A new approach to developing ‘soft skills’ lies at the intersection of psychology and neuroscience.

A Case Study

The Objective:
**Developing Student Self Agency in Their Own Learning**

From a Focus on Content ....

To a Focus on Learning Skills ....

Developing Great Citizens

9 Melbourne Schools
Education is Evolving in line with Recent Scientific Advances

Future Education

- Educational Psychology
- Cognitive Neuroscience
- Pedagogy
- Curriculum
- Information Technology

Education is expanding beyond just Curriculum and Traditional Pedagogy.

Newer Scientific Disciplines are being incorporated into Educational Practices.
The four fundamental domains of human performance

Combining Psychometrics, Cognition and Wellness into one Common Assessment and Training Platform

Objective: Classroom Differentiation

Providing the Teacher with a Digital Dashboard that shows a Holistic Perspective of each Student and an aggregated view of the Class. This helps to better identify core needs and more accurately target programs and interventions.

Digital Dashboards for both Students and Classes

Cognition | Emotion | Personality | Wellness

Objective: Student Self Agency

Providing the Student with greater insight into themselves and their abilities. The goal is for the student to have a series of intrinsic experiences in building their own core capacities. Learning that with effort they can grow – that intelligence is not fixed, it is plastic.
Objective: Positively Influencing the Entire Learning Spectrum

Objectives

- Classroom Differentiation
- Personalised Learning

Our intention is to impact positively on this entire spectrum, not just the Children with major Learning Difficulties.

But How do we do it ???

Adapted from Huppert et al. (Eds) "The Science of Wellbeing" and Reproduced in the UK Govt's "Foresight Project on Mental Capital 2008"
Scope of Schools Program (2015-6)

Three Levels of Data Collection and Analysis

<table>
<thead>
<tr>
<th>Baseline Data Gathering</th>
<th>Pilot Project – Key Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(1) Is there an improvement in Student Metacognition</td>
</tr>
<tr>
<td></td>
<td>(2) Are there benefits in running/managing Classes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classroom Metrics</th>
<th>Post Program Data Gathering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Teacher Feedback</td>
<td></td>
</tr>
<tr>
<td>Data Collection by ISV Facilitators</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component Skills – Task Data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Training Session CQ, EQ, PQ, WQ Skills</td>
<td></td>
</tr>
<tr>
<td>Automated Data Collection by the Software</td>
<td></td>
</tr>
</tbody>
</table>

Three Levels of Data Collection and Analysis:

1. Baseline Data Gathering
2. Classroom Metrics
3. Component Skills – Task Data

Customised Reporting for Each School

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## Time Management Objectives

### Educational Content

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

### Targeted Capacity Building

- Before: 1:1 (~4%)
- After: 1% miss out

### Small Group

- Before: 1:1 (~15%)
- After: 1:1 (~4%)

### Whole Class

- Before: 1:1 (~80%) 1% miss out
- After: 1:1 (~95%)

---

### Student Teacher Ratios (before)

- Students who need ...
- Students who can learn in a ...
- Students who can learn in the ...

### Student Teacher Ratios (after)

- Students who need ...
- Students who can learn in a ...
- Students who can learn in the ...

---

Source: Margaret Foster, Learning & the Brain Society (2014)
The Program is About ....

Moving from a focus on acquiring content based knowledge ....

..... to building learning capacity and capability

Objectives for ..... 

The Student

• Cognitive & Emotional Awareness
• Building Metacognitive Skills
• Self Agency in their own learning

The Teacher

• Personalised Learning
• Classroom Differentiation
• Data Analytics (Improved Visibility)
• Teacher as Facilitator or Coach

Bringing Together a Number of Key Themes

• Growth Mindsets (Dweck)
• Metacognition (Thinking, Feeling & Context)
• Bridging & Scaffolding through increasing layers of thinking abstraction/complexity (e.g. SOLO)

• Learning Dispositions (CLARA)
• Personality Styles

• A Suite of Cognitive Skills
• A Suite of Emotional Skills
• A Suite of Wellness Skills
• Neuroplasticity

• Data Analytics Dashboard

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Goals:
- Empowering the Teacher in terms of their “Craft of Teaching”
- Classroom Differentiation and Targeted (Personalised) Learning
- Bridging (“Active Transfer”) through ever Higher Layers of Abstraction

Pedagogy Domains:
- Learning to Learn
- Thinking about Thinking (Meta-Cognition)
- Mindsets & Self Management Skills
- More Holistic Perspectives of Student Capabilities
Operational Deployment in Schools

Methodology (flows down)

