NAVIGATE COMPLEXITY

SHORT COURSES IN COMPLEX PROBLEM SOLVING AND STRATEGY & DESIGN FOR COMPLEX CHALLENGES

The 21st century is throwing us many challenges, both entrenched problems and exciting opportunities

But many of these challenges are complex – dynamic, uncertain, interconnected and interdisciplinary, and our traditional, linear methods of problem-solving are no longer sufficient. We need..

.. A NEW APPROACH, AND PRACTICAL TECHNIQUES FOR THINKING ABOUT AND DEVELOPING INNOVATIVE STRATEGIES FOR COMPLEX CHALLENGES

by **Ponder.**

Contemporary Thinking For Complex Challenges

ONLINE early release now available

www.ponder.online
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“All life is problem solving.”

Sir Karl Popper

Complex Problem Solving

by **Ponder.**

Contemporary Thinking For Complex Challenges

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It's not easy to achieve outcomes in a world where things are interconnected in messy, dynamic and often counter-intuitive ways, where ideas are contested and the future is uncertain.

Without effective ways of grappling with complex challenges, we end up with wasted time and money as we figure out what to do, unintended consequences, and perhaps worst of all, little or no progress towards alleviating entrenched problems, and, missing the exciting opportunities.

That's why organisations such as
The World Economic Forum and the OECD cite complex problem-solving as the most important skill we need this century*.

But what are complex problem-solving skills? Often we hear of the need for longer-term thinking, strategic and creative approaches, learning and adaptability, innovation and resilience, taking an inter-disciplinary and collaborative approach. And we agree. But there is not much *practical* guidance on how, exactly, we should do these things on a day-to-day basis. What does it actually mean to think strategically? What do we need to actually *do*, to think creatively and more deeply? To be agile and resilient? To do 'learning and adaptive' design?

we believe there is a huge opportunity to make more progress with the challenges of the 21st Century by making complex problem-solving skills more accessible, tangible, systematic and practical.

It's the gap our *20 Questions* aims to fill. There is a pattern to the questions we should ask ourselves when problem-solving is complex and difficult to navigate. We've captured that pattern as

20 Questions for complex problem solving and strategy development (and practical techniques to help answer them).

The *20 Questions* don't give you the answers or do the thinking for you, but they prompt you to think about the most important things you need to think about when designing a strategy or solution for a complex challenge. And, the practical techniques we teach, help you to do that thinking and answer each question.

The techniques draw on a range of proven and trusted disciplines such as engineering design principles and logical reasoning, as well as emerging and influential disciplines such as behavioural insights and complexity science. They also embed higher-level thinking skills such as strategic thinking, systems thinking, critical thinking, creative thinking, design thinking, structured and analytical thinking and futures thinking. So that if you are asking (and answering) the 20 Questions, then you are complex problem solving.

The *20 Questions* bring structure to a messy issue, and help you to generate insights, to assess ideas, to provide guidance, direction and feedback to others, and above all, help you to take a rigorous approach to help bring about better outcomes.

We think the complex problem solving skillset provides essential, life-long skills for pretty much everyone, from students and the most junior analysts, to our most senior decision-makers.

For more information on the seminars and workshops we run, or, for help applying the concepts and techniques to the challenge you are working on at the moment, call us, or visit our website.

Complex challenges require contemporary thinking.

WEF: https://www.weforum.org/agenda/2016/03/21st-century-skills-future-jobs-students/
OECD: http://www.oecd.org/edu/the-nature-of-problem-solving-9789264273955-en.htm

World Economic Forum

Top 10 skills

in 2020	in 2015
1. Complex Problem Solving	1. Complex Problem Solving
2. Critical Thinking	2. Coordinating with Others
3. Creativity	3. People Management
4. People Management	4. Critical Thinking
5. Coordinating with Others	5. Negotiation
6. Emotional Intelligence	6. Quality Control
7. Judgment and Decision Making	7. Service Orientation
8. Service Orientation	8. Judgment and Decision Making
9. Negotiation	9. Active Listening
10. Cognitive Flexibility	10. Creativity

Source: Future of Jobs Report, World Economic Forum

OECD

…the world no longer rewards people just for what they know…but for what they can do with what they know. Problem solving is at the heart of this. …The skills considered most essential in our modern societies are often called 21st-century skills. Problem solving is clearly one of them.

