

# Contents

<b>Foreword by Professor Arthur Costa</b> .....	v
<b>Preface</b> .....	vii
<b>Introduction</b> .....	ix
<b>Chapter 1: Grown-Ups – We Have a Problem: Our Kids Are Trapped in the Shallows</b> .....	1
<b>Chapter 2: The World Is Changing: From Lines to Webs</b> .....	11
<b>Chapter 3: Surveying the Landscape: Education and Learning</b> .....	27
<b>Chapter 4: The 21<sup>st</sup> Century Needs Us</b> .....	43
<b>Chapter 5: What Is Happening in Our Schools?</b> .....	49
<b>Chapter 6: The Digital Divides: Immigrants and Natives, Real and Virtual</b> .....	59
<b>Chapter 7: Contrary to Popular Opinion, Television Can Help Bridge the Divide</b> .....	69
<b>Chapter 8: Living in Two Worlds: Tangible and Virtual</b> .....	75
<b>Chapter 9: The Best of Both Worlds</b> .....	89
<b>Chapter 10: Safe Enough to Think: Keeping Children Safe and Ensuring Safety of Information</b> .....	95
<b>Chapter 11: It's Hard to Manage What You Don't Understand</b> .....	107
<b>Chapter 12: Metacognition: What We Do When We Think in the Deep End</b> .....	131
<b>Chapter 13: Behaving Like a Deep Water Thinker</b> .....	157
<b>Chapter 14: Am I Clever Enough to Think in the Deep End?</b> .....	173
<b>Bibliography</b> .....	185
<b>Further Reading</b> .....	188

# Preface

The world has changed and continues to change at an ever increasing rate. Our children's brains are changing too. We have learned that brain architecture is not fixed at birth. It is moulded by the experiences we encounter throughout our lives.

The networked, digital world our children are developing in is having a significant effect on how they think.

We will demonstrate the nature of these changes and explain why it is important that the grown-ups understand how young people are interacting with this digital environment.

Our children run the risk of becoming superficial thinkers – knowing a little bit about a great many things, having only a surface understanding about how society works and losing the ability to think in depth and with focus. Their brains are becoming a tangle of impressions, information, emotions and more.

We provide illustrative examples drawn from our combined forty or more years' experience as educators. We offer practical suggestions and strategies that you can use in the classroom today and ideas that you can share with the parents of the children you teach.

As you read this book we ask you to do some deep thinking. Our intention is to help you understand what is happening so that you will be in a position to design appropriate lessons, interact with students and with your own children in ways that help them become deep thinkers in a digital age.

There are no scripted lessons here, no opportunities to simply choose a strategy and apply it in the classroom on Monday morning. There are plenty of examples drawn from our own experiences both as educators and as parents.

Our intention is not to provide you with easy answers to your children or student's digital experiences.

Instead, we will provide you with the understanding you will need to design strategies that are tailored to *your* circumstances, *your* children, *your* place and *your* time.

# Introduction

In 2015 and 2016 a ten year study began in Alberta, Canada. Two thousand two hundred and seventy two educators across more than one thousand schools were asked questions about the impact of digital technologies in their lives and in the lives of their students.

While 71% of these educators agreed that digital technologies enhanced teaching and learning, their responses to the survey acts as a warning. 67% of teachers stated that digital technologies were distracting their students negatively and more than half of them identified technology as a significant distraction in their own lives. Around 66% said that their students' ability to focus had declined, with one teacher saying, "I believe children are becoming passive learners; they don't know how to think on their own." This work was done by Dr Phil McRae, executive staff with the Alberta Teachers' Association two researchers from the University of Alberta, Drs Stanley Varnhagen and Jason Daniels and Dr Michael Rich of the Harvard Medical School (GUD, 2016).

This is a critical time; we are at risk of creating a generation of shallow, "gist" thinkers. It's time the grown-ups took charge in this digital age.

The teaching of thinking is too important to be left to chance. In every lesson, with every young person's interaction with the digital, online world we must seek to develop deeper thinking. It's about intention. We can be a powerful influence for good if phrases like, "Let's stop for a moment and think about this" are a natural part of our conversations with children.

