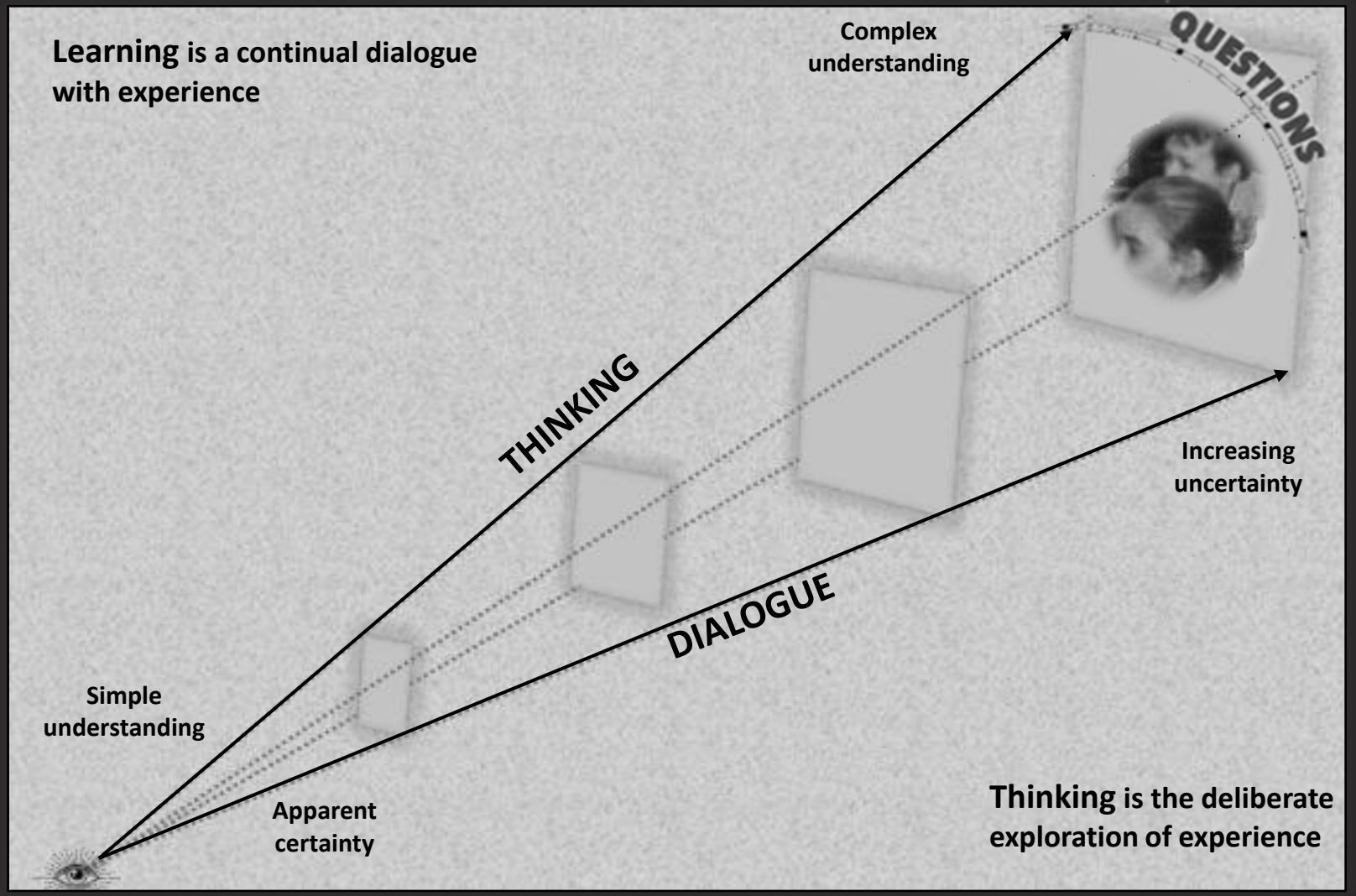
LEARNING FOUNDATIONS
Question-led learning



LEARNING FOUNDATIONS GATEWAY

Contents

Click to access

F = frame number

Note - the changes in referencing some of the frames in the podcasts is due to the addition of new frames in response to ongoing feedback

- ***F11 is referred to as F10 in the podcasts***
- ***F13 is referred to as F12 in the podcasts***

Back

Appreciating insights

People and organizations bring different perceptions

"Education is the most powerful weapon which you can use to change the world."

"Education is the great engine to personal development."

"No country can really develop unless its citizens are educated."

Nelson Mandela

"If you're not prepared to be wrong, you'll never come up with anything original."

"We stigmatize mistakes in school, mistakes are the worst thing you can make. We are educating our kids out of their creative capacities."

Sir Ken Robinson

Knowledge Building and Knowledge Creation: One Concept, Two Hills to Climb.

Carl Berieter & Marlene Scardamalia

"Learning is a treasure that will follow its owner everywhere."

Chinese Proverb

"Tell me and I forget, teach me and I may remember, involve me and I learn."

Benjamin Franklin

To help learners succeed in the future, we need to empower them to break the mold and think creatively.

Square Panda India

Lifelong principles

Courage – Accepting challenges and embracing opportunities.

Growth – Aspiring to learn, and improve even when it is tough.

Respect – Caring for ourselves, each other, and our environment.

Responsibility – Stepping up and doing what is right.

Connection – Building positive relationships and a sense of belonging

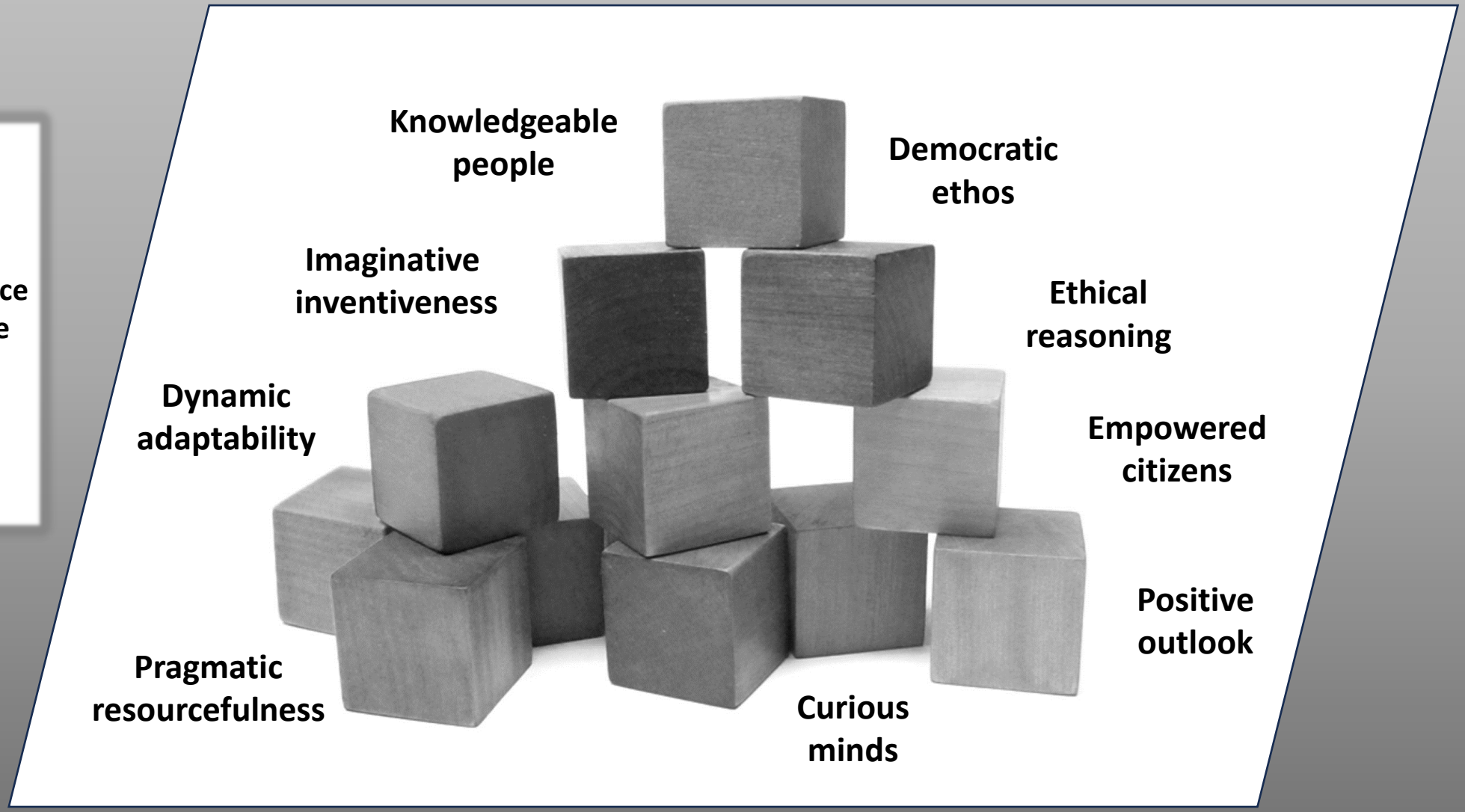
Tasmanian Government

Building valued practices

Different perspectives reflect values.

The values that underpin this resource are identified in the 'big picture'.

Interconnections between the blocks are incited by curiosity



Pinpointing perspectives

Different perspectives reflect values, purposes and experiences

A learning perspective

Curiosity and creativity are **intelligence having fun.**

Albert Einstein

Curiosity is the **engine of achievement.**

Sir Ken Robinson

Curiosity and questions will get you **further than confidence and answers.**

Maxime Lagacé

Much of what I stumbled into by following my curiosity and intuition turned out to be **priceless later on.**

Steve Jobs

We keep moving forward, opening new doors, and trying new things, because we are curious, and curiosity **keeps leading us down new paths**.

Walt Disney

Satisfaction of one's curiosity is one of the **greatest sources of happiness in life.**

Linus Pauling

A societal perspective

Being **democratic**, being **ethical**, being **knowledgeable**, being **imaginative** and being **inventive** are requirements for living and working in modern societies. They provide a raison d'être for curiosity, intelligent thinking and deep understanding.

They create contexts and purposes for thinking and understanding that transcend circumstances, needs or desires.

An expert perspective

A comment attributed to Einstein is particularly pertinent.

If I had an hour to solve a problem, I would spend fifty-five minutes finding the right question and then only need five minutes to solve the problem.

