to tasks for informed decision-making and effective problem-solving.
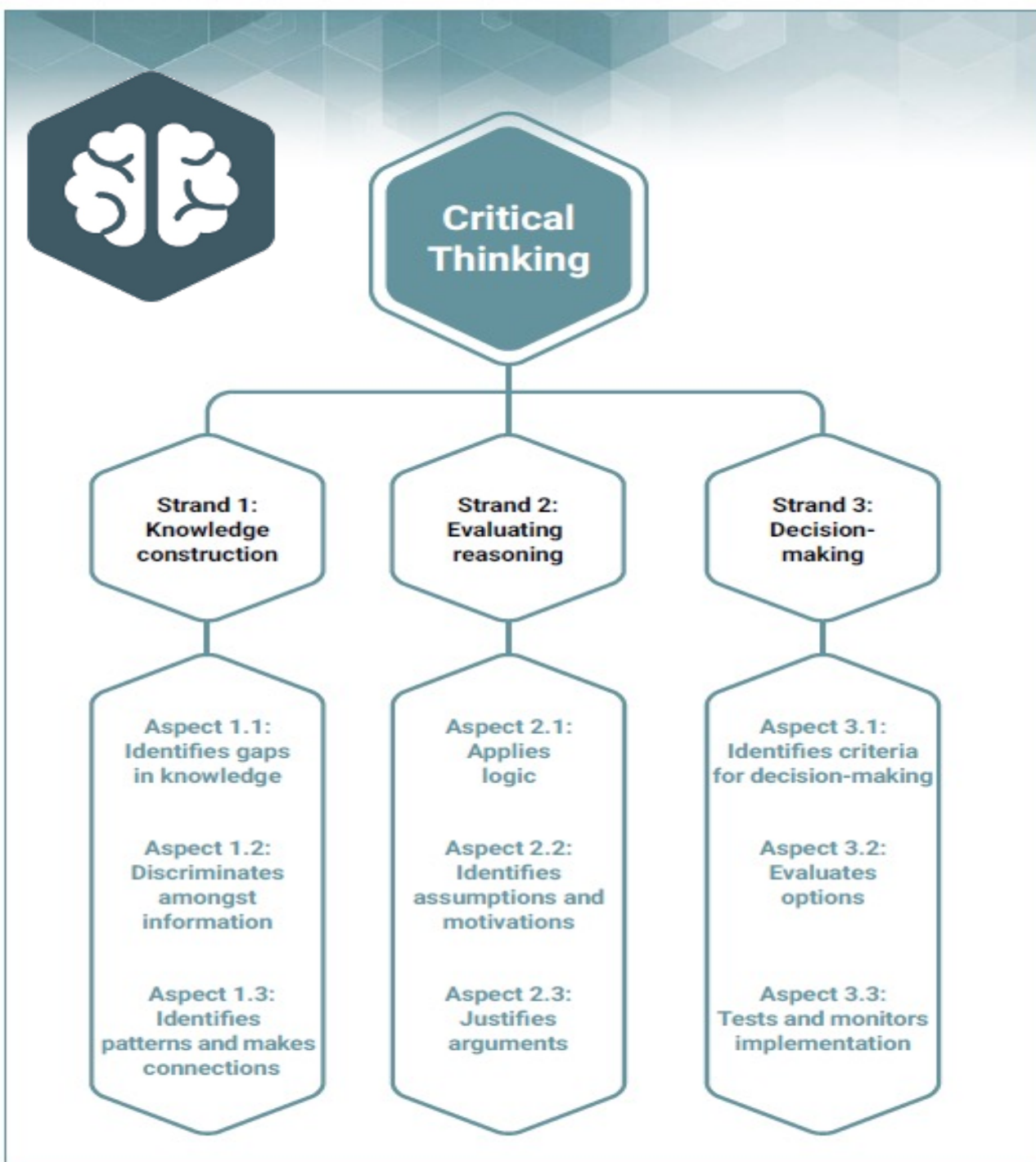