Continuous Improvement Cycle

Building a Supporting Methodology

Teacher Experiences & Evidential Data (flows up)

Longitudinal Objective Data

Pedagogy Development

Regional Champions & Peer Coaches

Teachers & Communities of Interest

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Translational Research Platform

Services Framework for Schools

Human Capital

Portfolio of Evolving Interventions

Pedagogy Development

Longitudinal Metrics

• Common Taxonomy
• Common Metrics

Active Participation in Research
- Cohort Recruitment
- Cohort Management
- Common Infrastructure Platform

Building Relationships

Student Mediation

Building Concepts

Continuous Improvement

Research Metrics have High Weight of Evidence

Customer Engagement
- Active Product Development
- Customer Feedback, Relationship Mgt, & Loyalty Programs

Multiple Research Groups
- Neuroscience
- Pedagogy
& Others

Education Leadership

Productivity

Quality Assurance

Govt Policy

Links to Research Institutions
- Hypothesis
- Methodology
- Ethics
- Project Mgt
- Data Analysis
- Publication

Active Participation in Research

Customer Engagement

Continuous Improvement

Evidence of “What Works”
The Springboard Effect

The Real benefit is what we do with the Information.

You Can’t Manage What You Can’t Measure

It’s the Translation into Practice (the Actual Teaching) that Matters.

Data : A Framework for a Coaching Conversation

Digital Dashboards for both Students and Classes

- Cognition
- Emotion
- Personality
- Wellness
Growth Mindset: An Attitude to Thinking and Effort

Children should understand that Intelligence is not a fixed trait, but grows with effort.

**Fixed Mind-set**
Intelligence is static

Leads to a desire to look smart

As a result, they may plateau early and achieve less than their full potential.

All this confirms a deterministic view of the world.

**Growth Mind-set**
Intelligence can be developed

Leads to a desire to learn

As a result, they reach ever-higher levels of achievement.

All this gives them a greater sense of free will.
Bloom's Taxonomy (2D Model)

Moving Beyond Content

In this model, each of the colored blocks shows an example of a learning objective that generally corresponds with each of the various combinations of the cognitive process and knowledge dimensions.
Teaching Meta-Cognition

Our Biology

Instinctive Reaction

The Situation

Reflexes

Teaching Reflective Behaviour

- Thinking About Thinking (& Learning)
- Thinking About Feeling (Self Awareness)
- Thinking About the Situational Context

Skill Development

- To gain *Mastery* over managing increasingly complex concepts and situations

Developing Meta Cognition and Self Awareness

Objective Decision Making

Thinking about ......

Awareness of Subjective Experiences

Emotions  Thoughts

Context The Situation at Hand

Awareness of the External World

A Framework for a Coaching Conversation
What is Meta-Cognition

Traditionally Metacognition is referred to as the process of “thinking about thinking”. Metacognition refers to one's knowledge concerning one's own cognitive processes or anything related to them.

For example:

• I find it easy to learn French but hard to learn maths
• I don’t know how to say “I learn” in French so should ask for help
• I don’t ask for help enough when I am learning
• Learning the past-tense is hard so I should allow more time for it

It is strongly related to concepts such as self-regulation, personal monitoring, and active planning.

We extend the definition to include ......

1) Thinking about our Thinking
2) Thinking about our Feeling
3) Thinking about our Context
Self Agency: An Attitude to Personal Feeling and Context

Elements of Self Agency

- Purpose (Vision)
- Passion (Motivation)
- Persistence (Resilience)

A Framework for a Coaching Conversation

Extending Beyond the Resilience Theme

Self Agency becomes an Intrinsic Sense of Self, part of your “Core” Personality

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Daniel Goleman’s Framework of Emotional Intelligence

<table>
<thead>
<tr>
<th>Personal Competence</th>
<th>Recognition</th>
<th>Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self-Awareness</td>
<td>Self-Management</td>
</tr>
<tr>
<td>✓ Self-confidence</td>
<td>✓ Getting along well with others</td>
<td></td>
</tr>
<tr>
<td>✓ Awareness of your emotional state</td>
<td>✓ Handling conflict effectively</td>
<td></td>
</tr>
<tr>
<td>✓ Recognizing how your behavior impacts others</td>
<td>✓ Clearly expressing ideas and information</td>
<td></td>
</tr>
<tr>
<td>✓ Paying attention to how others influence your emotional state</td>
<td>✓ Using sensitivity to another person’s feelings (empathy) to manage interactions successfully</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social Competence</th>
<th>Social Awareness</th>
<th>Relationship Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Picking up on the mood in the room</td>
<td>✓ Getting along well with others</td>
<td></td>
</tr>
<tr>
<td>✓ Caring what others are going through</td>
<td>✓ Handling conflict effectively</td>
<td></td>
</tr>
<tr>
<td>✓ Hearing what the other person is “really” saying</td>
<td>✓ Clearly expressing ideas/information</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Using sensitivity to another person’s feelings (empathy) to manage interactions successfully</td>
<td></td>
</tr>
</tbody>
</table>

