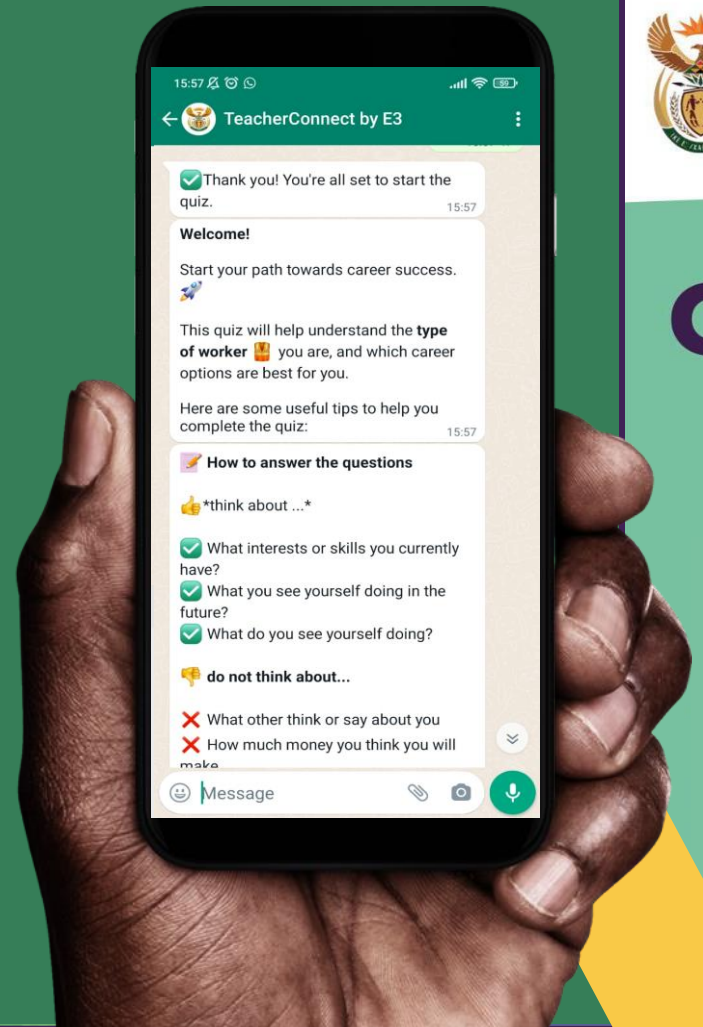

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Infusing 21st-Century Skills into the GEC

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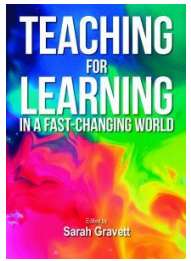
Agenda - curious questions

1. What are the key 21st-century skills our students need to thrive in today's changing world?
2. Why do we need 21st century skills?
3. What can we learn from international education systems efforts to infuse 21st Century Skills?
4. What does this mean for the GEC? How do we infuse 21st-Century Skills into the GEC?

Why curious questions?

Curiosity is the driver of attention and engagement. Getting and keeping learners curious is one of the key factors of successful education.
S. Gravett 2022
Science of learning: Attention and engagement



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Meeting Overall Objective 2: to explore the integration of 21st Century skills in the teaching, learning, and assessment related to the GEC.

What are the 21st-Century Skills we need to thrive in changing world ?

21st Century Skills

21st-Century Skills refer to key abilities that learners need to grow in order to succeed and thrive in today's fast-paced world.

Known by many names such as transferable skills, soft skills, competencies, essential skills, life skills, future skills, higher-order thinking skills…

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Ask the audience

What do you think are important 21st-Century Skills?

Science of learning: Assessing prior knowledge

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Examples of 21st-Century Skills

Adaptability

Conflict resolution

Self-efficacy

Self-Efficacy

Communication

Empathy

Intrinsic motivation

Systems thinking

Accountable

Collaboration

Resilience

Emotional Intelligence

Self-directed

Computational thinking

Information literacy

Critical thinking

Problem solving

Adaptability

Growth Mindset

Compassion

Creativity

Agency/Autonomy

Curiosity

Metacognition

Digital literacy

Innovation

Leadership

Solution seeking

Decision making

Logical reasoning

Environmental awareness

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Summary 21st-century leaders and learners

21st-century learners, teachers, and leaders are people who employ skills such as critical thinking, collaboration, creativity **to be**
problem-finders and solution-seekers
who are **self-directed** as they look for opportunities
to **solve problems** and create **value for everyone!**

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Why do we need 21st Century Skills?

Ask the audience

Why do we need 21st-Century Skills?

Science of learning: opportunities for deep thinking

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We live in a changing world…

Population: 4 billion
1980's

Population: 7 billion
2010's

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… where change is rapid

A recent controlled study found that ChatGPT can help professionals increase their efficiency in routine tasks by ~35%. If we keep in mind that the productivity gains brought by the steam engine in the nineteenth century was ~25%, this is *huge*.

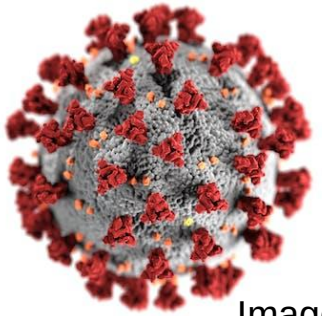
Quote from Dr. Philippa Hardman
Learning Research Digest

Moore’s law: computing power doubling every 18 months.

… and the future is uncertain

Our future is

- **V**olatile
- **U**ncertain
- **C**omplex
- **A**mbiguous



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Images were taken from Pexels

Can perpetuate inequality

…If we do not embrace these changes and prepare our young people with the skills they need for a rapidly changing world.

These skills are INTERCONNECTED. These 21st Century Skills also help the development of academic skills.

What can we learn from international education systems' efforts to infuse 21st Century Skills?

What can we learn from the learning sciences?

What is the science of learning?

A multidisciplinary field combining cognitive science, educational psychology, neuroscience, and pedagogy. Its goal is to enhance our understanding of learning processes to improve educational methods and outcomes. (This is NOT new)

What does it tell us about 21st-Century Skills?

Collaboration
Communication
Critical thinking
Creativity
Cognition/Metacognition/ Confidence

AND
Content (CAPS)

Are key to learners' success

What do the researchers say?

We've identified [through the learning sciences] the 6C's that will help all young people to become thinkers… contributing members of their communities as they forge a fulfilling life.

(Hirsch-Pasek Golingkoff, 2016, p5.)

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International frameworks

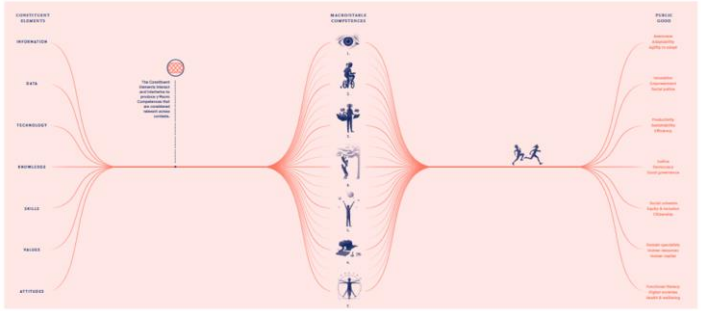
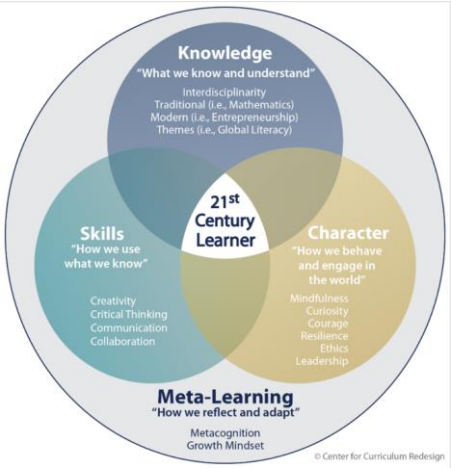
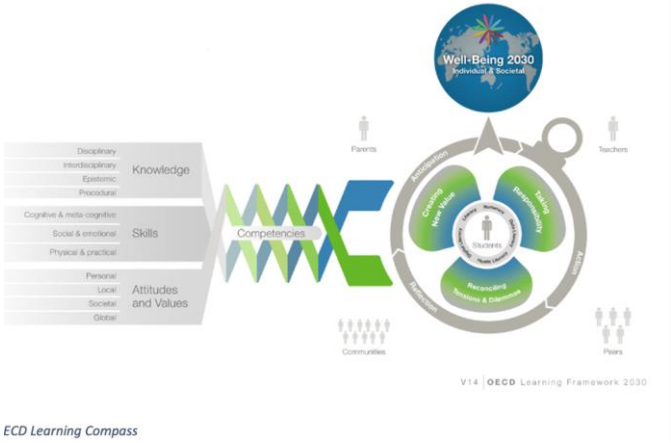


