

TABLE OF CONTENTS

FOREWORD by Cynthia A. Price, Esq.....	vii
PREFACE: Metacognition Finally Takes Centre Stage	ix
ACKNOWLEDGEMENTS: It Takes a Village	xi
INTRODUCTION: Noble Goals	xiii
CHAPTER 1: Curious Minds Inquire (IB Learner Profile – Knowledgeable/Inquirers)	1
TOK Connection: Knowledgeable Inquirers.....	1
A Tale: Analysis on the Brink of Genius	2
Research Discussion: Wonder! Question! Uncover!	4
Thinking Skill Rhyme: To Analyse Is to Take Apart	7
Real World: Inquiry	7
Academic World: Inquiry	8
Strategy: Archeology of a Wastepaper Basket.....	11
Three-Tiered Lesson: Analysis – Do! View! Construe Meaning.....	11
Transfer: Duplicates/Propagates	14
Closing: Curious Minds Inquire.....	15
CHAPTER 2: Confident Minds Risk (IB Learner Profile – Risk-Takers)	17
TOK Connection: Risk-Takers.....	17
A Tale: Here Ya’ Go, Doctor.....	18
Research Discussion: Growth! Guts! Grit!	18
Thinking Skill Rhyme: To Compare/Contrast Is Alike/Not Alike.....	20
Real World: Analysis.....	21
Academic World: Analysis.....	22
Strategy: Risky Business	22
Three-Tiered Lesson: Compare/Contrast – Do! View! Construe Meaning	23
Transfer: Replicates/Integrates.....	27
Closing: Confident Minds Risk	28

CHAPTER 3: Thinking Minds Connect (IB Learner Profile – Thinkers)	29
TOK Connection: Thinkers	29
A Tale: Crafting Connections or Misconceptions?	30
Research Discussion: Think! Link! Sync!	30
Thinking Skill Rhyme: To Infer Is to Read between the Lines.....	33
Real World: Inference.....	34
Academic World: Inference.....	34
Strategy: Bridging Snapshots	35
Three-Tiered Lesson: Inferring – Do! View! Construe Meaning	36
Transfer: Overlooks/Innovates	39
Closing: Thinking Minds Connect	40
CHAPTER 4: Reasoned Minds Resolve (IB Learner Profile – Principled)	41
TOK Connection: Principled	41
A Tale: Fire! Fire! Pants on Fire!.....	42
Research Discussion: Impulsivity, Delay, Reason	43
Thinking Skill Rhyme: To Evaluate Is to Judge	46
Real World: Evaluation.....	47
Academic World: Evaluation	47
Strategy: Aristotle’s Teaching.....	49
Three-Tiered Lesson: Principled – Do! View! Construe Meaning	52
Transfer: Replicates/Integrates.....	53
Closing: Reasoned Minds Resolve	54
CHAPTER 5: Decisive Minds Act (IB Learner Profile – Communicators)	55
TOK Connection: Communicate	55
A Tale: Do I or Don’t I? That Is the Question	56
Research Discussion: Determine, Decide, Do	57
Thinking Skill Rhyme: To Determine Is to Consider and Confirm	59
Real World: Determining.....	59
Academic World: Determining	60
Strategy: Determining Quick Wins.....	60
Three-Tiered Lesson: Determine – Do! View! Construe Meaning.....	61
Transfer: Replicate, Innovate	62
Closing: Decisive Minds Act.....	63

CONTENTS

CHAPTER 6: Mindful (Mirrored) Minds Reflect (IB Learner Profile – Reflective)	65
TOK Connection: Reflect.....	65
A Tale: Doing What’s Right, Getting it Wrong!	66
Research Discussion: Plan, Monitor, Evaluate	67
Thinking Skill Rhyme: To Clarify Is to Simplify.....	69
Real World: Clarify.....	69
Academic World: Clarify.....	70
Strategy: Turning Points and Defining Moments	70
Three-Tiered Lesson: Reflect – Do! View! Construe Meaning.....	70
Transfer: Overlooks/Innovates	72
Closing: Mirrored Minds Reflect.....	74
 CHAPTER 7: Global Minds Network: Generalise (IB Learner Profile – Open-Minded/Caring)	77
TOK Connection: Open-Minded/Caring	77
A Tale: “Wilbur, It’ll Never Fly.”.....	79
Research Discussion: Learn, Apply, Transfer.....	80
Thinking Skill Rhyme: To Generalise Is to Conceptualise.....	82
Real World: Generlisations	84
Academic World: Generlisations	84
Strategy: Moving Toward Open-Mindedness	85
Three-Tiered Lesson: Generalise – Do! View! Construe Meaning.....	87
Transfer: Replicates/Propagates	90
Closing: Global Minds Network.....	92
 BIBLIOGRAPHY	93