The 2016 National Education Technology Plan: Future Ready Learning: Reimagining the Role of Technology in Learning (NETP, 2016) makes the following observations:

- Few schools have adopted approaches for using technology to support informal learning experiences aligned with formal learning goals.
- Supporting learners in using technology for out-of-school learning experiences is often a missed opportunity.

## Thinking in a Digital World – Taking Our Kids into the Deep End

- Across the board, teacher preparation and professional development programs fail to prepare teachers to use technology in effective ways. (page 5)

We will help you to understand why after so many years of the internet and digital technology some of us still struggle to use it effectively. We will provide you with a wide range of ideas and strategies to ensure that your students are using digital technology in order to further their ability to think deeply and effectively as they learn.

In this book we explore how the world, the notion of education and the ways in which our children think are changing. You will also understand what you need to do about it.

- Chapter one points to the serious problem educators and parents are facing in this sometimes frenetic and shapeshifting modern, digital world.
- In chapter two we examine the shift in focus from linear thinking to dynamic interconnected thinking brought about by the digital age.
- Chapter three explores how our understandings of “learning” and “education” have become more complex and interwoven over time.
- Chapter four looks at the skills needed to thrive in the twenty-first century.
- Chapter five considers the extent to which our school systems have frequently failed to adapt to these growing understandings.
- Chapter six examines the digital divide that is developing as a result of these newly predominant ways of thinking and explores ways in which adults can bridge that divide and encourage our students to think more deeply.
- Chapter seven examines one medium and how it might be used to bridge the divide.
- In chapter eight we explore the differences between the virtual and the physical worlds and how important it is not to allow the digital world to crowd out the physical world. We consider the different properties of the tangible, physically experiential world and the virtual world and we show the importance of timely disengagement and disentanglement from that virtual world.
- Chapter nine addresses the argument that we benefit from integrating the virtual and the tangible by considering key boarding and hand writing.
- Chapter ten looks closely at safety. You will understand the importance of thinking in depth about the electronic media our young people use

## Introduction

and how to keep them safe in that challenging territory. We also examine ways to ensure that the information encountered within digital media are reliable. What can we safely believe?

- Chapter eleven explores ways of becoming more familiar and confident with digital media.
- In chapter twelve we explore the nitty-gritty of deep water thinking – thinking about our thinking – metacognition.
- Chapter thirteen describes some of the behaviours that support deep water thinking. In particular we look at some of the Habits of Mind that will make it possible for our students to think deeply, flexibly and creatively and to understand their own thought processes. We provide practical strategies that grow out of the Australian Curriculum and explore the power of good questioning.
- Finally, in chapter fourteen we show that everyone has the capacity to think more deeply and that this capacity persists throughout life. Understanding that the brain is a plastic organ that changes with every experience, every thought, we look at the work of Carol Dweck (Dweck, 2006) and the significance of having a fixed or a growth mindset. This chapter explores the brain's plasticity and the importance of mindset.
- We offer a list of books for further reading.

# CHAPTER 1

## Grown-Ups – We Have a Problem

### *Our Kids Are Trapped in the Shallows*

Teachers and parents read books, scour blogs and online resources, attend professional development sessions and talk with their colleagues, all in an effort to find ways to help kids engage with the educational process. Engagement has become a buzzword. It may seem surprising, then, that we have written this book in order to demonstrate how important it is to teach students how to *disengage* and escape from the entanglement of too much information and not enough understanding.

If you have ever been to Hawaii, you may have had the good fortune to swim in the warm waters of Hanauma Bay. With a mask and snorkel you can explore the shallow waters inside the reef and see a myriad brilliant coloured tropical fish swimming fearlessly around you. Their colours are mesmerising. It's exciting and exhilarating. You will learn a lot about the variety and profusion of sea life.

But if you have the skills of a fairly strong swimmer you can venture beyond the coral reef and into the deeper waters. As you glide from the shallow water across the reef you will see the ocean floor drop precipitately below you. This is a profoundly different experience. It is awe inspiring. There is a sense of calm here, the water is not so busy, and this is where the big fish dwell. In this deep water you are not distracted by the darting little attention seekers inside the reef. Here you can watch the behaviour of a single fish as it interacts with the currents, seeks out food and deals with other fish it might encounter. You can come to a deeper understanding of that fish within its environment. This water may not be as exciting, but it is inspirational.

