

Focus

Thinking: Critical for Learning

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Executive Summary

Teaching for learning is terminology deliberately applied throughout the body of this report. This report finds that teaching for effective learning is the key to the future for our school to continue to develop our shared understanding of the strategies and tools for, “Learning to Think, Thinking to Learn, Learners and Thinkers”. The report relays some of the strategies decisive to supporting “Thinking Critical for Learning” towards continuing to develop a culture of thinking. The paper illustrates the need to develop an understanding of current brain research leading to enhancement of teachers’ application of skills and strategies pivotal to the deliberate teaching of thinking.

Purpose

The purpose of the sabbatical was to investigate the extent to which a culture of thinking for learning had become embedded in classroom practice in order to enrich learning to learn. Findings from this investigation will provide the starting platform to develop a working document encompassing actions promoting “Thinking for Learning” This document will detail the schools pedagogical approach to thinking and learning resulting in a clear approach to how this knowledge will be disseminated at Te Papapa School. It will become the cornerstone document of detailing how the school will implement the new curriculum.

The opportunity for professional reading and reflection on how Te Papapa School can continue to refine actions and build on current practices to foster the development of a culture of learning; one which empowers student with the language, tools and strategies to engage in a wide range of analytical, critical, creative and caring thinking tasks.

Background

Te Papapa School is a small urban decil1 school whose population is mainly Pacifica. Current leadership has been focused on establishing a meta-cognitive learning environment; the development of a climate and culture of thinking as advocated by experts such as Edward de Bono, Julia Atkin, Art Costa. Such experts have hypothesised that intelligence is something that we are born with, but intelligence is not fixed. The school considers itself to be a “thinking school”, however there was considerable debate about thinking and learning to think; particularly did this correspond to our learning practice and the premise we can all learn to be more intelligent. Thinking skills can be learned. Research over the past 20 years in areas such as cognitive psychology and philosophy has demonstrated that people can improve their thinking and this axiom has been embraced by the teachers at Te Papapa School.

For several years the school has worked closely with Jannie van Hees in the area of Literacy/Oracy professional development. More recently several teachers have undertaken online learning with Gwen Garwith’s, 3 Doors into Information Literacy, and concurrently course development with Julia Atkin. This deliberate focus to professional learning has enabled the school to continue to move towards the goal of being an effective learning focused environment and not just a teaching focused environment.

The teaching of thinking is not a new concept. The Ancient Greeks conceived improving the intellect was a prime aim of education. More latterly Vygotsky and others challenged the notion of inborn intelligence and developed constructivist psychology theories. These theorists have evolved notions of ‘core’ or ‘key’ skills, such as problem solving and decision making becoming embedded in primary and secondary curricula. The draft curriculum framework defines “key competencies as being the capabilities people need in order to live, learn, work and contribute as active members of their communities.”

My claim is that thinking skills can be learnt despite language and socio-economic barriers. Moreover, students at Te Papapa School will best learn to think when teachers are given the appropriate skills, tools, support, and encouragement to foster teaching for learning. The methodologies incorporated herein provide evidence to support this claim.

Methodology Applied

Professional Reading concurrent with Reflective Thinking

Teacher survey and interactive discussion

In Class observation

Attendance at the 4th Annual Thinking and Learning conference in Melbourne, May 2007.

Resolutions derived from the Literature Review

In order to gauge whether a culture of thinking to learn has become embedded in classroom practice it is essential to establish a shared understanding of terminology used; primarily defining thinking and learning, coupled with a working knowledge of how the brain functions.

Definitions

Learning

During interactive sessions with Atkin the dominant concepts and analogies emerging to describe Learning are images of journey, growth, transformation, creation and light bulbs going on. As a result of learning the person feels enlightened, enriched or more empowered in some form or way. Atkin makes the claim that this constructivist view of learning is most representative of how people learn most meaningfully. This constructivist view corroborates the opinion shared by some teachers at Te Papapa School, viewing learning as being life long; a commitment to life long learning by life long learners.