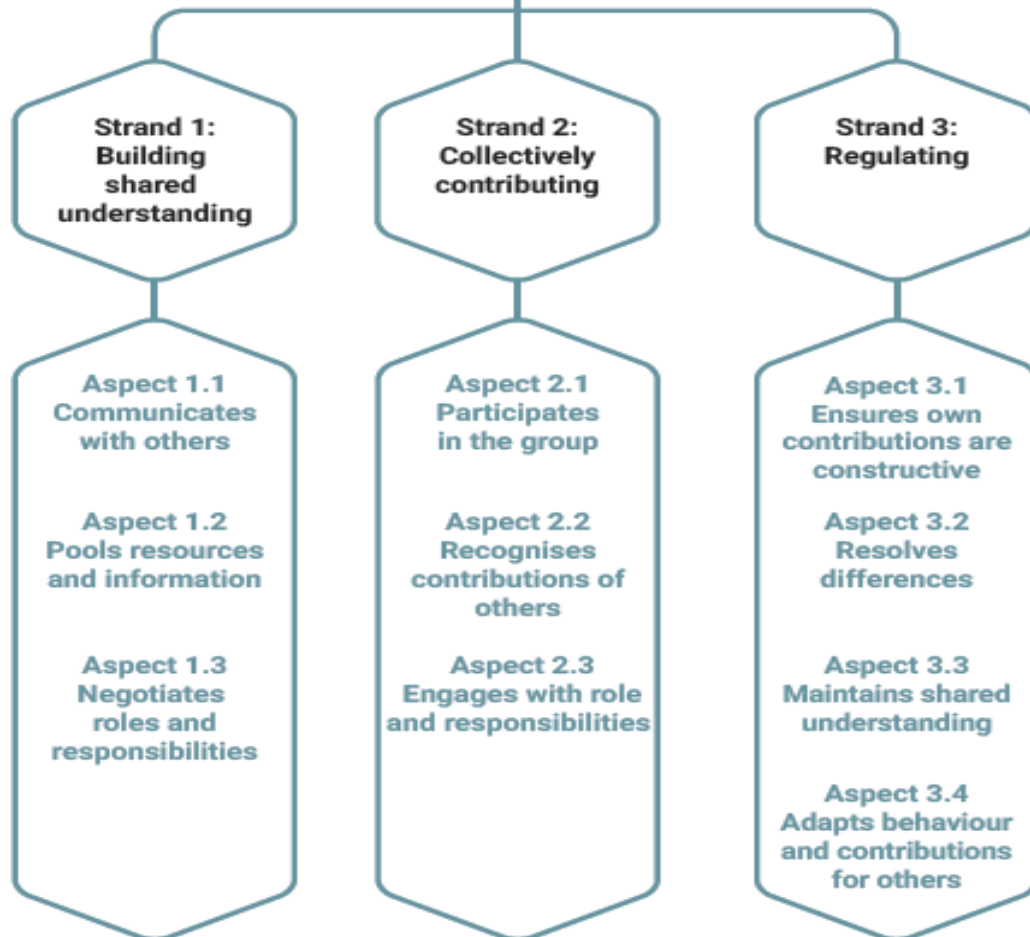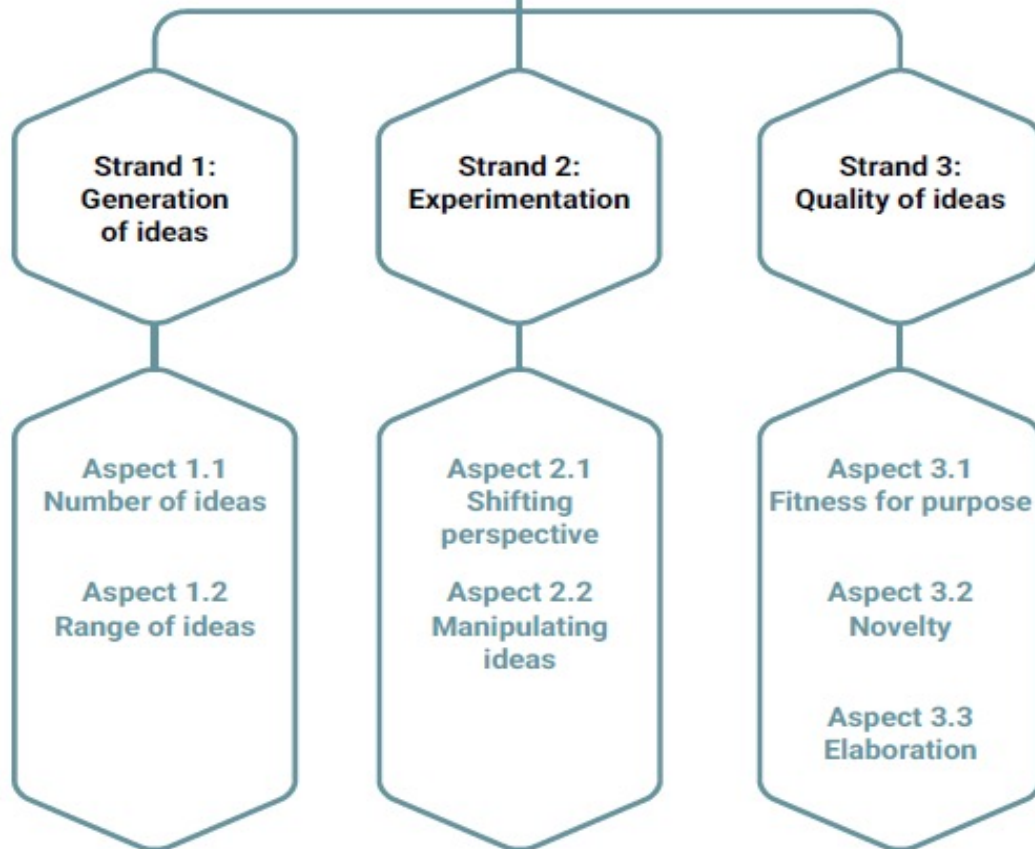
ACER's summary definition of collaboration:

Collaboration refers to the capacity of an individual to contribute effectively in a group. This involves perseverance, contributing to team knowledge, valuing contributions of others and resolving differences. Effective collaboration involves a division of labour with participants that are engaged in active discourse which results in a compilation of their efforts.

ACER's summary definition of creative thinking:

Creative thinking is the capacity to generate many different kinds of ideas, manipulate ideas in unusual ways and make unconventional connections in order to outline novel possibilities that have the potential to elegantly meet a given purpose.

Alignment across the system

ASPECT	CURRICULUM	ASSESSMENT	PEDAGOGY
	LEARNING OUTCOMES	CRITERIA	TEACHING STRATEGY
Aspect 2.1 Participates in the group	Personal and Social Capability Element: Social management Sub-element: Work collaboratively: Contribute to groups and teams, suggesting improvements in methods used for group investigations and projects	High: participate throughout the task, try alternative strategies Mid: participate in all activities in simple tasks, maintains a single strategy Low: take action in the task, don't reach the end	Provide each learner with a different set of resources, leading to a task that requires all learners' input into the group's shared task.
Aspect 3.2 Resolves differences	Personal and Social Capability Element: Social management Sub-element: Negotiate and resolve conflict: Identifies causes and effects of conflict, and practises different strategies to diffuse or resolve conflicts	High: resolve differences, justifying their understanding Mid: identify cause and effect of conflicts, make attempts to resolve differences Low: comment on differences, but are often unable to resolve them	Provide an authentic problem-based learning task that creates differing perspectives and solution ideas.

Popular reflections

"I only thought of two aspects, there is a lot more to it than I first thought"

"Division of labour will be really effective in ensuring everyone contributes"

"I always thought the most vocal students were the best collaborators, but now I see that listening and absorbing are just as important"

CONDUCTED WITH MINISTRY OFFICIALS AND TEACHERS IN 30+ COUNTRIES

"I only ever measure collaboration through how much a student participates. Now I have 11 extra indicators"

"Now I can see the difference between collaboration and cooperation"
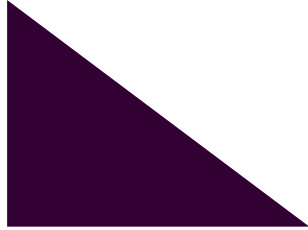
"It's not just about the final project, but all the little pieces they go through to get there"