There is a serious problem facing our young people today. Their digital world is like an ocean, with its shallow ends filled with multimedia light, sight and movement. They are awash with information, it's like a profusion of small fish darting about around them. Attention snaps from one fascination point to another and what they gain is an impression of how amazing the world is.

## Thinking in a Digital World – Taking Our Kids into the Deep End

We want children to have the skills they need to move safely out of these shallow waters of the digital world and into the deep water of concentrated, focused, effective thinking. We don't want to deny them the excitement or the value of staying close to the shore and all there is to offer there, but we want them to be able to disengage, to leave the shallows behind from time to time. We want them to develop the habits of deep thinking while being safe and confident in the deep end of the ocean.

Our young people are in serious danger of finding themselves trapped in the shallows. In part, this is because the shallows are so inviting and so fascinating, in part it is because they simply haven't had the opportunity to experience the deeper satisfactions of the deep water. Just as it is our responsibility to ensure our children are safe in the waters they swim in, it is up to us, the adults, to help them develop the skills they need to think deeply and effectively in the world they inhabit. We need to teach them how to dive deeply below the surface.

### It Is Time the Grown-ups Jumped in the Water Too.

To understand how this problem has arisen, we need to know something about the history of our understandings about learning and about education. Our beliefs about learning began with a simple thread – tell them, get them to repeat it, then they will know it. Over decades we have learned much about children and about how their brains develop. Sadly the increasing sophistication of our understandings about learning has not translated into the practices of many of our educational institutions.

Our knowledge about how people learn is embedded in a world that has also changed dramatically since the invention of the computer and the internet. Learning is a complex process in a complex world, and both are changing, even as we think about them. Is it any wonder that we sometimes feel “all at sea” as we confront one new learning theory after another. Like brilliant fish, new ideas dart at us and just when we think we have grasped the latest one it slips from our fingers and another one flashes into view. Trying to keep up with it all can leave us tearing our hair out as we try to accommodate to block scheduling, brain-based teaching, left brain/right brain, constructivism, cooperative learning, critical thinking, core knowledge, creative thinking, cultural literacy, didactic teaching, emotional intelligence, inquiry-based learning, integrated curriculum, multiple intelligences, Socratic questioning, mindfulness, fixed and growth mindset, character education, discovery learning, thinking hats, habits of mind, competency-based learning, flipped classrooms, whole language literacy learning, phonics-based learning, phonemic awareness ... and the list could go on.

## Chapter 1: Grown-Ups – We Have a Problem

We must value the shallows, with all its colour and movement. We must also know how to head for deeper water. As the teachers of the next generation it is important for us to be able to filter what is, at times, an overwhelming amount of information, and focus on what is most important and then come to understand it in depth. Sometimes we need to turn away from the little fish and focus on the big ones.

Educators must understand how people learn, how the digital world is changing how people think, and how they can help our young people to retain all that is helpful in the digital world without losing the ability to disengage, disentangle, focus and think in depth.

Building on this understanding we provide you with practical strategies to teach children to be deep thinkers in a digital world. These strategies encompass the classroom and link clearly with the Australian Curriculum, as well as offering ways in which schools can use their home school partnerships to further the thoughtful use of the internet.

Many teachers are parents and all parents are teachers. Grandparents, aunts and uncles, shopkeepers, police, doctors, librarians and check-out personnel are teachers too. The National Network of Partnership Schools was established in 1996 at Johns Hopkins University in the United States. Extensive research over several decades has demonstrated that when parents, teachers and communities collaborate in the education of our young people we can assure greater success in their education.

This is a book for anyone who spends time interacting with children and young people, and who takes seriously their role as mentor, guide and being the grown-up. It is primarily a book for teachers and schools, with the understanding that schools are one of the most effective conduits for informing parents and community members about the ways in which they can become involved in the education of the community's children.

As you read and discuss this book you will find opportunities to include the entire school community – parents, grandparents, aunts and uncles, day care providers, bus drivers, preschool teachers and anyone you believe has the opportunity to contribute to the growing understanding of the world that you engage with every day as you teach our children.

### Our Children Must Be Problem-Solvers

The ancient Chinese curse, “may you live in interesting times” cannot be far from our minds as we attempt to make sense of the shapeshifting environment in which we live. Our children today are now connected and involved with one

## Thinking in a Digital World – Taking Our Kids into the Deep End

another and with the world through their electronic devices in ways anyone born before 1990 can hardly understand.