Establishing purposes

Universal purposes that have gained wide acceptance

To know

Rich understandings developed from broad and diverse experiences

To do

Practicable knowledge applied in everyday life and to emerging challenges

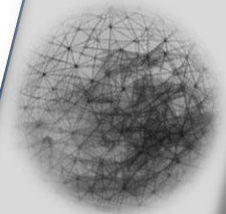
To live together

Social responsibility and wise action in caring communities and environments

To be

Personal strength and community identity expressed in unique and diverse ways

Inform-critique-discern
Transform-create-innovate
in a digital world

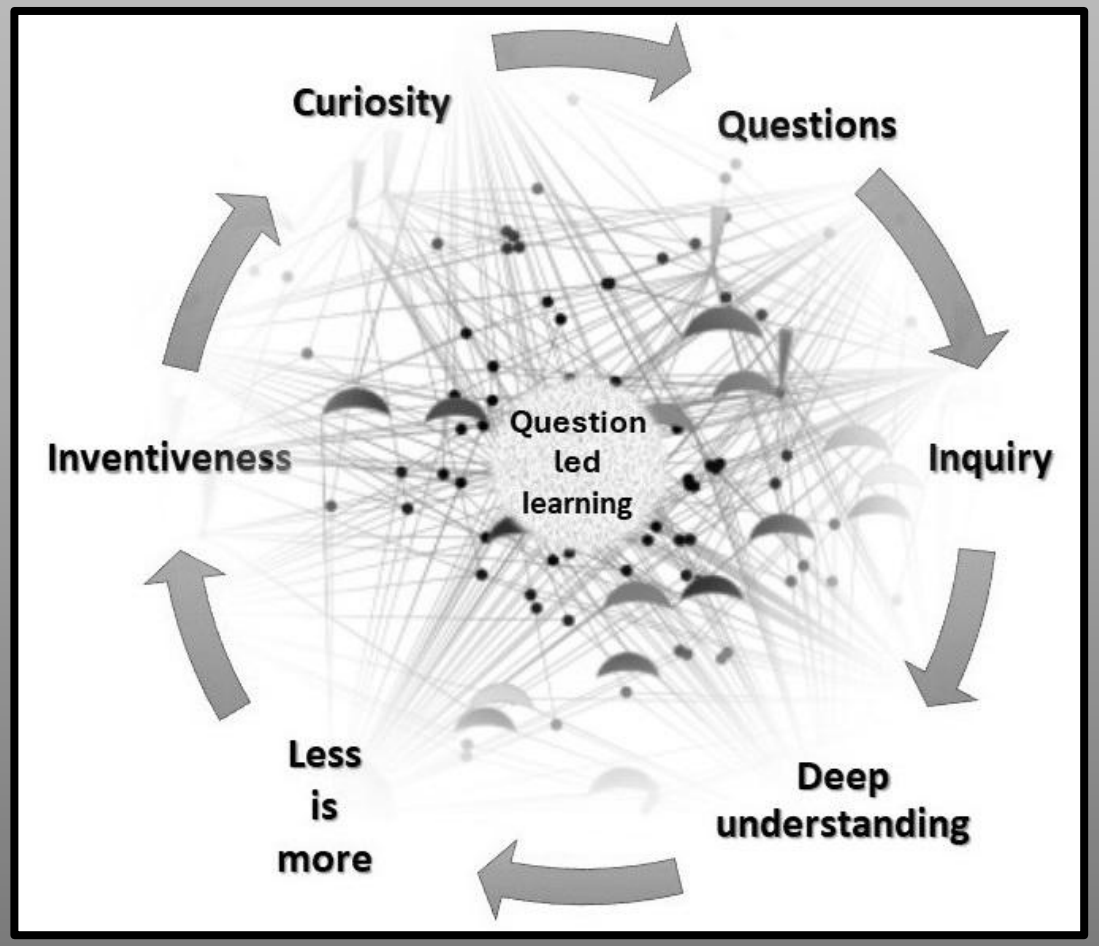


To participate
in a digital world
a 5th pillar?

Intercultural pillars for learning

Active learning

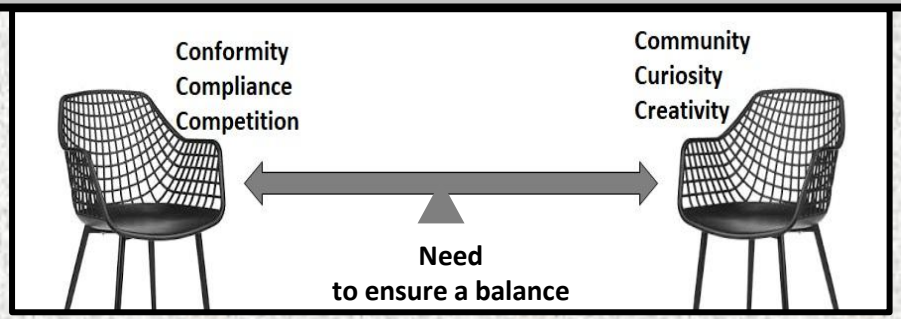
Key elements in dynamic, iterative and evolving learning processes across different domains of human endeavour.



Curiosity	• Generated from real-life experience • Purposeful thought and action • Making sense of the unknown
Questions	• Wonder questions focus on unknowns • Vexing questions focus on dissonance • 'What if' questions focus on possibility
Inquiry	• Structured and detailed investigations • Direct teaching ideas and skills required • Intentional yet open-ended explorations
Deep understanding	• Balance of simple and complex thinking • Development of transferable 'big ideas' • Conceptually and contextually grounded
Less is more	• Real-life connectedness and relevance • Personalised and customised to needs • Refined responses to curious inquiries
Inventiveness	• Discover and design ideas and practices • Generate strategic concepts for action • Develop and enact ideas and practices

Designing programs

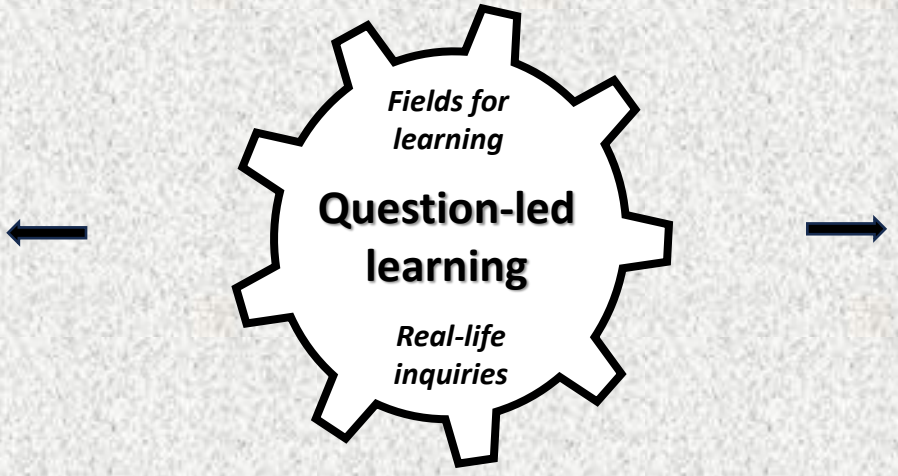
Focus on teaching and learning, not curriculum polemics!

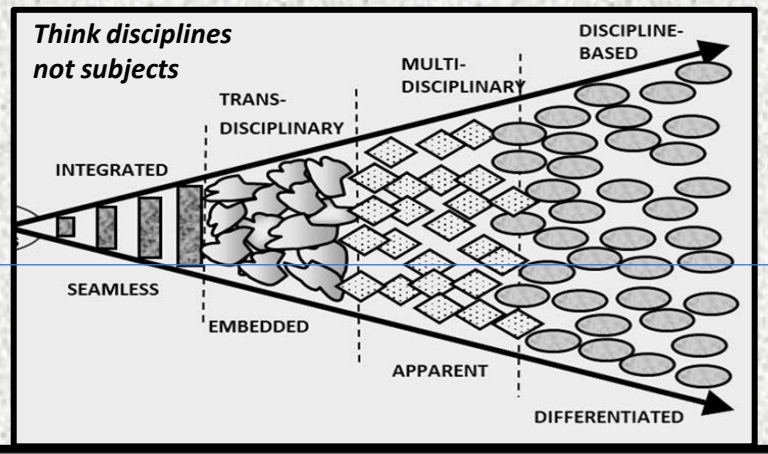


Contradiction

The Global Education Reform Movement (GERM) has led to a proliferation of prescriptive curriculum texts reinforced by standardized testing. With many education programs narrowed and teachers teaching to the tests.

Mandates for creativity and tightly regulated curriculum reform aimed at improving standardized test scores are contradictory. Tension between the two intentions weighs heavily on teachers and educators. Especially if learning to learn and go on learning throughout life is seen as the heart of education.





Shift

Learning led by curious questions is a significant development when juxtaposed against prescriptive content and outcomes-based curriculums. Personalizing learning as well as customizing programs to the circumstances and aspirations of different communities becomes more important.

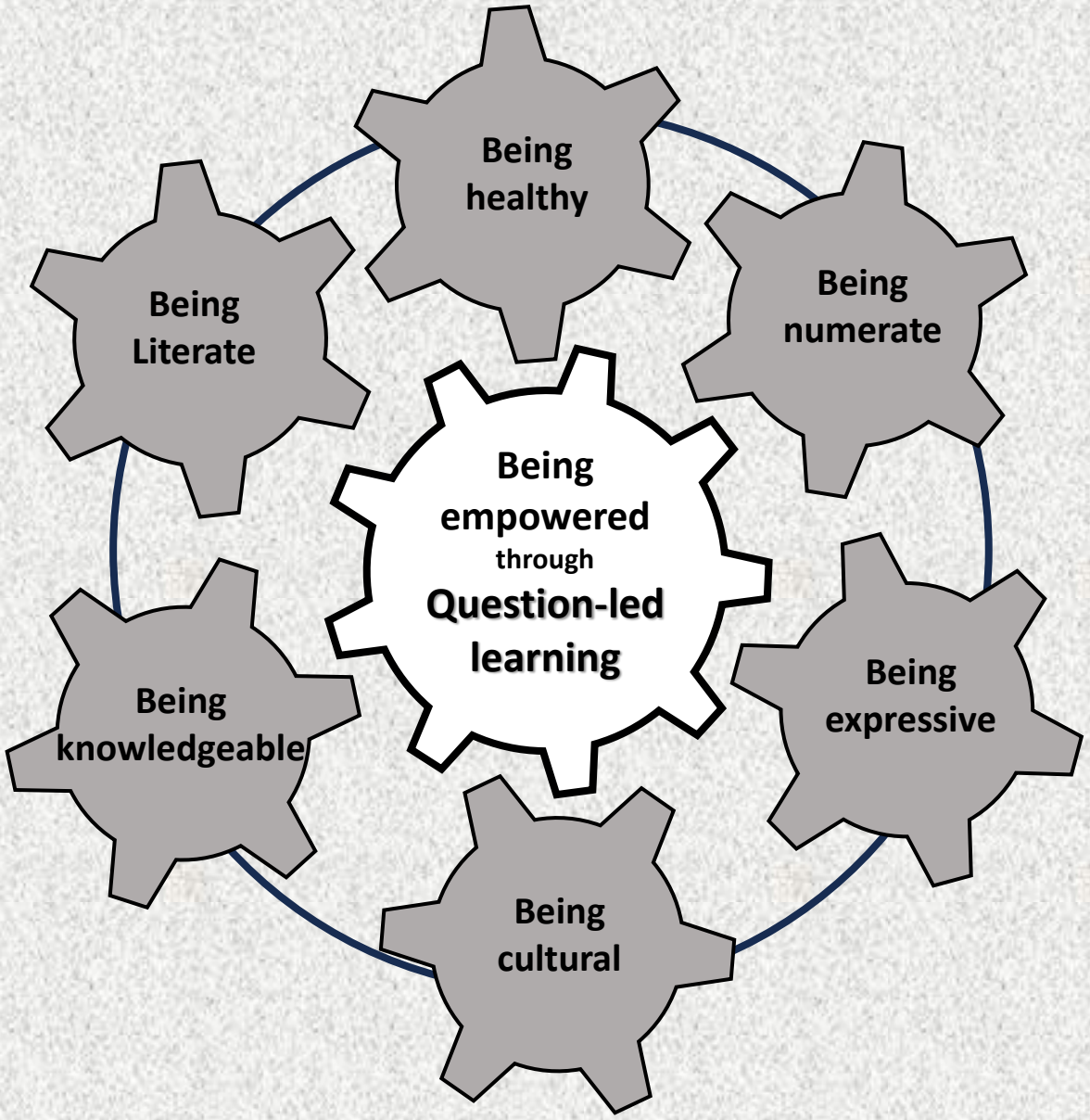
Teaching and learning strategies and processes would need to be made explicit. A move that might bring curriculum into the lifeblood of teaching and learning dialogues, instead of being an imposition or an encumbrance.