ATLANTIC OCEAN

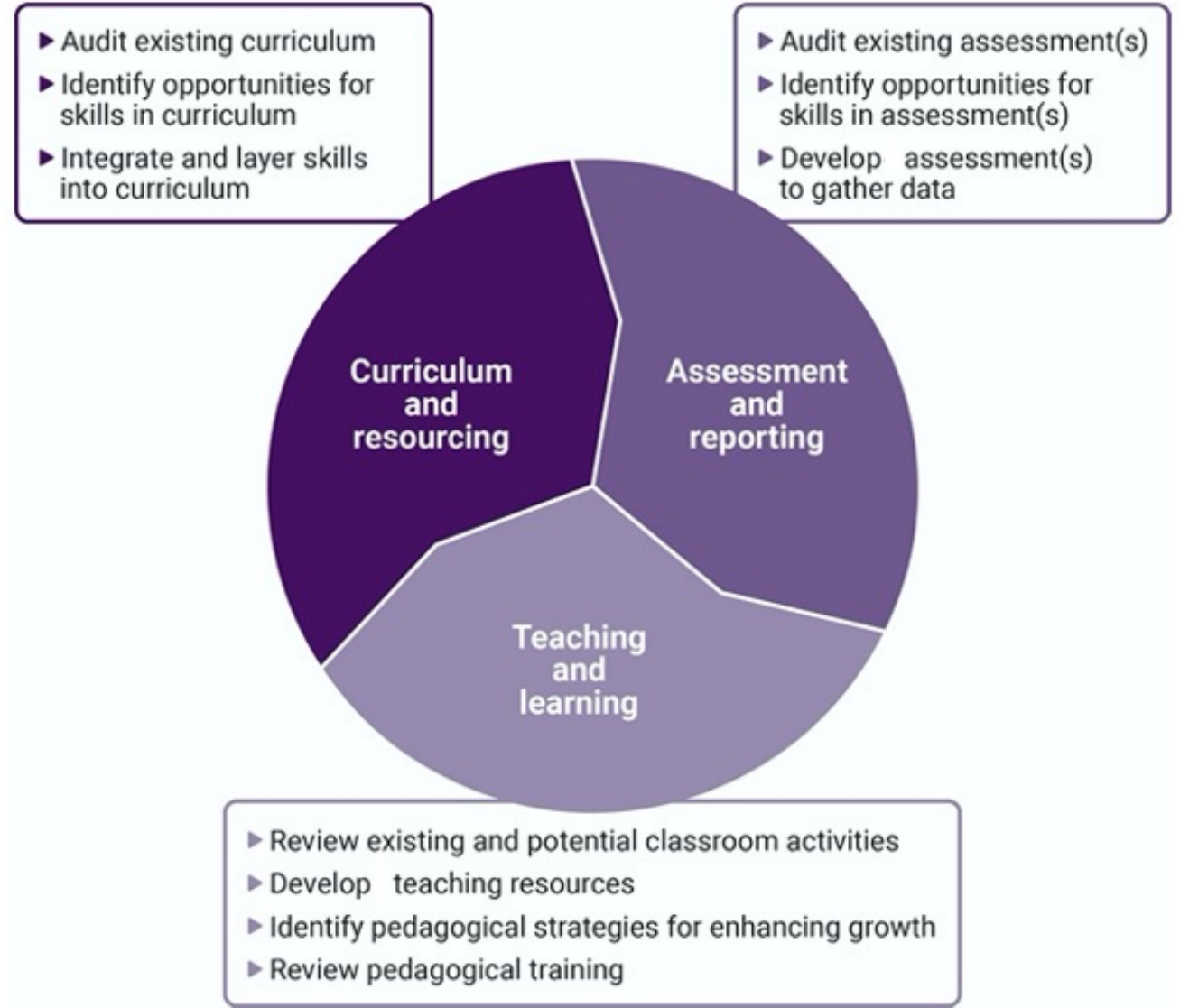PACIFIC OCEAN

PACIFIC OCEAN

INDIAN OCEAN

There are four main steps in developing a strategic plan for 21CS alignment:

Step 1. Establishing a Core Strategy Team

Step 2. Emphasizing mission and vision statements

Step 3. Adopting skill frameworks and definitions

Step 4. Prioritizing alignment components:
a. Curriculum **b.** Assessment **c.** Pedagogy

Establishing a Core Strategy Team ➤ Emphasising mission and vision statements ➤ Adopting skill development frameworks

- ▶ Audit existing curriculum
- ▶ Identify opportunities for skills in curriculum
- ▶ Integrate and layer skills into curriculum

- ▶ Audit existing assessment(s)
- ▶ Identify opportunities for skills in assessment(s)
- ▶ Develop assessment(s) to gather data

Curriculum and resourcing

Assessment and reporting

Teaching and learning

- ▶ Review existing and potential classroom activities
- ▶ Develop teaching resources
- ▶ Identify pedagogical strategies for enhancing growth
- ▶ Review pedagogical training

Identify opportunities for skills in curriculum

91-100%	
71-90%	
51-70%	Percentage of content descriptions tagged to each general capability
31-50%	
11-30%	
10% of less	

General capabilities	English	Mathematics	Science	Humanities & Social Sciences				The Arts					Health & physical education	Technologies	
				History	Geography	Civics & citizenship	Business & economics	Dance	Drama	Media arts	Music	Visual arts		Design & technologies	Digital technologies
Literacy	95	53	41	34	50	50	47	23	91	95	25	27	53	52	72
Numeracy	3	98	26	8	58	0	31	20	0	4	23	0	10	23	50
ICT capability	11	13	10	6	22	1	10	0	0	63	4	13	0	25	100
Creative & critical thinking	59	43	37	85	83	75	80	54	57	77	70	93	69	92	90
Personal & social skills	26	0	11	28	16	77	20	54	50	57	57	55	96	41	24
Ethical understanding	3	2	10	28	17	78	56	0	5	23	0	11	17	26	18
Intercultural understanding	7	0	1	49	20	31	3	32	36	39	32	46	11	4	0

Creative thinking example – domain general

Q. Look at the photo of the cloud. What can you see in the clouds that you think someone else would also be able to see?

Here is an example of clouds that look like a turtle.