Csapó, B. and J. Funke (eds.) (2017), ***The Nature of Problem Solving: Using Research to Inspire 21st Century Learning***, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264273955-en

I wonder if you would comment on what you see as the key workforce skills and capabilities that the APS needs to continue investing in ..?

Dr Jill Charker, Deputy Secretary, Department of Employment, Skills, Family and Small Business

Prime Minister's address to the Australian Public Service
IPAA,19 August 2019

Problem solving skills. That's the most important thing, because we're in the problem-solving business as a government. We're in the opportunity-taking business. And that requires complex problem solving skills that work across disciplines, that can see the full complexity of problems in one view and not just a bit of it. ... You get some problem solvers in a room, all sorts of good things happen.

Scott Morrison, Prime Minister of Australia

What is complex problem solving?

Complex problem solving is an approach for determining what to do, for non-routine, complex challenges which have high levels of uncertainty, because they change over time and are difficult to understand, predict, influence and control.

Complex problem solving is very different to the linear, step-by-step problem solving process most of us are familiar with. It's just no longer sufficient to do some research, identify and evaluate some options and make and implement a recommendation. The world is too dynamic, uncertain and interconnected for that now.

Complex problem solving is a dynamic, iterative, interdisciplinary and learning and adaptive approach to problem solving that allows for situations where we don't have all the information and where things change. It prompts us to test ideas, learn what works and what doesn't and refine our ideas, iteratively.

Complex problem solving is a skillset that draws on a rich range of ideas and techniques and embeds various higher-order thinking styles. It requires us to do problem solving activities concurrently and iteratively, rather than as 'steps'.

HIGHER-ORDER THINKING

These thinking styles are embedded in complex problem solving:

STRATEGIC THINKING
Deciding how to use available resources to achieve outcomes efficiently and effectively.

CRITICAL THINKING
Reasoned thinking to inform opinions, decisions and judgments, and, determining if the information we use for that purpose is relevant, accurate, timely, complete, consistent, fair and balanced, of sufficient breadth and depth, and supported with sound evidence.

DESIGN THINKING
An approach for achieving desired outcomes through an iterative and creative process of forming, testing and refining ideas and engaging stakeholders throughout the entire process.

CREATIVE THINKING
Forming original and useful ideas and insights.

SYSTEMS THINKING
Recognising that the world is comprised of interconnected things and how those things are interconnected determines outcomes.

FUTURES THINKING
Thinking about what might happen in the future, the implications should they occur, and what could be done now to mitigate the risks or amplify the benefits.

ANALYTICAL THINKING
Gathering information and inquiry to help understand and explain things.

STRUCTURED THINKING
Organising information in a way to facilitate planning, analysis and generation of insight.

FIVE COMPLEX PROBLEM SOLVING ACTIVITIES

These activities need to be done concurrently and iteratively:

BUILD A DEEPER UNDERSTANDING OF THE SITUATION
so what you do is an informed choice rather than a guess

(RE-)DESIGN THE SYSTEM AND RIGOROUSLY THINK IDEAS THROUGH
to achieve the outcomes we want effectively and efficiently, and to anticipate the unintended consequences

TAKE AN EVIDENCE-BASED APPROACH
to build a strong case for, and confidence that your ideas will work

WORK WITH UNCERTAINTY
so your strategy maintains its relevance in a dynamic and uncertain world

ENGAGE OTHERS
not because we're told we should, but because it's critical for success – to inform, test and build support for your ideas

20 QUESTIONS FOR COMPLEX PROBLEM SOLVING, STRATEGY & DESIGN

The 20 Questions (over the page) embed the higher-order thinking styles and help us to 'do' the five complex solving activities. So, that if you are iteratively asking and answering the 20 Questions, then you are complex problem solving.