Learning to Know

The International Commission on Education for the 21st Century's report to UNESCO defines learning to know as the type of learning that is concerned less with the acquisition of structured knowledge than with the mastery of learning tools. Learning to know implies how to learn by developing one's concentration, memory skills and ability to think.

Thinking

Some say that to think is to reason.

de Bono states that intelligence is something we are born with, whereas thinking is a skill that must and can be learned. Thinking can be defined as a skill engaged to help a learner plan how to approach a task. Thereby thinking, as a skill, can be categorized into creative, analytical, flexible, caring to name just a few. Livingston states that understanding metacognition empowers the learner to become more aware of their own thinking processes

thereby able to regulate these processes for more effective learning. Hence metacognition is often referred to as thinking about one's thinking

Brain Enlightening

It is advantageous to have a working understanding of how our brain functions; importantly how our brain enables us to remember, to image, to feel, to think, to solve problems.

Anatomically the brain is divided into two hemispheres. These processing modes have become known as 'right brain (cerebral cortex) predominantly used for analytical reasoning and left-brain (limbic) for intuitive processing

Correspondingly MacLean (1978) postulates that the brain has three main evolutionary parts.

The reptilian brain - driven by instinct.

The limbic brain – the emotional centre.

The cerebral cortex – the abstract thinking centre of the brain.

It has been demonstrated that the cerebral cortex component of the total brain is the section most adept at learning new ways of adapting and coping, and that the cerebral section processes more in an abstract and conceptual form than does the limbic segment which has more to do with emotions of sensing and doing, rather than reflecting.

Furthermore research demonstrates the left hemisphere provides the centre for basis of our verbal, logical, factual, sequential objective ways of knowing while our right hemisphere seems to provide the basis for our holistic, subjective, intuitive, spontaneous, non-verbal ways of knowing.

Indeed experts in this field are at pains to reflect that it is clear that we are not always in our right mind when solving problems or undertaking tasks. Based around this understanding teachers need to make explicit the type of thinking that will be expected for the designated learning task.

Insights gained from:

Teacher Survey, Interactive Discussion and Classroom Observation

Since the original study proposal being put forward and undertaking research Te Papapa School had a change in teaching staff. This created an opportunity for newly appointed teachers to share with us their impressions as to whether the school had created a culture of thinking for learning.

New teachers commented on:

- Teachers explicitly teaching thinking skills:
- Referring to brain pictures
- Blooms- remembering, understanding analysing, applying, evaluation ,creating.
- Talking about 3 doors
- Crafting sentences – a specific methodology used to support Oracy English skills.
- Explaining what level of thinking a child is utilizing or will need to access for a particular task.
- Employment of relevant questioning language
- Professional talk in staff room, meetings and planning of these thinking skills
- Evidence of professional development from the past which is still relevant, plus on going expansion.
- Children are aware of (and excited about) expanding on thinking skills and levels.
- Learning experiences designed to support a range of levels of thinking ensuring that thinking is infused into the learning process.
- Planned professional learning explicitly targeted at improving teacher capability and capacity in the area of using tools to infuse thinking into everyday learning experiences. These strategies form part of what the school refers to as 'soft systems technologies.' Examples include Blooms taxonomy, Picture this Question That, Thinkers Keys.
- Unit planning directly targeting the teaching of thinking skills with deliberate inclusion of learning activities to cover a range of thinking levels.

How does Te Papapa's practice of using brain pictures support the development of thinking skills and process as a means to enhance student engagement and student learning?

All teachers have stylised brain pictures displayed in their rooms adjacent to posters recording Blooms Taxonomy of thinking skills. While these pictures alone will do not enhance the development of thinking skills and process steering the learner to the type of thinking mode they will need to access to solve the problem increases student engagement with the learning. The teacher plays a pivotal role by labelling the thinking skill and the process thereby making the specific and direct link between the type of thinking involved and the processes used to complete the learning task. For example, if the thinking skill is analytical the teacher directs the processes that the student will use for this type of thinking, for instance, compare and contrast. The eventual goal is for the students to self regulate learning by employing a type of thinking skill and a thinking process appropriate to solving the confronted issue.