Draw over the photo of the clouds to show your teacher what you can see.

Add as much detail as you need.

Question intent	Associate an image of clouds with a recognisable object.
Strand	2. Experimentation
Aspect	2.2 Manipulating ideas

Critical thinking example – domain general

a alamy stock photo TD3XYB www.alamy.com

Q. You and your friends are trying to put the bird pictures into categories.

Your friend Jonathan says "Bird 2 and Bird 4 should form their own category".

Why might Jonathan have said this? Refer to the pictures

to support your answer.

Question intent	Compares a set of pictures to identify similarities
Strand	1. Knowledge construction
Aspect	1.3 Identifies patterns and makes connections

A template for assessing capabilities
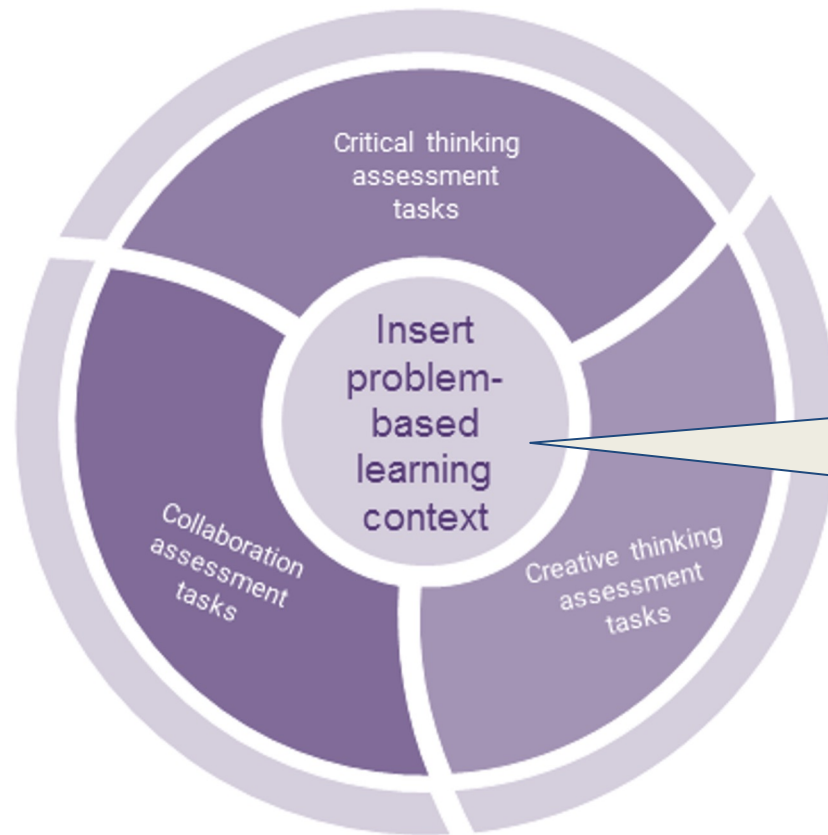
ACER developed a
- Humanities module (Refugee Resettlement)
- Design concept module (Sculpture design)

In PBL, students must
- think critically about information and ideas
- think creatively about the problem
- work collaboratively to find the best solution

Developing a problem context
refugee resettlement

- On 9 September 2015, the Australian Government announced that it would make an extra 12,000 humanitarian places available in response to the conflicts in Syria and Iraq.

- Resettlement can be challenging both for refugees and the local community.

- Community groups in Eltham provided cheap medium-term housing to support refugees.

- What else could be done by the local community to support refugees to smoothly re-settle into Eltham?

CARI PBL task flow of a module

Phase	Task		Central capability assessed
Problem presentation	Pre-learning/context and presentation of problem		n/a
Understanding the problem	Task 1	Analysing an FAQ	Critical thinking
	Task 2	Critical analysis of opinion pieces	Critical thinking
Initial idea generation	Task 3	Individual idea generation	Creative thinking
	Task 4a/b	Selection of own 'best' idea; evaluation of own and others' best ideas	Critical thinking
	Task 4c	Selection of group's best idea	Collaboration
	Task 5	Reflection	n/a
Further investigation	Task 6	Role agreement	Collaboration
	Task 7	Reflection	n/a
	Task 8a	Individual research of the topic; potential adjustments to the group's best idea	Critical thinking
Improvements and group decision	Task 8b	Sharing improvements and making a final group decision	Collaboration
	Task 9	Individual record of the group's agreed idea	Critical thinking Collaboration
Communication of solution	Task 10	Explanation of the group's agreed best idea	Creative thinking Critical thinking Collaboration

Task 02: Critical analysis of opinion pieces

Opinion by Victoria

"I am concerned that the refugees are coming from parts of the world where they have experienced war. We all know that being exposed to war can be very damaging psychologically. Do we really want to risk bringing people with this experience into our community?"