Figure 1: UNESCO IBE Framework of Future Competences

Figure 4: International Baccalaureate Learner Profile





ECD Learning Compass

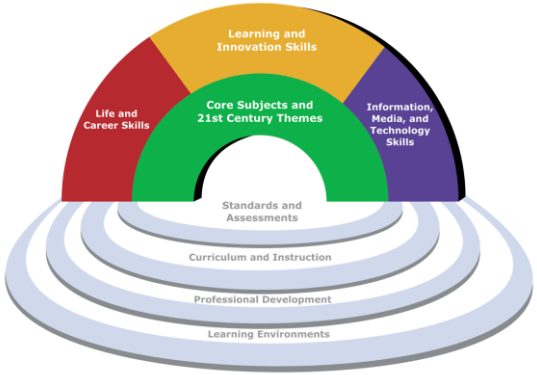


Figure 1 - P21 Framework for 21st Century Learning

International frameworks

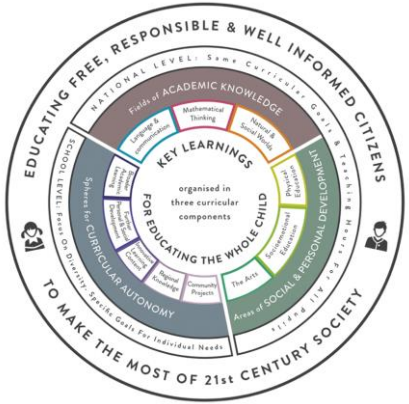
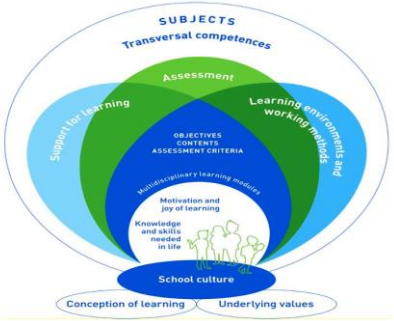


Figure 6: Mexico

Figure 10: British Columbia

Figure 8. Schematic view of Finnish Curriculum Framework



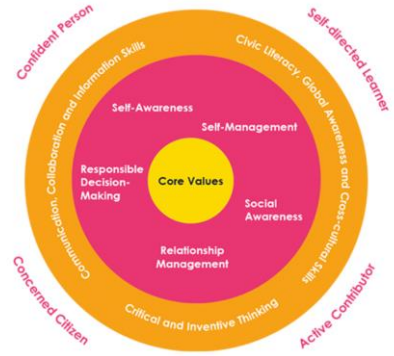


Figure 11: Singapore

Figure 9: Australia

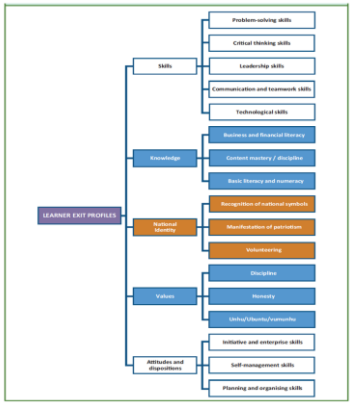


Figure 8: Zimbabwe

Learning from others

This collection of case studies has been developed to synthesise key insights and learnings across a sample of exemplary countries to inform ongoing education improvement in South Africa.

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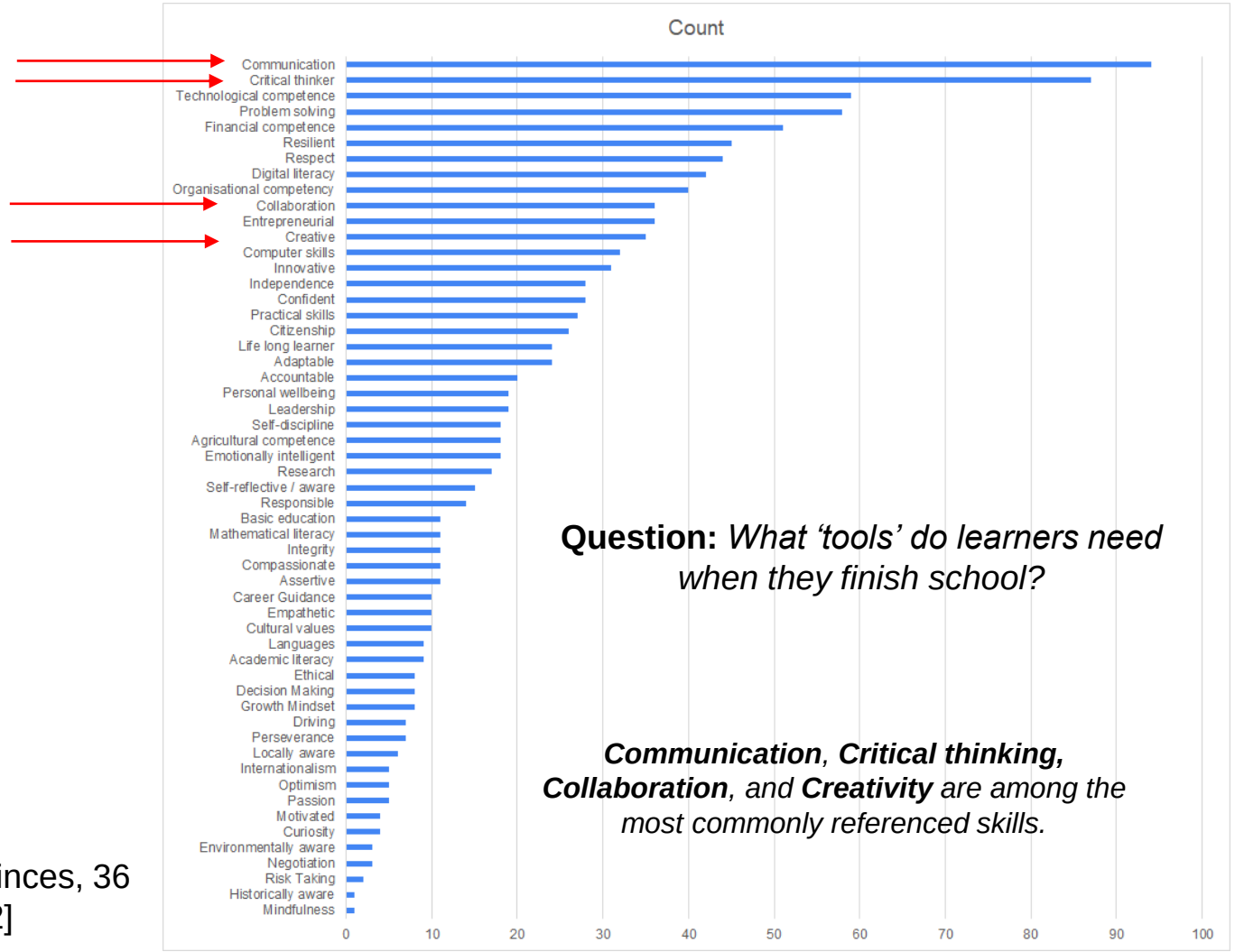
Learning from others

- Different frameworks have different purposes for different settings.
- Each framework adds to the conversation.
- No single framework can be used to solve every problem and meet every need.
- The is no ONE way to infuse competencies, different countries have done different things.
- Teaching and developing 21st-Century Skills requires alignment between assessment, curriculum and teacher development.
- The measurement of 21st -Century Skills is still in its infancy and does not lend itself to summative methods of assessment. (Care et al 2018)
- It is NOT a quick fix, it is a developmental process with a number of steps, taking place over time.

