Thinking Immersion: Creating a Classroom Culture for Thinkers of the Future

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In an age of substantial educational reform, the teaching and learning of 'thinking skills' are considered to be an integral component of a child's education. Further, they are considered an important factor in developing the skills which may contribute to increased learning outcomes for all learners. Current reform agenda nominate a range of 'thinking skills' and processes that inform essential lifelong learnings and that are supported by the characteristics that all learners should exhibit. At the heart of such prescription is a vision of a future in which 'process' rather than 'knowledge' will be the focus. This paper presents the results of case study research and details one teacher's approach to the provision of thinking skills instruction in a primary school classroom for year-six children. The teaching experiment that was "The Thinking Skills Immersion Program" proved successful. The research revealed effective 'transfer' after instruction for the students of this Trial Classroom. Learners across all strata of academic ability effectively applied new 'thinking understandings' into everyday thinking situations, in addressing real-life problem solving, and in producing evidence of new ways of operating.

A vision for education

When objectives of education are set out in official curriculum documents, frequently the list includes statements such as "teaching children to think for themselves" (National Goals for Schooling in the 21C., 1999; Queensland State Education 2010 Strategy). This goal highlights the essential underlying focus for education and all that stems from it. In fact the New Basics as defined in the (latter) above-mentioned document are understood as:

...essential areas of learning – critical thinking, problem solving and lifelong learning... schools would give assurances that all students would complete specific outcome tasks in these areas...

Further,

Teachers and schools will have wide scope to use productive pedagogies and to use diverse curriculum materials and learning strategies for students to achieve outcomes (QSE, 2010 Strategy, p. 15).

Even more specifically noted in the Years 1–10 Curriculum Framework for Education Queensland Schools Document (2001, p. 1) are the statements,

...education programs will optimize student opportunities to demonstrate knowledge and skills designated as being important for them to engage with changing futures,
and,

In deciding what to include in the curriculum greater value is placed on the knowledges, understandings and skills that will equip students to engage with the future (p. 3).

Indeed, future change necessitates a futures-oriented curriculum and pedagogy. As school education moves away from a curriculum intent on valuing knowledge acquisition to one that values knowledge production as an outcome (Costa, 2001), so too must its approach to the teaching and learning of new skills—essential real-life skills such as complex thinking skills, be examined and reassessed in light of a futures orientation.

The 'real' goals of educational reform

In light of a changing paradigm for education, the new purposes and goals for schooling in the 'information age' of the 21st century are contained within the ideals of the Smart State agenda documents (QSE 2010 Strategy, 1999)—posed as challenge questions—which schools and those educators within them must feel compelled to address.

We should ask ourselves what we do to:

• create a safe, tolerant and disciplined environment for students;
• prepare young people to be active and reflective Australian citizens;
• develop the skills and desire for lifelong learning in our students;
• help students to become active in community, economic and political life; and
• make students confident in their relationships with other cultures both here and abroad (QSE 2010 Strategy, 1999).

As many leading educationalists agree (Beare, 2000; Costa, 2001; de Bono, 1999; Resnick, 1999) the real goals of educational reform are locked into making future generations 'smarter' and more 'thoughtful' than those who went before them. To prepare and propel students into the information age will require a 'thoughtful' curriculum, and schools must therefore, act as the agents of change by finding ways to "elect to include other learnings [thinking] in their curriculum plans" (QSE 2010 Strategy, 1999).

Thinking for the information age

More effective thinking involves the additional components of thinking that are missing from traditional pedagogy, commonly described as lateral, critical and reflective thinking. These styles of thinking are the essential ingredients in the promotion of complete thinking. A complete thinker will be conscious of his/her own thinking, choose a strategy to use in order to solve a problem, or to assist in the creation of new ideas, will reflect continually on his/her thinking and make decisions about its efficacy as they proceed (Langrehr, 2001; de Bono, 1999; Wilson & Wing Jan, 1993).

As the educational paradigm shifts, educators have a responsibility to let go of their obsession with acquiring content knowledge (as an end in itself) and be more willing to view 'content' as a vehicle for developing the broader and more complex goals such as students' efficacy, flexibility, consciousness, interdependence and craftsmanship (Costa & Garmston, 1994).
A pedagogy for thinking
Traditionally stand-alone programs have been used as the sole vehicle for instruction in thinking, and the application of what is learned in the thinking lesson into other areas of academic work, or into everyday thinking in other social situations has been far from adequate (Swartz, 2001). A contrasting approach to helping students improve their thinking is the immersion (sometimes known as infusion) method. This approach infuses thinking into the regular content instruction of the curriculum (Swartz, 2001). It also requires teachers to create a 'culture of thinking' in their classrooms (Woolfolk, 1998) and redesign the way that they teach. The goal is to transform local (pre-determined) curricula into thinking-oriented curricula, whilst also retaining the integrity of their content focus (Swartz, 2001).