Constructing learning

Six
interconnected fields

Question-led learning engages imagination and creativity to generate knowledge, know-how and inventiveness.

It is integral to learning across the Sciences, the Humanities and the Arts.



Clarifying scenarios

Understand the key features of the context of an inquiry

Beware 'analysis paralysis' can sap energy and distract people.

Discover potential

Mindset	Different aspects
Focus ▪ The whole, not just bits and pieces ▪ Depth and subtlety, not simplistic information ▪ Real-life situations, not just a mixture of issues ▪ Innovation, not just an assemblage ideas and practices ▪ Forward thinking, not just a search for destinations. **Principles** ▪ Limit situational analyses to key features ▪ Be descriptive and appreciative, not judgmental ▪ Reveal areas for growth or challenge and commitment ▪ Respect the human and physical resources in play ▪ Generate a culture of open questions and inquiry	**Explore background realities** Listen to expressions of needs and intentions Observe the mix of talents and aspirations Perceive the expectations of people and systems Survey available human and physical resources Identify projected timeframe requirements Recognise political and historical realities **Consider process alternatives** Explore the strategies and tactics being enacted Scope potential for investigation and collaboration Expose innovative design possibilities Identify potential for growth in leadership Observe participation and decision-making possibilities Develop nuanced understanding of practical alternatives **Address action issues** Search for co-construction and co-design potential Appreciate delivery issues and longer-term needs Sense opportunities for spaced inquiry and innovation Observe control and accountability processes in play Identify feasible strategies for enactment of ideas Anticipate possible consequences and responses **Ascertain practicable actions** Determine potential commitment to shared action Give appropriateness and sustainability attention Reveal possibilities for individual and collective growth Identify beneficial action and potential difficulties Negotiate planned processes for improvement Appreciate coherence and continuity in space and time

Ownership perspective

'Situation analyses' are collaborative and cooperative processes.

- They generate ownership and commitment
- They build personal and collective capacity to act wisely
- They add nuance to the designs for improvement and means for action
- They inform and enhance implementation

Explore Features

Simple aspects ***Relatively independent***	**Sense -- categorise -- act**
Interwoven aspects ***Connected yet identifiable***	**Perceive -- analyse -- respond**
Complex aspects ***Layered and interdependent***	**Probe -- discover -- proceed**
Chaotic aspects ***No configuration or identity***	**Act -- discern -- engage**

School perspective

'Situational analysis' of the culture of a school is a starting point for developing and improving practice. The needs-interests-aptitudes-capabilities-knowledge-talents of learners, the capabilities and aspirations of teachers, the availability of resources, and the prevailing socio-economic conditions as well as community expectations and aspirations are all in the mix.

Keep the brush broad to the focus on sensemaking and understanding as distinct from an analysis of variables

Assessment perspective

Assessment is an integral part of learning.

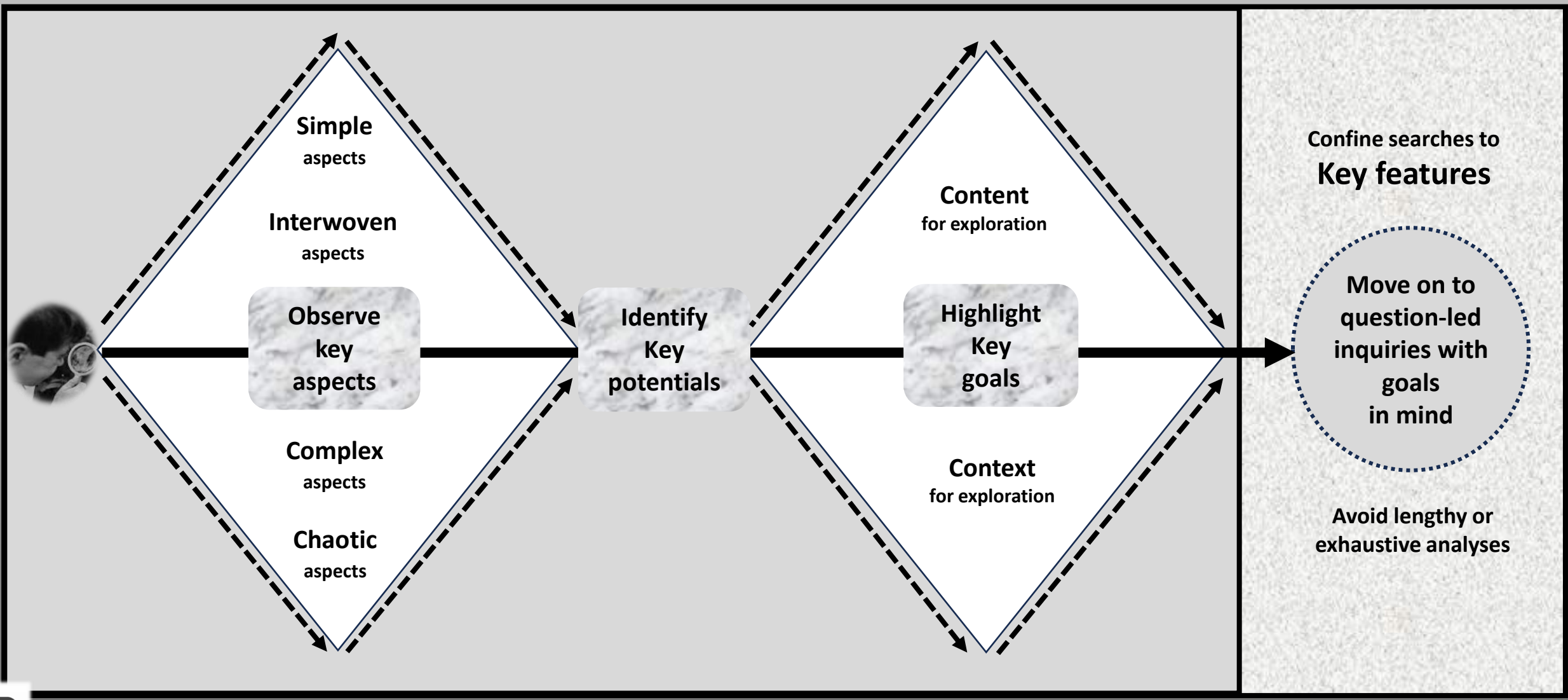
It encompasses-

- An appraisal of how learning is taking place
- A diagnostic assessment of what have been achieved and what is needed
- An assessment of achievement in terms of established criteria and processes

All three are important with an undue focus one likely to skew the overall picture. Reliance on one, such as the hegemony of standardised testing, can lead ito unwise short-term decisions.

Exploring conditions

Explore situations, circumstances, intentions and motivations to ascertain possibilities, potential for growth and realistic goals for inquiry.



Voicing curiosity

Questions are at the heart of curious inquiry.
They reveal the scope of inquires undertaken and the learning they evoked

Curious questions

Questions bespeak curiosity and a life-long dialogue with experience. They signify provocations to understand the world and incitements to create mature communities and societies. They promote deep understanding across the gamut of human experience and endeavour. Yet they often get lost in a maelstrom of answers.

Curiosity and questions are wonders that open minds to different possibilities and sometimes new or different ways of seeing experience. Asking curious questions-

- Enables people to direct their inquiries and drive knowledge construction.
- Fosters discussion and debate thereby enhancing the quality of human discourse and interaction.
- Helps people self-evaluate and monitor growth in their understanding, and
- Increases motivation and inquisitiveness related to the subject matters being explored.

TeacherThought (2019) has an interesting take.

> *Questions are more important than answers because they reflect both understanding and curiosity in equal portions. To ask a question is to see both backward and forward – to make sense of a thing and what you know about it and then extend outward in space and time to imagine what else can be known, or what others might know. To ask a great question is to see the conceptual ecology of the thing.*

Question framing

A set of three types of questions form a frame for building question-led inquiries

- **Generic generative questions** (GGQs) which direct and shape inquiries across all areas of human knowledge, experience, and endeavour.
- They spawn **consequent questions** (CQs) that can be investigated within the content of an inquiry.
- Sometimes, the context of an inquiry evokes more **pointed questions** (PQs) to address specific issues.

The frame creates expansive and searching processes which are particularly germane in a world where pressures for answers, often quick ones, are strong. While conclusions and solutions are important, the development of possibilities precedes reduction to act.

Variety of questions

Questions spark inquiry. Divergent questions open-up possibilities and alternatives. Convergent questions seek to discover ways to explain and act. They are often used in tandem.

Questions can be defined by their intention.

- **Wonderment questions** involve comprehension, prediction, anomaly detection, and application, or strategizing and planning when no procedure is given.
- **Vexing questions** are borne of intellectual dissonance that incites challenge or contradiction in response to specific lines of thinking or action.
- **'What if'** questions stimulate imagination and creativity without any precedent or examples to draw on.

Sensemaking provoked

A set of twelve generic generative questions (GGQs) around issues labelled - form, function, causation, change, connection, place, responsibility, care, ethical, aesthetic, thinking and innovation – cover the broad range of human endeavour. While they indicate scope, they are not a definitive list.

GGQs are generic because they can be applied to almost any situation or challenge. They are generative because they shape inquiries and spawn a myriad of related questions which are ripe for inquiry.

There are at least four ways GGQs can be selected to direct and guide an inquiry

- Nominated by teachers with little or no learner input
- Negotiated through thoughtful discussion between learners and teachers
- Established through collaborative agreement among a group of learners
- Chosen independently by a learner centred around his or her predispositions and interests

Teachers' questions

Teachers ask questions more frequently than learners. Often answering their own questions before learners have had time to construct answers. They often persist with the same question, or variations of it, until they receive answers that match their expectations. This begets a high incidence of closed questions that yield 'correct' answers with few questions that invite a variety of responses. Yet young children ask hundreds of open questions in a day.

Sensemaking questions

Questions open-up the disciplines of mind and understandings inherent in different fields of knowledge and experience

Generic generative questions (GGQs)	Sensemaking *Indicative possibilities*
FORM - What is it like? FUNCTION - How does it work? CAUSATION - Why is it like it is? CHANGE - How is it changing?	ENVIRONMENTAL PERSPECTIVE Systems, Structures, Designs, Roles, Elements, Patterns, Features, Networks, Performances, Situations, Mechanisms, Causes, Effects, Impacts, Dependence, Interoperability, Interdependence, Interactions
CONNECTION - How is it connected to other things? PLACE - What is the role of place here? RESPONSIBILITY - Who might be responsible? CARE - How might people care for each other?	SOCIAL PERSPECTIVE Circumstances, Factors, Sites, Interactions, Interconnectedness, Citizenship, Respect, Compassion, Rights, Justice, Friendships, Organisations, Civilisations, Laws, Needs, Processes, Obligations, Regulations
ETHICAL - Where is the ethical reasoning? AESTHETIC - How is aesthetic sense manifest? THINKING - How is the thinking evolving? INNOVATION - What might innovation add?	CULTURAL PERSPECTIVE Values, Beliefs, Morals, Traditions, Customs, Issues, Empathy, Justice, Principles, Appeal, Style, Artistry, Balance, Nuance, Intelligence, Creativity, Inventiveness, Flexibility, Alternatives, Designs, Potential, Justifications

Sensemaking

The generic generative questions (GGQs) listed cover the broad range of human endeavour. They give question-led learning direction and purpose.

GGQs open-up sensemaking in different fields of knowledge and experience. Indicative possibilities are clustered around three perspectives.