South African stakeholder engagement led by Curriculum Strengthening



Question: *What 'tools' do learners need when they finish school?*

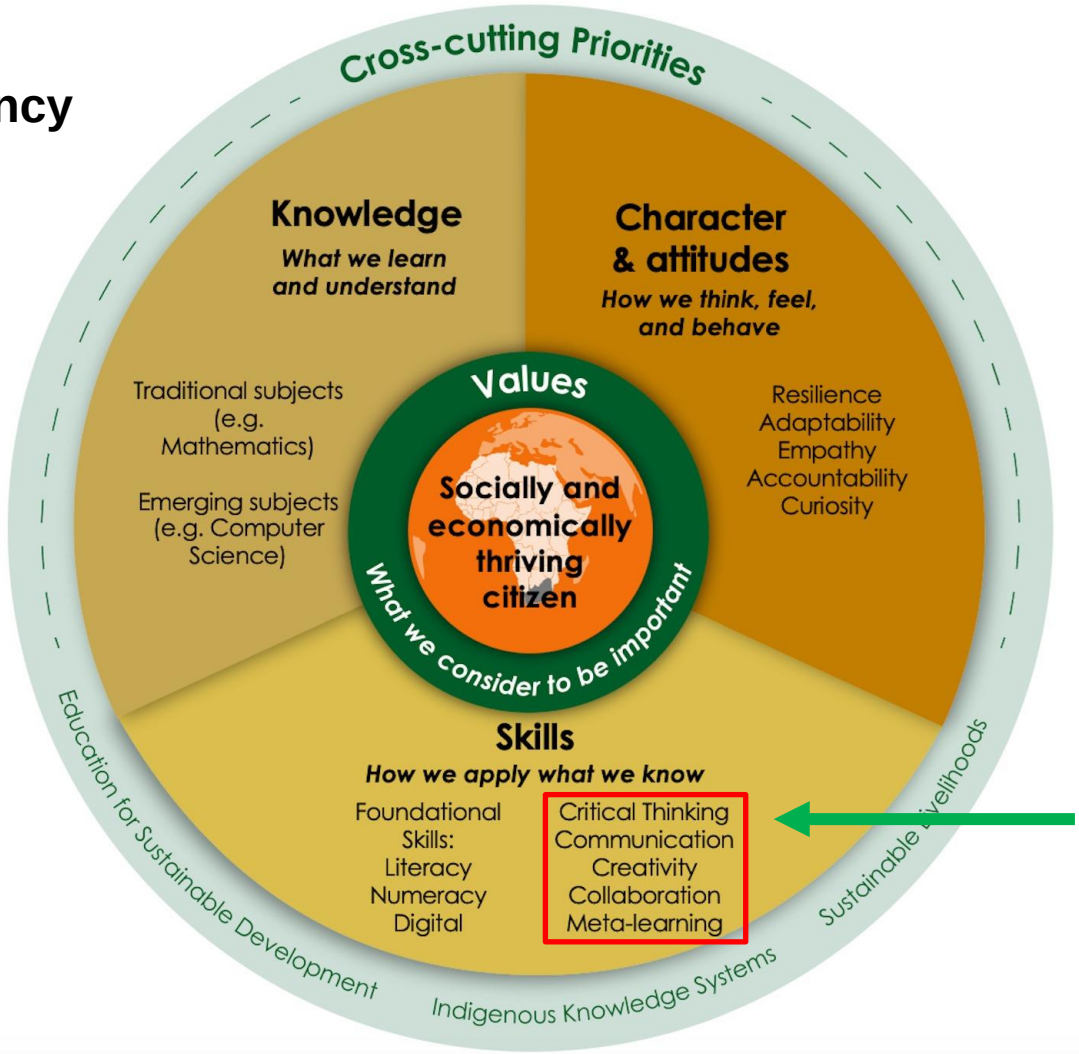
***Communication**, **Critical thinking**, **Collaboration**, and **Creativity** are among the most commonly referenced skills.*

Consulted with

- Adults(***314***)
- Learners(***117***)
- Virtual participants (***60***)

Workshops – across 9 provinces, 36 workshops [Sep to Nov 2022]

A possible South African Competency Framework



The five C's are very prominent in this framework!

What does this mean for the GEC? How do we infuse 21st-Century Skills into the GEC?

Process

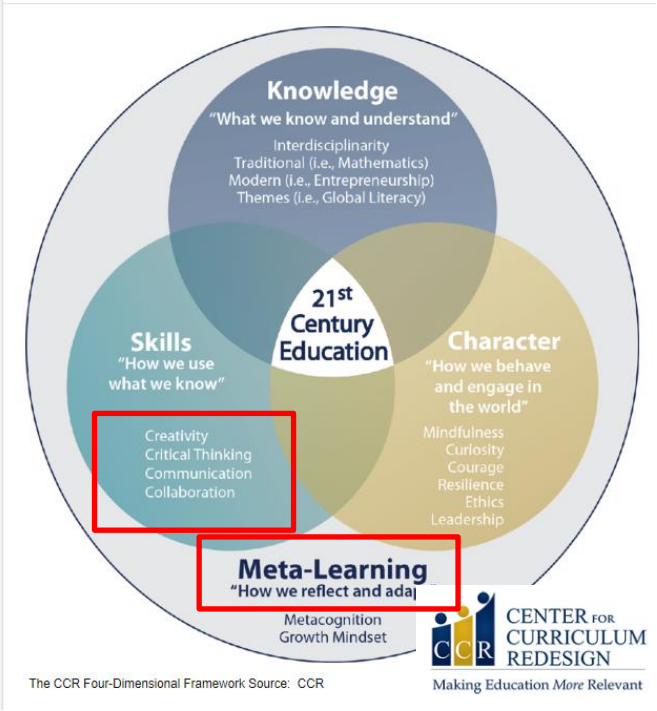
Framework comparison	Analyzed two international frameworks, the CCR Rubric, and the ACER framework, to check for overlap and differences. Chosen for their deep research, coherence, and relevance
Skills mapping	Linked key elements from these frameworks to the learning process of integrated projects (13 steps). What types of activities support the practice of 21st–Century Skills, because these skills are cultivated through pedagogies that support deep learning
Sub-skill selection	Selected a limited set of sub-skills from ACER and CCR to create a manageable framework, that are practically observable.
Rubric testing	Tested and updated the rubric based on findings.
Skill infusion	Purposefully embedded 21st-Century Skills into Integrated Projects (2023).

Updates from 2022

Challenges	Mitigation
Limited training and additional support resources	½ day training Teachers guide to 21st-Century Skills 21st-Century Skills toolkit
Too many criteria	Reducing measurement criteria from 25 - 15.
Lack of integration of 21st-Century Skills into the projects	Integrated 21st-Century Skills into projects
Vague reporting process	Refining the data collection process for 21st-Century Skills.

Testing and learning, from global to local

- Critical thinking
- Collaboration
- Creative thinking



The CCR Four-Dimensional Framework Source: CCR

Drawing on a couple of well-researched evidenced based and relevant frameworks

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ACER Framework example Critical Thinking

	Strand	Aspect
CRITICAL THINKING ***Critical thinkers ask questions, find the right information, and apply it to solve a problem***	Strand 1 Knowledge construction	Aspect 1.1 Identifies gaps in knoweldge
		Aspect 1.2 Discriminates amongst information
		Aspect 1.3 Identifies patterns and makes connections
	Strand 2 Evaluating reasoning	Aspect 2.1 Applies logic
		Aspect 2.2 Identifies assumoptions and motivations
		Aspect 2.3 Justifies arguments
	Strand 3 Decision-making	Aspect 3.1 Identifies criteria for decision-making
		Aspect 3.2 Evaluates options
		Aspect 3.3 Tests and monitors implementation

CCR Framework Example Critical Thinking

2	CRITICAL THINKING	
no.	**Sub-competency** ongoing parts that make up the competencies	**Elements** describe the behaviours indicative of each proficiency level
2.1.	**Analysing** **Identifying, clarifying, and organizing information**	Hierarchy of information
		Questions
		Research
		Ambiguity
		Visual
2.2.	**Considering alternatives** **Considering opposing points of view**	Assessing the source of opinions
		Seeking out Alternatives
		Judging opinions
2.3.	**Reasoning**	Identifying and Evaluating Reasoning
		Connecting Information and Arguments
2.4.	**Critically reflecting** **Reflecting critically**	Justifying Decisions and Behavior
		Reflecting on actions
		Learning from experiences

2022

	Scoring Rubric 21st Century Skills (5Cs)					
1. Critical thinking: *(Critical thinkers ask questions, find the right information, and apply it to solve a problem)*	SS (Project 1)			Math (Project 2)		Total
	1.1 Able to define a problem (How did apartheid laws influence business and career opportunities?)	Y	N	1.1 Able to define a problem (How do we calculate resistance in a current?)	Y	N
	1.2 Able to investigate information/do research	Y	N	1.2 Able to investigate information/research formulas	Y	N
	1.3 Knows how to select information	Y	N	1.3 Knows how to select Information/choose formula	Y	N
	1.4 Able to apply information	Y	N	1.4 Able to apply the information/formula to find a solution	Y	N
	1.5 Can present information	Y	N	1.5 Monitors information/checks with teacher if correct/adapts if necessary	Y	N
		/5			/5	/10