The case study

Purposes of the study
Most educational research is driven by the need to change learning approaches in order to maximize educational outcomes, and this particular case study was a classroom-based research investigation of the teaching and learning of thinking skills in one primary school classroom. It had a number of purposes:

- First it sought to trial a classroom-based pedagogy in a Year-six classroom which was suitable for a particular student clientele and purpose.
- Second, it aimed to compare outcomes data from this class at the completion of the trial period, with data collected from a more traditional teaching context, being a different Year-six classroom from within the same school.
- Third, to allow exploration of students’ perceptions regarding themselves and their abilities with the concept of ‘thinking’ both before and after the trial implementation.

The focal question that the teacher/researcher posed at the outset of the trial was: Does a systematic approach to the teaching and learning of thinking skills in a primary classroom context assist children to become more capable and more confident thinkers and learners both within the classroom context and beyond it in their everyday lives?

The school
The case study was undertaken in a suburban primary school located in an affluent socio-economic area of Brisbane. The school guiding philosophy and banner statements proclaim "A School of Excellence and Enrichment" and the staff and students portray a strong sense of pride and commitment to these ideals. In-class enrichment activities are planned for and implemented according to the guidelines contained in the Enrichment Program which are focused around Gardner's (1983) Multiple Intelligences Theory and de Bono's (1982, 1986, 1997) Thinking Skills Strategies. The enhancement of thinking skills across the board is an important school focus.
The trial classroom context
The trial was conducted in one Year-six double-teaching (cooperative) classroom context with 60 students and two classroom teachers. One teacher was also the researcher of the study. The full 'immersion' into a new skills-based approach was considered by her to be a logical approach to trial, given the (perceived) failure of previous models of thinking instruction to demonstrate significant levels of 'transference' in the students' deep and meaningful understandings of 'thinking' over an extended period of time. The teacher/researcher's cooperative teaching partner both supported and was fully involved in the new approaches to pedagogy that were inherent in the 'immersion' program.

The control classroom context
The control classroom was also Year-six, and was similar to the trial classroom in aspects of size, class numbers, cooperative teaching pairs and curriculum focus. As with the trial classroom, the teachers planned, prepared and implemented learning experiences according to the planning requirements and documentation of the Education Department, the school, and the particular needs of the children.

To ensure that 'thinking' had a focus in all classrooms, a range of mandatory theoretical underpinnings and thinking foci were presented to students and applied within the contexts of learning, so that students would develop an awareness and knowledge of strategies in order to inform and stimulate all aspects of their learning. Classroom teachers were cognizant of a range of strategies available for this purpose and were involved in much professional development in order to hone their teaching skills for the delivery of these topics into their classrooms. In the 'control' classroom, teachers planned and taught according to this prescribed formula. The students in this context then, were exposed to a variety of thinking skills and strategies as a result of their programs of instruction. This classroom was, in all aspects, typical of all other classrooms operating in the same way across the school from Years one to seven.

The participant sample
Within the context of the researcher's own classroom, six students, three boys and three girls, were invited to become the participants in the study from this particular context. This representational group consisted of two students (one boy and one girl) from each of three identified capability streams, namely, high-achievers, average-achievers and low-achievers. These participants, as part of the Trial classroom, were incorporated into the teaching and learning experiment, and were fully immersed, along with their classroom peers, into the environment of "The Thinking Skills Classroom".

Using the same conditions for selection, six children from the control context were also invited to participate (with one student later exiting the study). Their role, due to the nature of the project, was less focused in that they were only expected to complete the pre-trial data elicitation process at the beginning of the study and the same procedures at the end of the trial period. In this respect, both groups of participants were involved to the same degree. However, a difference between the two groups was that the Trial group was strategically taught 'thinking' and this was the major focus of all teaching and learning activity that occurred within the context of their learning environment.
The teaching trial

The teaching experiment conducted in the Year-six Trial classroom was centred around the teaching of a wide variety of thinking skills and strategies. These were implemented into all activities across the curriculum and involved much innovation to the teaching curriculum as well. The thinking skills program followed a definitive, logical and sequential teaching structure which was organized around constructivist teaching theory (Brooks & Brooks, 1999) regarding beliefs about student learning and knowledge acquisition. Here students take an autonomous and active role in the learning process, assume responsibility for their behaviour and plan and organize tasks to a satisfactory conclusion. Personal knowledge is built on a firm foundational knowledge base, but students’ individual interpretations that result from creative and critical thinking are more important as these indicate the significant personal understandings (knowledge) that they have made for themselves.