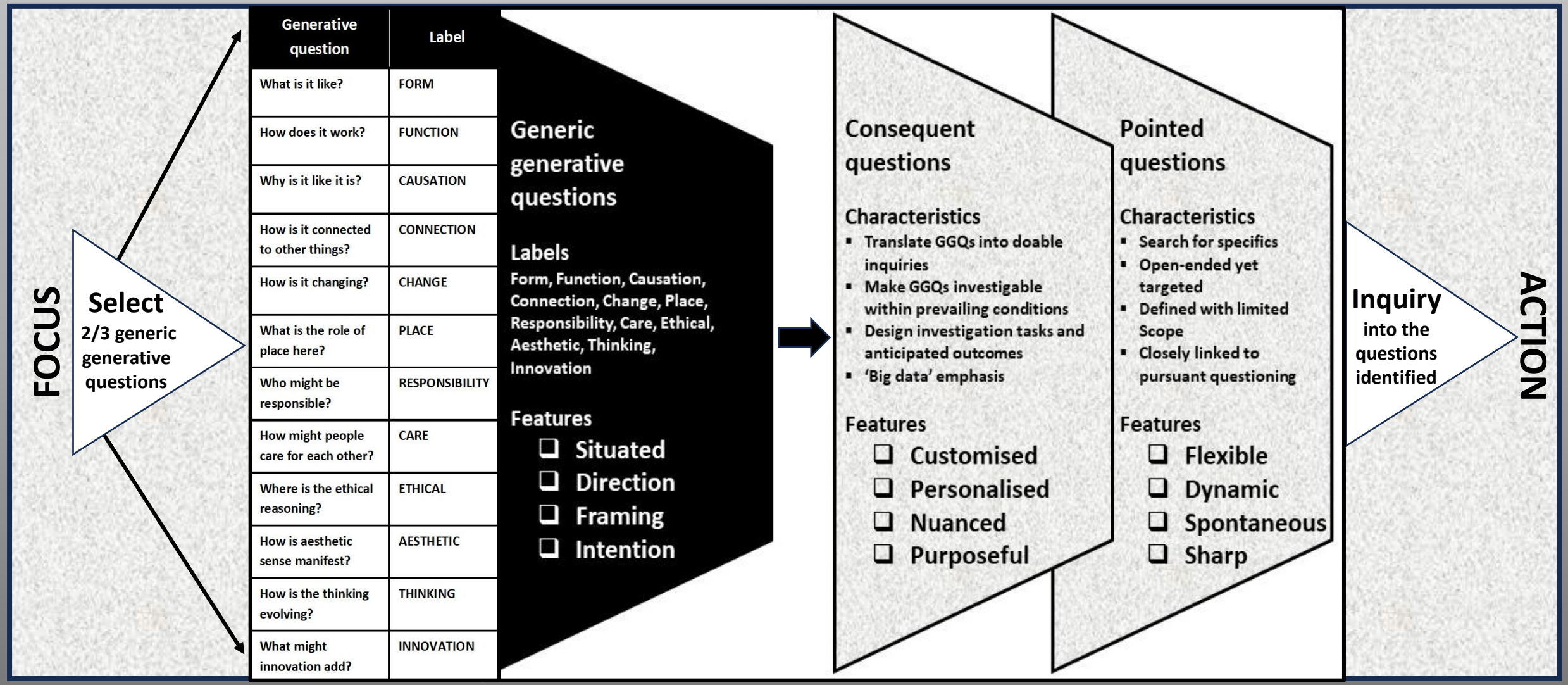
These possibilities point to some of the issues, ideas, and understandings that may be provoked in response to exploring selected GGQs.

Those studied stem from and reflect the content and context of specific inquiries.

Framing questions

A three-fold process for the framing of questions to direct inquiries.

Generic generative questions (GGQs), to consequent Questions (CQs), to pointed questions (PQs)



Enacting question framing

Covid pandemic - Indicative example # 1

Unfolding framework of Generic generative questions (GGQs), Consequent Questions (CQs), and Pointed questions (PQs)

Indicative questions to be transformed and scaled up or down through negotiation with Learners

Situated challenge

FOCUS
The Covid Pandemic

Prior knowledge and experience

Generic generative questions (Selected)

Function
How does it work?

Place
What is the role of place here?

Ethical
Where is the ethical reasoning?

Expand

Expand

CONSEQUENT QUESTIONS

Indicative examples for a Covid19 inquiry

(Translation of GGQs to specific content)

Function
- Could COVID-19 invade the human body by several means?
- Could Covid-19 be transferred from person to person in different ways?
- In what ways could a vaccine against COVID-19 be developed and distributed?

Place
- What might happen if local action were taken to prevent COVID-19 infections?
- Could medical services to deal with COVID-19 infections in our area be improved?
- In what ways might local community practices precipitate a COVID-19 outbreak?

Ethical
- Could ethical attitudes among people and communities affect a COVID-19 outbreak?
- Could enforcing a lockdown become a denial of human rights?
- In what ways might international measures be developed to combat pandemics ?

Contract

Contract

POINTED QUESTIONS

Indicative examples for a Covid19 inquiry

(Attention to contextual conditions)

- What are the routes through which the Covid -19 virus can invade the body?
- Could different solutions for prevention and treatment be needed in different contexts?
- In what ways could faults in preventive strategies be predicted and/or monitored?

- How could gaps be filled between where we are and where we need to be with preventive measures for Covid-19?
- How well are prevention and treatment methods going and how might they be customised for different communities?
- What's the 'best' way to see if preventive measures are carried out properly?

- How might measures to combat Covid-19 be culturally and ecologically acceptable?
- What are the ethical conflicts in dealing with Covid-19 and what underpins them?
- Why should governments intervene when Covid-19 might be better left to take its course?

New challenge

ACTION
Conduct inquiries and implement outcomes

Enhanced understanding

Enacting question framing

Renewable systems - Indicative example # 2

Unfolding the framework of Generic generative questions (GGQs), Consequent Questions (CQs), and Pointed questions (PQs)

Indicative questions to be transformed and scaled up or down through negotiation with Learners

Situated challenge

FOCUS
Sustainable practices

Prior knowledge and experience

Generic generative questions
(Selected)

Connection
How is it connected to other things?

Responsibility
Who might be responsible?

Innovation
What might innovation add?

Expand

Expand

CONSEQUENT QUESTIONS
Indicative examples for a renewable systems inquiry
(Translation of GGQs to specific content)

Connection
- Could renewable systems make the way we live more sustainable?
- Could the applications of renewable systems be extended to benefit everyday life and work?
- If renewable energy is to grow what might be the environmental impacts?

Responsibility
- Who should be accountable for the development of renewable energy?
- What might happen if people and organisations were encouraged to engage in renewable and sustainable practices?
- Might authentic and well researched information aide the introduction of renewable systems?

Innovation
- Might new or improved technological designs for renewable systems help?
- Are there practices around renewables that need to be controlled or eliminated?
- Could 'this or that' alternative provide a more efficient and sustainable system?

Contract

Contract

POINTED QUESTIONS
Indicative examples for a renewable systems inquiry
(Attention to contextual conditions)

- What are the arguments for and against different forms of energy?
- What factors are affecting the introduction and use of renewable systems?
- How are energy systems affecting specific environments and what might need to be done?

- Who is responsible for energy practices that have an adverse effect on our climate?
- What responsibilities do each of us have for encouraging renewable systems?
- How might renewable systems help in keeping local environments clean, looking good, and usable as a resource for recreation?

- What are the benefits and disadvantages of different means for producing energy?
- Why are some renewable systems a better fit than others in different communities?
- Why have some energy systems been adopted, and new ones are being devised?

New challenge

ACTION
Conduct inquiries and implement outcomes

Enhanced understanding

Enacting question framing

Healthy food - Indicative example # 3

Unfolding the framework of Generic generative questions (GGQs), Consequent Questions (CQs), and Pointed questions (PQs)

Indicative questions to be transformed and scaled up or down through negotiation with Learners

Situated challenge

FOCUS
Healthy food

Prior knowledge and experience

Generic generative questions (Selected)

Form
What is like?

Care
How might people care for each other?

Thinking
How is the thinking evolving?

Expand

Expand

CONSEQUENT QUESTIONS

Indicative examples for a healthy food inquiry

(Translation of GGQs to specific content)

Form
- In what ways are some foods better for people than others?
- Could eating a balance of nutritious foods improve our health and well-being?
- Could the convenience of fast foods be outweighed by their effects on individual and community health?

Care
- Could access to good food at an affordable cost help to alleviate poor nutrition?
- For people who do not have enough to eat what can or should be done about it?
- In what ways might attitudes and fashions on social media be affecting food habits?

Thinking
- Could different or better ways to prepare and preserve foods be developed ?
- Might publicity on cooking help prevent loss of nutritional value or food poisoning?
- What might happen if nutritious food were made more attractive and tastier?

Contract

Contract

POINTED QUESTIONS

Indicative examples for a healthy food inquiry

(Attention to contextual conditions)

- What are the food values of vegetables, meats, eggs, and other foods?
- Why are some people malnourished in situations where there is enough for everyone?
- How can people and communities produce their own food, process it and preserve it?
- How can we make sure elderly people who live on their own eat properly?
- How might waste food be kept to a minimum or 'recycled' wherever possible?
- How might schools help to promote good eating habits through their canteen policy?
- What could be done to educate people and communities about different foods and their effects on health?
- How could clean water and its availability for food preparation be improved?
- How could cooking practices be improved or customised to the needs and conditions of specific communities?

New challenge

ACTION
Conduct inquiries and implement outcomes

Enhanced understanding

Inquiry partners

Questions and questioning are different yet partners in inquiries

When people have a questioning attitude, they are expressing disbelief, doubt, or skepticism about something. When they are asking questions, they are expressing interest, curiosity, and wanting to learn. The questions they pose are strategic means of directing and shaping their inquiries, whereas their questioning focuses on processes for actions.
Lenski edited

Question-led inquiries

This resource is anchored around a set of three interdependent questions

- **GGQs which are directional and intentional**
- **CQs which are customised and personalised**
- **PQs which are contextual and flexible**

Origin of questions

The questions people ask reflect personal perceptions of experience, even when they are formulated collaboratively.

Questions asked echo the evolution thinking on the possibilities for action with interpretations of them varying from person to person.