Start with **Self Awareness** & Build a Strong Foundation
Emotions drive learning, decision making, creativity, relationships, and health. The Yale Center for Emotional Intelligence uses the power of emotions to create a more effective and compassionate society. The Center conducts research and teaches people of all ages how to develop their emotional intelligence. Refer [http://ei.yale.edu/ruler/the-anchors-of-emotional-intelligence/](http://ei.yale.edu/ruler/the-anchors-of-emotional-intelligence/).
Vygotsky believed that how children develop depends on their interaction with others more experienced than themselves. Two of the principles of his work were...

- **MKO** (the ‘more knowledgeable other’), and
- **ZPD** (the ‘zone of proximal development’).

Vygotsky identified the Zone of Proximal Development as the distance between what a child can already do without guidance and the level of performance they are capable of achieving through problem solving with help. The ZPD contains skills and concepts that are not yet fully developed but are "on the edge of emergence" emerging only if the child is given appropriate support.

The size of the zone to be crossed differs from child to child. Understanding the ZPD is helpful in establishing how ready a child is to benefit from the next stages of development/learning. The assistance provided within the zone has been termed **scaffolding** (Wood, Burner and Ross, 1976), and is now a recognised integrated teaching practice. As the child becomes more proficient, the More Knowledgeable Other will reduce the amount of guidance.

Vygotsky’s theories are also relevant to collaborative learning. In a peer group, members should have different levels of ability, with the more skilled in the group helping the others to understand and learn. When it comes to differentiation, teachers who know their students’ ZPDs can make sure they receive the correct levels of challenge and support to achieve their potential.
Teach Kids About Their Brains
..... and How it Works

Neural Networks –
New Insights into the Brain

• The brain is also the most complex structure known to man.
• It contains more than 100 billion neurons (brain cells).
• Each neuron is connected to around 10,000 other neurons.
• That’s one million billion connections that need to be maintained !!!
Our Brains are approximately 2% of our body weight (<1.4 kg), but ...

- processes 20% of the body’s oxygen, and
- 25% of the body’s glucose (energy consumption)

It needs Rest & Repair just like our Muscles do.

The Rest & Repair phase allows the new Neural Networks created through learning to consolidate.
Neuroplasticity is the ability of the brain to continually change or learn as a result of your learning experiences.
Why Emotions are more Powerful than Conscious Thought

You can’t turn any part of your brain off .....  

Conscious Part

Frontal Cortex

The NeoCortex

Unconscious Part

The Limbic System

Basic Sensory & Motor Functions

The Brain Stem & Spinal Cord

...... But you can focus your attention (your consciousness) on things of your choosing.

This part is, of necessity, very powerful.

It is responsible for keeping you (1) Alive and (2) Socialising / Reproducing

It will override your neocortex whenever these functions are under threat.
Pituitary Gland
A small structure at the base of the brain which releases a wide variety of hormones that in turn control the activity of the body's other hormone glands. In humans, it is roughly the size of a pea.

Hypothalamus
One of the most important functions of the hypothalamus is to link the nervous system to the endocrine system via the pituitary gland.

The hypothalamus is just above the brainstem. In humans, it is roughly the size of an almond.

The hypothalamus is responsible for most metabolic processes and other activities of the autonomic nervous system.

It stimulates or inhibits the secretion of hormones, which drives our endocrine system — the source of our feelings.

You Cannot Separate Emotions from Thinking
They are part of the Same Biological Process
The Limbic System exerts “Bottom Up” Indicators as to Our Emotional State

The corticolimbic circuit integrates motivationally salient information into the neocortex and makes decisions about action.