PREFACE

Metacognition Finally Takes Centre Stage

International Baccalaureate schools represent an inspired mission in intellectual inquiry. Grounded in the Theory of Knowledge, students are afforded a rigorous and, at the same time, noble path to discover not just what they know, but, more importantly how they know it. In their ongoing quest to understand how one knows what one knows, students are afforded a rigorously intellectual anchor for all their learning experiences, as they study, reflect and write constantly about various aspects of this enormously deep question.

Three Intersecting Observations

With that said, the inspiration for this book came from several sources that seemed to intersect in our lives at about the same time. Surprisingly, each, in its own way, was pointing us in the same direction: using metacognitive behaviours to enhance student learning. It's a logical focus for us as education writers, because we already believe that when students embrace metacognitive, reflective behaviours, and when practised effectively, consistently and with fidelity over time, they will internalise certain critical life skills. We believe that when practices in metacognition develop students' sense of agency, or control over their destinies, students become self-initiating, self-sustained, self-assessing and self-reflective.

Theory of Knowledge... or Not!

The first observation came about with our exposure to International Baccalaureate (IB) schools, and their students, in the US and abroad. Searching for the key to how one knows what one knows calls for students to become highly reflective and, definitely, metacognitive about their academic endeavours. Anecdotal evidence suggests that these students often do well with their assignments and assessments, but when asked about them will say, time after time, that they have no idea what the Theory of Knowledge means or why it is so important. This often-repeated observation of IB students intrigued us. The Theory of Knowledge is an intense, deep and enduring model that students are immersed into over several years, so how could they not know the “hows and whys” of what they were doing?

Intellectual Disconnect

The second observation involved an incident with a Year 7 student. As the student was leaving his Theory of Knowledge class, he described the robust discussion about examining one's thinking that he had just had as an "exercise in a vacuum of nothingness". His sentiments surprised us because his enthusiasm was real when he was in the moment, yet with his friends after class he seemed to want to diminish his role as a debater, or provocateur in the heat of an intellectual exercise.

Metacognition

Finally, the third observation that influenced our interest in what became "our IB mission", or what seemed to be an IB omission with students, was our revival of a past publication on metacognition. This was in response to a chart we had seen published about the high positive impact on learning when metacognition was employed. This, in addition to the realisation that the cost of such interventions was relatively low for an instructional initiative that had such high impact on student curiosity, learning, reflection and action, affirmed our drive to do this book.

The Thinking Person

This leads to a key component of the thinking person – the skill of being aware and in control of oneself. Metacognition heightens students' real awareness and measured control over their own thinking. While IB has enormous integrity as a staid and true model of learning – focusing on the nature of knowledge, and the discovery process of knowing how we know what we know – students may be oblivious to the critical concept of thinking about their own thinking. It is that phase in the maturing mind when complex skills of self-initiation, self-direction, self-examination and, above all else, self-reflection manifest themselves. These skills manifest as an authentic sense of self-agency, encompassing a true presence of self-awareness and a growing feeling of control and management of one's life journey.

CHAPTER 1

CURIOUS MINDS INQUIRE

(IB Learner Profile: Knowledgeable/Inquirers)

Curiosity killed the cat! And we'll leave it at that.

Driving Question: How is curiosity honoured, honed and heightened?

TOK Connection: Knowledgeable Inquirers

Curious minds inquire. And that is a fact. Students, who want to know about lots of different things, are always asking questions about this, that and the other thing. They are the epitome of Theory of Knowledge (TOK) learners, following the premise that simple acceptance of knowledge is not enough. Rather, through their incessant and persistent questioning, they can discover evidence that supports the information and convinces them of its true nature. While they certainly aren't fully aware of it, their questioning stance is their way of inquiring and digging deeper into ideas. In the end, perhaps unaware of their mission, it inadvertently helps them to define a context and develop a more elaborate understanding of their content knowledge through facts, details and peripheral data-driven information.