Devising CQs and PQs from selected GGQs

Broad questions as outlined previously include-

- ***Wonderment questions*** involve comprehension, prediction, anomaly detection, application, and strategizing or planning when no procedure is given
- ***Vexing questions*** are borne on intellectual dissonance that incites challenge or contradiction in response to specific lines of thinking or action
- ***'What if' questions*** stimulate imagination and creativity without any precedent or examples to draw on

Focused questions include-

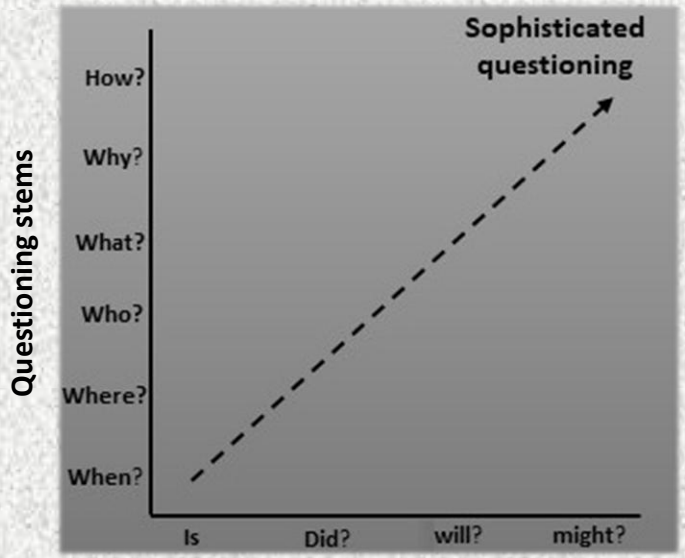
- ***Exploratory questions*** seek to explore or unfold the extent of new knowledge …
- ***Text-based questions*** are a response to reading texts and knowledge-based information …
- ***Investigative questions*** engage learners in designing and performing 'hands-on' inquiries …
- ***Confirmation questions*** seek to clarify information and transform understanding …
- ***Input questions*** recall information and construct ideas and relationships …
- ***Consolidation questions*** seek to expand new ideas and reconcile differences …
- ***Misunderstanding questions*** explore misconceptions and complexities …
- ***Hierarchical questions*** focus on increasingly sophisticated cognitive processes …
- ***'Deep reasoning' questions*** explore antecedents, consequences, procedures, and actions …
- ***Reflective questions*** are constructively critical to review or change mindsets

Tactical questioning

Questioning encompasses many purposes. For example, questioning processes incite-

- **Recognizing, querying, recalling, challenging**
- **Interpreting, exemplifying, classifying, summarizing**
- **Inferring, comparing, explaining, supposing**
- **Trialling, exploring, executing, implementing**
- **Differentiating, organizing, attributing, categorising**
- **Checking, examining, critiquing, evaluating**
- **Constructing, planning, producing, inventing**

A useful aid for the development of sophisticated tactical questioning is outlined below.



Distinguishing questions from questioning

Questions and questioning are often used interchangeably when they are different in nature and effect

Questions provoke imagination and creativity

Wonder questions evoke new thoughts, different ideas and innovative actions

Vexed questions investigate contradictions, uncertainties and problematic issues

'If' questions explore possibilities, alternatives and even crazy ideas

These question types are open-ended with multiple responses, as distinct closed questions that seek a single response

Feature	Questions Strategic thoughtfulness	Questioning Tactical enactment
Intention	Determine directions and shape inquiries	Investigates selected questions in specific situations and contexts
Scope	Focus on issues, ideas, and alternatives	Explores needs, possibilities and practicalities
Emphasis	Promote coherence and purpose	Performs investigative processes and tasks

Questioning processes can have different foci including attention to-

Why
What
How
Where
When
Who

Within the content and context of an inquiry and in ways that seek to investigate possibilities – not simplistic answers

Questions and questioning are different. Yet interdependent and mutually supportive.
In some situations the distinction may be a fine line.

Structuring collaboration

A flexible structures and processes facilitate collaborative inquiry processes

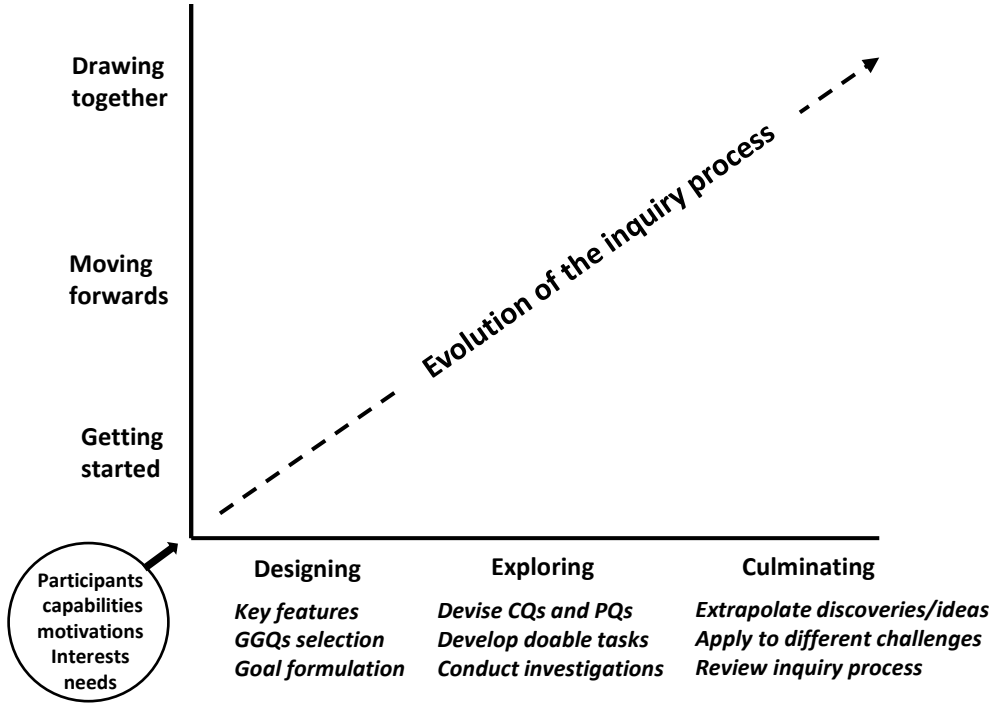
Iterative process

Collaborative communities often benefit from a structure to perform an inquiry. An iterative process, as distinct from a lock-step mechanism, which moves forward in a definite direction is required. The three phases – getting started, moving forwards and drawing together – form a flexible structure that facilitates critical and creative thinking implicit in the exploration of diverse thoughts and possibilities for action.

These 'performances' reflect engagement in purposeful work by doing and interacting with colleagues. Quite different from 'activities' which have a life of their own and can easily become 'busy work' that lacks a sense of direction or purpose.

Negotiated process

The performance processes are based on the premise that they are negotiated at age-appropriate levels with participants across three phases in an inquiry. The first phase is concerned with setting the scene and identifying the goals for inquiry. The second phase focuses on question framing to translate the content and context of the inquiry into doable investigations. The third phase centers on extrapolating what has been discovered or learnt, determining the degree to which the original goals have been achieved, and reflecting on the quality of the inquiry processes employed.



Natural process

Going backwards and forwards between phases within the structure of an inquiry is almost inevitable. It is part of a 'natural attitude' to refine and critique the quality of 'the action' and decide 'where to next'.

If dialogue is a primary means through which people learn and challenges are addressed, collaborative communities of learners, or groups of learners in many school settings, become 'hubs' for question-led inquiries.

The composition of the 'hubs' can be dynamic, not static. With a continuous process of grouping and regrouping participants based on need, performance, motivation, emerging requirements, and the overall evolution of the inquiry in which they are engaged.

Evolving processes

Collaborative inquiry as an iterative process with a clear sense of direction

Structured development of inquiry and sensemaking *An iterative process, not a lock-step mechanism.*	
Getting started formulation	**Positioning performances** - focus on prior learning, knowledge, experience, and interests, and on aspects of challenges that need to be explored or considered. **Opening performances** - select a few relevant GGQs, together with goals for inquiry associated with them, and develop shared understandings of what they mean.
Moving forwards enactment	**Design performances** - devise CQs, and PQs if necessary, for selected GGQs, prioritizing and translating them into practicable inquiries that contain realistic tasks. **Exploring performances** - conduct investigations customised to the demands of the design tasks, the capabilities of individual participants, and their expressed interests.
Drawing together reflection	**Culminating performances** - build on inquiries by extrapolating what has been discovered to different contexts and to new or emerging challenges and so doing by diverse means. **Reviewing performances** - backtrack to the initial questions and goals for an inquiry to determine what has been achieved or needs to be addressed, and where to next.

Engaging in two-cycles

Constructing inquiries in two-cycles promotes inventiveness

Transformative process

Inventiveness is a process through which ideas, imagination and creativity are transformed into innovative ways of responding to challenges and problems**.**

The process has two distinct cycles-

- 'Discover and design'

evolving into

- 'Develop and enact'.

These cycles represent a strategic process that provokes inventiveness.

Each cycle in the double diamond diagram that follows involves a continuous process of opening-up and closing-down to explore, envisage and assess ideas and possibilities**.** The whole process is dynamic and in a continual state of flux.

Broad application

A two-cycle inventiveness process is not confined to scientific and technological innovation. It is equally valuable when writing a book, composing a piece of music, solving an everyday problem, developing a business enterprise, painting a picture, creating a drama, or even quietly reflecting on experience.

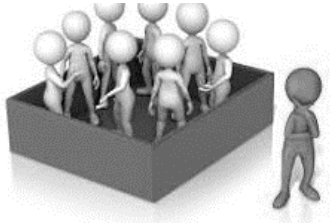
In each case, the outcomes may be unique, or they may be innovative improvisations and transformations of current or previous ideas and practices.

Strategic inquiry – cycle 1 – design and discover

In cycle 1, the focus is on the generation of ideas and practices that address the key features of a challenge with GGQs, CQs and PQs question frames driving the process. As thoughts and possibilities are uncovered, created, and appraised, connections and associations are made in people's minds.

'Curious connections' are constructed with their functional value and intent related to and emerging from the substance of the inquiries in which people are engaged. They embody a sense of practicability that is beyond passive linkage. They enable-

- Order to be created out of disorder.
- Intention to be balanced with perceived value.
- Comprehensible mental images to be created.
- Simple and complex clusters of sense to be framed.
- Understanding and insight to be deepened.
- Imaginative thoughts and ideas to be networked.
- Inventive thoughts and processses to be generated.



Outside the box?

Structure inquiries in two synergistic cycles

Strategic inquiry - cycle 2 – develop and enact

Dialogue around different 'curious connections' reveals congruences, dissonances and possibilities. These conversations reach maturity when the relations between them become sufficiently aligned to form strategic designs that have opportunities and potential for application.

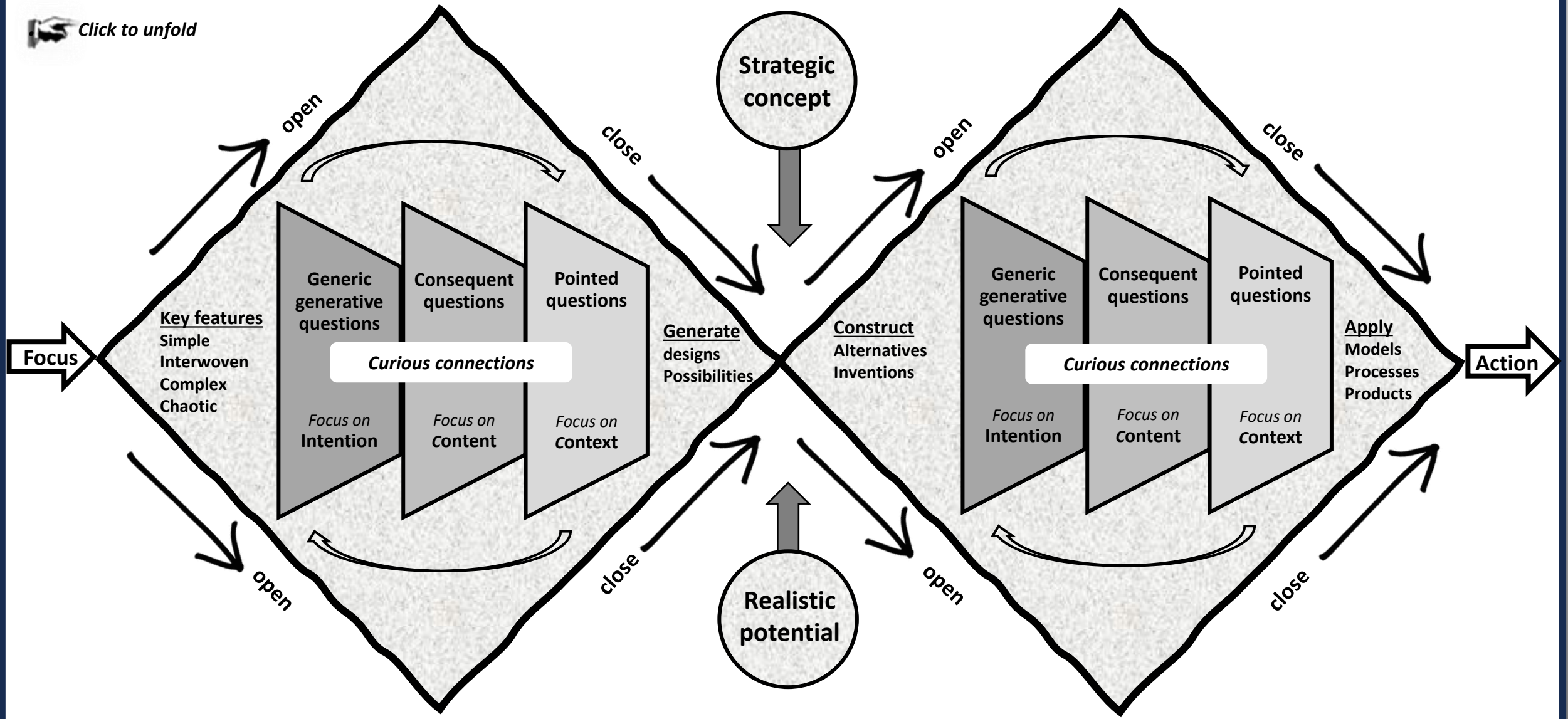
At this point, the envisioning process is ready to move on to cycle 2 – 'develop and enact'. A process like that in cycle 1 evolves, except the focus is on exploring alternatives that lead to practicable actions and solutions. A new or modified set of GGQs, CQs and PQs often evolves to drive the refocused process.