What is Victoria's main concern regarding the community?

Your answer

Aspect	0	1	2
Identifying assumptions and motivations (2.2)	Student response either repeats a stated aspect of the idea, or is irrelevant.	Broadly identifies the 'gist' or essential aspect of an unstated concern in an idea, but with limited accuracy.	Correctly and accurately identifies an unstated concern in an idea.

Code 0: Refers to the reputation of the community or responses that are vague, irrelevant or repeat the stem.
Example responses
Bringing emotionally damaged people into our community is going to give us a bad reputation. [*reputation*]
They could have a negative impact. [*vague*]
The refugees might think they will get hurt. [*irrelevant*]

Code 1: Refers to the refugees literally causing/starting/bringing a war
Example responses
• She is worried that they might bring a war with them.
• Maybe she thinks they will start a war.

Code 2: Refers to the safety of the community or a plausible danger from the refugees.
Example responses
That the refugees could be dangerous to the community.
She is scared that they might harm others.
The refugees will be violent.
The refugees could be dangerous.

Example: Student A (p. 12)

	Ideas
1	Starting amount of money to give for people to start. E.g. like about $80
2	To be able to have 1 set of each of each clothing for Summer or Winter.
3	Starting a Free Fruit store, Free apples, oranges, bananas. Everyday you could go down to the fruit store to get 1 or 2 fruits for free
4	Allowing free passes to go to primary school, highschool, University? Especially in primary school.
6	Enter response here
7	Enter response here
8	Enter response here

4 ideas
(Number of ideas)

Lack of detail about how the ideas solve the issue
(Elaboration)

Most ideas are naïve, likely to have limited impact as a solution to the problem
(Fitness for purpose)

Most ideas are not strikingly original within the test population
(Novelty)

Limited consideration of perspectives beyond the refugees themselves (shifting perspective)

All ideas focus on the provision of free essentials (money, food, clothing, education)
(Range of ideas)

Example: Student B (p.12)

	Ideas
1	To have a welcome party to welcome them into the community, and each person donates some money to help them start off
2	For each refugee/refugee family to live with someone short term until they can afford a long term residential
3	To help take take their children to school, if it's to hard for them
4	To welcome them into the community, to not discriminate them, and to include them in events.
5	If there are any free housing units, to let them stay there without rent for short term/medium term
6	To not discriminate the children at school, on the street or anywhere, and to stand up for them if you see them getting bullied.
7	For the community to come together, so that they can explain what they've been through to create a bit of awareness to what's happening through the world
8	If they need medical attention, to try to help them or care for them if you can

Most ideas consider the needs of the refugees but the active role of the community is also apparent (Perspective-taking)

At least one idea shows some striking originality (Novelty)

At least one idea demonstrates some explanation or reasoning (Elaboration)

7-8 distinct and coherent ideas (Number of ideas)

Most ideas clearly meet the purpose (Fitness for purpose)

A more diverse range of solutions; limited 'variation on a theme' (Range of ideas)

Task 06: Role agreement

Goal: Negotiate what role you will adopt to determine what information (resources) you will have access to

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CARI - Capabilities Assessment

Role: Entrepreneur

Core Skills & Qualities:

- Generating and presenting ideas
- Understanding and defining processes
- Willingness to take risks
- Persuasive

Technical Skills

- Working with data and spreadsheets
- Creating presentations
- Presenting to an audience

Role Description:

I'm always on the lookout for new ideas and ways to make the world a better place, I do my research along less traditional lines. Blog posts, news feeds, interviews, trending social media topics and anything that allows me to keep up with what's new and interesting in the world.

I like to talk about new ideas with others to get feedback to help me solve problems.

Resources:

- Yesterday a refugee, today an entrepreneur
- Case study: English language school
- Report: Personal income of migrants

CARI - Capabilities Assessment

Role: Social Worker

Core Skills & Qualities:

- Working with people
- Empathetic
- Understanding of Individual Rights

Technical Skills

- Presenting information clearly
- Listening to others

Role Description:

I work with people at the grass roots level. Spending time talking to people, listening to what they have to say. My job is to make people aware of their rights and also to connect them to services that can help support their lives.

When looking for solutions to problems, I like to hear about what has worked for others and see what I can learn from it.