NAVIGATE COMPLEXITY

20 QUESTIONS

FOR COMPLEX PROBLEM SOLVING & STRATEGY DESIGN

AND PRACTICAL TECHNIQUES TO HELP ANSWER THEM

Build a deeper understanding of the situation

so what you do is an informed choice rather than a guess

(Re-)design the system & rigorously think ideas through

to achieve the outcomes we want effectively and efficiently, and to anticipate the unintended consequences

Take an evidence-based approach

to build a strong case for, and confidence that your ideas will work

Work with uncertainty

so your strategy maintains its relevance in a dynamic and uncertain world

Engage others

not because we're told we should, but because it's critical for success – to inform, test and build support for your ideas

The 20 Questions are intended to be asked and answered iteratively and often concurrently. The same 20 Questions should be asked at all stages of problem-solving or strategy development, because what changes over time is the emphasis given to each question, and the answers, as you learn things and refine them.

Not shown here are the practical techniques that help answer the 20 Questions. These are explored in-depth in our short courses.

1. **FRAMING THE PROBLEM & DESIRED OUTCOME**
   What is the issue? Why is it an issue? What is the outcome you want? What question are you answering? Why is this a problem? Why are you doing this?
2. **CONTEXT, CONSTRAINTS AND REQUIREMENTS**
   What are the political & policy context and what constraints and requirements does the strategy and solution need to satisfy?
3. **KNOWNS & UNKNOWNS**
   What do you know & what do you need to find out?
4. **NEVER MISS AN OPPORTUNITY TO LEARN AND GAIN INSIGHT**
   Really?, Why?, What's the 'so what'?
5. **UNDERSTANDING THE PROBLEM**
   What is the scale & nature of the problem? How has it been changing? Why is the problem occurring?
6. **THINK ANALYTICALLY**
   What structural changes to the system design could change its outcomes? What levers and courses of action could bring about the outcome(s) you want?
7. **THINK CREATIVELY**
   If you think about the problem and solution from different angles, what new and useful insights emerge?
8. **GOAL DESIGN**
   Have the goals, targets, KPIs and incentive structures been designed so they are aligned with, rather than distorting the system?
9. **ASSUMPTIONS AND NECESSARY CONDITIONS**
   What conditions need to be in place for the strategy to work? What assumptions have been made and are they being tested along the way?
10. **PEOPLE AND BEHAVIOURAL INSIGHTS**
    What factors influence what people think and do in this context? What unconscious biases might be influencing yourselves and others?
11. **CONSEQUENCES**
    How could this idea play out? What are the costs, benefits and potential unintended consequences?
12. **TRADE-OFFS**
    How will we balance feasibility, affordability, outcomes and externalities? What are the trade-offs?
13. **INTEGRATION & IMPLEMENTATION**
    How will this work in practice? What needs to be done to put it into practice?
14. **STRATEGY LOGIC**
    How will the things you plan to do lead to the changes you want?
15. **POLICY RATIONALE**
    What are the reasons for thinking the idea will work? What are the counter-arguments? Are the arguments sound?
16. **DATA & INFORMATION**
    What information supports (and contests) the reasons for thinking your ideas will work? Is it sound?
17. **LEARNING & ADAPTIVE DESIGN**
    What works and what doesn't and why? How will you test your ideas and refine them based on what you learn along the way?
18. **AGILITY, RESILIENCE & INNOVATION**
    What might happen in the future that could impact this work? How will your ideas be resilient to threats and how will you be ready to pursue opportunities?
19. **INTER-DISCIPLINARY PERSPECTIVES**
    What are the inter-disciplinary viewpoints and why do people have those views? How will you have purposeful conversations in collaborative and/or contested contexts?
20. **COMPELLING COMMUNICATION**
    Are you explaining your ideas so they are understood by, and resonate with others?