Question-led inventiveness

A two-cycle process of thought and action

Melvin Freestone
www.questionledlearning.org

Click to unfold



Discover and Design
Cycle # 1

Develop and Enact
Cycle # 2

Back

Interacting elements

Thought, action and dialogue led by curious questions

Curious enterprise

GGQs act as drivers of curious inquiry. They encompass and frame the 'ecology' of a challenge. The set of twelve, outlined previously, indicate potential directions an inquiry might take in addressing a specific challenge. Those selected reflect its nature and demands as well as the predispositions, perceptions and motivations of participants.

In contrast, questioning focuses on detailed issues or aspects of an inquiry. They are 'tactics' that aid, indeed incite, exploration and investigation. They range from simple to complex depending upon the nature of the tasks involved and stage(s) an inquiry has reached. Indeed, the clusters outlined in the circular diagram that follows represent increasing levels of cognitive demand.

Collaboration is at the heart of dialogue. Without it curious inquiries can become sterile and limited in their scope of imaginative and creative thinking. As is shown in the circular diagram the dialogical strategies are enormous. They, and others, can be employed singly or in combinations.

Especially if respect is afforded to past and present cultural activity as well as attention given to future potential and possibilities.

Hackneyed word

In education 'integration' has become a malleable word, because it is used to describe a multitude unrelated or different topics. Here it refers the synergistic linkage between questions, questioning and dialogue in addressing challenges and undertaking inquiries. As a 'job lot' the three elements energize curiosity and inventiveness.

Very different from when the word is used to describe interconnected subject matters embedded in an investigation. In real-life situations, subject matters are usually 'integrated', seldom isolated into 'silos' (subjects in educational circles). Hence, breaking challenges into subjects to be dealt with independently can easily detach them from everyday reality.

Question-led inquiries need to employ, and develop, the disciplines of knowledge and experience that have been distilled by humanity from historical times to the present day. Each of these disciplines has characteristic intentions, concepts and processes. They facilitate curiosity and its partner question-led inquiry.

Disciplined, synthesizing, creative, respectful and ethical minds are much more than agglomerations of subject matters. They spawn and integrate knowledge and understanding.

Working synergistically

Useful language

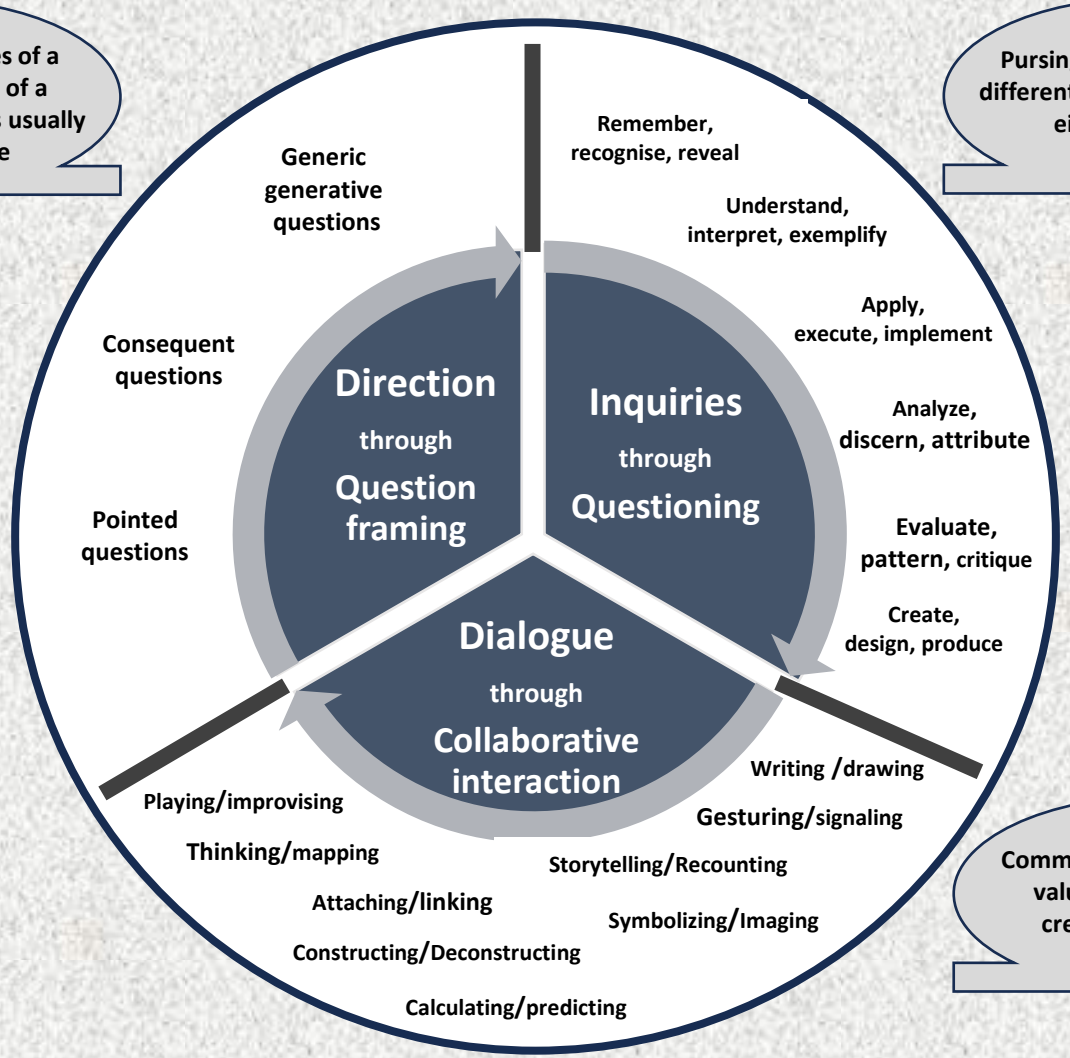
Words like - ***could, might, should, can, would… –*** are useful when framing questions, especially CQs

Incorporation of **'if'** can also be helpful when framing questions.

> ***If*** - <u>proposition</u> - ***would, could, should , why, how, when etc.*** - <u>outcome</u>***?***
>
> ***Or***
>
> ***Would, could, might, should , why, how, when etc.*** - <u>outcome</u> - ***if*** <u>proposition</u>***?***

Traditional question stems like - ***why, what, how, where, when, who… –*** also have value and can often form a bridge between questions and questioning processes

Once the key features of a situation or context of a challenge are clear, it is usually best to start here



Pursing investigations with different focal points in mind – either singly or in combinations

Communicating, thinking and valuing through critical, creative and inventive thinking

Scaffolding inquiries

Question-led scaffolding of learning processes

Scaffolding learning

If language requires structure, development of question-led learning might also be aided by a flexible yet coherent architecture. Four elements –

- ***Situation analysis***
- ***Question framing***
- ***Iterative structures***
- ***Practical inventiveness***

form a doable design for scaffolding inquiries. The process is iterative, not a recipe or a mechanism.

Scaffolding culture

"The role of a creative person *(edit)* is not to have all the ideas; it's to create a culture where everyone can have ideas and feel that they're valued."

And

"If you're not prepared to be wrong, you'll never come up with anything original."

Sir Ken Robinson

Situation analysis

Investigating key features of the context of an inquiry is not in the same mindset as defining the conditions surrounding a curriculum or an education program.

Instead, the purpose is to inform the situated inquiries at hand through the engagement of teachers and learners, and others, in designing and enacting the inquiry processes from the start.

Beware of getting bogged down in never-ending analyses. Keep it to the 'key features' that describe the scope and limits of the challenge or scenario at hand.

Question framing

As has already been emphasized, a crucial issue in framing questions is to distinguish between questions which direct inquiries and questioning which is a tactical means for enacting investigations.

While the development of inquiries needs to go where discoveries and actions lead, it is not a laisse-faire process where anything goes. Incorporating question frames into a comprehensive scaffold adds coherence and purpose to inquiries.

GGQs, CQs and PQs properly enacted represent a frame that gives inquiries structure and direction.

Iterative structures

Question-led inquiries are different from other approaches to scaffolding in education by being structured and constructed around questions, not content requirements. Especially if the questions posed originate from learners and drive their learning.

Knowledge, imagination and creativity are key to the whole enterprise. They need to be given ample time to grow, develop and flourish. Pushing too hard or too fast can be counterproductive.

Practicable inventiveness

Embedding 'practicable inventiveness' within a scaffolding strategy is based on the two-cycle discipline for inventiveness described previously. The cycles dovetail into each other, with the touchstone for movement from one to the other being the evolution of designs which have practicable potential.

Strategic movement between the two cycles helps to bring theory and practice together in creative ways.