Resources:

- Right to Work
- Refugees helping refugees
- Raising awareness

CARI - Capabilities Assessment

Role: Town Planner

Core Skills & Qualities:

- Visionary
- Organised
- Risk averse (conservative)
- Analytical

Technical Skills

- Graphic design
- Presentation design

Role Description:

I work to make modern life as streamlined and effective as possible. Most of my day is spent deciding which proposals for making cities better are accepted and rejected.

I work with people from all over the community, especially the council and businesses.

Resources:

- Fact Sheet: Eltham
- Fact Sheet: Syria
- Shepparton case study
- Fitzpatrick slams refugees on literacy
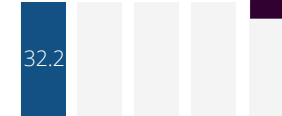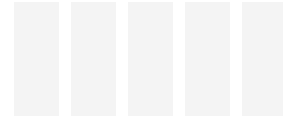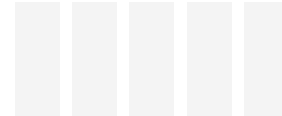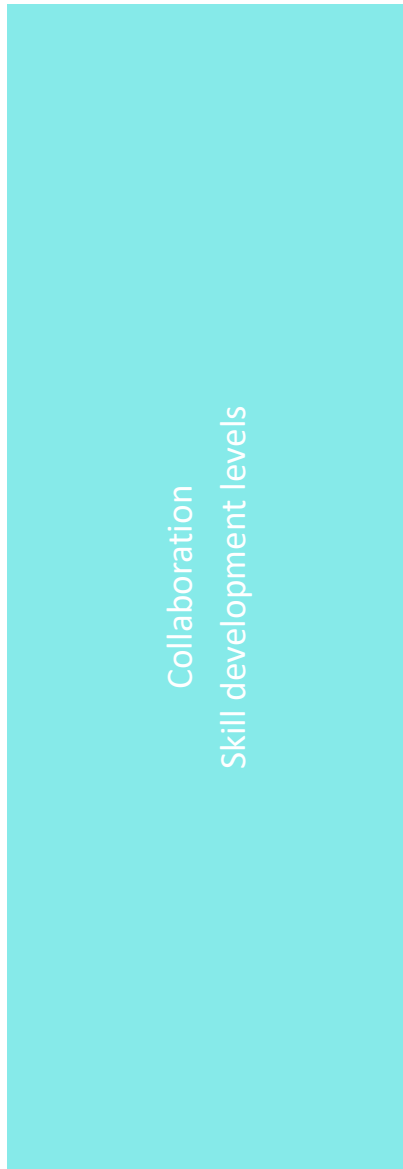
		Building shared understanding	Collectively contributing	Regulating
Collaboration Skill development levels	E		Learners try alternative strategies to reach the end goal even during difficult situations or problems. (Aspect 2.1)	Identify/map where students are at See what they need to do next Monitor growth
	D	Learners facilitate and maintain relevant and effective communication within the group throughout the task. (Aspect 1.1)	Learners participate throughout the task, and see it through to the end goal or solution. They make multiple attempts at group tasks. (Aspect 2.1	
	C	Learners ask for justification of responses or perspective provided. (Aspect 1.1)	Learners acknowledge that others may have a different perspective, and that based on these perspectives', others' contributions may be beneficial (Aspect 2.2)	
	B	Learners negotiate roles but without considering the expertise, information, or skills held by other group members. (Aspect 1.3)	Learners understand that others may ... alternative perspective. They listen to and acknowledge the perspective of others. (Aspect 2.2)	
	A	Learners share their resources or information with others when asked. (Aspect 1.2)	Learners take action in the task but may not reach the end of the whole task. (Aspect 2.1)	
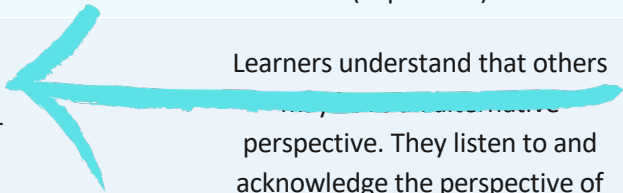
Peer Evaluation