Typically when a team gets together to work on a complex challenge, there is a period at the beginning where people feel overwhelmed. There can be indecision and sometimes disagreement about what to do. People bring their own knowledge, experience, mental models, language and opinions and it can be frustratingly difficult to reconcile all these into something useful and to make progress.

The *20 Questions* helps avoid all this by:

- providing a common approach, language and toolkit that sits across discipline-specific methods and knowledge. All team members understand and can contribute to the problem-solving process;
- giving teams useful things to do and think about from day 1 so no time is wasted;
- prioritising effort in a way that brings about progress over time;
- giving structure to messy issues;
- providing team leaders a framework for providing guidance, direction and feedback to teams;
- delivering a better outcome from the project because less time is wasted, and knowledge and time is used productively, effort is focused, and the approach used has been rigorous and robust.

"The most valuable people are the ones who can turn their minds to anything."

Kathryn North, Director, Murdoch Children's Research Institute

THE REAL BENEFIT FOR INDIVIDUALS AND TEAMS IS THAT THESE IDEAS ARE AN ENABLER – THEY HELP PEOPLE TO MAKE MORE PROGRESS, MORE EFFICIENTLY. INSTEAD OF 'MUDDLING THROUGH', THEIR WORK IS RIGOROUS AND PRODUCTIVE.

THE PROCESS IS BETTER AND THE OUTCOME IS BETTER.

AND THESE ARE VALUABLE LIFELONG SKILLS THEY CAN TAKE WITH THEM ANYWHERE.

Why take a Navigate Complexity short course?

Learn practical skills
Complex problem solving is a valuable lifelong skillset that you can take with you anywhere and apply to complex challenges of any nature, including public policy, organisational, business and social challenges. You will learn what complex problem solving means and practical techniques for doing it, including techniques for strategic thinking, critical thinking, creative thinking, systems thinking, futures thinking, design thinking and analytical thinking and structured thinking.

Better collaboration & teamwork
The course provides a common approach, language and toolkit that sits across discipline-specific methods and knowledge. All team members understand and can contribute to the problem-solving process
The course gives teams useful things to do and think about from day 1, so less time and money is wasted.

Have impact
The real benefit for individuals and teams is that these skills are an enabler – they help people to have more impact, more efficiently. Instead of 'muddling through' and wasting time and money, work is rigorous and productive. The process is better and the outcomes are better.

Be inspired
Throughout this course you'll explore some of the most interesting and valuable ways of thinking about the world that we've come across from many different sectors and disciplines. They will inspire you to think differently.
We hope you enjoy it.

NAVIGATE COMPLEXITY

Short courses in complex problem solving

face-to-face

workshops

Ponder.

Contemporary Thinking For Complex Challenges

www.ponder.online
navigatecomplexity.com

The *Navigate Complexity* short courses are jam-packed full of ideas. However, they are not technically demanding and they are all presented using plain English. They are designed to make the job of grappling with a complex challenge easier, not harder. They are full of real-world examples, stories, fun quizzes, prizes (books on important topics) and interactive activities.

Please contact us for pricing information as this varies according to duration of workshop, number of participants, and number of workshops. Significant discounts are available for the public sector and education sector.

The *Navigate Complexity* short courses can be delivered in person to groups in workshop format. The short course has been designed to be very modular so that there is flexibility in delivery:

Face-to-face workshops can be delivered as:

- **Overview courses:** either half or one day
- **The full short course** on complex problem solving and strategy (policy) development can be delivered over 2-5 days (or as a series of half days etc.) This option allows groups to work through several examples and to apply the ideas and techniques to the challenge they are working on.
- **Stand-alone modules** (ranging from 1 hour to 1 day). The modules can focus on:
  - Any of the higher-order thinking types:
    - Strategic thinking
    - Critical thinking
    - Systems thinking
    - Design thinking
    - Creative thinking
    - Futures thinking
    - Structured and analytical thinking
  - Any of the *20 Questions* (e.g. a module can be run on Framing the Problem and Desired Outcome (Question 1), or Behavioural Insights (Question 10), or Engaging Others (Questions 19 & 20).