While curiosity is a known, natural human trait noticeably prevalent in the youngest of children, it seems to temper with age and schooling, and does not always continue to provide the drive that it did in those early years. Imagine a two-year-old and their insatiable curiosity as they travel around the room – touching, tasting and toying with anything and everything within reach. TOK attributes the seeking of knowledge as an admirable trait that defines sophisticated, complex and deep learning. One of the overriding goals of TOK is to coach and further develop this inquiry mode as part and parcel of life-long learning, and as a grounding from which to launch one's own take on the ideas.

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This leads to a key component of the thinking student, and that is the skill of metacognition. Metacognition is “the mind watching itself”, reflecting on ideas under scrutiny. It heightens students’ real awareness and control over their own thinking. While IB has enormous integrity as a staid and true model of learning, focusing on the nature of knowledge and discovering how we know what we know, students may, more often than not, be oblivious to the critical concept of thinking about their own thinking. As we noted previously, it is that phase in the maturing mind when complex skills of self-initiation, self-direction, self-examination and self-reflection manifest themselves. They appear in an authentic sense of self-agency; a true presence of self-awareness and a feeling of self-control.

A Tale: Analysis on the Brink of Genius

Genius ... can be defined as exceptional intellectual or creative power or natural ability and expertise in some other area.

Genius, as in the geniuses that host the Apple Genius Bar, can be defined as exceptional intellectual or creative power or natural ability and expertise in some other area. Creative genius seems to drift into a story Edward de Bono (1973) tells about how some targeted inquiry helped stakeholders delve into a situation and reflectively ask question after question in search of an acceptable response. In this scenario,

de Bono relates the conundrum of the owners of a brand new, fully occupied, high-rise office building. He describes the existing situation that has the tenants in an uproar. The occupants are complaining every day to the building manager that the elevators are too slow and they are outraged about the inconveniences this is causing. The situation has gotten so bad, the tenants have come together and filed a formal petition to the effect that the owners must do something to solve this problem or tenants will withhold their payments (Figure 1.1).

FIGURE 1.1: Tenant Meeting Notes

Questions were asked to determine what, when and how the owners might resolve the elevator problem. As reflective questions were posed, others would supply the answers.

1. **What is the problem?** Occupants are outraged about the elevators.
2. **How long has this been going on?** Since the building has been fully occupied.
3. **Who are the complainants?** Many, but more from the upper floors.
4. **What do they want?** Faster elevators.
5. **What will appease them?** The real problem seems to be the wait time.



6. **What alternatives do we have?**
Designate certain elevators for different floors. More elevators (not an option).
Use stairways (promote it as an exercise program).
7. **Isn't the real problem not the elevators, but rather, how long people have to wait?** I have a really crazy idea that just might work. If not, it's so cost effective it might be worth a try anyway. Do you wanna hear it?

Yes, yes, of course. We need to address this. What's your idea?

My idea is based on human psychology. Since they seem to get most upset by the long wait for the elevator, we could install expansive mirrors on all the walls. That way, people will be so busy looking at themselves they may not notice the long wait. What'd'ya think?

You were right. It's an outlandish, insane idea – but it just might work.

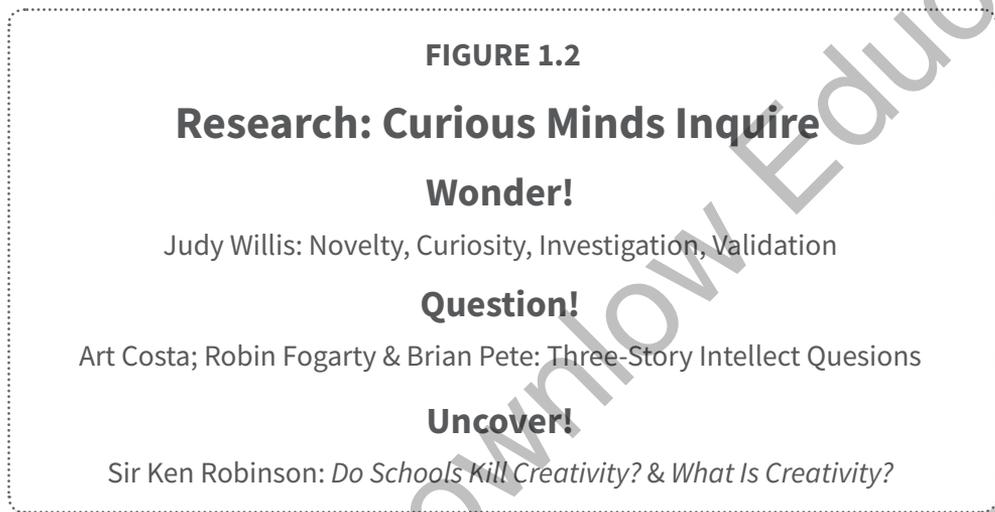
I say let's go for it and see what happens. Anybody with me on this?