The following table presents an overview of the stages involved in the research study and of the methodologies and methods employed throughout its implementation; including the pre and post trial data elicitation periods and the extensive trial teaching period. Note the key * indicating the stratified representation of the sample from the two teaching contexts involved in the research study.

Table 1
Overview of research methodology and methods

<table>
<thead>
<tr>
<th>RESEARCH ACTIVITIES</th>
<th>METHODOLOGIES</th>
<th>METHODS</th>
<th>PARTICIPANTS</th>
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<tbody>
<tr>
<td>Stage 1 2 weeks</td>
<td>Pre Teaching Trial Data Collection</td>
<td>Ethnography</td>
<td>Categorisation Procedure Repertory Grid Technique</td>
</tr>
<tr>
<td>Stage 2 Teaching Year</td>
<td>The Teaching Trial: as part of normal everyday classroom practice</td>
<td>Action Research Ethnography: participant observation Reflective practitioner / researcher</td>
<td>Teaching thinking Immerging Observing Facilitating Reflecting</td>
</tr>
<tr>
<td>Stage 3 2 weeks</td>
<td>Conclude Teaching Trial Data Collection</td>
<td>Interview Research</td>
<td>Concept Mapping Repertory Grid Technique Interviews</td>
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*Representative participants—one boy and one girl from each of 3 academic strata: High Achievers, Average Achievers and Low Achievers
Curriculum model for "immersion" of thinking skills

Why immersion and what does it mean?

In this changing educational climate, many researchers including these authors, believe that teaching students how to learn and apply thinking skills is an important goal of all classroom instruction. However, effective and skillful thinking is the product of a cumulative developmental process, and not the product of maturity alone (Case, 1992). Not all learners become skillful at thinking if left to their own devices. Gaining competence in thinking takes time and experience. Research has shown that competency is sharply enhanced through instruction that incorporates modelling of skills and strategies in combination with metacognitive reflection. This type of instruction will support skill learning. In The Thinking Skills Classroom explicit skills were taught and learned cumulatively and were practised consistently across the full spectrum of learning opportunities. Thinking skills and attitudes that are essential for all learning were the focus of this particular teaching and learning context.

In a 'thinking' classroom, "education is seen as enculturation, a broad and complex process of acquiring knowledge and understanding" (Woolfolk, 1998, p. 315). However, there are no formulae to follow in order to bring this about, only the creativity and determination of the teacher or teachers involved. To be truly effective the thinking classroom will need to adopt a balanced approach, displaying all three components of a successful thinking skills program namely; teaching for thinking; teaching of thinking; and teaching about thinking (Costa, 2001).

Teaching for thinking means that teachers strive to create classrooms that are conducive to children's thinking by – challenging student's minds, encouraging group collaboration, valuing student's thinking and celebrating and encouraging student's self reflection and growth in thinking ability.

Teaching of thinking includes the skills, strategies and dispositions that will be taught in a direct and explicit manner. The processes of teaching thinking are practiced and applied. There is an exhaustive list of thinking tools and strategies available on the open market. Many excellent strategies that have been used for years can be a useful starting point for any new educator willing to trial the process.

Teaching about thinking consists of four essential components. They are: brain functioning, metacognition, great thinkers and epistemology (Costa, 2001). The interest that children have in finding out about the brain and how they learn is natural and amazing. Brain study is a pre-cursor to formal thinking strategies and skills. Metacognition includes self-awareness on a number of fronts such as preferred learning styles and intelligence 'smarts'. Students need to know about the great thinkers that have influenced their world and of their particular power and significance—these include artists, writers, scholars and thinkers. Epistemology for children includes the study and comparison of the methods and creativity used by great artists, scholars and writers.

Table 2 shows an overview of the strategies and techniques used to achieve immersion in the Thinking Skills Classroom.
Table 2
Techniques to achieve immersion of thinking skills: grounded in constructivist pedagogical theory