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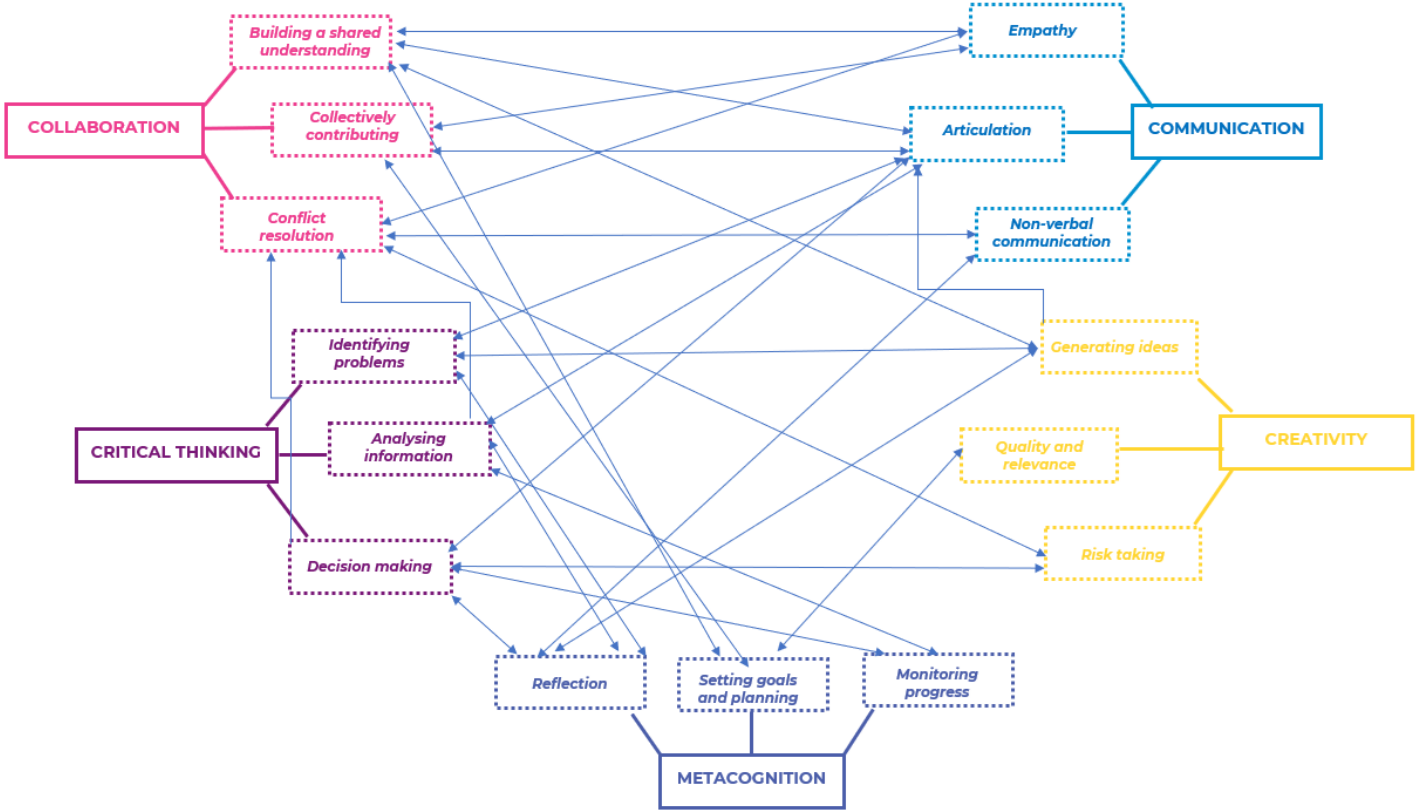
2023

21st-century skill	Descriptor
Critical thinking ***Critical thinkers ask questions, find the right information, and apply it to solve a problem***	*1.1 Asking questions: The learner asks appropriate questions to find out more information.*
	1.2 Evaluating ideas: The learner identifies which information was helpful to solve the problem.
	1.3 Identifying patterns: The learner uses tools (e.g., mind maps and diagrams) to help organise his/her information.

A journey to the ultimate goal

Finding the **simplicity** behind the complexity, while maintaining **integrity**, **quality** and **impact** [of the resources and tools].

Interconnected



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Mapping of 21st-Century Skills into the Integrated Projects

21st Century skills overlapping in projects

	1.1 **Asking questions**: The learner asks appropriate questions to find out more information?	1.2 **Evaluating ideas**: The learner identifies which information was helpful to solve the problem.	1.3 **Identifying patterns**: The learner uses tools (e.g. mind maps and diagrams) to help organise his/her information.	2.1 **Non-verbal communication**: The learner recognises nonverbal cues such as tone of voice and expression.	2.2 **Articulation**: The learner uses the correct language for the situation.	2.3 **Empathising**: The learner tries to understand how others were feeling.	3.1 **Number of ideas**: The learner comes up with many ideas.	3.2 **Range of ideas**: The learner thinks of a range of different ideas.	3.3 **Feasibility of ideas**: These ideas were realistically possible to implement as solutions to the problem.	4.1 **Negotiating roles and responsibilities**: The learner negotiates and decides on the role he/she would play in the group.	4.2 **Pooling resources**: The learner shares his/her own knowledge and experiences with the group to help strengthen the project.	4.3 **Engaging with roles and responsibilities**: The learner completes and submit the required tasks for the group.	5.1 **Setting goals and planning**: The learner set goals and makes plans during the project.	5.2 **Monitoring progress against plans**: The learner monitors their progress against their plans	5.3 **Reflecting on planned work**: The learner reflects on their project and or their prior knowledge.
Step	**Critical thinking**			**Communication**			**Creativity**			**Collaboration**			**Metacognition**		
Step 1: Prior Knowledge															MST Project
															LO Project
Step 2: New knoweldge	MST Project	MST Project													
	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project						
Step 3: Order	MST Project	MST Project	MST Project												
	LO Project	LO Project	LO Project												
Step 4: Apply knowledge to a context	MST Project	MST Project	MST Project												
	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project
Step 5: Define - ask questions to define your problem					MST Project										
				LO Project	LO Project	LO Project				LO Project	LO Project	LO Project			
Step 6: Explore - the research phase										MST Project	MST Project	MST Project	MST Project	MST Project	
	LO Project	LO Project	LO Project							LO Project	LO Project	LO Project	LO Project	LO Project	
Step 7: Brainstorm solutions		MST Project											MST Project	MST Project	
	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	
Step 8: Present for feedback					MST Project										MST Project
				LO Project	LO Project	LO Project				LO Project	LO Project	LO Project	LO Project	LO Project	LO Project
Step 9: Evaluation														MST Project	MST Project
	LO Project	LO Project	LO Project										LO Project	LO Project	LO Project
Step 10: Creating a prototype										MST Project		MST Project			
	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project			
Step 11: Feedback	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	
	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	
Step 12: Integration in the MADD space									MST Project	MST Project		MST Project			MST Project
							LO Project	LO Project	LO Project	LO Project		LO Project			LO Project
Step 13: Present in public presentation					MST Project							MST Project			MST Project
				LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project			LO Project

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GEC 21st-Century Skills Rubric

21st Century Skills	Descriptor
Critical thinking Critical thinkers ask questions, find the right information, and apply it to solve a problem	1.1 Asking questions: The learner asks appropriate questions to find out more information?
	1.2 Evaluating ideas: The learner identifies which information was helpful to solve the problem.
	1.3 Identifying patterns: The learner uses tools (e.g. mind maps and diagrams) to help organise his/her information.
Communication Communication is the process of sharing information, attitudes and values. Both "what we say" (verbal communication) and "how we say it" (non-verbal communication) are important)a problem	2.1 Non-verbal communicationL The learner recognises nonverbal cues such as tone of voice and expression.
	2.2 Articulation: The learner uses the correct language for the situation.
	2.3 Empathising: The learner tries to understand how others were feeling.
Creativity Creative thinking is defined as the ability to come up with many different ideas and apply them to find realistic solutions to problems. There are two important aspects to creative thinking: Originality and usefulness	3.1 Number of ideas: The learner comes up with many ideas.
	3.2 Range of ideas: The learner thinks of a range of different ideas.
	3.3 Feasibility of ideas: These ideas were realistically possible to implement as solutions to the problem.
Collaboration Collaboration is when two or more people work together to solve a problem. Interdependence is achieved when group members share responsibility and pool their information and resources to develop a shared understanding of the problem and their solution to it.	4.1 Negotiating roles and responsibilities: The learner negotiates and decide on the role he/she would play in the group.
	4.2 Pooling resources: The learner shares his/her own knowledge and experiences with the group to help strengthen the project.
	4.3 Engaging with roles and responsibilities: The learner completes and submit the required tasks for the group.
Metacognition Meta-learning is about being aware of how we think, what we know and how we know it. Metacognition helps us to reflect on our thinking, set goals, and monitor and evaluate our learning.	5.1 Setting goals and planning: The learner set goals and make a plan during the project.
	5.2 Monitoring progress against plans: The learner monitors their progress against their plans
	5.3 Reflecting on planned work: The learner reflects on their project and or their prior knowledge.

GEC 21st-Century Skills Rubric

CRITICAL THINKING	COMMUNICATION	CREATIVITY	COLLABORATION	METACOGNITION
Critical thinkers ask questions, find the right information, and apply it to solve a problem	Communication is the process of sharing information, attitudes and values. Both “what we say” (verbal communication) and “how we say it” (non-verbal communication) are important	Creative thinking is defined as the ability to come up with many different ideas and apply them to find realistic solutions to problems. There are two important aspects to creative thinking: Originality and usefulness	Collaboration is when two or more people work together to solve a problem. Interdependence is achieved when group members share responsibility and pool their information and resources to develop a shared understanding of the problem and their solution to it.	Meta-learning is about being aware of how we think, what we know and how we know it. Metacognition helps us to reflect on our thinking, set goals, and monitor and evaluate our learning.

GEC 21st-Century Skills Rubric

CRITICAL THINKING	COMMUNICATION	CREATIVITY	COLLABORATION	METACOGNITION
1.1 Asking Questions 1.2 Evaluating ideas 1.3 Identifying patterns	2.1 Non-verbal communication 2.2 Articulation (how we say things) 2.3 Empathising	3.1 Number of ideas 3.2 Range of ideas 3.3 Feasibility of ideas	4.1 Negotiating roles and responsibilities 4.2 Pooling resources 4.3 Engaging with roles and responsibilities	5.1 Setting goals and planning 5.2 Monitoring progress against plans 5.3 Reflecting on work

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Making the intangible, tangible!

A journey towards complexity

Identifying competencies

Testing systems not assessing the impact of the curriculum on developing competencies

Developmental process

Growth in Development of competencies and complexity of the measurement tools.