From observations within the classrooms and when teachers send children to the Principal for praising it is evident that some teachers utilizes these learning tools to a greater degree than others. Notably use of this tool is not limited or restricted by the year level and students as young as 5 can comfortably talk about their thinking mode just as well as older students. Some students are of course limited by not having adequate language to discuss thinking. In such instances the teacher directs the type of thinking that the students will need to engage in to complete the learning task, e.g. the kind of thinking that you will be doing is applying. Habitually the students become very keen and excited about the learning that is happening with some becoming able to distinguish between the task and the learning outcome. As an example a group students worked co-operatively to produce a play explaining their understanding of the way different types of food affected their bodies. Therein this group of 8 year olds competently interpreted the level of thinking and the social skills needed to complete the task simultaneously with expanding their knowledge. They where able to discuss the "tools" they used to aid them in completing the task.

Can we teach thinking?

This simple question generated an intensive discussion between staff whether it is actually possible to teach thinking. Clearly all humans can think, so perhaps this notion needs to be restated more aptly as can children be taught to think more effectively, thereby developing an awareness of themselves as thinkers and learners and practise the approaches and strategies for effective thinking and learning.

The myriad of text references support the premise that by practising the approaches and strategies makes for more effective thinkers and hence thinking can be taught

Newly appointed teachers unanimously commented that staff appear committed to teaching and improving their knowledge and understanding of thinking skills perceiving Te Papapa School as individuals embarked on a learning journey.

As one teacher stated,

*“Thinking is hard. Teaching thinking is hard.
But at Te Papapa School we have been equipped with the tools.”*

Developing Learning Environments that foster learning to learn

The bulleted descriptors can be used by teachers as a self reflection tool. This list is no means complete as to what one would expect to see and hear in a learning environment that fostered learning to learn. These strategies are evident to greater and lesser degrees in classrooms at Te Papapa School.

- Focus the learner’s attention on and name the thinking skill and thinking processes that will/has enabled them to be successful at the task.
- Encourage students to reflect on what they do that is effective in providing a solution and to provide names applicable to each process.
- Model strategies by thinking aloud or by asking students why they did something when they successfully employed a thinking skill.
- Encourage students to talk to themselves while they think. At an early stage, it may be necessary for them to talk out loud; until eventually they will be able to talk silently to themselves about the process being conducted.
- Help students realise that a major part of using thinking skills is knowing when (not just how) to use them.

- Provide feedback for feed forward on the degree to which learners are tapping into a range of thinking processes, as opposed to mere success on related task completion.
- Design learning intentions that focus on labelling the thinking skill and the thinking process to be employed.
- Group students to cooperate on higher order activities so that they can model thinking skills to one another then evaluate the comparative effectiveness of various thinking style. For example, encourage them to ask one another why they chose that specific cognitive thinking skill.
- Engineer co-operative grouping based on thinking skills and processes to foster collaborative learning environments.
- Teachers explicitly model and teach the difference between thinking tasks, thinking processes and tools available to support either.

The acquired thinking skills will help learners cope with life after school and prepare for citizenship.

- Consider issues from other people's point of view.
- Value other peoples opinions.
- Respect others.
- Recognises differences
- Be motivated to learn and enjoy learning
- Raise their confidence and self esteem
- Be more aware of how they learn.

Implications

Atkin makes the claim that as individuals we show an innate preference for a particular way of processing information thereby favouring a specific way of thinking and different ways of knowing. This does not mean that as individuals we are not capable nor have the capacity of using other modes of processing information to solve problems. However, by understanding our preferred way of thinking will help us to understand others, and ourselves, and indicate ways in which less preferred modes can be accessed or developed.