<table>
<thead>
<tr>
<th>TEACHING FOR THINKING</th>
<th>TEACHING OF THINKING</th>
<th>TEACHING ABOUT THINKING</th>
</tr>
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<tbody>
<tr>
<td><em>Establish a sound philosophical basis for program</em></td>
<td><em>Begin with the explicit instruction of thinking skills</em></td>
<td><em>Teach – Learning to Learn</em></td>
</tr>
<tr>
<td><em>Teacher develops an enriched environment</em></td>
<td><em>Nurture positive dispositions</em></td>
<td><em>Begin with a study of the human brain – structure and functions</em></td>
</tr>
<tr>
<td><em>Teacher modelling of behaviours and dispositions</em></td>
<td><em>Teach a range of essential thinking skills</em></td>
<td><em>Teach about various Thinking Theorists/ theories e.g., de Bono, Gardner</em></td>
</tr>
<tr>
<td></td>
<td><em>Teach a range of thinking strategies</em></td>
<td></td>
</tr>
<tr>
<td><em>Create a culture for thinking and learning</em></td>
<td><em>Provide opportunities for practice and application</em></td>
<td><em>Costa Goleman</em></td>
</tr>
<tr>
<td><em>Practise a ‘pedagogy for thinking’</em></td>
<td><em>Move on to higher-order thinking skills</em></td>
<td><em>Metacognition – Instruction and practise</em></td>
</tr>
<tr>
<td><em>Foster and encourage group collaboration</em></td>
<td><em>Practise consistently and relate to variety of real-life situations</em></td>
<td><em>Study the world’s Greatest Thinkers</em></td>
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<td></td>
<td><em>Apply across all KLAS</em></td>
<td></td>
</tr>
<tr>
<td><em>Philosophical Inquiry and self reflections</em></td>
<td><em>Introduce metacognitive thinking strategies</em></td>
<td><em>Epistemology for children</em></td>
</tr>
</tbody>
</table>

Teaching “for” thinking

The Teacher’s role in the immersion process

Perhaps the most important aspect of any thinking classroom is the example set by the teachers within the classroom context. Attitudinal change will be evident as effective teachers of thinking constantly strive to bring their words, actions, values, beliefs and goals for students, into harmony. Teachers must model the behaviours and dispositions that they aim to pursue with their students. They must show enthusiasm for thinking, learning, challenges and complex reasoning tasks (Costa, 2001). When the details associated with preparing the thinking skills classroom are attended to, and when a culture for thinking becomes apparent, then the ‘pedagogy for thinking’ will prove successful. The students will be engrossed in the business of thinking and learning and the teachers will be engaged in facilitating the process. This will result in real opportunities for transfer and deep meaningful learning to occur—the ultimate goal for students and teachers alike.

Teaching “of” thinking

The teaching of thinking requires that teachers instruct students directly in the processes of thinking. There are many aspects of thinking to consider here. Essential thinking skills are the life skills that we apply to each and every decision that we make on a daily basis, and they incorporate several ways of knowing something, including perception, reasoning and intuition. Each thinking process is considered and taught in line with student development and the use of a suitable taxonomy is considered imperative in order to link essential skills to higher-order, more complex thinking operations.
After this foundational work the students are ready to learn and practice a wide range of thinking skills and strategies. These include many of de Bono’s (1997) *Direct Attention Thinking Tools,* a variety of creative and critical thinking techniques. Other important features of the Thinking Skills Classroom and essential to the 'immersion' process also include:

- **Mindmapping Technique.** This strategy accelerates learning in a number of ways. It is a useful strategy that assists students to organize copious content material, save time when note taking, improve memory and recall, and allows free scope to creativity.
- **Visual Tools.** A wide variety of organizers, webs, storylines, timelines and concept maps assist students to organize information and ideas and to link patterns, concepts or ideas using words or pictures for easier understanding.
- **Metacognitive Skills.** Costa (2001) suggests that learners need to develop the ability to know what they know and what they don't know. This uniquely human trait, known as the process of metacognition, (should be formally introduced at around the age of 11). A skill that can be learned, metacognition is a key attribute of higher-level process skills and should be considered as an essential feature of any teacher's classroom methodology.

**Teaching "about" thinking**

Strategies considered essential include:

- **Learning to Learn.** Physical brain structure and the functions of its various components. A foundational basis for teaching about learning and the brain.
- **Multiple Intelligences.** When students understand that there are many ways in which they can demonstrate and grow their intelligence, they are comforted to realize that they are indeed intelligent in at least one of the eight or nine ways identified by Gardner (1983). They are then able to define their strengths and weaknesses, and this understanding can become the incentive they need to improve learning in a weaker area. *This theory also contributes to a wider social perspective of understanding and compassion for those peers who display strengths and difficulties different to their own.*
- **A variety of Learning Styles.** Students become aware of the many different learning and thinking modes that influence their own personality and temperament and that impact on their ability to successfully operate and learn in this and other environments. *Again students begin to understand difference as it pertains to friends and peers.*
- **Great Thinkers.** Students in the Thinking Skills Classroom undertake an extensive study of many of the world's greatest thinkers to learn how they have influenced creative and critical thought and have solved many of the world’s greatest mysteries. The range of scientists, artists, musicians, composers, philosophers and others is extensive. *When children study the Great Thinkers’ unique creative drives, their perseverance and willingness to take risks, as well as their determination to succeed, they are inspired to follow by example.*
• **Epistemic Cognition.** Students investigate the methodology used by various disciplines to produce knowledge. For example, begin by comparing the work processes of scientists and artists to gain insights and understandings about how their work processes (and thinking processes) differ. This is interesting for most children, but especially fascinating and empowering for learners who are interested in gaining increased understandings about others' thought processes.