Tools and resources to support scaffolding

Starting from the **know**, moving to the **unknown**
Scaffolding and building capacity of both teachers and learners in the process

TIME

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Research to inform practice

Looking at questions such as:

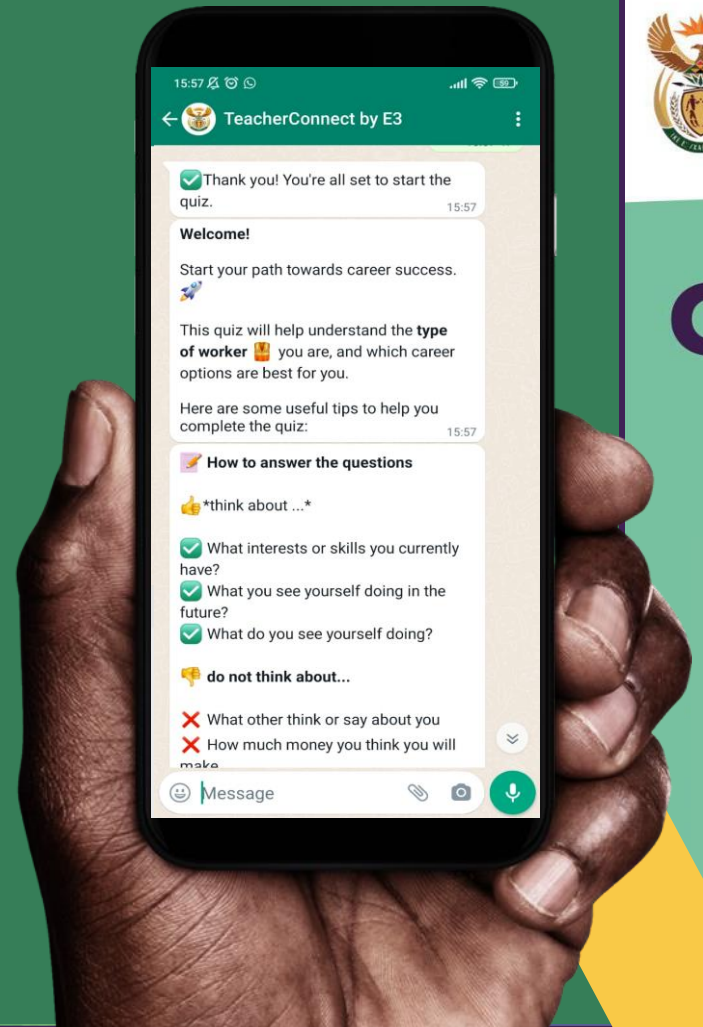
- How effective do teachers find the rubric in observing 21st century skills among learners?
- What challenges do teachers encounter when implementing the rubric in their classrooms?
- How easily can teachers incorporate this rubric into their existing teaching practices?
- How do teachers interpret the rubric? Is it too granular, or too simplistic?
- Do current teaching practices give teachers enough opportunities to see learners practice their 21st-Century skills?
- What teacher training is needed?
- What changes to the curriculum need to take place to support this, if any?

Informing the Curriculum Strengthening process of developing a South African Competency Framework

What next?

A journey towards the development of

- Ensuring clear definitions and descriptions of 21st-Century Skills
- Clear developmental trajectories for 21st-Century Skills
- Focus on formative assessment methods
- Implementation of a teaching-for-learning approach that support the development of 21st Century Skills
- Prioritising learner reflection



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My curious questions

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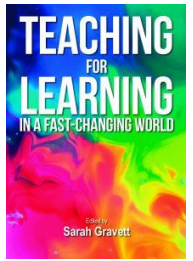

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Meeting Overall Objective 2: to explore the integration of 21st Century skills in the teaching, learning, and assessment related to the GEC.

What are the 21st-Century Skills we need to thrive in changing world ?

21st Century Skills

21st-Century Skills refer to key abilities that learners need to grow in order to succeed and thrive in today's fast-paced world.

Known by many names such as transferable skills, soft skills, competencies, essential skills, life skills, future skills, higher-order thinking skills...

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Ask the audience

What do you think are important 21st-Century Skills?

Science of learning: Assessing prior knowledge

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Examples of 21st-Century Skills

Adaptability

Conflict resolution

Self-efficacy

Self-Efficacy

Communication

Empathy

Intrinsic motivation

Systems thinking

Accountable

Collaboration

Resilience

Emotional Intelligence

Self-directed

Computational thinking

Information literacy

Critical thinking

Problem solving

Adaptability

Growth Mindset

Compassion

Creativity

Metacognition

Agency/Autonomy

Curiosity

Digital literacy

Innovation

Leadership

Solution seeking

Decision making

Logical reasoning

Environmental awareness

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Summary 21st-century leaders and learners

21st-century learners, teachers, and leaders are **problem-finders and solution-seekers** who are **self-directed** as they look for opportunities to **solve problems** and create **value for everyone!**

Why do we need 21st-Century Skills

Ask the audience

Why do we need 21st-Century Skills?

Science of learning: opportunities for deep thinking

We live in a changing world…

Population: 4 billion
1980's

Population: 7 billion
2010's

… where change is rapid

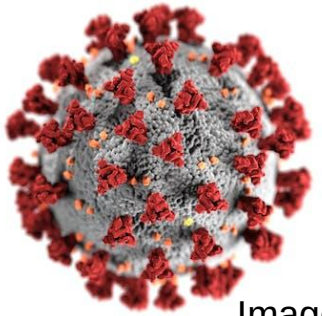
A recent controlled study found that ChatGPT can help professionals increase their efficiency in routine tasks by ~35%. If we keep in mind that the productivity gains brought by the steam engine in the nineteenth century was ~25%, this is *huge*.

Quote from Dr. Philippa Hardman
Learning Research Digest

… and the future is uncertain

Our future is

- **V**olatile
- **U**ncertain
- **C**omplex
- **A**mbiguous



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Images were taken from Pexels

Can perpetuate inequality

...If we do not embrace these changes and prepare our young people with the skills they need for a rapidly changing world.

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What can we learn from international education systems' efforts to infuse 21st Century Skills?

What can we learn from the learning sciences?

What is the science of learning?

A multidisciplinary field combining cognitive science, educational psychology, neuroscience, and pedagogy. Its goal is to enhance our understanding of learning processes to improve educational methods and outcomes.

What does it tell us about 21st-Century Skills?

Collaboration
Communication
Critical thinking
Creativity
Cognition/Metacognition/ Confidence

AND
Content (CAPS)

Are key to learners' success

What do the researchers say?

We've identified [through the learning sciences] the 6C's that will help all young people to become thinkers... contributing members of their communities as they forge a fulfilling life.

(Hirsch-Pasek Golingkoff, 2016, p5.)

International frameworks

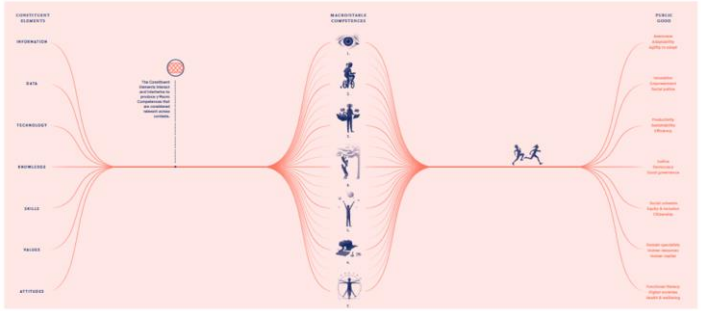
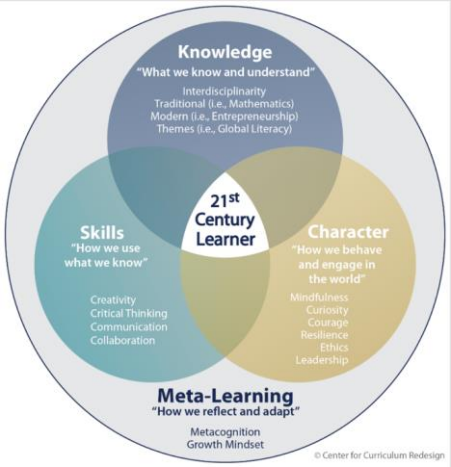
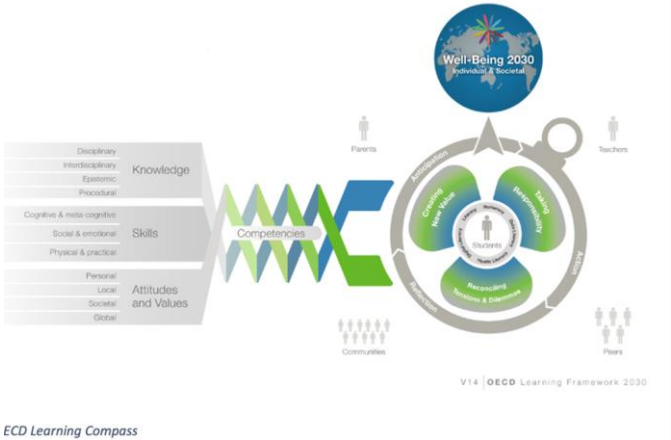