In the ever-increasing environment of multimedia exposure today's learners are more accustomed to receiving multiple inputs. Getting the learner to pause and reflect for more than 30 seconds before responding to a question often produces superior answers. The habit of 'think time' is well established into the culture of Te Papapa School.

The propensity for being an effective learner and doer is having the ability to draw on the mode of thinking appropriate for the task thereby engaging in a range of thinking modes. Planning and teaching for effective learning with meaning will involve designing learning tasks, employing a range of thinking modes, incorporating the integration of feelings, experiences, of thinking analytically as well as intuitively. There is a need for teachers to make explicit everything they do, not only to explain the task at hand but to explicitly explain and model the range of thinking skills, thinking processors and thinking tools. Using all modes of the brain results in the integration of many ways of knowing.

Despite significant advances in research there is still much to learn about the interactive brain function although specific areas of the brain are associated with particular functions. The cerebrum sector for example is, commonly referred to as the thinking cap, and appears to have a more general function. There appears to be a two-way relationship between the working of the cerebrum and the task upon which it is engaged. Cognitive psychology is concerned with the processes involved in thinking, (i.e. knowing, remembering, perceiving, attending) and La Francois suggests the cognitive view of intelligence as being like a box of tools that we can use to play a game of cognition (thinking): we may not all have the same tools in our kit, we can all certainly improve how we use them.

If teachers gain an understanding of their own preferred modes of processing information and, of ways of knowing, then they can utilize this knowledge when designing for learning and make clear the type of thinking that is required to complete the task employing explicit strategies to support and introduce new ways of knowing. Classroom observations reveal there is a need for continued professional learning in this area, extending teachers to deepen their own understanding and enhance their application of different modes of processing.

Clark also asserts that thinking and learning are inextricably linked. Moreover when students learn HOW to learn, when they are armed with a wide repertoire of tools to encourage diverse thinking, when they are tutored on the ways in which thinking tools are layered and framed to ensure rigor and deep thinking, thereby enabling and empowering them to stretch their own thinking and learning. When students understand the hierarchy of thinking and are provided with tools to think at a variety of levels they become empowered to stretch their own learning.

If cognition is to be improved, Clarke argues that teachers must make the learners' thinking processes explicit by demonstrating methods which influence the thinking process directly.

Only then are learners made aware of themselves as thinkers and how they process knowledge.

The terms 'learners and thinkers' and 'life long learners' frequently appear in The New Zealand Curriculum. If as educators we are serious about developing 'life long learners' for life long learning; defined as the capacity to innately teach oneself, then thinking is critical for learning and teaching for effective learning needs to provide tools and strategies for learning to think, thinking to learn.

The teaching of subject matter is important in that the learner engages with the concepts, thereby developing deep level understanding. However the learner also needs time to engage with the concept for learning to be meaningful, rather than just iterating information that others have accumulated. The establishment of inquiry learning, plus the advances in technology and access to information has further cemented the need for teaching for effective learning. Teaching thinking is a critical ingredient in all schools delivery as supported in the draft curriculum. Effective learning essentially involves applying the appropriate style of thinking process to the task at hand.

The power of knowing is not a gift given magically to a fortunate few. It is an ability that we must cultivate in our students in order for them to tap their potential for being life long learners. We can teach the brain to think logically/analytically concentrating the thinking in the cerebral cortex and emotionally/ intuitive utilizing the limbic centre.

Being a good thinker involves disciplining attitudes and behaviours. We must equip teachers to equip students with thinking tools and strategies in the areas of creative, critical and caring thinking domains. Good thinking involves behaviours we consciously chose again, and again, and again. From this we develop thinking routines, habits and dispositions. We start to find solutions to problems by using a range of thinking modes rather than our preferred or own perspective. Hence the saying "Sometimes we are not in our right minds."

As Colin Golding, lecture in thinking curriculum, University of Melbourne, states, the teaching of thinking essentially emphasises what is going on inside people's heads. The real key to whether you are a good thinker is how you deal with stuff that you don't know how to deal with. Having been taught algebra for many years practising solving more problems does not make

you a better thinker. Ones thinking ability needs to be stretched and thereby the nature of learning replaces the nature of teaching as the core of the educational experience.