Early release now available

by Ponder.

Contemporary Thinking For Complex Challenges

NAVIGATE COMPLEXITY

A short course in complex problem solving

online

Online learning

- On-demand and self-paced
- Suitable for individual or team-based learning
- Guidance for activity/experiential-based learning helps people to 'learn-by-doing'

40 modules each comprising –

- Multimedia video (5 – 29 minutes in duration)
- Activity/experiential-based learning guidance
- Case studies and examples
- Quiz
- Downloadable summary sheet
- References for further information

Approx. 9 hours video viewing time.
Extra time required for activities, quiz, and team-based work.

Other features

- Unique profile for every subscriber to track progress and mark favourites
- One-year access (with renewals available)
- Certificate provided on successful completion of the quiz questions
- Discounts for bulk subscriptions – please contact us

Learning Outcomes

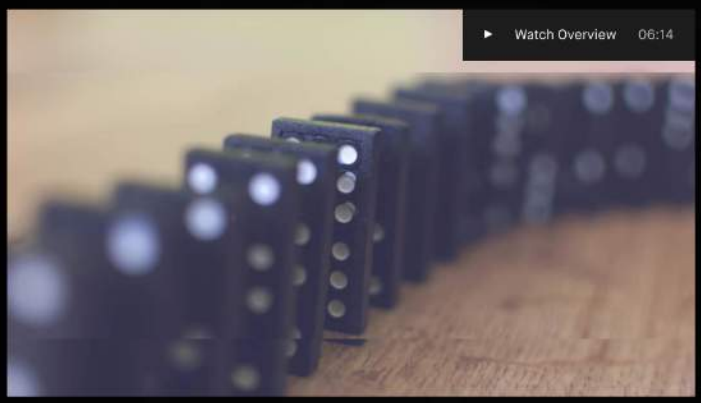
This course helps people to:

1. understand why our traditional problem-solving approaches are not effective for complex challenges;
2. identify complex challenges and recognise the characteristics that make a challenge complex
3. apply a conceptual framework for complex problem solving;
4. apply techniques to deepen their understanding of a problem in order to generate insight about what to do next;
5. apply techniques for designing strategies and solutions for bringing about desired outcomes;
6. apply techniques for taking an evidence-based approach;
7. apply techniques for working more effectively with the uncertainty of complex challenges;
8. apply techniques to engage effectively with others;
9. understand what is meant by higher-order thinking styles and apply techniques for higher-order thinking including critical thinking, creative thinking, strategic thinking, design thinking, systems thinking, analytical thinking and futures thinking

More detailed learning outcomes for each of the 40 modules are available – please contact us.

Contemporary thinking for complex challenges

A short course in complex problem-solving, strategy & design



40 Lessons
Each lesson contains a mix of a multimedia video (5-29 mins), case studies, examples, quiz, guidance for activity-based learning, downloadable worksheets and references

For Everyone
Enrol yourself, your team or your organisation. Relevant and valuable for everyone from students to senior decision-makers. No prerequisite knowledge needed

On demand
Learn when it suits you, at your own pace. Re-visit content as many times as you like. Subscription provides one year access which can be renewed. On completion, receive a Certificate

Sir Karl Popper
" All life is problem solving. "

OECD, The Nature of Problem Solving
" ..the world no longer rewards people just for what they know...but for what they can do with what they know. Problem solving is at the heart of this. ...The skills considered most essential in our modern societies are often called 21st-century skills. Problem solving is clearly one of them. "

Why take the course...

Learn valuable lifelong skills
..that you can take with you anywhere and apply to complex challenges of any nature, including public policy, organisational, business and societal challenges. You will learn what complex problem solving means and practical techniques for doing it.

Improve how you think
Complex problem solving embeds higher-order thinking skills including strategic thinking, critical thinking, creative thinking, analytical thinking, systems thinking, design thinking, structured thinking and futures thinking.