Figure 1: UNESCO IBE Framework of Future Competences

Figure 4: International Baccalaureate Learner Profile





ECD Learning Compass

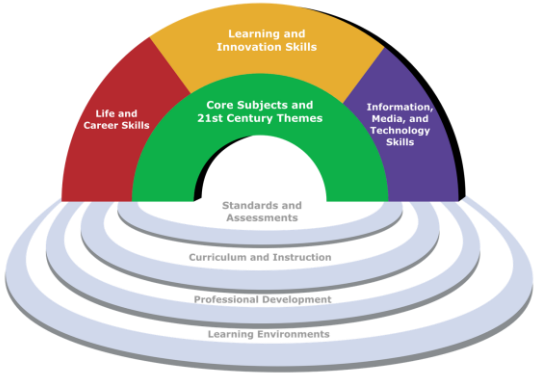


Figure 1 - P21 Framework for 21st Century Learning

International frameworks

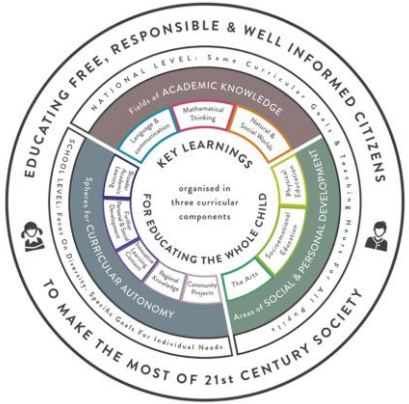


Figure 6: Mexico

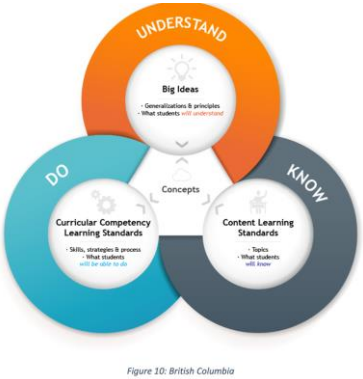
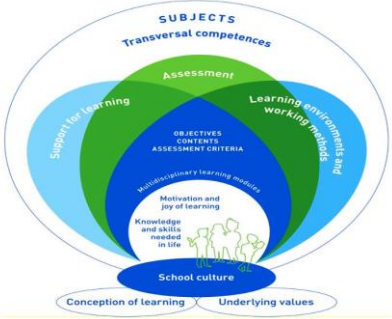


Figure 10: British Columbia

Figure 9: Australia

Figure 8. Schematic view of Finnish Curriculum Framework



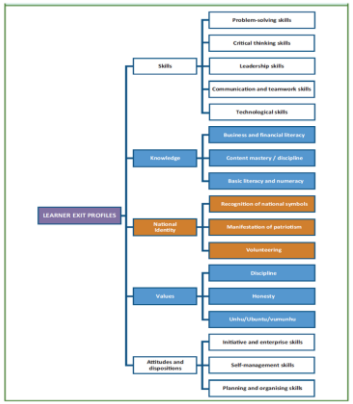


Figure 8: Zimbabwe

Figure 11: Singapore

Learning from others

This collection of case studies has been developed to synthesise key insights and learnings across a sample of exemplary countries to inform ongoing education improvement in South Africa.

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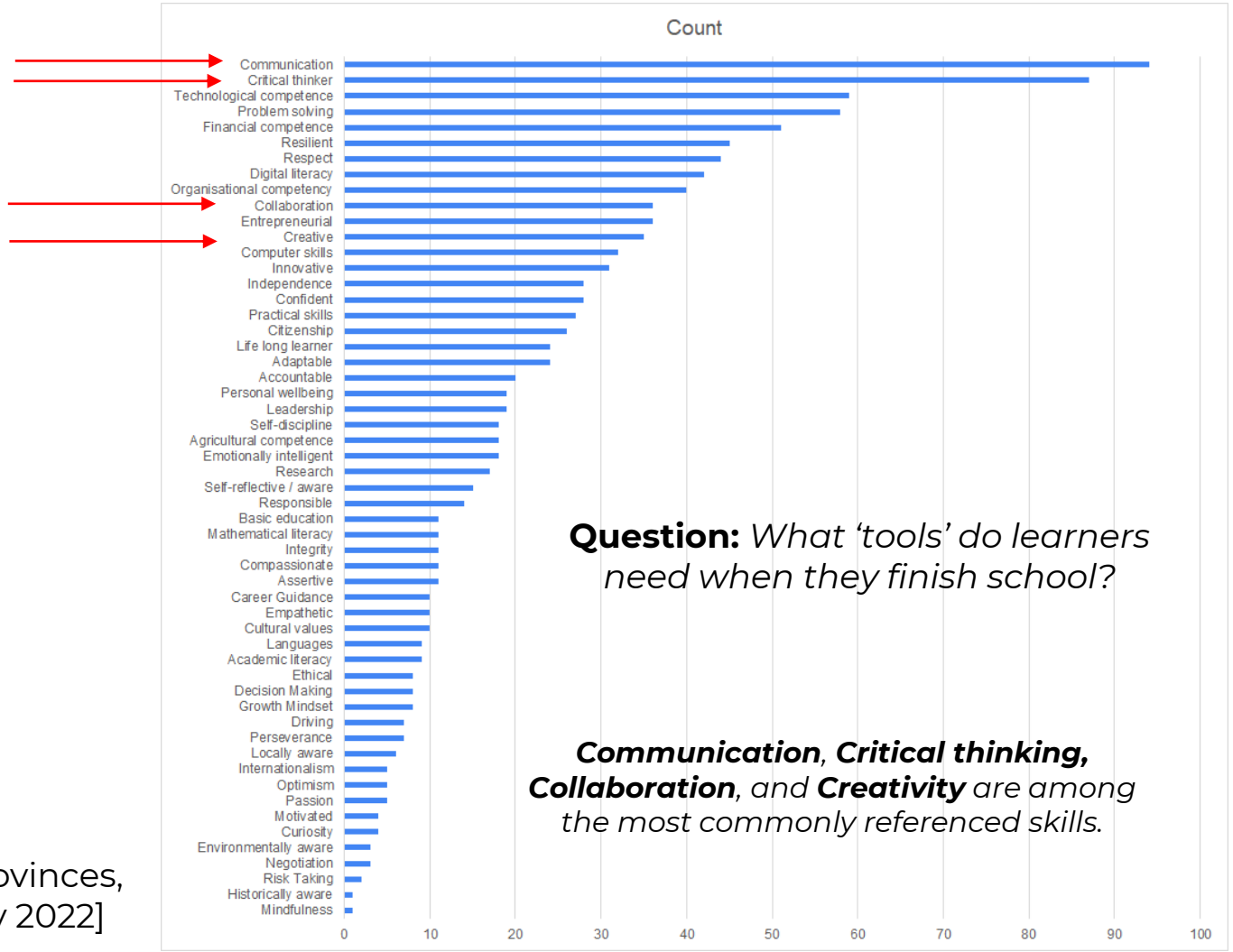
Learning from others

- Different frameworks have different purposes for different settings.
- Each framework adds to the conversation.
- No single framework can be used to solve every problem and meet every need.
- The is no ONE way to infuse competencies, different countries have done different things.
- Teaching and developing 21st-Century Skills requires alignment between assessment, curriculum and teacher development.
- It is NOT a quick fix, it is a developmental process with a number of steps, taking place over time.