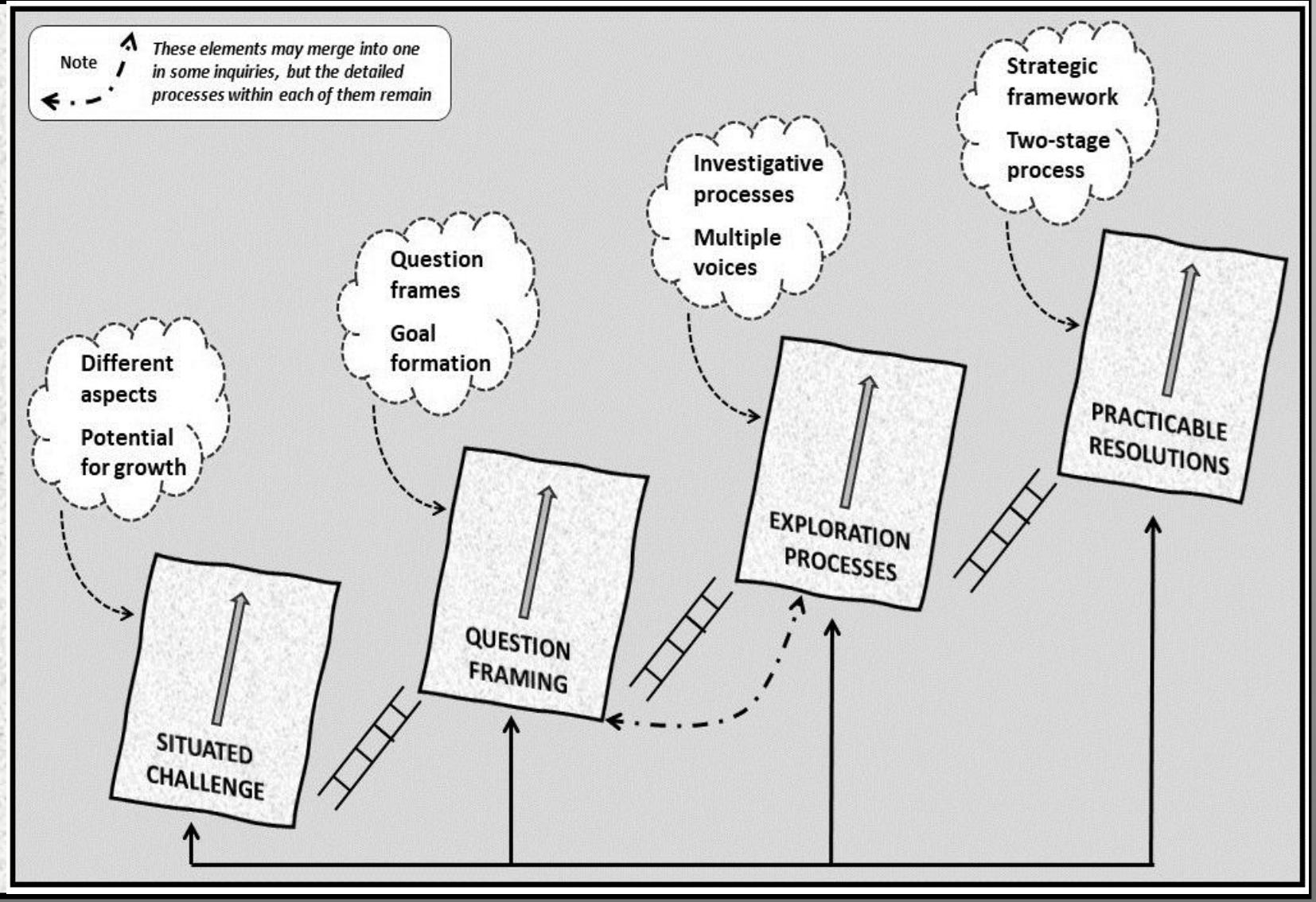
'Practicable inventiveness' – implies shifting endpoints without needing deterministic solutions. Yet movement between 'discover and design' and 'develop and enact' creates conditions for transforming explorations into actions.

Structuring curiosity

A flexible structure that aids coherence and purposefulness

Four
iterative phases
evolve
as curious inquiries proceed

Learner's questions are what really counts
Teacher's questions facilitate learning



Handling dilemmas

Question-led programs need to balance learner's needs with learning requirements

Issues

At times educational discourse seems to be full of dichotomous arguments that entice yes/no decisions. Perennial 'chestnuts' include-

- Skill development versus inquiry learning
- Mixed ability groupings versus streaming
- Horizontal versus vertical communities of learners
- Behavioural objectives versus process approaches to learning
- Prescription versus negotiation with learners
- First-hand experience versus second-hand learning from others
- Learning as enlightenment versus utilitarian competency

These polarities often seem to make taking sides attractive. Yet, depending upon need, circumstance, intention and motivation, desirable resolutions often lie somewhere in between these extremes.

When conversations explore and reveal diverse possibilities, the trap of being seduced by false dichotomies is more likely to be avoided. With nuanced, innovative and practical resolutions discovered and enacted.

Dialogical

ways

Choices

Balanced thoughts, actions and judgements are not a smorgasbord of options or a laissez-faire paradise.

Nelson Mandela sets the scene.
"May your choices reflect your hopes, not your fears."

Henry Giroux identifies the context.
Knowledge is power, and education is the means to empower individuals.

Karen Glass provides a warning.
"Educational trends and fads tend to drive the practices of teachers and schools, making education seem like a frantic pursuit to keep up with something new.

Dialogical

means

Learning programs

Four interdependent and synergistic elements are inherent in a balanced education program.

- **Interdisciplinary inquiry** – where learners encounter established disciplines of mind and fields of knowledge and experience. In so doing they acquire and create knowledge through inquiry
- **Autonomous studies** – development of enabling capabilities and skills require continuing autonomous study. They cannot be left to chance and need ongoing development.
- **Special needs** – where the diverse learning needs of individual learners and groups of learners are addressed. With customised and personalised programs devised to meet the aspirations and circumstances of different learners.
- **Special interests** – where personal talents, needs, predispositions, concerns and curiosities are identified and given expression. With opportunities provided for them to develop in established as well as unique ways.

Collaboration

To establish a collaborative environment where co-design and co-construction can flourish.

- Build a climate that will create a community of inquiry.
- Establish critical dialogue that will support systematic inquiry.
- Nurture a sense of community through expression of group cohesion.
- Encourage and support the progression of inquiry through to resolution.

To resolve dilemmas encountered devise strategic agendas that incorporate a set(s) of evolving processes.

- Establish short term goals together with longer-term intentions
- Research the situation and context to identify key features
- Negotiate a set of agreed principles to guide action
- Explore different possibilities and alternatives
- Decide on the 'best' course of action
- Review the ideas and practices that are enacted against initial intentions
- Determine any modifications and improvements that maybe required.

Balancing the ledger

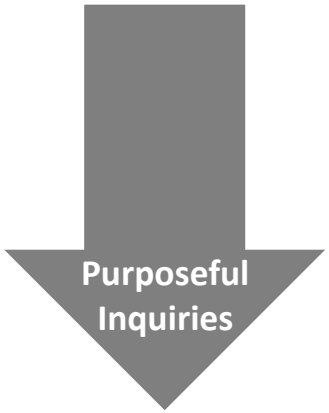
Balancing learners' needs with learning requirements

Deep understandings

Deep understandings embody 'big ideas' that can be applied across different fields of knowledge and experience as well as concepts derived from one or a few fields.

Capabilities needed for specific inquiries, for example digital skills or concepts of percentage, may need to be developed and applied as a question-led inquiry unfolds.

Knowledge and capability are partners in learning.



Deep
Understandings
Broad and generative
Trans-disciplinary
Multiple contexts
Integrated learning
Modular studies

Balanced learning
Continuous development of deep understandings and enabling capabilities

Enabling
Capabilities
Specific knowledge and skills
Targeted learning
Narrow focus
Autonomous delivery
Continuous programs

Enabling Capabilities

Enabling capabilities, for example the capacity to read or computation in mathematics, can not be left to chance. Explicit, coherent and sequenced programs are necessary.

That said, they are best developed through a question-led approach, as distinct from on overdose repetitive exercises.

Yet practice is important, for example in spelling words accurately, but it needs to be used wisely on an 'as needs' basis.

Ongoing assessment

Assessment of need and performance is an integral part of question-led inquiries

Purposes

Assessment is a process of acquiring information and making judgements about learning. It includes.

- Assessment **As** learning which is an integral part of ongoing question-led inquiries
- Assessment **For** learning which focuses on progress and what needs to be done or learnt next
- Assessment **Of** learning which is concerned with identifying and reporting on achievements

While once-off tests may give an estimate of performance against recognized benchmarks at a given moment in time, assessment is a continuous part of learning and teaching.

Assessment assists learners and teachers

- to make judgements about progress and achievements,
- to evaluate the effectiveness of programs and inquiries, and
- to make decisions about future action.

Interpretation

Evidence across the three purposes (As, For and Of learning) needs to be patterned for each learner or group of learners. The patterns that emerge give a picture of progress and achievement over time.

- The cascading movement upwards through zones of proximal development (ZPD) in the diagram that follows bespeaks increasing internalization of intelligence.
- Depth of learning encompasses four levels of sophistication labelled – descriptions, explanations, interrelations and extrapolations
- 'Cycles of learning' within each level signify growth in understanding from simply recognising different aspects of issues and ideas to understanding relations among them.
- The horizontal spiral at each level of sophistication describes movement from enactive or action-based activity to iconic or image-based exploration to symbolic or language-based performance.

This process yields profiles of individual and group performance and attainment.

Evidence

To be authentic and reliable, assessments need to be based a broad range and a continuous flow of evidence. This can come from many sources. For example-

- Portfolios of work
- Data from conferencing
- Peer feedback
- Performance results
- Anecdotal records
- Discursive writings
- Conferencing feedback
- Photographic records
- Multimedia presentations
- Metacognitive perceptions
- Talents expressed
- Story telling or retelling
- Multimedia storyboards
- Self-assessment
- Test data

The evidence needs to be comprehensive and collected over the life of an inquiry. It should genuine, not contrived, with ownership of different items respected and people protected from undue exposure.

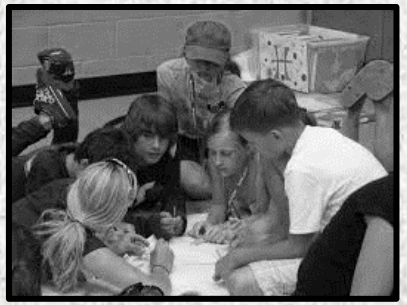
Standards

Identifying and determining standards of performance and achievement are demanding and often contentious issues. Deciding on the focus is the first step. For example-

- What is worthy of understanding and requiring of action?
- What might be evidence for different performances?
- What learning experiences and teaching might promote understanding, interest and excellence.

Once the scenario for assessment is clear, standards of achievement can be ascribed by observing progress in terms of-

- Recall and reproduction
- Development of skills and concepts,
- Growth in strategic thinking,
- Expansion of imaginative and innovative ideas and practices.