Have impact
The real benefit for individuals and teams is that these skills are an enabler – they help people to have more impact, more efficiently. Instead of 'muddling through' and wasting time and money, work is productive. The process is more rigorous and the outcomes are better.

Be inspired
Throughout this course you'll explore some of the most interesting and valuable ways of thinking about the world that we've compiled from many different sectors and disciplines. They will inspire you to think differently. We hope you enjoy it.

Find out more

Course outline

40 lessons - jam-packed with ideas, practical techniques, stories, examples, case studies, quiz questions, useful resources and guidance for learning-by-doing. Take a peek.

Part I — Complexity and the 21st Century
We'll explore why a growing number of people and organisations are citing complex problem solving as a necessary, if not the most-needed, skillset for the 21st Century. We explore what we mean by the term 'complex' and why our traditional, linear methods of problem-solving need updating

Part II — 21st Century Thinking Skills
A guide for higher-order thinking including strategic thinking, critical thinking, systems thinking, creative thinking, design thinking, analytical thinking, structured thinking, and futures thinking; and, a conceptual model for complex problem solving that embeds these higher-order thinking styles.

Part III — 20 Questions for Complex Problem Solving, Strategy and Design
A practical guide for complex problem solving based on 20 Questions that prompt you to think about the most important things you need to think about when grappling with a complex challenge, and, importantly, practical techniques to help you do that thinking. Topics include: framing problems, knowns and unknowns, understanding problems, design, goal design, implementation, evaluation, unintended consequences, trade-offs, testing assumptions, data, evidence-based decision-making, stakeholder engagement, interdisciplinary approaches, listening and having purposeful conversations, and compelling communication.

View full course overview

Why we developed this course

The 21st Century is throwing us many challenges, both entrenched problems and exciting opportunities. But these challenges are increasingly complex and our traditional methods of problem-solving are no longer adequate.

That's why the World Economic Forum and the OECD have cited complex problem solving as the most important skill we need this century. However, it is a relatively new concept and (until now) there has not been much around on what it entails and how to do it.

We believe there is a huge opportunity to make more progress with the challenges of the 21st Century, by making complex problem solving skills more accessible, tangible, systematic and practical.

We think complex problem solving skills are essential, life-long skills for pretty much everyone, from students and the most junior analysts, to our most senior decision-makers across academia, public, private, and NGO sectors.

What is complex problem solving?

Complex problem solving is a dynamic, iterative, and learning and adaptive approach to problem solving that draws on a rich range of ideas and techniques for designing strategies to achieve outcomes for 'complex' challenges – challenges which have a high level of uncertainty, and which change over time, and because of this they are difficult to understand, predict, influence and control.

Read more

Learn as a Team

Complex problem solving skills are valuable lifelong skills for individuals, but there is even greater value when whole teams are aware of the ideas and can use the techniques together.

Better Teamwork
Provides a common approach, language and toolkit that sits across discipline-specific methods and knowledge. All team members understand and can contribute to the problem-solving process.

More Impact
Complex problem solving skills help to deliver better outcomes from projects because less time and money is wasted, knowledge and time is used productively, effort is focused, and the approach used has been rigorous.

Capability Development
Track your team members' progress through the course. Build valuable and transferrable lifelong skills in your people. Learn more about how team subscriptions work.

About the author and presenter

My name is Jane MacMaster and I am the founder and director of Ponder Enterprises – an organisation that works with the public sector, private sector, NGOs and academia to build complex problem solving capabilities and to help design strategies to achieve outcomes for complex real-world challenges. I designed an approach for complex problem solving after recognising a growing need for these skills and an absence of a practical model for teaching and 'doing' it. The approach brings together the rigour of aerospace system design together with insights from complexity science for coping with the uncertainty inherent in complex challenges, as well as many other useful ideas from a range of disciplines.

I spent the early part of my career working as an aerospace systems design engineer for a global defence company for 14 years, the middle part of my career as a senior policy advisor for government departments, including as a senior adviser in strategic policy unit of the Department of the Prime Minister and Cabinet for six years, and I've also worked as a management consultant in the financial services sector for two years.