South African stakeholder engagement led by Curriculum Strengthening



Question: *What 'tools' do learners need when they finish school?*

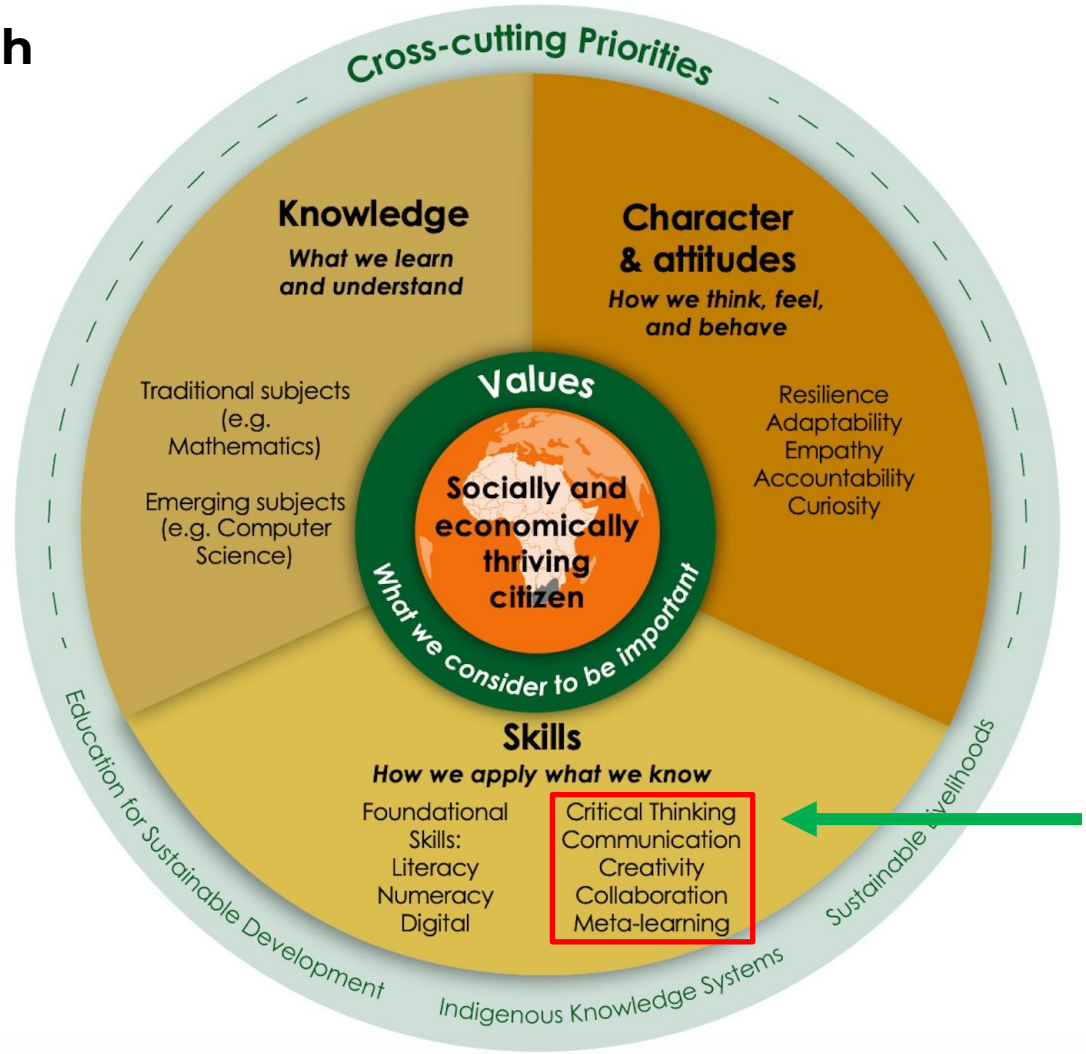
***Communication**, **Critical thinking**, **Collaboration**, and **Creativity** are among the most commonly referenced skills.*

Consulted with

- Adults(***314***)
- Learners(***117***)
- Virtual participants (***60***)

Workshops – across 9 provinces, 36 workshops [Sep to Nov 2022]

A possible South African Competency Framework



The five C's are very prominent in this framework!

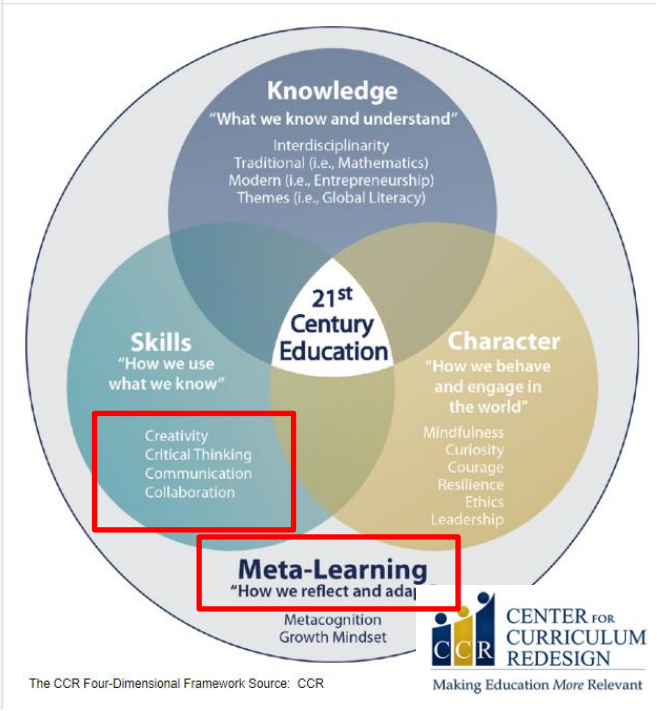
What does this mean for the GEC? How do we infuse 21st-Century Skills into the GEC

Process

Framework comparison	Analyzed two international frameworks, the CCR Rubric, and the ACER framework, to check for overlap and differences. Chosen for their deep research, coherence, and relevance
Skills mapping	Linked key elements from these frameworks to the learning process of integrated projects (13 steps). What types of activities support the practice of 21st–Century Skills?
Sub-skill selection	Selected a limited set of sub-skills from ACER and CCR to create a manageable framework, so as not to overwhelm.
Rubric testing	Tested and updated the rubric based on findings.
Skill infusion	Purposefully embedded 21st-Century Skills into Integrated Projects (2023).

Testing and learning, from global to local

- Critical thinking
- Collaboration
- Creative thinking



The CCR Four-Dimensional Framework Source: CCR

Drawing on a couple of well-researched evidenced based and relevant frameworks

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ACER Framework example Critical Thinking

	Strand	Aspect
CRITICAL THINKING ***Critical thinkers ask questions, find the right information, and apply it to solve a problem***	Strand 1 Knowledge construction	Aspect 1.1 Identifies gaps in knoweldge
		Aspect 1.2 Discriminates amongst information
		Aspect 1.3 Identifies patterns and makes connections
	Strand 2 Evaluating reasoning	Aspect 2.1 Applies logic
		Aspect 2.2 Identifies assumoptions and motivations
		Aspect 2.3 Justifies arguments
	Strand 3 Decision-making	Aspect 3.1 Identifies criteria for decision-making
		Aspect 3.2 Evaluates options
		Aspect 3.3 Tests and monitors implementation

CCR Framework Example Critical Thinking

2	CRITICAL THINKING	
no.	**Sub-competency** ongoing parts that make up the competencies	**Elements** describe the behaviours indicative of each proficiency level
2.1.	**Analysing** **Identifying, clarifying, and organizing information**	Hierarchy of information
		Questions
		Research
		Ambiguity
		Visual
2.2.	**Considering alternatives** **Considering opposing points of view**	Assessing the source of opinions
		Seeking out Alternatives
		Judging opinions
2.3.	**Reasoning**	Identifying and Evaluating Reasoning
		Connecting Information and Arguments
2.4.	**Critically reflecting** **Reflecting critically**	Justifying Decisions and Behavior
		Reflecting on actions
		Learning from experiences

2022

2023

21st-century skill	Descriptor
Critical thinking ***Critical thinkers ask questions, find the right information, and apply it to solve a problem***	*1.1 Asking questions: The learner asks appropriate questions to find out more information.*
	1.2 Evaluating ideas: The learner identifies which information was helpful to solve the problem.
	1.3 Identifying patterns: The learner uses tools (e.g., mind maps and diagrams) to help organise his/her information.