**Results of classroom-based research**

The results of the research study strongly suggest that 'thinking' is indeed a learnable skill, and as such, 'thinking' is capable of being taught, practised and improved. And when sufficient understanding of thinking has been achieved, 'good thinking' can be usefully applied in a range of different contexts, both within and beyond the classroom in which it was first learned. Furthermore, a review on a pedagogy for teaching 'thinking' suggests that students at the very early stages of their formal education should be 'immersed' into a 'culture of thinking' if proper transfer, that is deep and meaningful learning, is to occur (Resnick, 1999). The comparative data obtained from this comparative study confirms the imperative nature of these new understandings. Given the limit on the length of this paper, the results are presented here only in summary form. The details of all results and discussion of the data collected may be found in Hurley (2003).

**Comparisons between trial and control contexts**

**Pre-trial data**

All eleven of the students involved as participants in the study would have begun the school year with a similar background and level of exposure to concepts of thinking. The results of data collection taken at the outset of the trial teaching and learning experiment were very similar from both educational contexts. Generally the students had limited knowledge and understanding of thinking concepts/strategies despite being exposed to them (albeit in a less focused way) throughout their previous school years. However, as a group, they were able to clearly identify the characteristics of effective and ineffective thinkers, and there appeared to be very little difference in understandings between Trial and Control students, across all three levels of academic strata.

**Post-trial data**

The results and findings from the Trial classroom regarding post-trial concept maps, repertory grid, and interviews confirmed growth in thinking knowledge, understanding, and application, and that this growth was associated with the thinking-skills instruction and a focus on 'thinking within the context of the Thinking Skills Classroom. Positive perceptions of self, together with increased confidence in their developing abilities with the concept of thinking enabled all participants to tackle the task of producing a self-initiated 'thinking' map without concern. Students showed strong evidence that they were 'thinking about their own thinking' and that they could apply their new understandings and abilities with 'thinking' to contexts within the classroom, incorporating strategies across all core learning areas, and beyond the classroom into their everyday lives. They showed their enjoyment of thinking, taking it seriously, as they grow more aware of its
application and impact upon every aspect of their lives. They also began to understand
that knowing how to think and how to problem solve has provided them with the skills
and processes deemed necessary for a future of successful learning.

In sharp contrast, the participants from the Control context involved in the
comparative study, showed every indication that they were immobilized in their thinking
abilities. They were stuck in the 'understanding' that thinking was about providing
answers to questions and getting them 'right'. They also believed that 'memory' was what
counted for 'knowledge' and that their teachers would have all the answers for questions
that they wished to pursue. These students had not progressed in their attitudes and
assumptions about 'thinking' because they had not been encouraged or taught to do so.
They have been restricted in their 'thinking' growth because their learning environment
still conformed to, and operated within, an outdated paradigm and pedagogy. This made
it difficult for them to construct their own knowledge and understandings in order to
acquire the deep and meaningful learning that 'effective thinking' can achieve.

Perhaps the most significant of all the results that emerged as a result of this study,
was that the Trial participants of all academic strata, along with and including other Trial
classroom students, were able to indicate improvement in 'thinking' growth as a result of
having been involved in the Trial 'immersion' process. Increasingly it was observed that
the students felt a sense of 'thinking empowerment'. Empowered students are interested,
motivated, positive thinkers, and therefore tend to be more successful. They are more
likely to aim higher and achieve higher levels of academic, creative and social growth,
than those who remain constricted by a teaching and learning environment in which an
outmoded paradigm and pedagogy still prevail.

Because being an 'excellent thinker' is not dependent upon remembering content
knowledge and being able to regurgitate factual answers to content-bound questions,
those children who are not good at remembering facts, but rather are good at reasoning,
questioning and inquiring—will ultimately prove to be highly effective thinkers learners:
the type of learners who are developing the skills and attitudes that they will need to
carry with them into the future. These qualities feature in the 'desired characteristics of
the learner' according to reform agenda documents (QSE 2010 Strategy, 1999) and are
the same qualities that were observable in the participants from the Trial context who
were involved in this study.

References
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