- **Strengthening Behaviours**
- **Strengthening Memories**

The Emotional Encoding Network

- Cortical processes
- Limbic processes

The System is Plastic
Zull’s Learning Cycle

Concrete Experience
(Collecting)

Abstract Hypothesis
(Creating)

Reflective Observation
(Analysing)

Active Testing
(Doing)

Adapted from “The Art of Changing the Brain” by Professor James E. Zull
## Description of Some of Our “Base Level” Cognitive Skills

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Working Memory: your capacity to actively hold information in your mind that is needed to perform a task(s)</td>
</tr>
<tr>
<td>2</td>
<td>Auditory Short Term Memory: your capacity to remember a number of sounds or spoken words</td>
</tr>
<tr>
<td>3</td>
<td>Visual Short Term Memory: your capacity to remember a number of pictures, images or written words</td>
</tr>
<tr>
<td>4</td>
<td>Response Time: the speed at which you perceive and appropriately respond to a stimulus</td>
</tr>
<tr>
<td>5</td>
<td>Divided Attention: your ability to successfully pay attention to more than one thing at a time</td>
</tr>
<tr>
<td>6</td>
<td>Shifting: your ability to redirect your attention between different tasks while maintaining good performance levels (your mental agility)</td>
</tr>
<tr>
<td>7</td>
<td>Visual Scanning: your ability to discern and process a greater amount of detail from what you see</td>
</tr>
<tr>
<td>8</td>
<td>Naming: your ability to connect “concrete” labels from your long term memory to the objects you are currently working with to make them meaningful</td>
</tr>
<tr>
<td>9</td>
<td>Updating: your ability to add to existing ideas and/or memory objects in ways that make them more useful in the future</td>
</tr>
<tr>
<td>10</td>
<td>Contextual Memory: your ability to connect your current activity with a similar historical experience in ways that make it more meaningful</td>
</tr>
<tr>
<td>11</td>
<td>Spatial Perception: your ability to perceive how objects are related in space</td>
</tr>
<tr>
<td>12</td>
<td>Inhibition: your capacity to quickly recognise and dismiss distractions not relevant to the task being performed</td>
</tr>
<tr>
<td>13</td>
<td>Planning: your ability to anticipate an outcome and mentally construct a series of activities to achieve this</td>
</tr>
<tr>
<td>14</td>
<td>Hand-Eye Co-ordination: the level of sensitivity with which two or more functions of your brain and/or parts of your body are synchronised (in this instance your hand &amp; eye co-ordination)</td>
</tr>
<tr>
<td>15</td>
<td>Long Term Memory: your ability to recall information after a period of time longer than around two days</td>
</tr>
<tr>
<td>16</td>
<td>Short Term Memory: your ability to recall information within several hours and less than approximately two days</td>
</tr>
<tr>
<td>17</td>
<td>Processing Speed: your ability to mentally translate information from one form into another more useful form</td>
</tr>
<tr>
<td>18</td>
<td>Fluid Intelligence: your ability to learn new things and/or solve problems in new situations</td>
</tr>
<tr>
<td>19</td>
<td>Focus &amp; Attention: your ability to maintain your concentration on a task for lengthy periods of time</td>
</tr>
<tr>
<td>20</td>
<td>Divided Execution: your ability to successfully apply different actions to more than one thing at a time</td>
</tr>
<tr>
<td>21</td>
<td>Sensory Fidelity: your ability to discern a greater amount of detail from one or more of your senses</td>
</tr>
<tr>
<td>22</td>
<td>Awareness: your ability to perceive events, objects, emotions or sensory patterns with some level of quality</td>
</tr>
<tr>
<td>23</td>
<td>Association: your ability to connect ideas and/or concepts in ways that make them more meaningful</td>
</tr>
<tr>
<td>24</td>
<td>Time Estimation: your ability to estimate event durations</td>
</tr>
<tr>
<td>25</td>
<td>Prediction: your ability to accurately forecast a future event based on experience</td>
</tr>
<tr>
<td>26</td>
<td>Anticipation: your ability to anticipate an outcome based on your motivations</td>
</tr>
<tr>
<td>27</td>
<td>Sequencing: your ability to order ideas and/or objects in your mind</td>
</tr>
</tbody>
</table>

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Company Director,
Proactive Ageing Pty Ltd.

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Company Purpose: My professional goal is to help develop organisations and communities that motivate and assist their people to want to take a proactive approach in their own mental, physical & social wellbeing. To build a strong platform from which to engage in active fulfilling lives and better collaborate with and participate in their collective networks for mutual benefit.

Specialities: Developing and deploying new products and services in emerging markets.

Research Linkages: I have developed an extensive network of research institutions both locally in Australia and around the world. These connections supply significant value to the consumer education, training and management consultancy that we provide in a variety of industries that are now enthusiastically examining the potential for adopting effective psychology and neuroscience interventions.

Life Experience: Most recently, 7 years as an Independent Entrepreneur, running several businesses. Prior to that over 25 years in services industries, including a global role in a multinational. Over 15 years product development experience, 15 years martial arts training progressing to national competition (UK), Australian government professional sports coaching qualification (level 2), psychotherapy, mindfulness meditation, and independent travel in more than 60 countries.