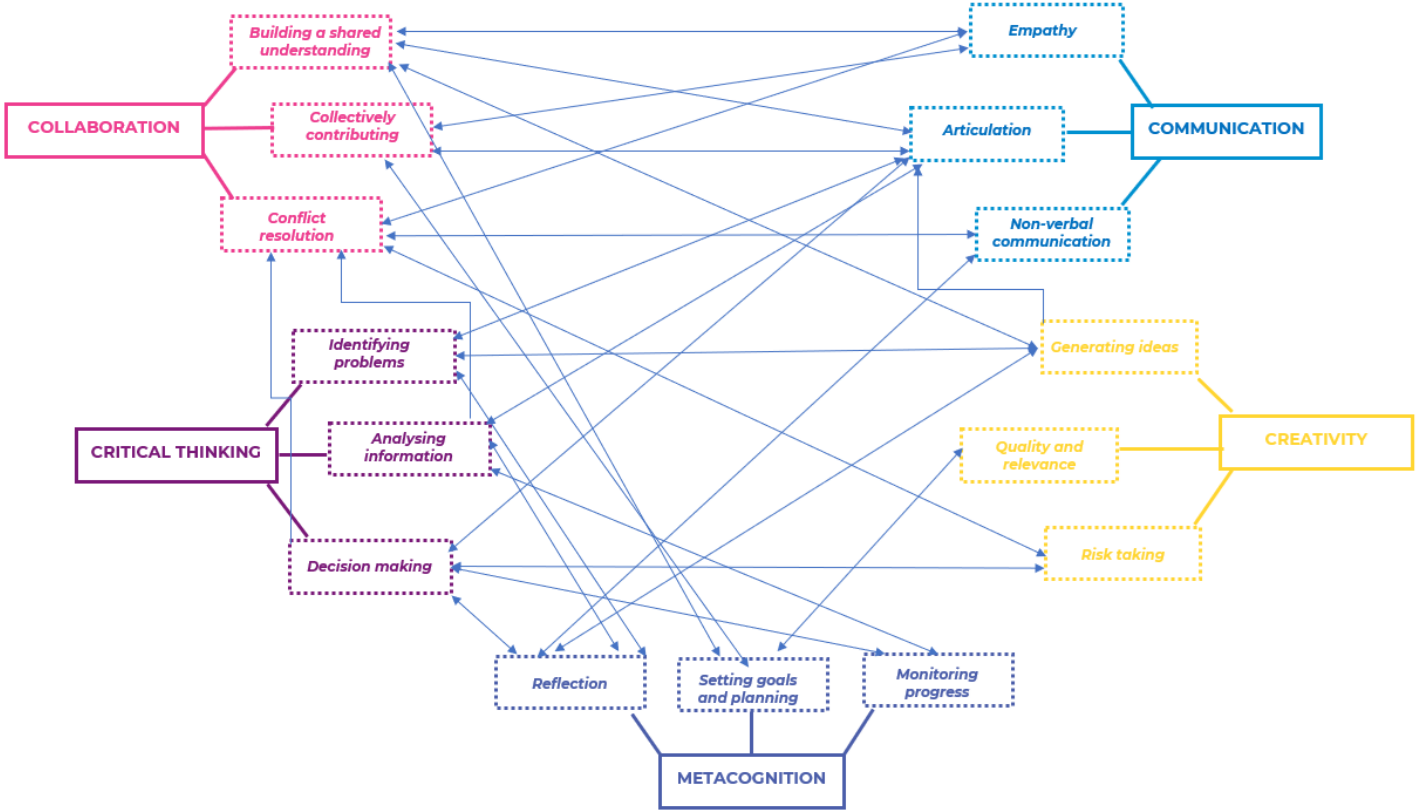
A journey to the ultimate goal

Finding the **simplicity** behind the complexity, while maintaining **integrity**, **quality** and **impact** [of the resources and tools].

Updates from 2022

Challenges	Mitigation
Limited training and additional support resources	½ day training Teachers guide to 21st-Century Skills 21st-Century Skills toolkit
Too many criteria	Reducing measurement criteria from 25 - 15.
Lack of integration of 21st-Century Skills into the projects	Integrated 21st-Century Skills into projects
Vague reporting process	Refining the data collection process for 21st-Century Skills.

Interconnected



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Mapping of 21st-Century Skills into the Integrated Projects

21st Century skills overlapping in projects

	1.1 **Asking questions**: The learner asks appropriate questions to find out more information?	1.2 **Evaluating ideas**: The learner identifies which information was helpful to solve the problem.	1.3 **Identifying patterns**: The learner uses tools (e.g. mind maps and diagrams) to help organise his/her information.	2.1 **Non-verbal communication**: The learner recognises nonverbal cues such as tone of voice and expression.	2.2 **Articulation**: The learner uses the correct language for the situation.	2.3 **Empathising**: The learner tries to understand how others were feeling.	3.1 **Number of ideas**: The learner comes up with many ideas.	3.2 **Range of ideas**: The learner thinks of a range of different ideas.	3.3 **Feasibility of ideas**: These ideas were realistically possible to implement as solutions to the problem.	4.1 **Negotiating roles and responsibilities**: The learner negotiates and decides on the role he/she would play in the group.	4.2 **Pooling resources**: The learner shares his/her own knowledge and experiences with the group to help strengthen the project.	4.3 **Engaging with roles and responsibilities**: The learner completes and submit the required tasks for the group.	5.1 **Setting goals and planning**: The learner set goals and makes plans during the project.	5.2 **Monitoring progress against plans**: The learner monitors their progress against their plans	5.3 **Reflecting on planned work**: The learner reflects on their project and or their prior knowledge.
Step	**Critical thinking**			**Communication**			**Creativity**			**Collaboration**			**Metacognition**		
Step 1: Prior Knowledge															MST Project
															LO Project
Step 2: New knoweldge	MST Project	MST Project													
	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project						
Step 3: Order	MST Project	MST Project	MST Project												
	LO Project	LO Project	LO Project												
Step 4: Apply knowledge to a context	MST Project	MST Project	MST Project												
	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project
Step 5: Define - ask questions to define your problem					MST Project										
				LO Project	LO Project	LO Project				LO Project	LO Project	LO Project			
Step 6: Explore - the research phase										MST Project	MST Project	MST Project	MST Project	MST Project	
	LO Project	LO Project	LO Project							LO Project	LO Project	LO Project	LO Project	LO Project	
Step 7: Brainstorm solutions		MST Project											MST Project	MST Project	
	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	
Step 8: Present for feedback					MST Project										MST Project
				LO Project	LO Project	LO Project				LO Project	LO Project	LO Project	LO Project	LO Project	LO Project
Step 9: Evaluation														MST Project	MST Project
	LO Project	LO Project	LO Project										LO Project	LO Project	LO Project
Step 10: Creating a prototype										MST Project		MST Project			
	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project			
Step 11: Feedback	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	MST Project	
	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	
Step 12: Integration in the MADD space									MST Project	MST Project		MST Project			MST Project
							LO Project	LO Project	LO Project	LO Project		LO Project			LO Project
Step 13: Present in public presentation					MST Project							MST Project			MST Project
				LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project	LO Project			LO Project

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GEC 21st-Century Skills Rubric

21st Century Skills	Descriptor
Critical thinking Critical thinkers ask questions, find the right information, and apply it to solve a problem	1.1 Asking questions: The learner asks appropriate questions to find out more information?
	1.2 Evaluating ideas: The learner identifies which information was helpful to solve the problem.
	1.3 Identifying patterns: The learner uses tools (e.g. mind maps and diagrams) to help organise his/her information.
Communication Communication is the process of sharing information, attitudes and values. Both "what we say" (verbal communication) and "how we say it" (non-verbal communication) are important)a problem	2.1 Non-verbal communicationL The learner recognises nonverbal cues such as tone of voice and expression.
	2.2 Articulation: The learner uses the correct language for the situation.
	2.3 Empathising: The learner tries to understand how others were feeling.
Creativity Creative thinking is defined as the ability to come up with many different ideas and apply them to find realistic solutions to problems. There are two important aspects to creative thinking: Originality and usefulness	3.1 Number of ideas: The learner comes up with many ideas.
	3.2 Range of ideas: The learner thinks of a range of different ideas.
	3.3 Feasibility of ideas: These ideas were realistically possible to implement as solutions to the problem.
Collaboration Collaboration is when two or more people work together to solve a problem. Interdependence is achieved when group members share responsibility and pool their information and resources to develop a shared understanding of the problem and their solution to it.	4.1 Negotiating roles and responsibilities: The learner negotiates and decide on the role he/she would play in the group.
	4.2 Pooling resources: The learner shares his/her own knowledge and experiences with the group to help strengthen the project.
	4.3 Engaging with roles and responsibilities: The learner completes and submit the required tasks for the group.
Metacognition Meta-learning is about being aware of how we think, what we know and how we know it. Metacognition helps us to reflect on our thinking, set goals, and monitor and evaluate our learning.	5.1 Setting goals and planning: The learner set goals and make a plan during the project.
	5.2 Monitoring progress against plans: The learner monitors their progress against their plans
	5.3 Reflecting on planned work: The learner reflects on their project and or their prior knowledge.

GEC 21st-Century Skills Rubric

CRITICAL THINKING	COMMUNICATION	CREATIVITY	COLLABORATION	METACOGNITION
Critical thinkers ask questions, find the right information, and apply it to solve a problem	Communication is the process of sharing information, attitudes and values. Both “what we say” (verbal communication) and “how we say it” (non-verbal communication) are important	Creative thinking is defined as the ability to come up with many different ideas and apply them to find realistic solutions to problems. There are two important aspects to creative thinking: Originality and usefulness	Collaboration is when two or more people work together to solve a problem. Interdependence is achieved when group members share responsibility and pool their information and resources to develop a shared understanding of the problem and their solution to it.	Meta-learning is about being aware of how we think, what we know and how we know it. Metacognition helps us to reflect on our thinking, set goals, and monitor and evaluate our learning.

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GEC 21st-Century Skills Rubric

CRITICAL THINKING	COMMUNICATION	CREATIVITY	COLLABORATION	METACOGNITION
1.1 Asking Questions 1.2 Evaluating ideas 1.3 Identifying patterns	2.1 Non-verbal communication 2.2 Articulation (how we say things) 2.3 Empathising	3.1 Number of ideas 3.2 Range of ideas 3.3 Feasibility of ideas	4.1 Negotiating roles and responsibilities 4.2 Pooling resources 4.3 Engaging with roles and responsibilities	5.1 Setting goals and planning 5.2 Monitoring progress against plans 5.3 Reflecting on work

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Making the intangible, tangible!

A journey towards complexity

Identifying competencies

Testing systems not assessing the impact of the curriculum on developing competencies

Developmental process

Growth in Development of competencies and complexity of the measurement tools.

Tools and resources to support scaffolding

Starting from the **know**, moving to the **unknown**
Scaffolding and building capacity of both teachers and learners in the process

TIME

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Research to inform practice

Looking at questions such as:

- How effective do teachers find the rubric in observing 21st century skills among learners?
- What challenges do teachers encounter when implementing the rubric in their classrooms?
- How easily can teachers incorporate this rubric into their existing teaching practices?
- How do teachers interpret the rubric? Is it too granular, or too simplistic?
- Do current teaching practices give teachers enough opportunities to see learners practice their 21st-Century skills?
- What teacher training is needed?
- What changes to the curriculum need to take place to support this, if any?

Informing the Curriculum Strengthening process of developing a South African Competency Framework