In this task my partner...
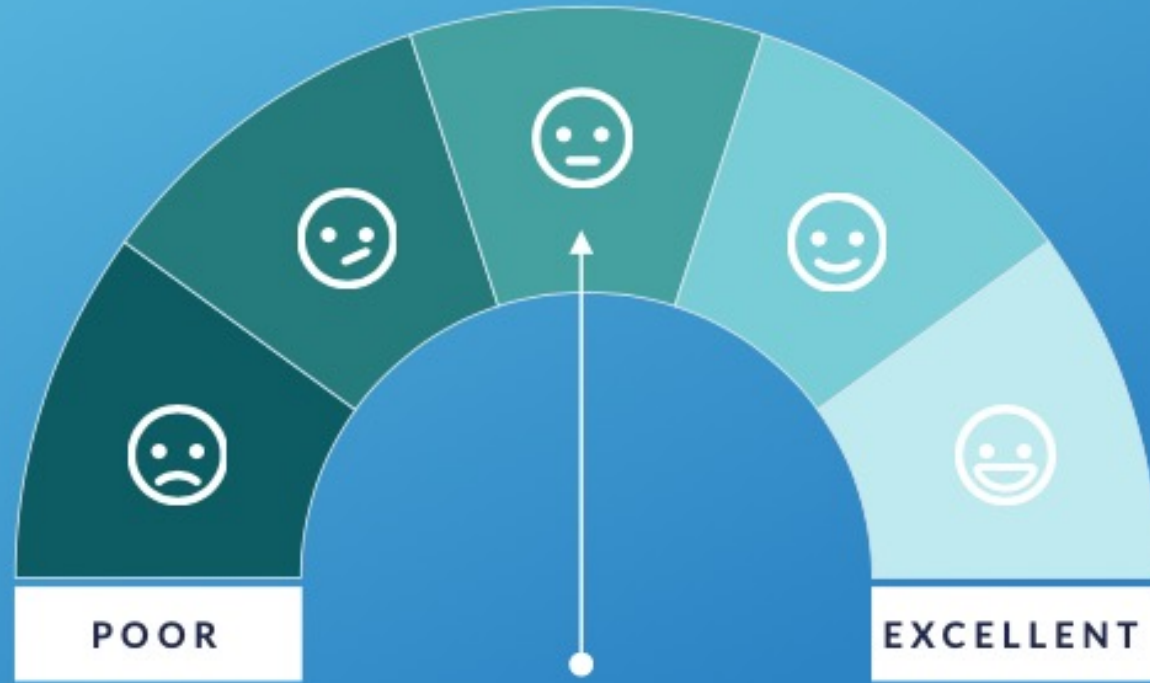
POOR	AVERAGE	GOOD	GREAT	EXCELLENT
My partner didn't communicate with me	My partner responded to my requests and questions	My partner asks questions and asked me to clarify information	My partner asked for justification or provided their perspective	My partner facilitated effective communication throughout the task

Critical thinking

- Applying logic was the most difficult aspect of critical thinking
- Identifying propositions consistent with another appeared a crucial first developmental step towards learning how to identify a logical conclusion of a proposition

Collaboration

- Communicating in collaborative groups was a common behaviour and appeared easy to do
- Regulating own contributions was generally difficult
- Resolving differences when deciding roles was significantly more difficult than resolving differences when deciding on the best ideas, suggesting the most difficult aspect of collaboration in the assessment is the employment of diplomatic strategies when members of the group are personally invested in some outcome contrary to your own

Creative thinking

- Coming up with multiple ideas was generally easy
- Generating original or novel ideas was more difficult

Generating better understanding of the skills

The project presents a valid and reliable assessment approach for measuring critical thinking, creative thinking and collaborative skills.

Problem-based learning modules are one effective way to measure multiple skills in different grades and learning areas.

The conceptualisation of the skills and their respective levels in the *skill development frameworks* were validated and informed by the assessment data

The assessment data indicates three separate constructs were visible and these constructs have relationships with one another. Of the three skills, critical thinking and creative thinking have the larger overlap conceptually

Assessments were well targeted to the selected grades (5 and 8). Only a few items were too easy or difficult for the students tested. It was possible for younger students to engage with more sophisticated problem-based scenarios if they were given the appropriate scaffolding, and the scenarios were framed appropriately

The embedment of the aspects in the *skill development frameworks* can be achieved at different grade levels, as evidenced by the majority of items across all three skills showing no difference in the way students of the same ability performed depending on their grade level
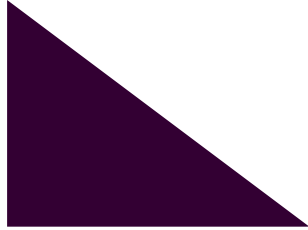
Data indicates three separate constructs were visible, some relationship between them

How do the skills develop from Grade 5 to Grade 8? What does the rate of growth look like for these skills?

How, if at all, do the skills transfer across different learning areas?

Assessments were well targeted for grades 5 & 8, younger students could engage with sufficient scaffolding

What is the dependency between the skills? How can this help us understand how to teach them?

Embedding of frameworks can be achieved across grade and learning areas, majority of items showed no difference in performance of students of the same ability depending on age

QUESTIONS?

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