The yeas have it. And with the meeting notes, the residents attached a petition prompting that management provide mirrored walls near all elevators.

Did it work? Indeed it did! And that is the tale of "Analysis on the Brink of Genius".

Research Discussion: Wonder! Question! Uncover!

Digging deeper into the concept of why “curious minds inquire”, there are three areas of research on best practices that seem to relate well to the power that can be harnessed by fostering curiosity. The three sources include Judy Willis’s (2009a & 2009b) work on the brain and the power of wonder, Art Costa’s (2001) premise that student thinking is fostered by compelling teacher queries and Sir Ken Robinson’s (2006) quest to uncover the natural creativity of children (Figure 1.2).



Wonder

There seems to be a predictable sequence of events according to Willis (2009a & 2009b), about the workings of the brain in relationship to one’s natural curiosity and the evidence of learning in the classroom. As a neuroscientist turned middle years teacher, she has observed and studied the inner and outer stimuli that affect the engagement of neurons that are the electrical/chemical sparks that connect and grow in dendrites, indicating learning.

Her message, that she has adhered to as a teacher, is a simple one that visibly motivates students to act upon their curiosity. Willis makes the case that one’s natural curiosity, if left untethered, leads to some sort of investigation. As a meaning-making machine, the brain

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wants to know more as it seeks answers – perhaps tentatively at first, but soon more aggressively as new stimuli come into play. In turn, the subsequent hypothesis, no matter how primitive, leads the investigative journey to a need for validation. The brain is wondering, am I right or wrong? Once the idea has been validated, the brain may let go of it and move on to something else, or it may become so focused on the findings that the

student is propelled to pursue it further.

Fascinating as it is, teachers often overlook this phenomenon and don't take advantage of that natural inclination to want to know, explore and understand. Fortunately, in the International Baccalaureate program, with the Theory of Knowledge as its backbone (International Baccalaureate Organization, 2018), students are encouraged to question, inquire and explore in pursuit of deeper clarity, understanding and insight of the academic and universal truths they encounter. Isn't it affirming to know that the science of the brain/mind fully supports the pedagogy?

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Question

Costa's work on the concept of questioning and inquiry targets teacher modelling of open-ended questions that dictate expansive responses and deeper thinking from students – in hopes that they also generate their own lively questions that push them along the inquiry line. Figure 1.3 (p. 6) demonstrates the construct of the Three-Story Intellect (Fogarty, 2016). Costa (2001) uses this visual to illustrate the likely flow of questions from simple, knowledge-based queries, (who, what, when, where) to more process-oriented questions (compare, predict, elaborate.) He eventually leaps forward to high-level inferential meanderings (why, why not, how) as the student continues to persevere with the mysteries being revealed.

Uncover

The third research piece that speaks to this concept of “curious minds inquire” is displayed visually with an amazing and engaging video presentation by Sir Ken Robinson (2006). He passionately addresses the passive, and possibly destructive role of schools in fostering, growing and enhancing the creativity of youngsters in our care.

In a second video presentation on creativity, Robinson (2017) unravels the marvel of the creative mind and the absolute power, ingenuity and genius it offers. To not unleash the power and productivity of creativity is insane, and yet it is a highly neglected natural resource that has potential capabilities beyond our imaginations. Creative thinking must be placed front and centre as one of the critical skills urgently needed to be developed in our students if they are to experience authentic success as 21st century citizens. At this point in time, as Robinson illustrates, creativity is a sorely neglected realm in our curriculum.