A common theme throughout my career has been design and strategy development – how to achieve outcomes for different types of challenges ranging from public policy to technological challenges. Throughout this work I have seen many useful and practical ways of thinking about and developing effective strategies for complex problems, but they are scattered about, across various disciplines and sectors.

So, I set about researching, distilling, compiling and sharing a unique and useful collection of ideas and practical techniques for complex problem solving. These techniques are general and flexible so they can be applied to complex challenges of any nature.

I now share these ideas and techniques with public and private sector audiences, and help organisations to apply them to real-world challenges.

I think there is a huge opportunity to improve how we think about, talk about and go about addressing the most complex challenges of our time. I am passionate about sharing ways that we can do this.

Our clients include Commonwealth Government departments, including the Department of the Prime Minister and Cabinet, Department of Health, Department of Employment, Department of Social Services; State and Territory Government departments, including the Department of the Chief Minister, and the Department of Environment and Natural Resources (NT) and the Department of Premier and Cabinet (NSW); The National Security College; universities; NGOs and private sector organisations. Our work has spanned many sectors and disciplines including health, indigenous affairs, employment and the labour market, environment, immigration, regional growth, workforce and skills, disruptive technology, cyber security, refugees and population.

I have a Bachelors degree in Engineering from the University of Sydney, a Masters degree in International Relations and a Certificate IV in training and assessment.

Further information about my experience, background and qualifications can be found at my LinkedIn profile (link below).

Jane MacMaster
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THE COURSE HAS BEEN DESIGNED TO BE HIGHLY ENGAGING AND TO APPEAL TO MULTIPLE LEARNING STYLES. MANY STORIES AND EXAMPLES ARE EMBEDDED THROUGHOUT TO MAKE THE CONCEPTS AND TECHNIQUES TANGIBLE AND REAL…

What people have said about the face-to-face ***Navigate Complexity*** *short course*

"I wish everyone thought like this."
Policy Officer, NGO

"The best workshop I have ever been on"
Executive Director, State/Territory government department

"Aside from my Masters, this is the best training I've ever done."
Policy officer, State/Territory government department

"Why did we need to wait until third year to learn this? Everyone should learn this in first year"
Third year undergraduate university student

"We really enjoyed the workshop and a number of people said to me it was the best training they have ever attended!"
Director, Commonwealth government department

"You know, these 20 Questions really are very good!"
Deputy Secretary, central government agency

"Thank you, that was tremendous. And potentially life-changing."
Academic and educator, The University of Sydney

This is the most strategic workshop I have ever been on."
Policy Adviser, Commonwealth government department

"Love your work. Many thanks again."
Advisor, Commonwealth government department

"I couldn't fault it"
Director, State/Territory government department

Ponder.

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".. We're all hungry today for better answers, but first we must learn to ask the right questions."

Warren Berger, A More Beautiful Question

".. In recent years the themes and results of complexity science have touched almost every scientific field, and some areas of study, such as … social sciences, are being profoundly transformed by these ideas."

Complexity: A Guided Tour, Melanie Mitchell, p.300

"To [find effective policies] you have to think, to deliberate. …. To deliberate [well] requires a rich list of intellectual and practical virtues… Deliberation [and] thinking is not second best… it is what you have to do".

Evidence-based Policy: A Practical Guide to Doing it Better, Nancy Cartwright and Jeremy Hardie, 2012, p.158, 170

"Economists had found an almost one-to-one match Between PISA scores and a nation's long-term economic growth. Many other things influenced economic growth, of course, but the ability of a workforce to learn, think, and adapt was the ultimate stimulus package."

Note: PISA is the OECD's Programme for International Student Assessment that tests 15 year old students from around the world, not on competency against school curriculums, but how well they can apply their knowledge to real-life situations and be equipped for full participation in society. See http://www.oecd.org/pisa/aboutpisa/ . Source: The Smartest Kids in the World and How They got That Way, Amanda Ripley, p.24.

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short online course (beta): navigatecomplexity.com