At times we all need to step outside our comfort zone to exercise our thinking ability. As a leader of learners I must model the learning that is expected from others and emphasize the values and behaviours that represent the collective goal of the school. Modelling the thinking skills, thinking processes and the range of thinking tools to support a culture and climate of thinking.

Te Papapa School is very versed at modelling how to read and write and construct oral texts. These same practises of modelling in subject specific areas must be relocated and extended into the province of learning to think, thinkers and learners.

The statement, “To foster thinking we don’t change **what we teach** we change **how we teach**,” is particularly pertinent for teachers at Te Papapa School. The work undertaken with van Hees has altered how English is taught as a subject to new learners of English. Now as the school progresses toward its goal of being an effective learning focused school, rather than just a teaching focus school it remains critical that all current and especially newly appointed teachers need to be onboard with this vision.

To advance the notion that a learner can be taught to think more effectively Te Papapa School is provisioning the learner with tools to stretch their thinking, and broaden their minds to a range of possibilities, encouraging the student to embrace flexibility rather than taking a positional viewpoint

As the teachers understanding of the concepts of teaching thinking skills broadens so can the range of tools accessed to teach thinking be expanded, concurrent with the knowledge that the teaching of thinking is not limited to one single strategy. This understanding is critical if we are committed to the learner acquiring a range of skills for organising, recording and reflecting on their own thinking.

When a school becomes truly committed to developing and maintaining a culture of thinking where teaching thinking places greater emphasis on ‘how we teach’ and ‘how we learn’ rather than what is taught it may be necessary for some experienced teachers to alter the way they relate to their students. When teaching thinking is to become the prime objective of the school the school needs to provide an intensive professional learning for all staff that work directly

with students introducing the language of thinking and then encouraging the use of this language as a natural part of their students learning. Like any change this approach will only be successful if it has the full commitment of all staff who are open to being held accountable by the vision.

For thinking to be adopted as a core value the students have to become aware of their own thinking processes and thereby become self motivated learners able to plan, set priorities, cooperate with each other, justly consider others points of view, express empathy, and moreover grasp understanding of consequences of actions. While it may be unrealistic for a 5 year old to possess these skills it is not unrealistic for the teacher of 5 year olds upwards to model and demonstrate the myriad of skills that will expand their thinking skills when teaching content knowledge. The challenge for Te Papapa is to incorporate teaching strategies that foster both the development of thinking skills and the mastery of subject knowledge in reading, writing and number.

Teaching thinking skills must not be perceived as a discrete area separate from subject knowledge, rather the whole curriculum is the vehicle for instruction in thinking skills. We need to introduce and incorporate the terminology of thinking skills, cognitive thinking, creative, critical and caring thinking from day one in order to impress upon the learner they are here to think plus to reinforce to all the value the school places on thinking

To develop a thinking culture all teachers will need to be tutored and become familiar with a diverse range of thinking strategies so that they may confidently use the tools of teaching thinking incorporated into planned learning activities. The implications being all who work with children will require professional tutoring.

Conclusion

Te Papapa's journey has begun; it can be likened to a trip down the Amazon. In our luggage we have stored some knowledge of the terms describing thinking and learning, a partial understanding of how the brain functions and a number of specific strategies to support a culture and climate of learning to think, in conjunction with thinking to learn. There are many more tools available, but we do not want to overload our luggage at the expense of weighing ourselves down on this journey and we risk tipping out of our canoe. Our journey, like the mighty Amazon, will provide many tributaries to explore; be they categorized as creative, caring or reflective thinking. Simultaneously it is important that as learners we also enjoy and have fun as this journey unfolds.

Like the might river our destination is clear. To evolve the dispositions, attitudes and inclinations that are characteristic of intelligently behaving human beings willingly engrossed in life long learning.

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