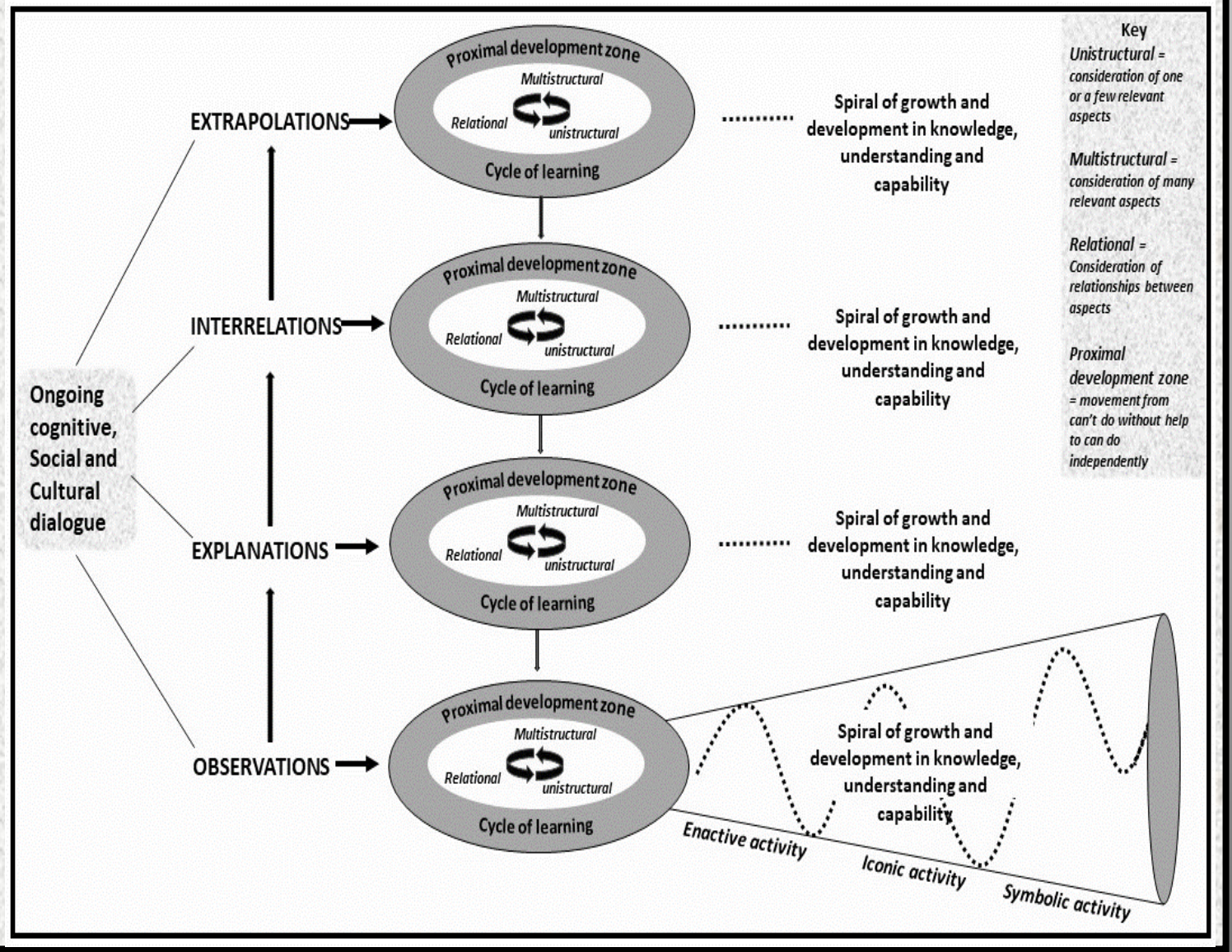
Appraising performance

Assess the quality of learning by three interconnected and interdependent means.

1. **Increasing sophistication** - learning from observations, to explanations, to interrelations to extrapolations.

2. **Cycles of learning** – uni-structural, multi-structural, and relational – within each of the above levels of proximal development

3. **Activity growth** - expanding sophistication from hands-on to image-based to symbol-based learning



Reporting progress

Recording performance needs to support question-led learning not hinder it.

Scenario

In Australia as in other OECD countries the emergence of prescriptive curriculum texts has been accompanied by extensive requirements for assessment and reporting. A snapshot from one state authority illustrates the scope of the task.

- School reports show how well your child is achieving in the Australian Curriculum for their year group.
- School reports are based on a wide range of evidence the teacher collects across the year.
- The 9-point scale shows more specifically where your child is at with his or her learning.

These requirements are linked to the national Australian curriculum and the standards within it. The National Assessment Program in Years 3, 5, 7 and 9 includes.

- An annual standardized test in Literacy and Numeracy (NAPLAN) for all learners, and
- Planned three-yearly sample assessments in science literacy, civics and citizenship, and information and communication technology (ICT) literacy; and communication literacy.

Assessment and reporting are thus demanding tasks, which some people say create almost impossible workloads for teachers and schools. An unbalanced amount of time can easily be taken away from the main task of teaching. In many situations the curriculum has narrowed with much teaching to standardized tests aimed at trying to increase test scores.

Challenge

This scenario presents a provocation for teachers and schools to find ways to enact the sentiments that follow.

- "Things are tied up in a system that is not able to be flexible enough for teachers". (Sahlberg)
- "Teaching is the art which expresses in a form accessible to learners an understanding of the nature of that which is to be learned". (Stenhouse)
- "The ultimate aim of education is to enable individuals to become the architects of their own education and through that process to continually reinvent themselves". (Eisner)

Question-led learning is a creative process not a mechanism to be administered.

Possibility

The visual that follows is a means of summarizing progress in learning. It provides a simplified, non-mechanistic approach to reporting on question-led inquiries. It pictures progress in terms of key criteria with relative performance represented on a seven-point scale of increasing depth and sophistication in learning.

These criteria maybe be derived from the demands and requirements of specific challenges, or they may come from outcome statements in curriculum texts, or both. They represent a selection of learning outcomes for assessment of and reporting on an inquiry or a series of inquiries.

The design of the visualization can also be used to map the key elements in a program or unit of study from a provision of learning experiences perspective. That is, as distinct from a learning outcomes viewpoint. The gradations could represent the relative significance and emphasis of specific intentions and goals embedded in teachers plans.

When these visual maps are juxtaposed for individual learners and groups of learners a **diagnostic picture** of progress and where to next emerges.

Authenticity

Evidence of progress needs to be broad and comprehensive. This means collecting samples of wide variety of each learner's work. Once to hand 'on balance judgements' across a range performances are more reliable than a selection of the best ones.

Collections of learner's work can have two related yet distinct purposes. To record-

- Progress where patterns of growth are key
- Achievements where judgements are key.

If these **records of development** or **records of achievement** respectively are to be doable learners need to take responsibility at age-appropriate levels for collecting and culling their own work. These experiences are valuable in developing learners' self-appraisal capabilities.

Visualizing progress

A large volume of words is surplus to requirements

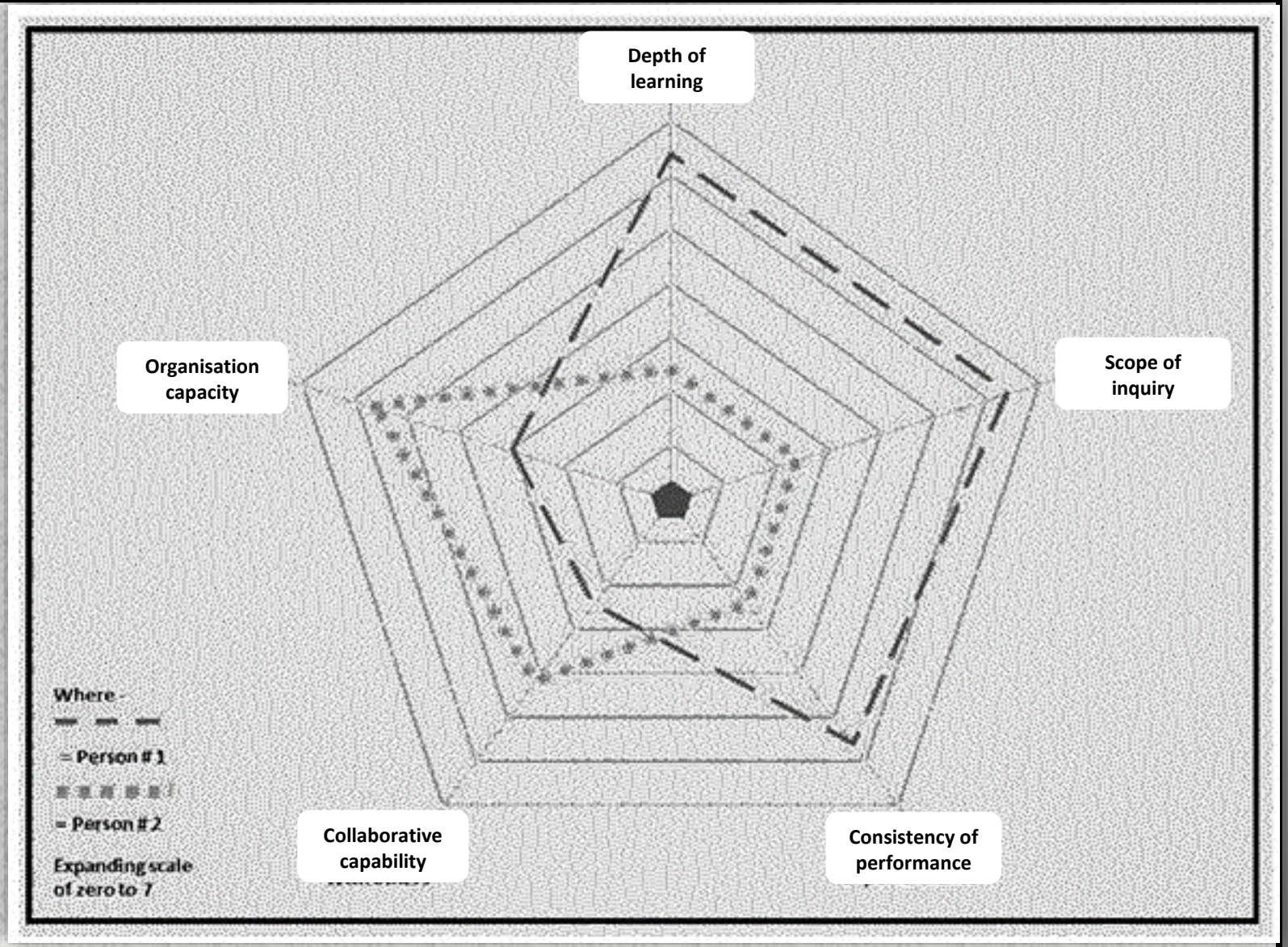
Progress at a glance

Derive a 'picture' from three types of assessment

- **Assessment <u>of</u> learning which is achievement orientated**
- **Assessment <u>for</u> learning which is diagnostic in intent**
- **Assessment <u>as</u> learning which is integral to inquiries undertaken**

The patterns of growth for person 1 and 2 differ over a seven-point scale. With each aspect (indicative only) – depth, scope, consistency, collaboration, and organisation – to be assessed around specific criteria.

Portfolios of learners' written, graphical, pictorial and multimedia work etc. inform the construction of summary pictures.



Promoting deep learning

Maturation of thinking and dialogue in question-led inquiries

Maturation

The development of personal knowledge can be seen as maturation from simple to complex thinking, and movement from certainty to uncertainty in dialogue.

The depth of thought, learning and action can be described in terms of – growth from developing insight, to improving insight and to maturing insight. Each of which has a characteristic set of performance features.

Playful dialogues provoke maturation from simple to complex and from certainty to uncertainty. They precipitate a spike of mental energy.

Assessing the degree of maturation sheds light on where learning has reached and helps to identify where to next.

THINKING

Complex understanding

Maturation

Simple understanding

Functioning	Characteristic processes
Maturing Concern for **Complexity**	**Features** ▪ Possibility - potential and alternatives ▪ Nuance - peculiarities and refinements ▪ Flexibility - personalised and customised
Improving Concern for **Judgement**	**Features** ▪ Reliability – measured and balanced ▪ Dissonance – collaboration and difference ▪ Predictability – assumptions and probability
Developing Concern for **Technicality**	**Features** ▪ Reason – analytical and logical ▪ Coherence– limits and confines ▪ Order – structured and ordered

DIALOGUE

Increasing uncertainty

Maturation

Apparent certainty

Applications

An air of puzzlement fuels motivation to discover new horizons. The ensuing reasoning provokes maturation in thinking and dialogue.

The differentiations in the table can be used for several purposes

- For self-reflection and metacognition
- For determining the degree of sophistication of the conversations among a work group or taskforce
- For assessing the depth and potential of the discussions inherent in the design and enactment of projects

Perceptions of reality differ and when different conceptualisations are shared people and societies become enriched.

Monitoring sophistication

Maturation of thinking and dialogue is joint enterprise

Review maturation in learning from two perspectives.

- Movement from simple to complex
- Movement from certainty to uncertainty

The depth of thought and action can be described in terms of

- Developing
- Improving
- Maturing

Each of these has a characteristic set of performance features (as is outlined in the diagram).