We repeatedly hear that our children will face a tomorrow that we cannot predict, a world with problems and solutions that will be as novel, mystifying and exciting as the internet itself would have been to our grandparents.

It seems only a handful of years ago that we were sitting together quietly one evening. Martin was working with his computer and clearly having some problems. He exclaimed “I think my mouse must be dirty” and we both burst out laughing trying to imagine what our mothers and fathers would have made of this stated dilemma.

The discomfoting thought is that our children today don’t know what a mouse is in this context. As it was for our parents, a mouse to them is a small, furry rodent that squeaks and gets into the pantry during the winter months. Theirs is a world of touchscreens and is becoming one of gestures, as they interact with kinetic game machines that respond to their own physical movements, without them ever having to physically touch anything. A mouse? How terribly last century.

Our parents could not have imagined the things we take for granted today. Anyone over forty can probably think back to their early twenties and have a sense of the enormity of change that this burgeoning electronic age has given us. This speed and scope of change raises a profound question for anyone concerned with the generation of children and young people who will soon be in charge of the world.

If we cannot get our imaginations around what the world will look like in ten or fifteen years how can we help prepare our children to be effective agents within it? To thrive they will need to be able to think effectively, flexibly and creatively.

Over the years we have asked different groups with whom we have worked the same question, “What would you hope your children would have retained five years after they leave school?” The responses have been both fascinating and illuminating, both for their content and for their uniformity.

Everyone seems to feel much the same way, parents, teachers, administrators, employers, seniors groups – and they all tell the same story. They want our children to have appropriate levels of literacy and numeracy, be able to work collaboratively, to be self-sustaining, to be flexible in their thinking, to know how to solve problems and to be independent lifelong learners. No one has mentioned the need to know the dates of first settlement, the signatories to the Treaty of Versailles or the stages of cell division. No one has mentioned any particular “stuff” as essential for children to learn. Instead the clear focus has been on the

## Chapter 1: Grown-Ups – We Have a Problem

development of the behaviours and skills that will enable our young people to be effective participants in any environment, no matter how dynamic or different it may be from what surrounds them now.

No one questions the importance of our young people learning how to think skilfully. The human capacity to think skilfully and in depth is what sets us apart from every other creature on earth. It is our ability to think creatively that has taken us from the cave to the city, from squatting in the forest to having sewerage treatment works, from dipping a hollow gourd in a river to turning on a tap. It is our delight in solving problems collaboratively that has ensured relief from toothache, the almost total eradication of smallpox and polio and the ability to use the bountiful energy of the Sun to heat our homes in winter, keep our ice-cream frozen in the summer and to entertain us in the evening.

### We Have Been Good at Solving Problems

The history of the human race has been one of problem-solving. London in 1900 used horses to transport people and goods around the ever growing city – around 50 000 of them altogether. Each horse produced between 5 and 15 kilograms of manure a day. A writer in the London Times lamented that within fifty years every London street would be buried under more than 9 feet of manure – that’s 2.75 metres. The problem seemed insoluble. But the Great Horse Manure Crisis of the late 19th century never happened. Building on the research of others going back as far as the 17th century, Karl Benz patented the first practical motor car engine in 1879 and by 1920 a Ford Model T was coming off the assembly line every fifteen minutes. It was the efficacy of people’s thinking that brought about the age of the motor car.

The Great Horse Manure Crisis was averted by innovation, the capacity of thinkers to bring different ideas together and to think collaboratively across time and space, to learn from and with each other. So it has been time and time again in the past, and so it will be in the future.

Today we face massive challenges to our ingenuity far greater than an excess of horse manure. Climate change, the rapid economic expansion of previously underdeveloped nations, the growing disparity between the rich and the poor and the decline of the middle class, the need to find replacements for finite and perhaps damaging carbon-based energy sources, as well as never-ending geopolitical conflicts, all tell us that the future belongs to the thinkers and to the doers.

We need problem-solvers. Thinking alone will not achieve anything, but action without effective thought will only get us deeper into trouble. We can find enough examples of “shooting from the hip”, acting first and thinking later, to know this from bitter experience.